2020-2021 IDAHO CONTENT STANDARDS IN MATHEMATICS REVISION

Detailed Proposed Revisions of the 2017 Idaho Content Standards in Mathematics

IDAHO STATE DEPARTMENT OF EDUCATION

CONTENT AND CURRICULUM | IDAHO CONTENT STANDARDS

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KINDERGARTEN

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Overall suggestions	*Note: Glossary terms identified in each K-2 Standard template by "bold" and mastery standards identified by highlighting.* Practice standards should be included in the grade overview as well as included (perhaps after grade-level standards) with grade-level clarifications Formatting suggestion of highlighting or beginning grade-level standards with the identified mastery standards. **We recommend highlighting major work (green), supporting work (yellow), and where appropriate, ad**ditional work (blue). The color coding would be very beneficial. Adding a grade-level vocabulary **glossary** document would be helpful for clarification for readers of our standards. **Definition of fluency should be included in all appropriate grade levels: Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the distributive property).** Professional development, for both instructors as well as family and community stakeholders, that focus on building procedural fluency through conceptual understanding, especially in the area of "math facts" and in the introduction of "new ideas" in every domain, is strongly encouraged by this group. Supplying information about mathematical progressions (fliers or videos) for parents (parent support documents) is necessary for successful implementation of these standards. Supplying information about mathematical progressions (fliers or videos) for parents (parent support documents) is necessary for successful implementation of these standards.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Counting and Cardinality – K.CC

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Know number names and the count sequence.	**A. Know number names and the count sequence.**	Keep K.CC.A	Meets legislative expectations
1. Count to 100 by ones and by tens.	1. Count to 100 by ones and by tens.	Keep K.CC.A.1	Meets legislative expectations
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	2. Starting at a given number, count forward within 100 and backward within 20.	Revise K.CC.A.2 Starting at a given number, count forward within 100 and backward within 20.	Meets legislative expectations Backward cardinality is included in Florida standards
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).	Keep K.CC.A.3	Meets legislative expectations
Count to tell the number of objects.	**B. Count to tell the number of objects.**	Keep K.CC.B	Meets legislative expectations
4. Understand the relationship between numbers and quantities;	4. Understand the relationship between numbers and quantities;	Keep K.CC.B.4	Meets legislative expectations **Include cardinality in glossary of terms**

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
connect counting to cardinality.	connect counting to cardinality.		
a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	Keep K.CC.B.4a	Meets legislative expectations
b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	Keep K.CC.B.4b	Meets legislative expectations
c. Understand that each successive number name refers to a	c. Understand that each successive number name refers to a	Keep K.CC.B.4c	Meets legislative expectations

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
quantity that is one larger.	quantity that is one larger. Recognize the one more pattern of counting using objects.		MA added last line which is different than Idaho
5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.	5. Given a group of up to 20 objects, count the number of objects in that group and state the number of objects in a rearrangement of that group without recounting given a verbal or written number from 0–20, count out that many objects.	Revise K.CC.B.5 Given a group of up to 20 objects, count the number of objects in that group and state the number of objects in a rearrangement of that group without recounting given a verbal or written number from 0–20, count out that many objects. ***Clarification:*** *Objects can be arranged in a line, a rectangular array, or a circle. For as many as 10 objects, they may be arranged in a scattered configuration.*	Meets legislative expectation Clarification for instruction-things can be arranged in a line, a rectangular array, or a circle FL B.E.S.T. standard
Compare numbers.	**C. Compare numbers.**	Keep K.CC.C	Meets legislative expectations

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.	6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group for groups with up to 10 objects,	Revise K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group for groups with up to 10 objects.	Meets legislative expectation Updated MA standard Removed instructional strategies
7. Compare two numbers between 1 and 10 presented as written numerals.	7. Compare two numbers between 1 and 10 presented as written numerals.	Keep K.CC.C.7	Meets legislative expectation

Operations and Algebraic Thinking – K.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand addition as putting together and adding to, and under- stand subtraction as taking apart and taking from.	**K.OA.A. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**	Keep K.OA.A	Meets legislative expectation

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
1. Represent addition and subtraction with objects, fingers, mental images, drawings[2], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	1. Represent addition and subtraction of two whole numbers within 10.	Revise K.OA.A.1 Represent addition and subtraction of two whole numbers within 10. Use objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	Meets legislative expectation Added "within 10" to address grade-level appropriateness. Removed instructional strategies and suggest the following clarification: Clarification: K.OA.A.1 Use objects, fingers, mental images, drawings,[2] sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	2. Solve addition and subtraction word problems, and add and subtract within 10.	Revise K.OA.A.2 Solve addition and subtraction word problems within 10 by using physical, visual, and symbolic representations.	Meets legislative expectation Removed instructional strategies and suggest the following clarification: Clarification By using objects or drawings to represent the problem, as well as the quantities within the

[2] Drawings need not show details, but should show the mathematics in the problem.

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			problem. Note that fluency within 10 is not expected.
3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	3. Decompose numbers less than or equal to 10 into pairs in more than one way. (Examples of decomposing 5 may include 5 = 2 + 3 and 5 = 4 + 1).	Revise K.OA.A.3 Decompose whole numbers from 1 to 10 into pairs in more than one way by using physical, visual, or symbolic representations. ***Example***: *Decomposing* 5 *may include* $5 = 2 + 3$ *and* $5 = 4 + 1$.	Meets legislative expectation Removed instructional strategies and suggest the following clarifications: Clarification: e.g., by using objects or drawings, and record each decomposition by a drawing or equation Clarification: Find the different ways a number from 0-10 can be represented as the sum of two numbers. Decompose, in general, means to break apart into parts. We've decided to keep the word "decompose" to allow for vertical alignment. It is an example of necessary academic language.

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	4. For any number from 1 to 9, find the number that makes 10 when added to the given number and record the answer.	Revise K.OA.A.4 For a given whole number from 1 to 9, find the number that makes 10 when added to the number by using physical, visual, or symbolic representations.	Meets legislative expectation Removed instructional strategies and suggest the following clarification: Clarification: Create a ten using manipulatives, number lines, models and drawings, and record the answer with models, drawing, or equation.
5. Fluently add and subtract within 5.	5. Fluently add and subtract within 5, including zero.	Keep K.OA.A.5 Added Clarification: Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.	Meets legislative expectation Suggested Mastery Standard Clarification: Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the distributive property).

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Numbers and Operations in Base Ten – K.NBT

Current Idaho Standard	Current Massachusetts standard	Proposed Revision	Rationale for Revision
Work with numbers 11-19 to gain foundations for place value.	**K.NBT.A. Work with numbers 11-19 to gain foundations for place value.**	Keep K.NBT.A	Meets legislative expectation
1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	1. Compose (put together) and decompose (break apart) numbers from 11 to 19 into ten ones and some further ones,	Revise K.NBT.A.1 Compose (put together) and decompose (break apart) numbers from 11 to 19 into ten ones and some further ones, and record each composition or decomposition by using physical, visual, or symbolic representations; understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. ***Example:*** *Recording the decomposition of* 18 *may look like* $18 = 10 + 8$.	Meets legislative expectation Removed instructional strategies and suggest the following clarification: Clarification: Using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. Include compose and decompose in glossary of terms

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Measurement and Data – K.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Describe and compare measurable attributes.	**K.MD.A. Describe and compare measurable attributes.**	Keep K.MD.A	Meets legislative expectation
1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	Keep K.MD.A.1	Meets legislative expectation
2. Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	2. Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.	Revise K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/ "less of" the attribute, and describe the difference. ***Example:*** *Directly compare the heights of two children and describe one child as taller/shorter.*	Meets legislative expectation Removed instructional strategies and suggest the following clarification: ***Clarification:*** For example, directly compare the heights of two children and describe one child as taller/shorter.

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Classify objects and count the number of objects in each category.	**K.MD.B. Classify objects and count the number of objects in each category.**	Keep K.MD.B	Meets legislative expectation
3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	3. Classify objects into given categories; count the numbers of objects in each category (up to and including 10) and sort the categories by count.	Keep K.MD.B.3	Meets legislative expectation

Geometry – K.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	**K.G.A. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).**	Keep K.G.A	Meets legislative expectation
1. Describe objects in the environment using names of shapes and describe the relative positions of these	1. Describe objects in the environment using names of shapes, and describe the relative positions of	Keep K.G.A.1	Meets legislative expectation

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objects using terms such as above, below, beside, in front of, behind, and next to.	these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.		
2. Correctly name shapes regardless of their orientations or overall size.	2. Correctly name shapes regardless of their orientations or overall size.	Keep K.G.A.2	Meets legislative expectation
3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).	3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).	Keep K.G.A.3	Meets legislative expectation
Analyze, compare, create, and compose shapes.	**K.G.B. Analyze, compare, create, and compose shapes.**	Keep K.G.B	Meets legislative expectation
4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g.,	4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g.,	Keep K.G.B.4	Meets legislative expectation

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having sides of equal length).	having sides of equal length).		
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	5. Model shapes in the world by building shapes from components/materials and drawing shapes.	Revise K.G.B.5 Model shapes in the world by building shapes from components/materials and drawing shapes. ***Clarification:*** *Components/materials may include: sticks, clay balls, marshmallows and/or spaghetti.*	Meets legislative expectation Removed instructional strategies and suggest the following clarification: Clarification: **Components/materials may include: sticks and clay balls, marshmallows and spaghetti.**
6. Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"	6. Compose **simple shapes to form larger two-dimensional shapes.**	Revise K.G.B.6 Compose simple shapes to form larger two-dimensional shapes. ***Example:*** *Can you join these two triangles with full sides touching to make a rectangle*	Meets legislative expectation **Included "two-dimensional" to clarify that three-dimensional shapes are not expected.** Removed instructional strategies and suggest the following clarification: Clarification: For example, *"Can you join these two triangles with full sides*

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			touching to make a rectangle?"

FIRST GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Please note overall standards suggestions from the K-2 Subgroup found on the Kindergarten document

Operations and Algebraic Thinking – 1.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and solve problems involving addition and subtraction.	**1.OA.A. Represent and solve problems involving addition and subtraction.**	Keep 1.OA.A	Meets legislative expectations
1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking	1. Use addition and subtraction within 20 to solve word problems.	Revise 1.OA.A.1 Solve addition and subtraction word problems within 20 involving situations of adding to, taking from, putting together, taking	Meets legislative expectations Removed instructional strategies and suggest the following clarification:

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apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.[2]		apart, and comparing, with unknowns in all positions by using physical, visual, and symbolic representations.	Clarification: Problems should involve situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. (See glossary table 1.) Clarification: Solve problems using objects, drawings, and equations (number sentences) with a symbol for the unknown number to represent the problem.
2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.	Revise 1.OA.A.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 by using physical, visual, and symbolic representations.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: By using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
Understand and apply properties of operations and	**1.OA.B. Understand and apply properties of**	Keep 1.OA.B	Meets legislative expectations

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the relationship between addition and subtraction.	**operations and the relationship between addition and subtraction.**		
3. Apply properties of operations as strategies to add and subtract.[3] Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)	3. Apply properties of operations to add. [3]	Revise 1,.OA.B.3 Apply properties of operations to add. ***Examples***: *1) If* $8 + 3 = 11$ *is known, then* $3 + 8 = 11$ *is also known. (commutative property of addition)* *2) To add* $2 + 6 + 4$*, the second two numbers can be added to make a ten, so* $2 + 6 + 4 = 2 + 10 = 12$*. (associative property of addition)*	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: For example, when adding numbers order does not matter. If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known (Commutative property of addition). To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12 (Associative property of addition). When adding zero to a number, the result is the same number (Identity property of zero for addition). Students need not use formal terms for these properties.

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4. Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.	4. Restate a subtraction problem as a missing addend problem using the relationship between addition and subtraction. *For example, the equation 12 – 7 = ? can be restated as 7+?=12 to determine the difference is 5.*	Revise 1.OA.B.4 Restate a subtraction problem as a missing addend problem using the relationship between addition and subtraction. ***Example:*** *The equation* $12 - 7 = ?$ *can be restated as* $7 + ? = 12$ *to determine the difference is* 5.	Meets legislative expectations Adopted Florida B.E.S.T. standard and example. We've decided to keep the example that helps define "missing addend" for the non-teacher reader of the standards.
Add and subtract within 20.	**1.OA.C. Add and subtract within 20.**	Keep 1.OA.C	Meets legislative expectations
5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	5. Relate counting to addition and subtraction.	Revise 1.OA.C.5 Relate counting to addition and subtraction. ***Example:*** *When students count on* 3 *from* 4*, they should write this as* $4 + 3 = 7$*. When students count on for subtraction,* 3 *from* 7*, they should connect this to* $7 - 3 = 4$.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: *The counting all strategy requires students to count an entire set and occurs when students are able to hold the "start number" in*

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		Students write "$7-3=$?" and think "I count on $3+?=7$."	*their head and count on or back from that number.* Clarification: *Use various counting strategies, including counting all, counting on, and counting back, with numbers up to 20.*
6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use mental strategies such as counting on; making 10 (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a 10 (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known	6. Demonstrate fluency for addition and subtraction within 10, use strategies to add and subtract within 20.	Revise 1.OA.C.6 Demonstrate fluency for addition and subtraction within 10, use strategies to add and subtract within 20. ***Clarification:*** *Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.*	Recommend to make this a mastery standard Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the distributive property). Clarification: Use mental strategies such as counting

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
equivalent 6 + 6 + 1 = 12 + 1 = 13).			on; making 10 (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a 10 (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). Clarification: As these strategies are repeatedly used in ways that make sense to the students, they begin to understand and internalize the relationships that exist between and among numbers.
Work with addition and subtraction equations.	**1.OA.D. Work with addition and subtraction equations.**	Keep 1.OA.D	Meets legislative expectations

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7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.	Revise 1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. ***Example:*** *Which of the following equations are true and which are false?* $6 = 6, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2$	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Problem types are limited to an equation with no more than four terms. The sum or difference can be on either side of the equal sign, and are limited to sums within 20. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.
8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8	8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers, with the unknown in any position.	Revise 1.OA.D.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers, with the unknown in any position. ***Example:*** *Determine the unknown number that*	Meets legislative expectations Adopting Florida B.E.S.T. standard Removed instructional strategies and suggest the following clarification: Clarification: Instruction begins the development of algebraic thinking skills is

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+ ? = 11, 5 = ? – 3, 6 + 6 = ?.		*makes the equation true in each of the equations* $8+?=11,\ 5=?-3,\ 6+6=?$.	where the symbolic representation of the unknown uses any symbol other than a letter. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ? – 3, 6 + 6 = ?.

Number and Operations in Base Ten – 1.NBT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Extend the counting sequence.	**1.NBT.A. Extend the counting sequence.**	Keep 1.NBT.A	Meets legislative expectations
1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	1. Starting at a given number, count forward and backwards within 120 by ones. Skip count by 2s to 20, by 5s to 100, and by 10s to 120. In this range, read and write numerals and represent a number of	Revise 1.NBT.A.1 Starting at a given number, count forward and backwards within 120 by ones. Skip count by twos to 20, by fives to 100, and by tens to 120. In this range, read and write numerals and represent a	Meets legislative expectations Included skip counting which is found in Florida B.E.S.T. and Texas standards. Clarification: When skip counting, identify patterns in skip counting starting at zero. Note that in 2nd grade skip

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	objects with a written numeral.	number of objects with a written numeral.	counting by 5s, 10s, and 100s will start at any number.
Understand place value.	**1.NBT.B. Understand place value.**	Keep 1.NBT.B	Meets legislative expectations
2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:	2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:	Keep 1.NBT.B.2	Meets legislative expectations
a. 10 can be thought of as a bundle of ten ones — called a "ten."	a. 10 can be thought of as a bundle of ten ones — called a "ten."	Keep 1.NBT.B.2a	Meets legislative expectations
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	Keep 1.NBT.B.2b	Meets legislative expectations
c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six,	c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six,	Keep 1.NBT.B.2c	Meets legislative expectations

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
seven, eight, or nine tens (and 0 ones).	seven, eight, or nine tens (and 0 ones).		
3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons.	Revise 1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Compare using terms less than, greater than, or equal to, and with the symbols <, >, and =.
Use place value understanding and properties of operations to add and subtract.	**1.NBT.C. Use place value understanding and properties of operations to add and subtract.**	Keep 1.NBT.C	Meets legislative expectations
4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings, and strategies based on place value, properties of operations,	4. Add within 100.	Revise 1.NBT.C.4 Add whole numbers within 100 by using physical, visual, and symbolic representations, with an emphasis on place value, properties of operations, and/or the relationship between addition and subtraction.	Meets legislative expectations We restructured this standard from one long standard to a short standard with specific parts for readability and clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.			Removed instructional strategies and suggest the following clarification: Clarification: Use concrete models, drawings, strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning. Clarification: Students should be familiar with multiple strategies but should be able to select and use the strategy with which they most closely connect and understand.
	a. Add a two-digit number and a one-digit number	Keep 1.NBT.C.4a	
	b. Add a two-digit number and a multiple of 10	Keep 1.NBT.C.4b	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	c. Understand that when adding two-digit numbers, combine like base-ten units such as tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	Keep 1.NBT.C.4c	
5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	Revise 1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	Meets legislative expectations Removed confusing and unnecessary language. Removed instructional strategies and suggest the following clarification: Clarification: This standard builds on students' number sense work with tens and ones and requires them to understand and apply the concept of 10 by mentally adding ten more or ten less than any number less than 100. This understanding leads to future place value

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			concepts. It is critical for students to do this without counting or having to write down anything.
6. Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	7. Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences). Example: 70 – 40 can be thought of as 7 tens take away 4 tens or can be rewritten as a missing addend problem 40 + ? = 70.	Revise 1.NBT.C.6 Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 by using physical, visual, and symbolic representations, with an emphasis on place value, properties of operations, and/or the relationships between addition and subtraction; relate the strategy to a written method and explain the reasoning used. ***Example***: $70-40$ *can be thought of as* 7 *tens take away* 4 *tens or can be rewritten as a missing addend problem* $40+?=70$.	Meets legislative expectations An example was included in this standard to clarify and to distinguish the intended difference between this standard and the previous standard. Removed instructional strategies and suggest the following clarification: Clarification: Use concrete models or drawings, strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			Clarification: Students should be familiar with multiple strategies but should be able to select and use the strategy with which they most closely connect and understand. They should also be able to relate their strategy to a written method and explain the reasoning used.

Measurement and Data – 1.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Measure lengths indirectly and by iterating length units.	**1.MD.A. Measure lengths indirectly and by iterating (repeating) length units.**	Revise 1.MD.A **Measure lengths indirectly and by iterating (repeating) length units.**	Meets legislative expectations "Iterating" is a necessary academic language but we felt clarification would be helpful which is why we've included the parenthetical "repeating".
1. Order three objects by length; compare the	1. Order three objects by length; compare the	Keep 1.MD.A.1	Meets legislative expectations

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
lengths of two objects indirectly by using a third object.	lengths of two objects indirectly by using a third object.		This is a part of "major work" in first grade and is a standard worth focusing on. Suggest the following clarifications: Clarification: This is a very important standard with research showing that students' early understanding of spatial reasoning is a strong predictor of success in later mathematical learning. Clarification: Students have to be able to conserve quantity and length in order to understand that the amount doesn't change just because I move the third object from one place to another in order to measure two objects. Clarification: This standard is introducing the idea of transitivity of length. Transitivity can be explicitly discussed: If A is longer than B

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			and B is longer than C, then A must be longer than C as well. Clarification: This standard is also building on a students' understanding of seriation, ordering a set of objects by length which is area students struggle with when asked to sequence a large group of objects (6 or more). **Include iterating in glossary**
2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is	2. Express the length of an object as a whole number of length units.	Revise 1.MD.A.2 Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. **Clarification:** *Limit to contexts where the object being measured is*	Meets legislative expectations Removed instructional strategies and suggest the following clarifications: Clarification: Lay multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps, including use of standard units such as inch-tiles or centimeter tiles.

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
spanned by a whole number of length units with no gaps or overlaps.		*spanned by a whole number of length units with no gaps or overlaps. Include use of standard units such as inch-tiles or centimeter tiles.*	Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. Clarification: This concept is referred to as iteration and is a foundational building block for the concept of area in 3rd Grade. Suggestion: Due to research that shows that the use of a variety of different length units, before students understand the concepts, procedures, and usefulness of measurement, may actually deter students' development. Instead, students might learn to measure correctly with standard units, and even learn to use rulers, before they can successfully use nonstandard units and understand relationships between different units of

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			measurement. It may be useful to include use of non-standard units along with standard units for length in 2nd grade. Note that non-standard units for area are addressed in 3rd grade and non-standard units for volume are addressed in 5th grade. We would like input about the use of non-standard units to measure length from the larger standards group.
Tell and write time.	**1.MD.B. Tell and write time.**	Keep 1.MD.B	Meets legislative expectations Note that this is a real-life problem at this grade level.
3. Tell and write time in hours and half-hours using analog and digital clocks.	3. Tell and write time in hours and half-hours using analog and digital clocks.	Keep 1.MD.B.3	Meets legislative expectations Note that this is a real-life problem at this grade level.
Represent and interpret data.	**1.MD.C. Represent and interpret data.**	Keep 1.MD.C	Meets legislative expectations

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	Keep 1.MD.C.4	Meets legislative expectations
	1.MD.D. Work with money.	Keep 1.MD.D	Meets legislative expectations Note that this is a real-life problem at this grade level.
	5. Identify quarters, dimes, and nickels and relate their values to pennies. Find equivalent values (e.g., a nickel is equivalent to five pennies).	Revise 1.MD.D.5 Identify quarters, dimes, and nickels and relate their values to pennies. Find equivalent values (e.g., a nickel is equivalent to five pennies).	Meets legislative expectations Clarified "all US coins" and simplified the language. Note that this is a real-life problem at this grade level. Suggested clarification: Clarification: This standard focuses on the connection to place value and skip counting.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Geometry – 1.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Reason with shapes and their attributes.	**I.G.A. Reason with shapes and their attributes.**	Keep 1.G.A	Meets legislative expectations
1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes that possess defining attributes.	1. Identify, compare, and distinguish between two- and three-dimensional figures based on their defining attributes.	Revise 1.G.A.1 Compare defining attributes and non-defining attributes of two- and three-dimensional shapes; build and draw shapes that possess defining attributes. ***Clarification:*** *The defining attributes of triangles are closed and three-sided versus non-defining attributes of color, orientation, overall size.*	Meets legislative expectations Adopted Florida B.E.S.T. standard Suggested clarifications: Clarification: For example, students should build and draw shapes that possess defining attributes. The defining attributes of triangles are closed and three-sided versus non-defining attributes of color, orientation, overall size. Clarification: Exploration and discovery of shapes while comparing and contrasting them based on defining attributes is a major focus of this standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.[3]	2. Compose two-dimensional or three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape.	Revise 1.G.A.2 Compose two-dimensional (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. ***Clarification:*** *Students do not need to learn formal names such as "right rectangular prism."*	Meets legislative expectations Removed instructional strategies and suggest the following clarifications: Clarification: Two-dimensional figures are limited to rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles. Three-dimensional figures are limited to cubes, right rectangular prisms, right circular cones, and right circular cylinders. Clarification: Students do not need to learn formal names such as "right rectangular prism."
3. Partition circles and rectangles into two and four equal shares, describe the shares using	3. Partition circles and rectangles into two and four equal shares. Describe the shares using	Revise 1.G.A.3, 1.G.A.3a, 1.G.A.3b Partition circles and rectangles into two and four	Meets legislative expectations

[3] Students do not need to learn formal names such as "right rectangular prism."

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	the words *halves*, *fourths*, and *quarters*.	equal shares. Understand for these examples that decomposing into more equal shares creates smaller shares. a. Describe the shares using the words halves, fourths, and quarters and use the phrases half of, fourth of, and quarter of. b. Describe the whole as two of, or four of the shares.	Removed instructional strategies and suggest the following clarifications: Clarification: Use the phrases *half of*, *fourth of*, and *quarter of.* Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

SECOND GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Please note overall standards suggestions from the K-2 Subgroup found on the Kindergarten document.

Operations and Algebraic Thinking – 2.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and solve problems involving addition and subtraction.	**A. Represent and solve problems involving addition and subtraction.**	Keep 2.OA.A	Meets legislative expectations
1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown	1. Use addition and subtraction within 100 to solve one- and two-step word problems.[1]	Revise 2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions by using physical, visual, and symbolic representations.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Problems should involve situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. (See glossary table 1.)

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
number to represent the problem.[1]			Clarification: Solve problems using drawings and equations (number sentences) with a symbol for the unknown number to represent the problem.
Add and subtract within 20	**A. Add and subtract within 20**	Keep 2.OA.B	Meets legislative expectations
2. Fluently add and subtract within 20 using mental strategies.[2] By end of Grade 2, know from memory all sums of two one-digit numbers.	2. Demonstrate fluency for addition and subtraction within 20 using mental strategies. By the end of Grade 2, recall basic facts to add and subtract within 20 with automaticity.	Revise 2.OA.B2 Demonstrate fluency for addition and subtraction within 20 using mental strategies. By the end of Grade 2, recall basic facts to add and subtract within 20 with automaticity. ***Clarification:*** *Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.* *Students may use mental strategies such as*	Meets legislative expectations Recommend to make this a mastery standard Included Texas standard Removed instructional strategies and suggest the following clarification: Clarification: Use mental strategies such as counting on; making 10 (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a 10 (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g.,

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		counting on; making 10; decomposing a number leading to a 10; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.	knowing the sum 6 + 5 = 11 has related differences of 11 – 5 = 6 and 11 – 6 = 5); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). Clarification: As these strategies are repeatedly used in ways that make sense to the students, they begin to understand and internalize the relationships that exist between and among numbers. Clarification: The word "automaticity" was chosen purposefully as a distinction from memorization. Memorization refers to committing the results of unrelated operations to memory so that thinking through a computation is unnecessary. Automaticity is

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			when answers to facts must be automatic, produced in only a few seconds; thinking about the relationships among the facts is critical. Clarification: Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility. **Grade 2 vocabulary that should be added to a glossary: automaticity, fluency**
Work with equal groups of objects to gain foundations for multiplication.	**B. Work with equal groups of objects to gain foundations for multiplication.**	Keep 2.OA.C	Meets legislative expectations
3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or	3. Determine whether a group of objects (up to 20) has an odd or even number of members and write an equation to	Revise 2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members and write an	Meets legislative expectations Removed instructional strategies and suggest the following clarification:

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	**Current Massachusetts Standard**	**Proposed Revision**	**Rationale for Revision**
counting them by 2s; write an equation to express an even number as a sum of two equal addends.	express an even number as a sum of two equal addends.	equation to express an even number as a sum of two equal addends. ***Clarification:*** *Students may pair objects or count them by twos.*	Clarification: Focus on the connection of recognizing even and odd numbers using skip counting, arrays and patterns in the ones place; pairing objects or count them by 2’s.
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	Keep 2.OA.C.4 Added example: *The total number of objects arranged in a* 2×5 *rectangular array can be found by adding* $2+2+2+2+2$.	Meets legislative expectations Suggested clarifications: Clarification: Focus on making a connection between arrays and repeated addition, which builds a foundation for multiplication. Clarification: Ex. The total number of objects arranged in a 2x5 rectangular array can be found by adding 2+2+2+2+2.

Number and Operations in Base Ten – 2.NBT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand place value.	**Understand place value.**	Keep 2.NBT.A	Meets legislative expectations

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:	1. Compose and decompose three-digit numbers in multiple ways using hundreds, tens and ones. Demonstrate each composition or decomposition with objects, drawings, and expressions or equations.	Revise 2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones. Understand: Added Example ***Example****: The number* 241 *can be expressed as* 2 $hundreds + 4\ tens + 1\ one$ *or as* $24\ tens + 1\ one$ *or as* $241\ ones.$	Meets legislative expectations Adopted Florida B.E.S.T related standard Removed instructional strategies and suggest the following clarifications: Clarification: Ex. The number 241 can be expressed as 2 $hundreds$ + 4 $tens$ + 1 one or as 24 $tens$ + 1 one or as 241 $ones$. Clarification: This standard is also making clear that the word “hundred” is used in multiple ways: 100 ones, 10 tens, or 1 unit that we call “one-hundred”. **Grade 2 vocabulary that should be added to a glossary: compose (put together), decompose (break apart)**

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
a. 100 can be thought of as a bundle of ten tens — called a "hundred."	a.	Remove Chose to keep 2.NBT.A.1a	This is now captured in the overarching standard #1.
b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	b.	Remove Chose to keep 2.NBT.A.1b	This is now captured in the overarching standard #1.
2. Count within 1000; skip-count by 5s, 10s, and 100s.	2. Count within 1000; skip-count by 5s, 10s, and 100s. Identify patterns in skip counting starting at any number.	Keep 2.NBT.A.2	Meets legislative expectations Recommended clarification: Clarification: Students need many opportunities counting, up to 1000, from different starting points (Example: Skip count by 10s starting at 13, or by 5's starting at 215). Multiple experiences skip counting by 5s, 10s, and 100s develops the concept of place value

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	3. Read and write numbers from 0 to 1,000 using standard form, expanded form and word form.	Revise 2.NBT.A.3 Read and write numbers from 0 to 1,000 using standard form, expanded form and word form. ***Example***: *The number two-hundred forty-one written in standard form is* 241 *and in expanded form is* $200 + 40 + 1$.	Meets legislative expectations Adopted Florida B.E.S.T. Standard Recommended clarification: Clarification: For example, the number two-hundred forty-one written in standard form is 241 and in expanded form is 200+40+1.
4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits.	Revise 2.NBT.B.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.	Meets legislative expectations Removed instructional strategies and suggest the following clarifications: Clarification: Instruction should encourage students to use >, =, and < symbols to record the results of comparisons as well as ordering and plotting these numbers on a number line. Clarification: This standard calls for students to apply their knowledge of 2.NBT.1

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			and 2.NBT.3 by examining the value of the digits within two three-digit numbers in order to compare them.
Use place value understanding and properties of operations to add and subtract.	**B. Use place value understanding and properties of operations to add and subtract.**	Keep 2.NBT.B	Meets legislative expectations
5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	5. Add and subtract within 100 by choosing reliable strategies and/or **models**.	Revise 2.NBT.B.5 Fluently add and subtract whole numbers within 100 using understanding of place value and properties of operations. ***Clarification:*** *Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.*	Meets legislative expectations Recommend to make this a mastery standard Removed the word "Fluently" as standard 2.OA.2 defines the expectation of fluency expectations in Grade 2. Simplified standard language to assist in readability. Clarification: Reliable strategies may include strategies based on place value, properties of operations, and/or the relationships between addition and subtraction.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			Reliable models may include use of drawings, number lines, and/or expressions. Clarification: Students should be familiar with multiple strategies but should be able to select and use the strategy with which they most closely connect and understand. Clarification: As these strategies are repeatedly used in ways that make sense to the students, they begin to understand and internalize the relationships that exist between and among numbers. An appropriate strategy should be selected in order to efficiently compute sums and differences. Clarification: Instruction focuses on helping a student choose a method they can use reliably. **Grade 2 vocabulary that should be added to a**

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			glossary: strategies and models
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.	6. Add up to four two-digit numbers using strategies based on place value and properties of operations.	Keep 2.NBT.B.6	Meets legislative expectations Suggested clarification: Clarification: Instruction may include the use of manipulatives, number lines, drawings, recognize numbers may be grouped and added in any order (associative property), and combine numbers in ways that make adding easier (composing and decomposing ones, tens and hundreds when needed).
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method.	7. Add and subtract within 1000.	Revise 2.NBT.B.7 Add and subtract whole numbers within 1000 by using physical, visual, and symbolic representations, with an emphasis on place value, properties of operations, and/or the relationships	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: An appropriate strategy should be selected in order to efficiently compute sums and differences: Use concrete models or drawings

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.		between addition and subtraction. a. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones. b. Understand that sometimes it is necessary to compose or decompose tens or hundreds.	and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	8. Use mental strategies to add or subtract a number that is ten more, ten less, one hundred more and one hundred less than a given three-digit number.	Revise 2.NBT.B.8 Use mental strategies to add or subtract a number that is ten more, ten less, one hundred more and one hundred less than a given three-digit number.	Meets legislative expectations Reworded to make more clear using Florida B.E.S.T. language. Recommended clarification: Clarification: Students should have ample experiences developing proficiency with mental computation. Mentally adding and

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			subtracting 10 or 100 to a given number understanding that they are only changing the tens place (multiples of ten) or the digit in the hundreds place (multiples of 100). For example, the number 236 is one hundred more than 136 because both numbers have the same digit in the ones and tens place, but differ in the hundreds place by one.
9. Explain why addition and subtraction strategies work, using place value and the properties of operations.[3]	9. Explain why addition and subtraction strategies work, using place value and the properties of operations.[3]	Keep 2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.	Meets legislative expectations Suggested clarification: Clarification: Explanations should include the connections between the different representations. Representations can include numbers, words (including mathematical language), pictures, number lines, and/or physical objects. Any/all of these

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			representations should be used as needed.

Measurement and Data – 2.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Measure and estimate lengths in standard units.	**A. Measure and estimate lengths in standard units.**	Keep 2.MD.A	Meets legislative expectations
1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	Keep 2.MD.A.1	Meets legislative expectations Suggested clarification: Clarification: This standard connects the measuring tool to the number line.
2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to	2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to	Keep 2.MD.A.2	Meets legislative expectations Suggested clarification Clarification: Recognize that when an object is measured in two different units, fewer of the larger units are required. When comparing measurements of the same

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the size of the unit chosen.	the size of the unit chosen.		object in different units, measurement conversions are not expected.
3. Estimate lengths using units of inches, feet, centimeters, and meters.	3. Estimate lengths using units of inches, feet, centimeters, and meters.	Keep 2.MD.A.3	Meets legislative expectations
4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	Keep 2.MD.A.4	Meets legislative expectations
Relate addition and subtraction to length.	**B. Relate addition and subtraction to length.**	Keep 2.MD.B	Meets legislative expectations
5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown	5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units.	Revise 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units. ***Clarification:*** *Students may use drawings (such as drawings of rulers) and*	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Using drawings (such as drawings of rulers) and equations with a symbol

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
number to represent the problem.		*equations with a symbol for the unknown number to represent the problem.*	for the unknown number to represent the problem.
6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	Keep 2.MD.B.6	Meets legislative expectations
Work with time and money.	**C. Work with time and money.**	Keep 2.MD.C	Meets legislative expectations
7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	Keep 2.MD.C.7	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Know the relationships of time including seconds in a minute, minutes in an hour, hours in a day, days in a week; days in a

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			month and a year and approximate number of weeks in a month and weeks in a year.
	a.	Remove	It suffices to include this as a clarification in Standard 7 above.
8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies (up to $10), using $ and ¢ symbols appropriately and whole dollar amounts.	Revise 2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies (up to $10), using $ and ¢ symbols appropriately and whole dollar amounts. ***Example***: *A sample question could be, "If you have 2 dimes and 3 pennies, how many cents do you have? If you have $3 and 4 quarters, how many dollars or cents do you have?"*	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: A sample question could be, "If you have 2 dimes and 3 pennies, how many cents do you have? If you have $3 and 4 quarters, how many dollars or cents do you have?" (Students are not expected to use decimal notation.)

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and interpret data.	**D. Represent and interpret data.**	Keep 2.MD.D	Meets legislative expectations
9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object.	Revise 2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Organize and record data on a line plot (dot plot) where the horizontal scale is marked off in whole-number units.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Organize and record data on a line plot (dot plot) where the horizontal scale is marked off in whole-number units.
10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems[4] using information presented in a bar graph.	10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put- together, take-apart, and compare problems[4] using information presented in the graph.	Revise 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in the graph.	Meets legislative expectations Revised to show that problems can be using information for picture or bar graphs. Clarification: See glossary table for problem type explanations.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Geometry – 2.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Reason with shapes and their attributes.	**A. Reason with shapes and their attributes.**	Keep 2.G.A	Meets legislative expectations
1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	1. Identify, categorize, and draw two-dimensional figures based on their defining attributes.	Revise 2.G.A.1	Meets legislative expectations Rewritten using Florida B.E.S.T. Clarification: Figures are limited to triangles, rectangles, squares, pentagons, hexagons, trapezoids, and octagons. Clarification When students categorize two-dimensional figures they should do so based on the number and length of sides, number of vertices, whether they are closed or not and whether the edges are curved or straight. **Grade 2 vocabulary that should be added to a glossary: trapezoid**

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Keep 2.G.A.2	Meets legislative expectations
3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	3. Partition circles and rectangles into two, three, or four equal shares.	Revise 2.G.A.3, 2.G.A.3a, 2.G.A.3b, 2.G.A.3c Partition circles and rectangles into two, three, or four equal shares. Understand for these examples that decomposing into more equal shares creates smaller shares. a. Describe the shares using the words halves, thirds, fourths, and quarter, and use the phrases half of, a third of, a fourth of, and quarter of. b. Describe the whole as two of, three of, or four of the shares.	Meets legislative expectations Removed instructional strategies and suggest the following clarification: Clarification: Describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		c. Recognize that equal shares of identical wholes need not have the same shape.	

THIRD GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Operations and Algebraic Thinking – 3.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and solve problems involving multiplication and division.	**A. Represent and solve problems involving multiplication and division.**	Keep 3.OA.A	
1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a	1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a	Revise 3.OA.A.1 Interpret a product of whole numbers as grouping of sets, e.g., 5 × 7 as five groups of seven objects each.	Adopted the MA standard and revised for complex verbiage. *The highlighted section needs to be indented and

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
context in which a total number of objects can be expressed as 5 × 7.	context in which a total number of objects can be expressed as 5 × 7.		highlighted under the standard.
2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	Revise 3.OA.A.2 Interpret a quotient of whole numbers as equal sharing, e.g., 56 ÷ 8 as the number in each share when 56 objects are split into 8 equal shares, or as the number of shares when 56 objects are split into equal shares of 8 objects each.	Adopted the MA standard and revised for complex verbiage. *The highlighted section needs to be indented and highlighted under the standard.
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities,	3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities,	Revise 3.OA.A.3 Use multiplication and division within 100 to solve word problems involving equal groups, arrays, and measurements by using visual	[1] Go to glossary to review the various problem types. Adopted the MA standard and revised for complex verbiage.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]	e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]	and symbolic representations, with a symbol for an unknown number.	*The highlighted section needs to be indented and highlighted under the standard.
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 =? ÷ 3, 6 × 6 = ?.	4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 =? ÷ 3, 6 × 6 = ?.	Keep 3.OA.A.4	Adopted the Texas standard and added the MA example.
Understand properties of multiplication and the relationship between multiplication and division.	**B. Understand properties of multiplication and the relationship between multiplication and division.**	Keep 3.OA.B	
5. Apply properties of operations as strategies to multiply and divide.[2] Examples: If 6 × 4 = 24 is	5. Apply properties of operations to multiply. Examples: When multiplying numbers	Revise 3.OA.B.5 Apply the properties of operations to multiply and divide.	*[1] Students need not use formal terms for these properties. Students are not

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	order does not matter. If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication). The product 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) When multiplying two numbers either number can be decomposed and multiplied. One can find 8 × 7 by knowing that 7 = 5 + 2 and 8 × 5 = 40 and 8 × 2 = 16, resulting in 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.) When a number is multiplied by 1 the result is the same number. (Identify Property of 1 for multiplication.)	***Clarification:*** *Students need not use formal terms for these properties (identity, communicative, associative, distributive).*	expected to use distributive notation. Adopted the MA standard and revised for complex verbiage.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
6. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	6. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	Revise 3.OA.B.6 Understand division as determining an unknown factor in a multiplication problem.	Adopted the FL standard and revised for complex verbiage using the word "understand" instead of "restate".
Multiply and divide within 100.	**C. Multiply and divide within 100.**	Keep 3.OA.C	
7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two single-digit numbers and the related division facts. For example, the product 4 × 7 = 28 has	Revise 3.OA.C.7, 3.OA.7a, 3.OA.7b Demonstrate fluency for multiplication within 100. a. Demonstrate understanding of strategies that make use of the relationship between multiplication and division or properties of operations. b. Know from memory all products of two single-digit numbers and related division facts.	*Keep as MASTERY STANDARD* Reworked to ensure mastery is clearly stated and addressed complex verbiage. **Clarification: 3.OA.7: Students are fluent when they display accuracy, efficiency, and flexibility. Strategies should focus on developing relationships between numbers, helping students internalize parts of numbers, and developing efficient strategies for fact retrieval.*

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	related division facts 28 ÷ 7 = 4 and 28 ÷ 4 = 7		*Proficiency* rather than fluent/fluency, discuss with large group.
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	**D. Solve problems involving the four operations, and identify and explain patterns in arithmetic.**	Keep 3.OA.D	
8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3]	8. Solve two-step word problems using the four operations for problems posed with whole numbers and having whole number answers. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3]	Revised 3.OA.D.8, 3.OA.D.8a, 3.OA.D.8b Solve two-step word problems involving whole numbers using the four operations. a) Represent these problems using equations with a letter standing for the unknown quantity. b) Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.	Reworked to address complex structure

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	Revise 3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. ***Example:*** *Arithmetic patterns are patterns that change by the same rate, such as adding the same number the series 2, 4, 6, 8, 10 is an arithmetic pattern that increases by 2 between each term.*	Adopted the MA standard and reworked the example to address complex structure.

Numbers and Operations in Base Ten – 3.NBT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use place value understanding and properties of operations to	**A. Use place value understanding and properties of operations to**	Keep 3.NBT.A	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
perform multi-digit arithmetic.[4]	**perform multi-digit arithmetic.**[4]		
1. Use place value understanding to round whole numbers to the nearest 10 or 100.	1. Use place value understanding to round whole numbers to the nearest 10 or 100.	Revise 3.NBT.A.1 Round a whole number to the tens or hundreds place, using place value understanding or a visual representation.	Adopted from NE standards.
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Revise 3.NBT.A.2 Fluently add and subtract whole numbers within 1000 using understanding of place value and properties of operations. ***Clarification:*** *Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.*	*Keep as MASTERY STANDARD* Reworked to address complex structure.
3. Multiply one-digit whole numbers by multiples of 10 in the range 10– 90 (e.g., 9 × 80, 5 × 60) using strategies based on place	3. Multiply one-digit whole numbers by multiples of 10 in the range 10– 90 (e.g., 9 × 80, 5 × 60) using strategies based on place	Revise 3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10– 90 using	Adopted the MA standard and reworked to address complex structure.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
value and properties of operations.	value and properties of operations.	understanding of place value and properties of operations.	

Number and Operations – Fractions[5] – 3.NF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Develop understanding of fractions as numbers.	**A. Develop understanding of fractions as numbers for fractions with denominators 2, 3, 4, 6, and 8.**	Keep Idaho Standard 3.NF.A	
2. Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	3. Understand a fraction 1/b as the quantity formed by 1 part when a whole (a single unit) is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	Revised 3.NF.A.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by one part when a whole (a single unit) is partitioned into b equal parts; understand $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.	Adopted MA standard and restructured to address complex structure.
2. Understand a fraction as a number on the number	2. Understand a fraction as a number on the number	Keep 3.NF.A.2	Leave as is, adopted from MA standards.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
line; represent fractions on a number line diagram.	line; represent fractions on a number line diagram.		
a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.	a. Represent a unit fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the fraction 1/b is located 1/b of a whole unit from 0 on the number line.	Keep 3.NF.A.2a	
b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the	b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the	Keep 3.NF.A.2b	

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Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
number a/b on the number line.	number a/b on the number line.		
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	Revise 3.NF.A.3 Explain equivalence of fractions and compare fractions by reasoning about their size, in limited cases.	
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	Keep 3.NF.A.3a	
b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.	b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.	Revise 3.NF.A.3b Recognize and generate simple equivalent fractions, and explain why the fractions are equivalent, such as by using a visual fraction model. ***Example:*** $\frac{1}{2} = \frac{2}{4}, \frac{4}{6} = \frac{2}{3}$.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.	c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.	Revise 3.NF.A.3c Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. ***Example:*** *Express 3 in the form* $3 = \frac{3}{1}$*; recognize that* $\frac{6}{1} = 6$*; locate* $\frac{4}{4}$ *and 1 at the same point of a number line diagram.*	
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <,	d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <,	Revise 3.NF.A.3d Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize the comparisons are valid only when the two fractions refer to the same whole. Record the results of the comparisons with the symbols $>, =$ and $<$, and justify the conclusion using	Adopted from MA and NE for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
and justify the conclusions, e.g., by using a visual fraction model.	and justify the conclusions, e.g., by using a visual fraction model.	visual representations and/or verbal reasoning.	

Measurement and Data – 3.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	**A. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**	Keep 3.MD.A	
1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	a. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	Revise 3.MD.A.1 Tell and write time to the nearest minute within the same hour and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes. ***Clarification:*** *Students may use tools such as*	Adopted MA and reworked the example for clarity and less complex verbiage.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		clocks, number line diagrams, and tables to solve problems involving time intervals.	
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[6] Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[7]	2. Measure and estimate liquid volumes and masses of objects using standard metric units of grams (g), kilograms (kg), and liters (l).[6] Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same metric units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[7]	Revise 3.MD.A.2 Identify and use the appropriate tools and units of measurement, both customary and metric, to solve one-step word problems using the four operations involving weight, mass, liquid volume, and capacity (within the same system and unit). ***Clarification:*** *Students may use drawings (such as a beaker with a measurement scale) to represent the problem.* *This standard does not include conversions between units. The focus is on measuring and reasonable estimates, use*	Adopted NE for clarity and added customary units.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		benchmarks to measure weight, and capacity.	
Represent and interpret data.	**B. Represent and interpret data.**	Keep 3.MD.B	
3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	Keep 3.MD.B.3	
4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where	5. Generate measurement data by measuring lengths of objects using rulers marked with halves and fourths of an inch. Record and show the data by	Keep 3.MD.B.4	Adopt MA standard as is.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	making a line plot (dot plot), where the horizontal scale is marked off in appropriate units—whole numbers, halves, or fourths.		
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	**C. Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**	Keep 3.MD.C	
5. Recognize area as an attribute of plane figures and understand concepts of area measurement.	5. Recognize area as an attribute of plane figures and understand concepts of area measurement.	Keep 3.MD.C.5	
a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.	a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.	Keep 3.MD.C.5a	
b. A plane figure which can be covered	b. A plane figure which can be covered	Keep 3.MD.C.5b	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
without gaps or overlaps by n unit squares is said to have an area of n square units.	without gaps or overlaps by n unit squares is said to have an area of n square units.		
6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).	Keep 3.MD.C.6	
7. Relate area to the operations of multiplication and addition.	7. Relate area to the operations of multiplication and addition.	Keep 3.MD.C.7	
a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	Keep 3.MD.C.7a	
b. Multiply side lengths to find areas of	b. Multiply side lengths to find areas of	Keep 3.MD.C.7b	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
rectangles with whole- number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	rectangles with whole- number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.		
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.	c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.	Keep 3.MD.C.7c	
d. Recognize area as additive. Find areas of	d. Recognize area as additive. Find areas of	Keep 3.MD.C.7d	Adopted the MA standard and added an example

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	Added example ***Example:*** *Using the distributive property, the area of a shape that is 6 by 7 can be determined by finding the area of the 6x5 section and the 6x2 section and then adding the two products together.*	
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	**D. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.**	Keep 3.MD.D	
8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different	8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different	Keep 3.MD.D.8	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
areas or with the same area and different perimeters.	areas or with the same area and different perimeters.		

Geometry – 3.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Reason with shapes and their attributes.	**A. Reason with shapes and their attributes.**	Keep 3.G.A	
1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals	1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Compare and classify shapes by their sides and angles (right angle/non-right angle). Recognize rhombuses, rectangles,	Revise 3.G.A.1 Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Compare and classify shapes by their sides and angles. Recognize rhombi, rectangles, squares, and trapezoids as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Adopted NE and merged with MA to provide clarity. QUESTION: Most elementary textbooks use the exclusive definition for trapezoid, and the Common Core State Standards do not specify which definition should be used. A sidebar in the geometry progressions states that most colleges/universities use the inclusive definition, but the mathematical goals at that

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
that do not belong to any of these subcategories.	squares, and trapezoids as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.		level are different. So, do we need to add a definition?
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	Revise 3.G.A.2 Partition two-dimensional figures into equal areas, and express the area of each part as a unit fraction of the whole. ***Example:*** *Draw lines to separate a shape into 4 parts with equal area, and describe the area of each part as* $\frac{1}{4}$ *of the area of the shape.*	Merged NE and MA to provide clarity for complex verbiage.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

FOURTH GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Operations and Algebraic Thinking – 4.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use the four operations with whole numbers to solve problems.	**A. Use the four operations with whole numbers to solve problems.**	Keep 4.OA.A	
1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	Revise 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., $35 = 5 \times 7$ as 35 is 5 times as many as 7. Represent verbal multiplicative comparisons as equations.	Adopted MA standard and revised for clarity. Clarification is from Kansas.
2. Multiply or divide to solve word problems involving multiplicative comparison,	2. Multiply or divide to solve word problems involving multiplicative comparison,	Revise 4.OA.A.2	Adopted MA standard and reworked for clarity, and

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1]	e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1]	Multiply or divide to solve word problems involving multiplicative comparison. ***Example***: *If the cost of a red hat is three times more than a blue hat that costs $5 then a red hat cost $15.* ***Clarification:*** *Students may use drawings and equations with a symbol for the unknown number to represent the problem.* *Distinguish between multiplicative comparison from additive comparison.*	added an example from the progression documents.
3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using	3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using	Revise 4.OA.A.3, 4.OA.A.3a, 4.OA.A.3b Solve multistep whole number word problems using the four operations, including problems in which remainders must be interpreted.	Adopted MA standard and revised for clarity. 3rd grade standard updated to include multiplication up to 12 x 12.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Know multiplication facts and related division facts through 12 x 12.	a. Represent these problems using equations with a letter standing for the unknown quantity. b. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	
Gain familiarity with factors and multiples.	**B. Gain familiarity with factors and multiples.**	Keep 4.OA.B	
4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole	4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole	Revise 4.OA.B.4, 4.OA.B.4a, 4.OA.B.4b, 4.OA.B.4c Find all factor pairs for a whole number in the range 1–144. a. Recognize that a whole number is a multiple of each of its factors. b. Determine whether a given whole number in the range 1–144 is a	Adopted MA standard, but changed the range to 1-144.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
number in the range 1–100 is prime or composite.	number in the range 1–100 is prime or composite.	multiple of a given one-digit number. c. Determine whether a given whole number in the range 1–144 is prime or composite.	
Generate and analyze patterns.	**C. Generate and analyze patterns.**	Keep 4.OA.C.	
5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	Revise 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify and explain features of the pattern that were not explicit in the rule itself. ***Example**: Given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the*	Adopted MA standard and revised for clarity. Added an additional clarification statement.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		numbers will continue to alternate in this way.	

Numbers and Operations in Base Ten – 4.NBT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Generalize place value understanding for multi-digit whole numbers.	**A. Generalize place value understanding for multi-digit whole numbers, less than or equal to 1,000,000.**	Keep 4.NBT.A	
1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.	1. Recognize that in a multi-digit whole number, a digit in any place represents ten times as much as it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.	Revise 4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in any place represents ten times as much as it represents in the place to its right	Adopted MA standard and rewrote for more clarity.
2. Read and write multi-digit whole numbers using base-ten numerals, number names, and	2. Read and write multi-digit whole numbers using base-ten numerals, number names, and	Revise 4.NBT.A.2 Read and write multi-digit whole numbers using standard form, expanded form, and	Adopted MA standard and Florida example

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	word form. Compare two multi-digit numbers based on meanings of the digits and each place, recording the results of comparisons with the symbols $>$, $=$, and $<$. ***Example:*** *The number two hundred seventy-five thousand eight hundred two written in standard form is* $275{,}802$ *and in expanded form is* $200{,}000 + 70{,}000 + 5{,}000 + 800 + 2$ *or* $(2 \times 100{,}000) + (7 \times 10{,}000) + (5 \times 1{,}000) + (8 \times 100) + (2 \times 1)$.	
3. Use place value understanding to round multi-digit whole numbers to any place.	3. Use place value understanding to round multi-digit whole numbers to any place.	Revise 4.NBT.A.3 Use place value understanding or visual representation to round multi-digit whole numbers to any place.	Merged MA and NE standards.
Use place value understanding and properties	**B. Use place value understanding and properties of operations to perform**	Keep 4.NBT.B	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
of operations to perform multi-digit arithmetic.	**multi-digit arithmetic on whole numbers less than or equal to 1,000,000.**		
4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Keep 4.NBT.B.4 Added Clarification ***Clarification**: Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.*	MASTERY STANDARD
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Revise 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers. a. Use strategies based on place value and the properties of operations. b. Illustrate and explain the calculation by using equations, rectangular	Reformatted MA standard,

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		arrays, and/or area models.	
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Revise 4.NBT.B.6, 4.NBT.B.6a, 4.NBT.B.6b Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. a. Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. b. Illustrate and explain the calculation by using rectangular arrays, area models, and/or equations. ***Clarification for 4.NBT.B.5 and 4.NBT.B.6:*** *Students should be familiar with multiple strategies but should be able to select*	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		and use the strategy with which they most closely connect and understand, with the ultimate goal of supporting students to use more efficient strategies.	

Number and Operations – Fractions[3] – 4. NF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Extend understanding of fraction equivalence and ordering.	**A. Extend understanding of fraction equivalence and ordering for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**	Keep Idaho Standard 4.NF.A	
1. Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same	1. Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the numbers and sizes of the parts differ even though the two fractions themselves are the same	Revise 4.NF.A.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n\times a}{n\times b}$ by using visual fraction models, with attention to how the numbers and sizes of the parts differ even though the two fractions themselves are the	Adopted MA standard and example from KS.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
size. Use this principle to recognize and generate equivalent fractions.	size. Use this principle to recognize and generate equivalent fractions, including fractions greater than 1.	same size. Use this principle to recognize and generate equivalent fractions, including fractions greater than 1. For example, when a horizontal line is drawn through the center of the model, the number of equal parts doubles and the size of the parts is halved.	
2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the	2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the	Revise 4.NF.A.2, 4.NF.A.2a, 4.NF.A.2b Compare two fractions with different numerators and different denominators, by creating common denominators or numerators, or by comparing to a fraction such as $\frac{1}{2}$. a. Recognize that comparisons are valid only when the two fractions refer to the same whole.	Adopted MA standard and revised to include verbal reasoning as a valid justification strategy.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
conclusions, e.g., by using a visual fraction model.	conclusions, e.g., by using a visual fraction model.	b. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, by using a visual fraction model and/or verbal reasoning.	
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	**B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**	Keep Idaho standard 4.NF.B	
3. Understand a fraction a/b with a > 1 as a sum of fractions 1/b.	3. Understand a fraction a/b with a > 1 as a sum of fractions 1/b.	Keep 4.NF.B.3	
a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. (The whole can be a set of objects).	Revise 4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.	b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using drawings or visual fraction models. Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.	Revise 4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify the conclusions by using a visual fraction model and/or verbal reasoning. ***Example:*** $\frac{3}{8}=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$; $\frac{3}{8}=\frac{1}{8}+\frac{2}{8}$; $2\frac{1}{8}=1+1+\frac{1}{8}=\frac{8}{8}+\frac{8}{8}+\frac{1}{8}$	Adopted MA standard and included verbal reasoning as a valid justification strategy.
c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between	c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between	Revise 4.NF.B.3c Add and subtract mixed numbers with like denominators by replacing mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
addition and subtraction.	addition and subtraction.		
d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Revise 4.NF.B.3d Solve word problems involving addition and subtraction of fractions, including mixed numbers, with the same denominator. Justify the conclusions by using a visual fraction model and/or verbal reasoning.	Adopted MA standard and included verbal reasoning as a valid justification strategy.
4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	Keep 4.NF.B.4	
a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the	a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the	Revise 4.NF.B.4a Understand a fraction a/b as a multiple of 1/b. ***Example:*** *Use a visual fraction model to represent* $\frac{5}{4}$ *as the product*	Adopted MA standard and revised for clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
conclusion by the equation 5/4 = 5 × (1/4).	conclusion by the equation 5/4 = 5 × (1/4).	*$5 \times \frac{1}{4}$, recording the conclusion by the equation $\frac{5}{4} = 5 \times \frac{1}{4}$.*	
b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)	b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)	Revise 4.NF.B.4b Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. ***Example:*** *Use a visual fraction model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$. In general, $n \times \frac{a}{b} = \frac{n \times a}{b}$.*	Adopted MA standard and revised for clarity.
c. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6	c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	Revise 4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number by using visual fraction models and/or equations to represent the problem.	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
× (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)	*For example, if each person at a party will eat ⅜ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	***Example:*** *If each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	
Understand decimal notation for fractions, and compare decimal fractions.	**C. Understand decimal notation for fractions, and compare decimal fractions.**	Keep 4.NF.C	
5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.4 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	Revise 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. ***Example:*** *Express $\frac{3}{10}$ as $\frac{3}{100}$, and add $\frac{3}{10}+\frac{4}{100}=\frac{34}{100}$.*	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		***Clarification**: Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.*	
6. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.4 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	6. Use decimal notation to represent fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	Revise 4.NF.C.6 Use decimal notation to represent fractions with denominators 10 or 100. ***Example:** Rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*	Adopted MA standard and revised for clarity. Added a number sense standard from Florida. keep

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	Revise 4.NF.C.7, 4.NF.C.7a, 4.NF.C.7b Compare two decimals to hundredths by reasoning about their size. a. Recognize that comparisons are valid only when the two decimals refer to the same whole. b. Record the results of comparisons using symbols (>, =, or <) and justify the conclusions using visual representations and/or verbal reasoning. *Clarification: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not required.*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Measurement and Data – 4.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	**A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**	Keep 4.MD.A	Adopted MA standard and revised for clarity.
1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	Revise 4.MD.A.1 Know relative sizes of measurement units within any one system of units. a. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. b. Record measurement equivalents in a two-column table. ***Example**: Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the*	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		number pairs $(1, 12)$, $(2, 24)$, $(3, 36)$, ...	
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Revise 4.MD.A.2, 4.MD.A.2a, 4.MD.A.2b, 4.MD.A.2c Use the four operations to solve word problems involving measurements. a. Include problems involving simple fractions or decimals. b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit. c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. ***Clarification***: *Measurement may include, but not limited to, length,*	Adopted MA standard and revised for clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		area, volume, capacity, mass, weight, and money.	
3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. (Note: When finding areas of a rectangular regions answers will be in square units. For example, the area of a 1 cm x 1 cm rectangular region will be 1 square centimeter (1 cm^2, students are not expected to use this notation.) When finding the perimeter of a rectangular region answers	Revise 4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. ***Example:*** *Find the width of a rectangle room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.* ***Clarification:*** *Students should express their answers in linear (perimeter) and square (area) units. Students are not expected to use the 1 cm^2 notation.*	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	will be in linear units. For example, the perimeter of the region is: 1cm + 1cm + 1cm + 1cm = 4cm or 2(1cm) + 2(1cm) = 4cm).		
Represent and interpret data.	**B. Represent and interpret data.**	Keep 4.MD.B	
4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	4. Make a line plot (dot plot) representation to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots (dot plots). For example, from a line plot (dot plot) find and interpret the difference in length between the longest and shortest specimens in an insect collection.	Revise 4.MD.B.4 Make a line plot (dot plot) to show a set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots (dot plots). ***Example:*** *From a line plot (dot plot) find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Geometric measurement: understand concepts of angle and measure angles.	**C. Geometric measurement: understand concepts of angle and measure angles.**	Keep 4.MD.C	
5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:	5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:	Keep 4.MD.C.5	
a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.	a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.	Revise 4.MD.C.5a An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. ***Example:*** *An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.*	Adopted MA standard and modified for an example.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	Keep 4.MD.C.5b	
6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	Keep 4.MD.C.6	
7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	Keep 4.MD.C.7, 4.MD.C.7a, 4.MD.C.7b Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. a. use an equation with a symbol for the unknown angle measure. b. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the	Adopted MA standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		angle measure of the whole is the sum of the angle measures of the parts.	

Geometry – 4.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	**A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**	Keep 4.G.A.	
1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Keep 4.G.A.1	
2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a	2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a	Keep 4.G.A.2	*where or how does the trapezoid fit? Look at the grades above for clarity. Look at ISAT documents for alignment.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
specified size. Recognize right triangles as a category, and identify right triangles.	specified size. Recognize right triangles as a category, and identify right triangles.		
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Keep 4.G.A.3	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

FIFTH GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Operations and Algebraic Thinking – 5.OA

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Write and interpret numerical expressions.	**A. Write and interpret numerical expressions.**	Keep 5.OA.A	
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols, e.g., (6 x 30) + (6 x ½).	Revise 5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. ***Example:*** $4.5 + (3 \times 2)$ *in word form is, four and five tenths plus the quantity* 3 *times* 2.	Adopted MA standard and added an example from the progression documents.
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without	2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without	Revise 5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret	Adopted MA standard and added an example from the progression documents.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	numerical expressions without evaluating them. ***Example:*** *Express the calculation “Add 8 and 7, then multiply by 2” as* $2 \times (8 + 7)$. *Recognize that* $12 \times (7 + 91)$ *is twelve times as large as* $7 + 91$, *without having to calculate the indicated sum or product.*	
Analyze patterns and relationships.	**B. Analyze patterns and relationships.**	Keep 5.OA.B	Keep
3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting	3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting	Revise 5.OA.B.3, 5.OA.B.3a, 5.OA.B.3b, 5.OA.B.3c Generate two numerical patterns using two given rules. a. Identify apparent relationships between corresponding terms. b. Form ordered pairs consisting of corresponding terms from the two patterns.	Adopted MA standard and reworked for clarity, and added an example from the progression documents.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	c. Graph the ordered pairs on a coordinate plane. ***Example:*** *Given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences. Observe that the terms in one sequence are twice the corresponding terms in the other sequence and explain why this is so.*	

Numbers and Operations in Base Ten – 5.NBT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand the place value system.	**A. Understand the place value system.**	Keep 5.NBT.A	
1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in	1. Recognize that in a multi-digit number, including decimals, a digit in any place represents 10 times	Keep 5.NBT.A.1 Keep standard, add example:	Adopted MA and added an example for clarification.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the place to its right and 1/10 of what it represents in the place to its left.	as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	***Example:*** *In the number* 55.55*, each digit is* 5*, but the value of the digits is different because of the placement.*	
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	Keep 5.NBT.A.2 Keep standard, add example: ***Example:*** 10^2 *which is* $10 \times 10 = 100$*, and* 10^3 *which is* $10 \times 10 \times 10 = 1{,}000$	
3. Read, write, and compare decimals to thousandths.	3. Read, write, and compare decimals to thousandths.	Keep 5.NBT.A.3	
a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g.,	a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g.,	Keep 5.NBT.A.3a Keep standard, add words "for example" ***Example:*** $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 +$	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	$3 \times \frac{1}{10} + 9 \times \frac{1}{100} + 2 \times \frac{1}{1000}$	
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Keep 5.NBT.A.3b	
4. Use place value understanding to round decimals to any place.	4. Use place value understanding to round decimals to any place.	Keep 5.NBT.A.4	
Perform operations with multi-digit whole numbers and with decimals to hundredths.	**B. Perform operations with multi-digit whole numbers and with decimals to hundredths.**	Keep 5.NBT.B	
5. Fluently multiply multi-digit whole numbers using the standard algorithm.	5. Fluently multiply multi-digit whole numbers. (Include two-digit x four-digit numbers and, three-digit x three-digit	Revise 5.NBT.B.5 Demonstrate fluency for multiplication of multi-digit whole numbers using the standard algorithm. Include	MASTERY STANDARD

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	numbers) using the standard algorithm.	two-digit × four-digit numbers and, three-digit × three-digit numbers. ***Clarification**: Fluency is reached when students are proficient, i.e., when they display accuracy, efficiency, and flexibility.*	
6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Revise 5.NBT.B.6, 5.NBT.B.6a, 5.NBT.B.6b Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. a. Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. b. Illustrate and explain the calculation by using equations, rectangular	Reformatted the MA standards.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		arrays, and/or area models.	
7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction and between multiplication and division; relate the strategy to a written method and explain the reasoning used.	Revise 5.NBT.B.7, 5.NBT.B.7a, 5.NBT.B.7b Add, subtract, multiply, and divide decimals to hundredths. a. Use concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction and between multiplication and division. b. Relate the strategy to a written method and explain the reasoning used.	Reformatted the MA standards.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Numbers and Operations – Fractions – 5.NF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use equivalent fractions as a strategy to add and subtract fractions.	**A. Use equivalent fractions as a strategy to add and subtract fractions.**	Keep 5.NF.A	
1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	Revise 5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions to produce an equivalent sum or difference of fractions with like denominators. ***Example:*** $\frac{2}{3}+\frac{5}{4}=\frac{8}{12}+\frac{15}{12}=\frac{23}{12}$ *In general,* $\frac{a}{b}+\frac{c}{d}=\frac{ad+bc}{bd}$.	Adopted MA standard and revised for clarity.
2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction	2. Solve word problems involving addition and subtraction of fractions referring to the same whole (the whole can be a set of objects), including cases of unlike	Revise 5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole (the whole can be a set	Adopted MA Standard and revised for clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
models or equations to represent the problem. Use benchmark fractions and number sense of fraction to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fraction to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	of objects), including cases of unlike denominators. a. Justify the conclusions by using visual fraction models and/or equations to represent the problem. b. Use benchmark fractions and number sense of fraction to estimate mentally and assess the reasonableness of answers. ***Example:*** *Recognize an incorrect result* $\frac{2}{5}+\frac{1}{2}=\frac{3}{7}$, *by observing that* $\frac{3}{7}<\frac{1}{2}$.	
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	**B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**	Keep 5.NF.B	
3. Interpret a fraction as division of the numerator by the denominator (a/b =	3. Interpret a fraction as division of the numerator by the denominator (a/b =	Revise 5.NF.B.3	Adopted MA Standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using visual fraction models and/or equations to represent the problem. ***Example:*** *Interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	Keep 5.NF.B.4	
a. Interpret the product (a/b) × q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)	a. Interpret the product (a/b) × q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model and/or area model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)	Revise 5.NF.B.4a Interpret the product $\left(\frac{a}{b}\right) \times q$ as a parts of a partitions of q into b equal parts, equivalently, as the result of the sequence of operations $a \times q \div b$. ***Example:*** *Use a visual model and/or area model to show* $\left(\frac{2}{3}\right) \times 4 = \frac{8}{3}$*, and create a story context for this equation. Do the same with* $\left(\frac{2}{3}\right) \times \left(\frac{4}{5}\right) = \frac{8}{15}$*. In general,* $\left(\frac{a}{b}\right) \times \left(\frac{c}{d}\right) = \frac{ac}{bd}$.	Adopted MA Standard and revised for clarity.
b. Find the area of a rectangle with fractional side lengths	b. Find the area of a rectangle with fractional side lengths by tiling it	Revise 5.NF.B.4b	Adopted MA Standards and revise for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	Find the area of a rectangle with fractional side lengths. a. Tile it with unit squares of the appropriate unit fraction side lengths. b. Show that the area is the same by tiling as would be found by multiplying the side lengths. c. Represent fraction products as rectangular areas.	
5. Interpret multiplication as scaling (resizing), by:	5. Interpret multiplication as scaling (resizing), by:	Keep 5.NF.B.5	
a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. For	Revise 5.NF.B.5a Comparing the size of a fractional product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	Adopted MA Standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	example, without multiplying tell which number is greater: 225 or ¾ x 225; 11/50 or 3/2 x 11/50?	***Example:** Without multiplying tell which number is greater*: 225 or $\frac{3}{4} \times 225$; $\frac{11}{50}$ or $\frac{3}{2} \times \frac{11}{50}$?	
b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the	b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the	Revise 5.NF.B.5b Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number; explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $\frac{a}{b} = \frac{n \times a}{n \times b}$ to effect of multiplying $\frac{a}{b}$ by 1.	Adopted FL Standard and added part of MA Standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
effect of multiplying a/b by 1.	effect of multiplying a/b by 1.		
6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	Revise 5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers by using visual fraction models and/or equations to represent the problem. ***Example:*** *Evan bought 6 roses for his mother,* $\frac{2}{3}$ *of them were red. How many red roses were there?*	Adopted MA Standards and revised for clarity. Added example from KRich.
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions	7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions	Keep 5.NF.B.7	
a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For	a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a	Revise 5.NF.B.7a Represent division of a unit fraction by a non-zero whole number and compute such quotients using a visual	Modified TX Standard and MA Standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.	story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.	fraction model. Use the relationship between multiplication and division to explain that $\frac{1}{b} \div c = \frac{1}{bc}$ because $\frac{1}{bc} \times c = \frac{1}{b}$. ***Example:*** *Create a story context to explain* $\frac{1}{3} \div 4$, *and use a visual fraction model to show the quotient.*	
b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that	b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.	Revise 5.NF.B.7b Represent division of a whole number by a unit fraction, and compute such quotients using a visual fraction model. Use the relationship between multiplication and division to explain that $a \times \frac{1}{b} = ab$ because $ab \times \frac{1}{b} = a$. ***Example:*** *Create a story context to explain* $4 \div \frac{1}{5}$, *and use a visual fraction*	Modified TX Standard and MA Standard and revised for clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4 ÷ (1/5) = 20 because 20 × (1/5) = 4.		*model to show the quotient.*	
c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	1. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	Revise 5.NF.B.7c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions by using visual fraction models and/or equations to represent the problem. ***Example:*** *How much chocolate will each person get if three people share $\frac{1}{2}$ lb of chocolate equally? How many $\frac{1}{3}$ cup servings are in two cups of raisins?*	Adopted MA Standard and revised for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Measurement and Data – 5.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Convert like measurement units within a given measurement system	**A. Convert like measurement units within a given measurement system**	Keep 5.MD.A	
1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	Revise 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system. Use conversions in solving multi-step, real world problems. ***Example:*** *Convert* 5 *cm to* 0.05 *m.*	revised MA standard for clarity
Represent and interpret data.	**B. Represent and interpret data.**	Keep 5.MD.B	
2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in	2. Make a line plot (dot plot) to display a data set of measurements in fractions of a unit. Use operations on fractions for this grade to solve problems involving information presented in line plot (dot	Revise 5.MD.B.2, 5.MD.B.2a, 5.MD.B.2b Collect, represent, and interpret numerical data, including whole numbers, fractional and decimal values.	Combined MA and FL. Wanted to add computation of mean, mode, median and range into the 5th grade standards per request of 6th grade.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	plot). For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	a. Interpret numerical data, with whole-number values, represented with tables or line plots. b. Use graphic displays of data (line plots (dot plots), tables, etc.) to solve real world problems using fractional data. ***Example:*** *Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	**C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**	Keep 5.MD.C	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	Revise 5.MD.C.3 Recognize volume as an attribute of solid figures and understand volume measurement in terms of cubic units.	Revised MA standard for clarity.
a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	Keep 5.MD.C.3a	
b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	Keep 5.MD.C.3a	
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and nonstandard units.	Revise 5.MD.C.4 Use concrete and/or visual models to measure the volume of rectangular prisms in cubic	Adopt NE standard and revised for clarity

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		units by counting cubic cm, cubic in, cubic ft, and nonstandard units.	
5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	Keep 5.MD.C.5	
a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as	a. Find the volume of a right rectangular prism with whole-number edge lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as	Revise 5.MD.C.5a Find the volume of a right rectangular prism with whole-number edge lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. ***Example:*** *To represent the associative property of multiplication,* $(l \times w) \times h = l \times (w \times h)$.	Reworded for clarity.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
volumes, e.g., to represent the associative property of multiplication.	volumes, e.g., to represent the associative property of multiplication.		
b. Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	b. Apply the formulas V = l × w × h and V = b × h (where b stands for the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	Keep 5.MD.C.5b	
c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping	c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping	Revise 5.MD.C.5c Recognize volume as additive. a. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes	Revised MA standards for clarity

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
parts, applying this technique to solve real world problems.	parts, applying this technique to solve real world problems.	of the non-overlapping parts. b. Apply this technique to solve real world problems.	

Geometry – 5.G

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Graph points on the coordinate plane to solve real-world and mathematical problems.	**A. Graph points on the coordinate plane to solve real-world and mathematical problems.**	Keep 5.G.A	
1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its	1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its	Revise 5.G.A.1, 5.G.A.1a, 5.G.A.1b Describe and understand the key attributes of the coordinate plane. a. Include perpendicular number lines (axes) with the intersection of the lines (the origin (0,0)) arranged to	Adopted MA standard and revised for clarity merging the MA and TX standards.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. b. Understand that the x-coordinate, the first number in an ordered pair, indicates movement parallel to the x-axis starting at the origin; and the y-coordinate, the second number, indicates movement parallel to the y-axis starting at the origin	
2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points	2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points	Revise 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, (x and y both have	Adopted from MA and defined first quadrant as having positive values. Check with 6th grade to see if they want the introduction of negative

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
in the context of the situation.	in the context of the situation.	positive values) and interpret coordinate values of points in the context of the situation.	integers and movement into other quadrants.
Classify two-dimensional figures into categories based on their properties.	**B. Classify two-dimensional figures into categories based on their properties.**	Keep 5.G.B	
3. Understand that attributes belonging to a category of two- dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	3. Understand that attributes belonging to a category of two- dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	Revise 5.G.B.3 Understand that attributes belonging to a category of two- dimensional figures also belong to all of the subcategories of that category. ***Example:*** *All rectangles have four right angles and squares are rectangles, so all squares have four right angles.*	Adopted MA standard and added an example from the progression documents.
4. Classify two-dimensional figures in a hierarchy based on properties.	4. Classify two-dimensional figures in a hierarchy based on properties. For example, all rectangles are parallelograms because they are all quadrilaterals	Revise 5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.	Adopted MA standard and added an example from the progression documents.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	with two pairs of opposite sides parallel.	***Example:*** *All rectangles are parallelograms because they are all quadrilaterals with two pairs of opposite sides parallel.*	

SIXTH GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Ratios and Proportional Relationships– 6.RP

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand ratio concepts and use ratio reasoning to solve problems.	**A. Understand ratio and rate concepts and use ratio and rate reasoning to solve problems.**	Keep	<u>Clearly stated, and age and mathematically appropriate.</u>
1. Understand the concept of a ratio and use ratio language to describe a	1. Understand the concept of a ratio including the distinctions between part:	Keep 6.PR.A.1 New format	The added example highlights a composed unit view of ratios and the added example

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”	part and part: whole and the value of a ratio; part/part and part/whole. Use ratio language to describe a ratio relationship between two quantities. For example: The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every two wings there was one beak; For every vote candidate A received, candidate C received nearly three votes, meaning that candidate C received three out of every four votes or ¾ of all votes.	6.PR.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. ***Examples***: *1) The ratio of wings to beaks in the bird house at the zoo was* $2:1$*, because for every two wings there was one beak.* *2) For every vote candidate A received, candidate C received nearly three votes, meaning that candidate C received approximately three times the number of votes as candidate A or candidate A received approximately* $\frac{1}{3}$ *of the number of votes as candidate C.* Understand the concept of a ratio and use ratio language	supports a multiplicative comparison view of ratios. Both are necessary in grade 6.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		to describe a ratio relationship between two quantities. For example: The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every two wings there was one beak ***For every vote candidate A received, candidate C received nearly three votes, meaning that candidate C received approximately three times the number of votes as candidate A or candidate A received approximately ⅓ of the number of votes as candidate C***	
2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so	2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship, including the use of units. For example: This recipe has a ratio of three cups	Keep 6.RP.A.2 New Format 6.RP.A.2. Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a: b$ with $b \neq 0$, and use rate	The ‘including the use of units’ seems like an unnecessary specification because all ratios are in context - that is, have units. If we think enough people don't understand this idea - then it should be added in a clarification (non-regulatory)

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." *Expectations for unit rates in this grade are limited to non-complex fractions.	of flour to four cups of sugar, so there is ¾ cup of flour for each cup of sugar; We paid $75 for 15 hamburgers, which is a rate of five dollars per hamburger.	language in the context of a ratio relationship. ***Example****: This recipe has a ratio of three cups of flour to four cups of sugar, so there is* $\frac{3}{4}$ *cup of flour for each cup of sugar; We paid* $75 *for* 15 *hamburgers, which is a rate of five dollars per hamburger.* Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship, For example: This recipe has a ratio of three cups of flour to four cups of sugar, so there is ¾ cup of flour for each cup of sugar; We paid $75 for 15 hamburgers, which is a rate of five dollars per hamburger.	document, not in the standards (regulatory document).

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	Keep 6.RP.A.3	Clearly stated, and age and mathematically appropriate.
a. Make tables of equivalent ratios relating quantities with whole- number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	a. Make tables of equivalent ratios relating quantities with whole- number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	Keep 6.RP.A.3a	Clearly stated, and age and mathematically appropriate.
b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if	b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if	Keep 6.RP.A.3b New Format b. Solve unit rate problems including	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	those involving unit pricing and constant speed. ***Example**: If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	PD Note: "At that rate" implies the rate remains constant.
c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	Keep 6.RP.A.3c New format a. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent. ***Example**: 30% of a quantity means $\frac{30}{100}$ times the quantity.*	<u>Clearly stated, and age and mathematically appropriate.</u> PD Note: Standard 3c is a significant standard and takes a substantial amount of time to develop a deep understanding. Important potential for connection to decimal operations.
d. Use ratio reasoning to convert measurement units;	d. Use ratio reasoning to convert measurement units	Keep 6.RP.3d Add example	Example added to increase clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
manipulate and transform units appropriately when multiplying or dividing quantities.	within and between measurement systems; manipulate and transform units appropriately when multiplying or dividing quantities. For example, Malik is making a recipe, but he cannot find his measuring cups! He has, however, found a tablespoon. His cookbook says that 1 cup = 16 tablespoons. Explain how he could use the tablespoon to measure out the following ingredients: two cups of flour, ½ cup sunflower seed, and 1¼ cup of oatmeal.	***Examples**:* *1) Malik is making a recipe, but he cannot find his measuring cups! He has, however, found a tablespoon. His cookbook says that 1 cup = 16 tablespoons. Explain how he could use the tablespoon to measure out the following ingredients: two cups of flour, $\frac{1}{2}$ cup sunflower seed, and $1\frac{1}{4}$ cup of oatmeal.* *2) Jessica is building a doghouse out of wooden planks. If the instructions say the house is 30 inches long, how long would the doghouse be using metric measurements (1 in = 2.54 cm)?*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	e. Solve problems that relate the mass of an object to its volume.	There is no Idaho Standard Remove Massachusetts Standard	Does not directly connect to the other standards in this domain.

The Number System – 6.NS

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	**A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.**	Keep 6.NS.A	Clearly stated, and age and mathematically appropriate.
1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show	1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show	Keep 6.NS.A.1 New format 1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions. e.g., by using visual fraction models and equations to represent the problem.	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	***Examples***: *1) Create a story context for $\frac{2}{3} \div \frac{3}{4}$ and use a visual fraction model to show the quotient.* *2) Use the relationship between multiplication and division to explain that $\frac{2}{3} \div \frac{3}{4} = \frac{8}{9}$ because $\frac{3}{4}$ of $\frac{8}{9}$ is $\frac{2}{3}$. In general, $\frac{a}{b} \div \frac{c}{d} = \frac{ad}{bc}$.* *3) After hiking $6\frac{1}{2}$ miles along the Salmon River, Fred realized he had traveled $\frac{3}{4}$ of the way to his campsite. What is the total distance Fred will end up traveling during his hike?* *4) How many $\frac{3}{4}$ cup servings are in $\frac{2}{3}$ of a cup of yogurt?*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		5) How wide is a rectangular strip of land with length $\frac{3}{4}$ mi and area $\frac{1}{2}$ square mi?	
Compute fluently with multi-digit numbers and find common factors and multiples.	**B. Compute fluently with multi-digit numbers and find common factors and multiples.**	Keep 6.NS.B	Clearly stated, and age and mathematically appropriate.
2. Fluently divide multi-digit numbers using the standard algorithm.	2. Fluently divide multi-digit numbers using the standard algorithm.	Keep 6.NS.B.2	Clearly stated, and age and mathematically appropriate. Formatting: Can the formatting somehow denote this standard as a mastery standard. PD Note: Could be used to review place value concepts also.
3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	2. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Keep 6.NS.B.3	Clearly stated, and age and mathematically appropriate. Formatting: Can the formatting somehow denote

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
			this standard as a mastery standard.
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).	4. Use prime factorization to find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two relatively prime numbers. For example, express 36 + 8 as 4(9 + 2).	Keep Idaho standard discard Massachusetts standard New format 6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. ***Example:*** *Express* $36 + 8$ *as* $4(9 + 2)$.	We simplified the language from the changes Massachusetts made in 2017.
Apply and extend previous understandings of numbers to the system of rational numbers.	**C. Apply and extend previous understandings of numbers to the system of rational numbers.**	Keep 6.NS.C	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, and positive/negative electric charge). Use positive and negative numbers (whole numbers, fractions, and decimals) to represent quantities in real-world contexts, explaining the meaning of zero in each situation.	Replace with: 6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers (including fractions and decimals) to represent quantities in real-world contexts, explaining the meaning of zero in each situation. ***Examples****: Temperature above/below zero, elevation above/below sea level, credits/debits, and positive/negative electric charge* Massachusetts standard Understand that positive and negative numbers are used together to describe quantities having opposite directions or values Use	Removed whole numbers from the parenthetical because integers are assumed and the parenthetical ensures people understand it includes these number sets. Formatting Note: Do we need consistency in the use of 'for example', 'such as', etc.? Our recommendation would be to consider this K-12

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		positive and negative numbers (including fractions and decimals) to represent quantities in real-world contexts, explaining the meaning of zero in each situation. Add examples	
6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	Keep 6.NS.C.6	Clearly stated, and age and mathematically appropriate.
a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the	a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the	Keep 6.NS.C.6a	Clearly stated, and age and mathematically appropriate. PD Note: Zero being its own opposite might be an interesting discussion point.

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
opposite of a number is the number itself, e.g., −(−3) = 3, and that 0 is its own opposite.	opposite of a number is the number itself, e.g., −(−3) = 3, and that 0 is its own opposite.		
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	Keep 6.NS.C.6b	Clearly stated, and age and mathematically appropriate.
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and	c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and	Keep 6.NS.C.6c	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
other rational numbers on a coordinate plane.	other rational numbers on a coordinate plane.		
7. Understand ordering and absolute value of rational numbers.	7. Understand ordering and absolute value of rational numbers.	Keep 6.NS.C.7	<u>Clearly stated, and age and mathematically appropriate.</u>
a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.	a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.	Keep 6.NS.C.7a New format 6.NS.C.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. ***Examples**: Interpret $-3.7 > -7\frac{1}{2}$ as a statement that -3.7 is located to the right of $-7\frac{1}{2}$ on a number line oriented from left to right.* For example, interpret –3.7 > –7 ½ as a statement that –3.7 is located to the right of –7 ½	Adjusted to clarify expectations that integers, decimals, and fractions can be interchanged in usage.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		on a number line oriented from left to right.	
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3°C > –7°C to express the fact that –3°C is warmer than –7°C.	b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write 3° C > –7° C to express the fact that 3° C is warmer than –7° C.	Keep 6.NS.C.7b New format 6.NS.C.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. ***Example**: Write −3°C> −7°C to express the fact that −3°C is warmer than −7° C.*	Standard modified to add clarity that the inequality should read: -3° C > –7° C.
c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –	c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –	Keep 6.NS.C.7c New Format 6.NS.C.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.	<u>Clearly stated, and age and mathematically appropriate.</u>

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
30 dollars, write |–30| = 30 to describe the size of the debt in dollars.	30 dollars, write |–30| = 30 to describe the size of the debt in dollars.	***Example**: For an account balance of -30 dollars, write $\lvert -30 \rvert = 30$ to describe the size of the debt in dollars.*	
d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.	d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.	Keep 6.NS.C.7d New format 6.NS.C.7d Distinguish comparisons of absolute value from statements about order. ***Example**: Recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.*	Clearly stated, and age and mathematically appropriate.
8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points	8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points	Keep 6.NS.C.8 Add example 6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of	Added a real-world example to give clarity to the standard.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
with the same first coordinate or the same second coordinate.	with the same first coordinate or the same second coordinate.	coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. ***Examples***: *Samuel draws a coordinate plane on a map of his neighborhood. He found that the distance between two consecutive whole number points is one block. His house is located at* $(-4, 6)$, *and his school is located at* $(-4, -3)$. *How many blocks are between Samuel's house and school?* For example, Samuel draws a coordinate plane on a map of his neighborhood. He found that the distance between two consecutive whole number points is one block. His house is located at (-4,6), and his school is located at (-	

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		4,-3). How many blocks are between Samuel's house and school?	

Expressions and Equations – 6.EE

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Apply and extend previous understandings of arithmetic to algebraic expressions.	**A. Apply and extend previous understandings of arithmetic to algebraic expressions.**	Keep 6.EE.A	Clearly stated, and age and mathematically appropriate.
1. Write and evaluate numerical expressions involving whole-number exponents.	1. Write and evaluate numerical expressions involving whole-number exponents.	Keep 6.EE.A.1	Clearly stated, and age and mathematically appropriate.
2. Write, read, and evaluate expressions in which letters stand for numbers.	2. Write, read, and evaluate expressions in which letters stand for numbers.	Keep 6.EE.A.2	Clearly stated, and age and mathematically appropriate.
a. Write expressions that record operations with numbers and with letters standing for	a. Write expressions that record operations with numbers and with letters standing for	Keep 6.EE.A.2a New format 6.EE.A.2a Write expressions that record operations with	Clearly stated, and age and mathematically appropriate.

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
numbers. For example, express the calculation "Subtract y from 5" as 5 – y.	numbers. For example, express the calculation "Subtract y from 5" as 5 – y.	numbers and with letters standing for numbers. ***Example:*** *Express the calculation "Subtract y from 5" as $5 - y$.*	
b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.	b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.	Keep 6.EE.A.2b New format 6.EE.A.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. ***Example:*** *Describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.*	Clearly stated, and age and mathematically appropriate.
c. Evaluate expressions at specific values of their variables. Include expressions	c. Evaluate expressions at specific values of their variables. Include expressions	Keep 6.EE.A.2c modify first example and add additional example.	Added context with rationale numbers

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole- number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = ½.	that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole- number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s^3 and A = 6 s^2 to find the volume and surface area of a cube with sides of length s = ½.	6.EE.A.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). ***Examples:*** *1) Use the formulas $V = s^3$ and $A = 6s^2$ to find the volume (V) and surface area (A) of a cube with sides of length $s = \frac{1}{2}$.* *2) The formula for finding the perimeter of a rectangle is $P = 2l + 2w$. Find the perimeter of a rug that measures 7.5 ft by 9.5 ft.*	

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume (V) and surface area (A) of a cube with sides of length s = ½. ***The formula for finding the perimeter of a rectangle is P=2l+2w. Find the perimeter of a rug that measures 7.5 ft by 9.5 ft.***	
3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	Keep 6.EE.A.3 New format 6.EE.A.3 Apply the properties of operations to generate equivalent expressions. ***Examples:*** *1) Apply the distributive property to the expression $3(2+x)$ to produce the equivalent expression $6+3x$.* *2) Apply the distributive property to the expression $24x+18y$ to produce the*	<u>Clearly stated, and age and mathematically appropriate.</u>

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		equivalent expression $6(4x + 3y)$. *3) Apply properties of operations to* $y + y + y$ *to produce the equivalent expression* $3y$.	
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.	Keep 6.EE.A.4 New format 6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). ***Example:*** *The expressions* $y + y + y$ *and* $3y$ *are equivalent because they name the same number regardless of the numeric value of* y.	Clearly stated, and age and mathematically appropriate.

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Reason about and solve one-variable equations and inequalities.	**B. Reason about and solve one-variable equations and inequalities.**	Keep 6.EE.B	<u>Clearly stated, and age and mathematically appropriate.</u>
5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	Keep 6.EE.B.5	<u>Clearly stated, and age and mathematically appropriate.</u>
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose	6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose	Keep 6.EE.B.6	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
at hand, any number in a specified set.	at hand, any number in a specified set.		
7. Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	7. Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	Keep 6.EE.B.7	<u>Clearly stated, and age and mathematically appropriate.</u>
8. Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	8. Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	Rewrite 6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Move to 6.EE.B.8a and 6.EE.B.8b	<u>Clearly stated, and age and mathematically appropriate.</u>

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Add 6.EE.B.8a Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.	
		Add 6.EE.B.8b Represent solutions of such inequalities on number line diagrams.	
Represent and analyze quantitative relationships between dependent and independent variables.	**C. Represent and analyze quantitative relationships between dependent and independent variables.**	Rewrite 6.EE.C **6.EE.C Represent and analyze quantitative relationships between two variables.** **Represent and analyze quantitative relationships between two variables.**	Removed the focus on independent and dependent variables, and increased the focus on the relationship between two variables which is a focus of proportional reasoning in grade 6.
9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one	9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one	Rewrite 6.EE.C.9 9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write	Removed the focus on independent and dependent variables, and increased the focus on the relationship between two variables which

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	equations to represent the relationship between the two quantities. Analyze the relationship using graphs and tables and relate these to the equations. Include an understanding of independent and dependent variables. ***Examples:*** *1) In a problem involving mixing water (W) and orange concentrate (C) to make a consistent flavor of orange juice, list and graph ordered pairs of cups of water and orange concentrate, and write the equations (e.g., $C = \frac{1}{2} \cdot W$ or $W = 2 \cdot C$) to represent the relationship between water (W) and orange concentrate (C).*	is a focus of proportional reasoning in grade 6.

		2) When examining the relationship between time and the growth of a plant. Time tends to be thought of as the independent variable and the height of the plant tends to be thought of as the dependent variable. 9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write equations to represent the relationship between the two quantities. Analyze the relationship using graphs and tables and relate these to the equations. Include an understanding of independent and dependent variables. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		write the equation d = 65t to represent the relationship between distance and time. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write ~~an~~ equations to represent the relationship between the two quantities. ~~express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.~~ Analyze the relationship ~~between the dependent and independent variable~~s using graphs and tables, and relate these to the equations. Include an understanding of independent and dependent variables. F ***For example, in a problem involving mixing water (W) and orange concentrate (C) to make a consistent flavor of***	

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		orange juice, list and graph ordered pairs of cups of water and orange concentrate, and write the equations (e.g., C = ½ * W or W = 2 * C) to represent the relationship between water (W) and orange concentrate (C). ***For example, when examining the relationship between time and the growth of a plant. Time tends to be thought of as the independent variable and the height of the plant tends to be thought of as the dependent variable.***	

Geometry – 6.G

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Solve real-world and mathematical problems involving area, surface area, and volume.	**A. Solve real-world and mathematical problems involving area, surface area, and volume.**	Keep 6.G.A	Clearly stated, and age and mathematically appropriate.

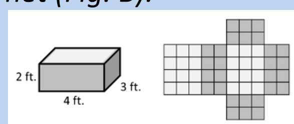
Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

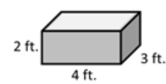
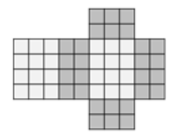
Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	Keep 6.G.A.1	<u>Clearly stated, and age and mathematically appropriate.</u>
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in	2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in	Keep 6.G.A.2	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the context of solving real-world and mathematical problems.	the context of solving real-world and mathematical problems.		
3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	Rewrite 6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side and area by joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side and area by joining points with the same first coordinate or the same second coordinate. Apply these techniques in the	Clarified the expectation to find the area which was implied because this standard falls under the cluster heading that includes area, surface area, and volume.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		context of solving real-world and mathematical problems.	
4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	Keep 6.G.A.4 Add example. 6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. ***Example:*** *Explain how you could find the surface area of a rectangular prism given a three-dimensional representation (Fig. A) or a net (Fig. B).*  Fig. A Fig. B	Example added to clarify the meaning of the two representations stated in the standard.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		For example, Explain how you could find the surface area of a rectangular prism given a three-dimensional representation (Fig. A) or a net (Fig. B).  Fig. A  Fig. B	

Statistics and Probability – 6.SP

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Develop understanding of statistical variability.	**A. Develop understanding of statistical variability.**	Keep 6.SP.A	Clearly stated, and age and mathematically appropriate.
1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For	1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For	Keep 6.SP.A.1 New format 6.SP.A.1Recognize a statistical question as one that anticipates variability in the	Clearly stated, and age and mathematically appropriate.

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	data related to the question and accounts for it in the answers. ***Example:*** *"How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	
2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	2. Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center (median, mean, and/or mode), spread (range, interquartile range), and overall shape.	Rewrite 6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center (median and/or mean), spread (range, interquartile range, and/or mean absolute deviation), and overall shape. The focus of mean absolute deviation (MAD) is visualizing deviations from the mean as a measure of variability as	Removed mode as a measure of center because this is typically used in conjunction with categorical data. Clarified that mean absolute deviation should be included as a topic with a focus on conceptual understanding, as opposed to a focus on calculation, likely with a visual model.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		opposed to a focus on calculating MAD. Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center (median, and/or mean), spread (range, interquartile range), and/or mean absolute deviation), and overall shape. The focus of mean absolute deviation (MAD) is visualizing deviations from the mean as a measure of variability as opposed to a focus on calculating MAD. Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center (median and/or mean), spread (range, interquartile range, and/or mean absolute deviation), and overall shape.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		The focus of mean absolute deviation is visualizing deviations from the mean as a measure of variability as opposed to a focus on calculating MAD.	
3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	Keep 6.SP.A.3	Clearly stated, and age and mathematically appropriate.
Summarize and describe distributions.	**B. Summarize and describe distributions.**	Keep 6.SP.B	Clearly stated, and age and mathematically appropriate.
4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots	4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots a. Read and interpret circle graphs.	Keep Idaho Standard Remove 6.SP.4a from the Massachusetts standard. ~~Read and interpret circle graphs.~~ 6.SP.B.4-Display numerical data in plots on a number	Circle graphs does not connect with the type of data examined in grade 6. This was a standard Massachusetts added. Note: Need to provide some visual examples of the

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		line, including dot plots, histograms, and box plots.	displays, measures of center and measures of variability in a companion document.
5. Summarize numerical data sets in relation to their context, such as by:	5. Summarize numerical data sets in relation to their context, such as by:	Keep 6.SP.B.5	Clearly stated, and age and mathematically appropriate.
a. Reporting the number of observations.	a. Reporting the number of observations.	Keep 6.SP.B.5a	Clearly stated, and age and mathematically appropriate.
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	Keep 6.SP.B.5b	Clearly stated, and age and mathematically appropriate.
c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations	c. Giving quantitative measures of center (median, and/or mean) and variability (range and/or interquartile range), as well as describing any overall pattern and any striking deviations from the overall	Rewrite 6.SP.B.5c Giving quantitative measures of center (median, and/or mean) and variability (range, interquartile range, and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations	Clearly stated, and age and mathematically appropriate. Note: If we create a clarifications document, it will be helpful to highlight the general alignment between mean, mean absolute deviations, and histograms and median, IQR, and box-

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
from the overall pattern with reference to the context in which the data were gathered.	pattern with reference to the context in which the data were gathered.	from the overall pattern with reference to the context in which the data were gathered. Giving quantitative measures of center (median, and/or mean) and variability (range, interquartile range, and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. Giving quantitative measures of center (median, and/or mean) and variability (range, interquartile range, and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the	plots. In addition, clarifying why mode is not highlighted here (but instead with categorical data in elementary school).

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		context in which the data were gathered.	
d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	Keep Add Example 6.SP.B.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. ***Examples:*** *Bobbie is a sixth grader who competes in the* 100 *meter hurdles. In eight track meets during the season, she recorded the following times (to the nearest one hundredth of a second).* $18.11, 31.23, 17.99, 18.25, 17.50, 35.55, 17.44, 17.85$	Clearly stated, and age and mathematically appropriate. Added an example to provide clarity of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Is the mean or the median a better representation of Bobbie's hurdle time? Justify your answer. (From Illustrative Mathematics) Keep standard as written, add example, and cite source. Bobbie is a sixth grader who competes in the 100-meter hurdles. In eight track meets during the season, she recorded the following times (to the nearest one hundredth of a second). 18.11,31.23,17.99,18.25,17.50,35.55,17.44, 17.85 Is the mean or the median a better representation of Bobbie's hurdle time? Justify your answer. (From Illustrative Mathematics)	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

SEVENTH GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Ratios and Proportional Relationship s – 7.RP

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Analyze proportional relationships and use them to solve real-world and mathematical problems.	**A. Analyze proportional relationships and use them to solve real-world and mathematical problems.**	Keep 7.RP.A	Clearly stated, and age and mathematically appropriate.
1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	Keep 7.RP.A.1 New format 7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. ***Example:*** *For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex*	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.	
2. Recognize and represent proportional relationships between quantities.	Recognize and represent proportional relationships between quantities.	Keep 7.RP.A.2	Clearly stated, and age and mathematically appropriate.
a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Keep 7.RP.A.2a	Clearly stated, and age and mathematically appropriate. Format Note: e.g., as opposed to for example
b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of	b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of	Rewrite 7.RP.A.2b Identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal	The intent was to clarify by more fully defining/describing the constant of proportionality.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
proportional relationships.	proportional relationships.	descriptions of proportional relationships. Recognize the constant of proportionality as both the unit rate and as the multiplicative comparison between two quantities. Identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Recognize the constant of proportionality as both the unit rate and as the multiplicative comparison between two quantities. Identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Recognize the constant of proportionality as both the unit rate and as the multiplicative comparison	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		between two quantities ~~to a ratio.~~	
c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.	c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.	Keep New format 7.RP.A.2c Represent proportional relationships by equations. ***Example****: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as* $t = pn$.	<u>Clearly stated, and age and mathematically appropriate.</u>
d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r)	d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r)	Keep 7.RP.A.2d	<u>Clearly stated, and age and mathematically appropriate.</u>

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
where r is the unit rate.	where r is the unit rate.		
3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	3. Use proportional relationships to solve multi-step ratio, rate, and percent problems. For example: simple interest, tax, price increases and discounts, gratuities and commissions, fees, percent increase and decrease, percent error.	Keep 7.RP.A.3 New format 7.RP.A.3 Use proportional relationships to solve multi-step ratio, rate, and percent problems. ***Example****: Simple interest, tax, price increases and discounts, gratuities and commissions, fees, percent increase and decrease, percent error*	Clearly stated, and age and mathematically appropriate.

The Number System – 7.NS

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Apply and extend previous understandings of operations with fractions to add,	**A. Apply and extend previous understandings of operations with fractions to add,**	Keep 7.NS.A	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
subtract, multiply, and divide rational numbers.	**subtract, multiply, and divide rational numbers.**		
1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	1. Apply and extend previous understandings of addition and subtraction to add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	Keep 7.NS.A.1	Clearly stated, and age and mathematically appropriate.
a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	a. Describe situations in which opposite quantities combine to make zero. For example: A hydrogen atom has zero charge because its two constituents are oppositely charged; If you open a new bank account with a deposit of \$30 and then withdraw \$30,	Keep New example 7.NS.A.1a Describe situations in which opposite quantities combine to make zero. ***Example**: If you open a new bank account with a deposit of* \$30.52 *and then withdraw* \$30.52*, you are left with a* \$0 *balance.*	Removed the example because it was not accurate and the new example specifically highlights that decimals are included in this standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	you are left with a $0 balance.	Replace with: Describe situations in which opposite quantities combine to make zero. For example: ~~A hydrogen atom has zero charge because its two constituents are oppositely charged;~~ If you open a new bank account with a deposit of $30.52 and then withdraw $30.52, you are left with a $0 balance.	
b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by	b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by	Rewrite 7.NS.A.1b Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite are additive inverses because they have a sum of 0 (e.g., $12.5 + (-12.5) = 0$). Interpret sums of rational	Clarified the intent of the standard and added an example for additive inverses.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
describing real-world contexts.	describing real-world contexts.	numbers by describing real-world contexts. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite are additive inverses because they have a sum of 0 (e.g., 12.5 + (-12.5) = 0). Interpret sums of rational numbers by describing real-world contexts. Replace with: Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite are additive inverses because they have a sum of 0 (e.g., 12.5 + (-12.5) = 0). Interpret sums of rational	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		numbers by describing real-world contexts	
c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	Keep 7.NS.A.1c	<u>Clearly stated, and age and mathematically appropriate.</u>
d. Apply properties of operations as strategies to add and subtract rational numbers.	d. Apply properties of operations as strategies to add and subtract rational numbers.	Keep 7.NS.A.1.d Add example Apply properties of operations as strategies to add and subtract rational numbers.	Example added to provide clarification on use of rational numbers and integer operations.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Example: $\frac{1}{4} - 5 + \frac{3}{4} + 7 = \left(\frac{1}{4} + \frac{3}{4}\right) + \left((-5) + 5\right) + 2$ For example, ¼ - 5 + ¾ + 7 = (¼ + ¾) + ((-5) + 5) + 2	
2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers.	Keep 7.NS.A.2	<u>Clearly stated, and age and mathematically appropriate.</u>
a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property,	a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property,	Rewrite 7.NS.A.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $\left(-\frac{1}{2}\right)(-1) = \frac{1}{2}$ and	Clarified by adding a rational number example.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $\left(-\frac{1}{2}\right)(-1) = \frac{1}{2}$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Replace with: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		the properties of operations, particularly the distributive property, leading to products such as ~~(-1)(-1) = 1~~ (-½)(-1)=½ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	
b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real- world contexts.	b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real- world contexts.	Keep 7.NS.A.2b	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
c. Apply properties of operations as strategies to multiply and divide rational numbers.	c. Apply properties of operations as strategies to multiply and divide rational numbers.	Keep Add example 7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers. ***Example:*** $-4(0.25 - 1) = \big((-4) \times 0.25\big) + \big((-4) \times (-1)\big) = -1 + 4 = 3$ ~~Add example~~ For example, -4(0.25 - 1) = ((-4) x 0.25) + ((-4) x (-1)) = -1 + 4 = 3	Example added to provide clarification on use of rational numbers and integer operations.
d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	Rewrite 7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates or eventually repeats. Convert a rational number to a decimal using long division;	Redundant to include in zero

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		know that the decimal form of a rational number terminates or eventually repeats. Replace with: Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates ~~in 0s~~ or eventually repeats.	
3. Solve real-world and mathematical problems involving the four operations with rational numbers	3. Solve real-world and mathematical problems involving the four operations with integers and other rational numbers.	Keep 7.NS.A.3 Add Example 7.NS.3 Solve real-world and mathematical problems involving the four operations with integers and other rational numbers. ***Example**: A water well drilling rig has dug to a height of* -60 *feet after one full day of continuous use. If the rig has been running constantly and is*	Added a real-world example to show integers and other rational numbers in context.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		currently at a height of −143.6 feet, for how long has the rig been running? (Modified from Illustrative Mathematics) ~~Add example~~ For example: A water well drilling rig has dug to a height of –60 feet after one full day of continuous use. If the rig has been running constantly and is currently at a height of –143.6 feet, for how long has the rig been running? -modified from Illustrative Mathematics	

Expressions and Equations – 7.EE

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use properties of operations to generate equivalent expressions.	**A. Use properties of operations to generate equivalent expressions.**	Keep 7.EE.A	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	1. Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. For example, 4x + 2 = 2(2x +1) and -3(x – 5⁄3) = -3x + 5.	Keep 7.EE.A.1 New format 7.EE.A.1 Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. ***Example**:* $4x+2=2(2x+1)$ *and* $-3\left(x-\frac{5}{3}\right)=-3x+5$	<u>Clearly stated, and age and mathematically appropriate.</u>
2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."	2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05." A shirt at a clothing store is on sale for 20% off the regular price, "p". The discount can be expressed	Keep 7.EE.A.2 Add example 7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. ***Examples**:* *1)* $a+0.05a=1.05$ *means that "increase by*	Added the language of 'for example' to clarify that there were two separate examples provided.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	as 0.2p. The new price for the shirt can be expressed as p – 0.2p or 0.8p.	*5%" is the same as "multiply by* 1.05*."* *2) A shirt at a clothing store is on sale for* 20% *off the regular price,* p*. The discount can be expressed as* $0.2p$*. The new price for the shirt can be expressed as* $p - 0.2p$ *or* $0.8p$*.* Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05." For example: A shirt at a clothing store is on sale for 20% off the regular price, "p". The discount can be expressed as 0.2p. The new	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		price for the shirt can be expressed as p – 0.2p or 0.8p.	
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	**B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**	Keep 7.EE.B	Clearly stated, and age and mathematically appropriate.
3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman	3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman	Rewrite 7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (integers, fractions, and decimals). Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***Examples***:	Clarified that integers were included. Taking out “using tools strategically.” because it did not provide clarity. In addition, using tools strategically is assumed across standards based on the mathematical practice standards. Add “For example” to the second example to make clear that there are two examples.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	*1) If a woman making* $\$25$ *per hour gets a* 10% *raise, she will make an additional* $\frac{1}{10}$ *of her salary an hour, or* $\$2.50$*, for a new salary of* $\$27.50$*.* *2) If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.* Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (integers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. Replace with: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (integers, fractions, and decimals). Apply properties of operations to	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. For example: If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	
4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities	4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities	Keep 7.EE.B.4	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
to solve problems by reasoning about the quantities.	to solve problems by reasoning about the quantities.		
a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	a. Solve word problems leading to equations of the form px + q = r and p(x ÷ q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	Keep Idaho standard New example 7.EE.B.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. ***Example****: The perimeter of a rectangle is* 54 *cm. Its width is* 6 *cm. What is its length?* Replace with:	Modification better represents the convention that width is the shorter side of a rectangle and length is the longer side.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Solve word problems leading to equations of the form px + q = r and p(x ÷ q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its ~~length~~ width is 6 cm. What is its length ~~width~~?	
b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For	b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For	Keep	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.	example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.		
	c. Extend analysis of patterns to include analyzing, extending, and determining an expression for simple arithmetic and geometric sequences (e.g., compounding, increasing area), using tables, graphs, words, and expressions.	Remove Massachusetts standard 7.EE.B.4c	Removed this standard (that was added by Massachusetts) because (a) analyzing patterns is already embedded as a mathematical practice standard, and (b) it is more fully developed in high school.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Geometry – 7.G

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Draw, construct, and describe geometrical figures and describe the relationships between them.	**A. Draw, construct, and describe geometrical figures and describe the relationships between them.**	Keep 7.G.A	<u>Clearly stated, and age and mathematically appropriate.</u>
1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Keep 7.G.A.1 Add example 7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **Example**: Mariko has an $\frac{1}{4}$ inch scale-drawing ($\frac{1}{4}$ inch=1 foot) of the floor plan of her house. On the floor plan, the scaled dimensions of her rectangular living room are $4\frac{1}{2}$ inches by $8\frac{3}{4}$	Added example to provide clarity on computing actual lengths from scale drawings.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		inches. What is the area of her living room in square feet? For Example: Mariko has an 80:1 scale-drawing of the floor plan of her house. On the floor plan, the dimensions of her rectangular living room are 178 inches by 212 inches. What is the area of her real living room in square feet? • From Illustrative Mathematics	
2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	2. Draw (freehand, with ruler and protractor, and with technology) two-dimensional geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique	Keep 7.G.A.2 Add example, add citation. 7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) two-dimensional geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine unique	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	triangle, more than one triangle, or no triangle.	triangles, more than one triangle, or no triangle. ***Example**: A triangle with side lengths 3 cm, 4 cm, and 5 cm exists. Use a compass and ruler to draw a triangle with these side lengths. (Modified from Engage NY M6L9)* For example, A triangle with side lengths $\mathbf{3\ cm}$, $\mathbf{4\ cm}$, and $\mathbf{5\ cm}$ exists. Use a compass and ruler to draw a triangle with these side lengths. • Modified from Engage NY M6L9	
3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	3. Describe the shape of the two-dimensional face of the figure that results from slicing three-dimensional figures, as in plane sections of right rectangular prisms and	Keep 7.G.A.3	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	right rectangular pyramids.		
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	**B. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**	Keep 7.G.B	Clearly stated, and age and mathematically appropriate.
4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	4. Circles and measurement:	Rewrite 7.G.B.4 Understand the attributes and measurements of circles. Understand the attributes and measurements of circles.	Clarified the expectations for students.
	a. Know that a circle is a two-dimensional shape created by connecting all of the points equidistant from a fixed point called the center of the circle.	Keep 7.G.B.4a	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	b. Understand and describe the relationships among the radius, diameter, and circumference of a circle.	Rewrite 7.G.B.4b Develop an understanding of circle attributes including radius, diameter, circumference, and area and investigate the relationships between each. Replace 7.G.4b, 7.G.4c and 7.G.4e with: Develop an understanding of circle attributes including radius, diameter, circumference, and area and investigate the relationships between each.	The standard was rewritten to clarify the need to investigate relationships between the attributes of circles listed.
	c. Understand and describe the relationship among the radius, diameter, and area of a circle. d. Know the formulas for the area and circumference of a	Rewrite 7.G.B.4c Informally derive and know the formulas for the area and circumference of a circle and use them to solve problems. Replace with 7.G.4b see above	Revised standard is addressed in 7.G.4b. Clarified the expectations to know and also derive the formula.

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	circle and use them to solve problems.	Renumber 7.G.4d as 7.G.4c, and replace with: Informally derive and know the formulas for the area and circumference of a circle and use them to solve problems	
	e. Give an informal derivation of the relationship between the circumference and area of a circle.	Remove Massachusetts standard	Revised standard is addressed in 7.G.4b.
5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write simple equations and use them to solve for an unknown angle in a figure.	Rewrite Add example 7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles to write equations and use them to solve for an unknown angle in a figure. ***Example**: The ratio of the measurement of an angle to its complement is* $1:2$. *Create and solve an*	Removing "simple" as it didn't add any meaning Removed "Multistep problems" for the same reason as above (Does the example need to include writing an equation?)

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		equation to find the measurement of the angle and its complement. (From Engage NY M5L1) Use facts about supplementary, complementary, vertical, and adjacent angles ~~in a multi-step problem~~ to write equations and use them to solve for an unknown angle in a figure. Replace with: Use facts about supplementary, complementary, vertical, and adjacent angles to write equations and use them to solve for an unknown angle in a figure. For example: The ratio of the measurement of an angle to its complement is $1:2$. Create and solve an equation to find the	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		measurement of the angle and its complement. -From Engage NY M5L1	
6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Rewrite 7.G.B.6 Generalize strategies for finding area, volume, and surface areas of two- and three-dimensional objects composed of triangles, quadrilateral, polygons, cubes, and right prims. Solve real-world and mathematical problems in each of these areas. ***Example****: A playground is being updated. Sand underneath a swing needs be at least 15 inches deep. The sand under the swings is currently only 12 inches deep. The rectangular area under the swing set measures 9 feet by 12 feet. How much additional sand will*	Focuses on students using efficient strategies and consistent structures for solving these problems.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		be needed to meet the requirement? (Modified from Illustrative Mathematics) Replace with: Generalize strategies for finding area, volume, and surface areas of two- and three-dimensional objects composed of triangles, quadrilateral, polygons, cubes, and right prims. Solve real-world and mathematical problems in each of these areas. For example, A playground is being updated. Sand underneath a swing needs be at least 15 inches deep. The sand under the swings is currently only 12 inches deep. The rectangular area under the swing set measures 9 feet by 12 feet. How much additional sand will be needed to meet the requirement?	

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		-modified from Illustrative Mathematics	

Statistics and Probability – 7.SP

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use random sampling to draw inferences about a population.	**A. Use random sampling to draw inferences about a population.**	Keep 7.SP.A	Clearly stated, and age and mathematically appropriate.
1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Keep 7.SP.A.1	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	Rewrite 7.SP.A.2 Use data from a random sample about an unknown characteristic of a population. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions, i.e., generate a sampling distribution. ***Example**: Estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.* Replace with: Use data from a random sample about an unknown characteristic of a population.	New standard clarifies the purpose of the standard and actions of students.

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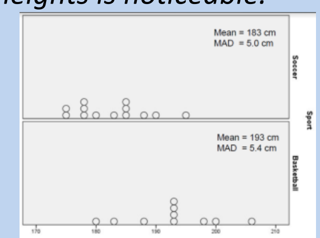
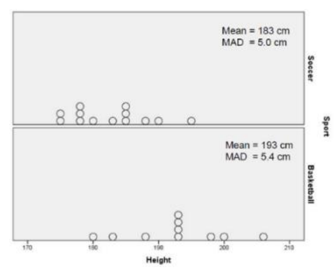
Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions (i.e., generate a sampling distribution). For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	
Draw informal comparative inferences about two populations.	**B. Draw informal comparative inferences about two populations.**	Keep 7.SP.B	Clearly stated, and age and mathematically appropriate.
3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as	3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing	Rewrite 7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the	The modified example and subsequent graph of data clarifies the purpose of this standard.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team and both distributions have similar variability (mean absolute deviation) of about 5 cm. The difference between the mean heights of the two teams (10 cm) is about twice the variability (5 cm) on either team. On a dot plot, the separation between the two distributions of heights is noticeable.	centers by expressing it as a multiple of a measure of variability. ***Example**: The difference in the mean height between players on the basketball team versus the soccer team is 10 cm. This difference in the means - 10 cm - is about twice the variability (mean absolute deviation) on either team (i.e., mean divided by the MAD). On a dot plot, the separation between the two distributions of heights is noticeable.*  Replace with: Informally assess the degree of visual overlap of two	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the difference in the mean height between players on the basketball team versus the soccer team is 10 cm. This difference in the means - 10 cm - is about twice the variability (mean absolute deviation) on either team (i.e., mean divided by the MAD). On a dot plot, the separation between the two distributions of heights is noticeable.* 	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	Keep 7.SP.B.4 New format 7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. ***Example****: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	<u>Clearly stated, and age and mathematically appropriate.</u>
Investigate chance processes and develop, use, and evaluate probability models.	**B. Investigate chance processes and develop, use, and evaluate probability models.**	Keep 7.SP.C	<u>Clearly stated, and age and mathematically appropriate.</u>
5. Understand that the probability of a chance event is a number between 0 and 1 that	5. Understand that the probability of a chance event is a number between 0 and 1 that	Rewrite 7.SP.C.5 Understand that the probability of a chance event	Definition doesn't need to be included in the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	is a number between 0 and 1 that expresses the likelihood of the event occurring. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. ***Example**: The likelihood of drawing a heart from a deck of cards is* 0.25*. The likelihood of flipping a coin and landing on heads is* 0.5*. It is more likely that a flipped coin will land on heads than it is to choose a heart from a deck of cards. (*0.5 *is greater than* 0.25*).* Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. A	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Replace with: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. ~~Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.~~ ~~Add example that covers definition and real life scenario~~ For example: The likelihood of drawing a 4 from a deck of cards is .25. The	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		likelihood of flipping a coin and landing on heads is .5. It is more likely that a flipped coin will land on heads than it is to choose a 4 from a deck of cards. (.5 is greater than .25).	
6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	Rewrite 7.SP.C.6 Approximate the (theoretical) probability of a chance event by collecting data and observing its long-run relative frequency (experimental probability). Predict the approximate relative frequency given the (theoretical) probability. ***Examples**:* *1) When drawing chips out of a bag containing an unknown number of red and white chips, estimate the probability of selecting a particular chip color given* 50 *draws.*	Note: Formatting issue – should we have an (A) and (B) under 6 or should we paste the example after each sentence?

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		2) When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly approximately 200 times, but probably not exactly 200 times. Replace with: Approximate the (theoretical) probability of a chance event by collecting data ~~on the chance process that produces it~~ and observing its long-run relative frequency (experimental probability). ***For example, when drawing chips out of a bag containing an unknown number of red and white chips, estimate the probability of selecting a particular chip color given multiple draws.*** Predict the approximate relative frequency given the (theoretical) probability. ***For example, when rolling a***	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		number cube 600 times, predict that a 3 or 6 would be rolled ~~roughly~~ approximately 200 times, but probably not exactly 200 times.	
7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	Keep 7.SP.C.7	Clearly stated, and age and mathematically appropriate.
a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random	a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random	Keep 7.SP.C.7a	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
from a class, find the probability that Jane will be selected and the probability that a girl will be selected.	from a class, find the probability that Jane will be selected and the probability that a girl will be selected.		
b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?	b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?	Keep 7.SP.C.7b New format 7.SP.C.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. ***Example****: Find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	Keep 7.SP.C.8	Clearly stated, and age and mathematically appropriate.
a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	Keep 7.SP.C.8a	Clearly stated, and age and mathematically appropriate.
b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the	b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the	Keep 7.SP.C.8b	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
sample space which compose the event.	sample space which compose the event.		
c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?	c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?	Keep 7.SP.C.8c New format 7.SP.C.8b Design and use a simulation to generate frequencies for compound events. ***Example***: *Use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

EIGHTH GRADE

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

The Number System – 8.NS

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Know that there are numbers that are not rational, and approximate them by rational numbers.	**A. Know that there are numbers that are not rational, and approximate them by rational numbers.**	Keep 8.NS.A	Clearly stated, and age and mathematically appropriate.
1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Keep 8.NS.A.1	Clearly stated, and age and mathematically appropriate.

2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	Keep 8.NS.A.2 New format and example Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. ***Examples**:* *1) Estimate the value of* $\sqrt{2}$. *2) By truncating the decimal expansion of* $\sqrt{2}$, *show that* $\sqrt{2}$ *is between* 1 *and* 2, *then between* 1.4 *and* 1.5, *and explain how to continue on to get better approximations.*	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Expressions and Equations – 8.EE

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Work with radicals and integer exponents.	**A. Work with radicals and integer exponents.**	Keep 8.EE.A	Clearly stated, and age and mathematically appropriate.
1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 32 × 3–5 = 3–3 = 1/33 = 1/27.	1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, *32 ⍰ 3–5 = 3–3 = 1⁄33 = 1⁄27.*	Keep 8.EE.A.1 New format 8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. ***Example***: $3^2 \times 3^{-5} = 3^{-3} = \left(\frac{1}{3}\right)^3 = \frac{1}{27}$	Clearly stated, and age and mathematically appropriate.
2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect	2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect	Keep 8.EE.A.2	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
cubes. Know that $\sqrt{2}$ is irrational.	cubes. Know that $\sqrt{2}$ is irrational.		
3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.	3. Use numbers expressed in the form of a single digit multiplied by an integer power of 10 to estimate very large or very small quantities, and express how many times as much one is than the other. *For example, estimate the population of the United States as 3 ⍰ 10^8 and the population of the world as 7 ⍰ 10^9, and determine that the world population is more than 20 times larger.*	Rewrite 8.EE.A.3 Use numbers expressed in the form of a single digit multiplied by an integer power of 10 (scientific notation) to estimate very large or very small quantities, and express how many times as much one is than the other. ***Example****: Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.* Use numbers expressed in the form of a single digit multiplied by an integer power of 10 (scientific notation) to estimate very	Clarifying the concept being described with the parenthetical related to scientific notation.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		large or very small quantities, and to express how many times as much one is than the other. Example: Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger. Replace with: Use numbers expressed in the form of a single digit multiplied by an integer power of 10 (scientific notation) to estimate very large or very small quantities, and express how many times as much one is than the other. ***For example, estimate the population of the United States as 3 ⍰ 108 and the population of the world as 7 ⍰ 109, and determine that the world population is more than 20 times larger.***	

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Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Keep 8.EE.A.4 New format 8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology. ***Example***: *Millimeters per year for seafloor spreading*	Clearly stated, and age and mathematically appropriate.
Understand the connections between proportional relationships, lines, and linear equations.	**B. Understand the connections between proportional relationships, lines, and linear equations.**	Keep 8.EE.B	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	Keep 8.EE.B.5 New format 8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. ***Example**: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	Clearly stated, and age and mathematically appropriate.
6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	Keep 8.EE.B.6	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Analyze and solve linear equations and pairs of simultaneous linear equations.	**C. Analyze and solve linear equations and pairs of simultaneous linear equations.**	Keep 8.EE.C	Clearly stated, and age and mathematically appropriate.
7. Solve linear equations in one variable.	7. Solve linear equations in one variable.	Keep 8.EE.C.7	Clearly stated, and age and mathematically appropriate.
a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	Keep 8.EE.C.7aAdd example 8.EE.C.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$ (1 solution), $a = a$ (infinitely many solutions), or $a = b$ (no solution) results (where a and b are different numbers). ***Example***: $-3x - 2 = 7x + 2 - 10x$ *has no*	Added example for clarification

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		solution because the equation simplifies to $-2 = 2$ *which is false for any value of* x. Replace with: Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a (1 solution), a = a (infinitely many solutions), or a = b (no solution) results (where a and b are different numbers). For example: -3x – 2 = 7x + 2 – 10x has no solution because the equation simplifies to –2 = 2 which is false for any value of x.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Keep 8.EE.C.7b	Clearly stated, and age and mathematically appropriate.
8. Analyze and solve pairs of simultaneous linear equations.	8. Analyze and solve pairs of simultaneous linear equations.	Keep 8.EE.C.8	Clearly stated, and age and mathematically appropriate. Note: Talk to high school about linear systems and how they are different across the grade levels.
a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because	a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because	Keep 8.EE.C.8a	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
points of intersection satisfy both equations simultaneously.	points of intersection satisfy both equations simultaneously.		
b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.	b. Solve systems of two linear equations in two variables algebraically (using substitution and elimination strategies), and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.	Rewrite Add example 8.EE.C.8b Solve systems of two linear equations in two variables algebraically (including but not limited to using substitution and elimination strategies), and estimate solutions by graphing the equations; solve simple cases by inspection. ***Example***: $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6. Solve systems of two linear equations in two variables algebraically (including but not limited to using substitution and elimination strategies), and estimate	Clarification of the standard in terms of expectations, age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		solutions by graphing the equations; solve simple cases by inspection. Example: 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. Replace with: Solve systems of two linear equations in two variables algebraically (including but not limited to using substitution and elimination strategies), and estimate solutions by graphing the equations. Solve simple cases by inspection.	
c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points,	c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points,	Keep 8.EE.C.8c Add example 8.EE.C.8c Solve real-world and mathematical problems leading to two linear equations in two variables. ***Examples***:	Added example for clarification

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
determine whether the line through the first pair of points intersects the line through the second pair.	determine whether the line through the first pair of points intersects the line through the second pair.	*1) Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* *2) Your family decided to rent a snowmobile at Island Park. Company A charges* \$125 *for the first hour plus* \$37.50 *for each additional hour. Company B charges a* \$50 *one-time rental fee plus* \$45 *per hour. Which company would cost less for you to rent for* 3 *hours?* 5 *hours?* 8 *hours?* Keep standard and example as written, add additional example. For example: Company A charges \$0.10 for each pencil ordered plus a flat shipping fee of \$5.95. Company B	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		charges $0.15 for each pencil ordered with free shipping. How many pencils would you need to order for the total cost to be less for Company A than Company B?	

Functions – 8.F

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Define, evaluate, and compare functions.	**A. Define, evaluate, and compare functions.**	Keep 8.F.A	<u>Clearly stated, and age and mathematically appropriate.</u>
1. Understand that a function is a rule that assign to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	1. Understand that a function is a rule that assign to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Rewrite 8.F.A.1 Understand that a function is a rule that assign to each input exactly one output and that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Understand that a function is a rule that assign to each input exactly one output and	<u>Clearly stated, and age and mathematically appropriate.</u> Note: Make sure the footnote stays about not needing function notation in grade 8.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Is the verb tense correct on assign?
2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Keep 8.F.A.2 New format 8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). ***Example****: Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*	<u>Clearly stated, and age and mathematically appropriate.</u>
3. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give	3. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give	Keep 8.F.A.3 New format	<u>Clearly stated, and age and mathematically appropriate.</u>

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.	examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.	8.F.A.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. ***Example**: The function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1)$, $(2,4)$ and $(3,9)$, which are not on a straight line.*	
Use functions to model relationships between quantities.	**B. Use functions to model relationships between quantities.**	Keep 8.F.B	Clearly stated, and age and mathematically appropriate.
4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two	4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two	Keep 8.F.B.4	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
(x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	(x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		
5. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	5. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Keep 8.F.B.5	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Geometry – 8.G

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand congruence and similarity using physical models, transparencies, or geometry software.	**A. Understand congruence and similarity using physical models, transparencies, or geometry software.**	Keep 8.G.A	Clearly stated, and age and mathematically appropriate.
1. Verify experimentally the properties of rotations, reflections, and translations:	1. Verify experimentally the properties of rotations, reflections, and translations:	Keep 8.G.A.1	Clearly stated, and age and mathematically appropriate.
a. Lines are taken to lines, and line segments to line segments of the same length.	a. Lines are transformed to lines, and line segments to line segments of the same length.	Keep Massachusetts 8.G.A.1a Lines are transformed to lines, and line segments to line segments of the same length. Idaho standard Lines are transformed to lines, and line segments to line segments of the same length.	Clearly stated, and age and mathematically appropriate.
b. Angles are taken to angles of the same measure.	b. Angles are transformed to angles of the same measure.	Keep 8.G.A.1b	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
c. Parallel lines are taken to parallel lines.	c. Parallel lines are transformed to parallel lines.	Keep Massachusetts 8.G.A.1c Parallel lines are transformed to parallel lines. Idaho standard Parallel lines are transformed to parallel lines.	Clearly stated, and age and mathematically appropriate.
2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; Given two congruent figures, describe a sequence that exhibits the congruence between them.	Keep 8.G.A.2 New format Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. ***Example**: Given two congruent figures, describe a sequence that exhibits the congruence between them.*	Clearly stated, and age and mathematically appropriate.
3. Describe the effect of dilations, translations, rotations, and reflections	3. Describe the effect of dilations, translations, rotations, and reflections	Keep 8.G.A.3 Add example	Added example for clarification

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
on two-dimensional figures using coordinates.	on two-dimensional figures using coordinates.	8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. ***Example**: The image of Triangle ABC with* $A = (-3,0)$*,* $B = (-3,-2)$ *and* $C = (4,-2)$ *would have coordinates* $A' = (-3-3, 0+2) = (-6,2)$*,* $B' = (-3-3,-2+2) = (-6,0)$*, and* $C' = (4-3,-2+2) = (1,0)$ *following a translation* 3 *units to the left and* 2 *units up.* For example: The image of Triangle ABC with A = (-3,0), B = (-3,-2) and C = (4,-2) would have coordinates A' = (-3-3, 0+2) = (-6,2), B' = (-3-3, -2+2) = (-6,0), and C' = (4-3, -2+2) = (1,0) following a translation 3 units to the left and 2 units up.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them.	4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. Given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them.	Keep 8.G.A.4 New format 8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. ***Example**: Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.*	<u>Clearly stated, and age and mathematically appropriate.</u>
5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle	5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle	Keep 8.G.A.5 New format 8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-	<u>Clearly stated, and age and mathematically appropriate.</u>

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	angle criterion for similarity of triangles. ***Example**: Arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	
Understand and apply the Pythagorean Theorem.	**B. Understand and apply the Pythagorean Theorem.**	Keep 8.G.B	<u>Clearly stated, and age and mathematically appropriate.</u>
6. Explain a proof of the Pythagorean Theorem and its converse.	6b. Analyze and justify the Pythagorean Theorem and its converse using pictures, diagrams, narratives, or models.	Rewrite 8.G.B.6 Analyze and justify the Pythagorean Theorem and its converse using pictures, diagrams, narratives, or models. Idaho Standard - Analyze and justify the Pythagorean Theorem and its converse using pictures, diagrams, narratives, or models.	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	6a. Understand the relationship among the sides of a right triangle.	Delete Massachusetts 8.G.6a.	Removed this standard because it does not add any clarity. (Added by Massachusetts in 2017)
		Make this 8.G.6 instead of 8.G.6b	We removed 8.G.6a and adjusted the labeling.
7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Keep 8.G.B.7	Clearly stated, and age and mathematically appropriate.
8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Keep 8.G.B.8	Clearly stated, and age and mathematically appropriate.
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	**C. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**	Keep 8.G.C	Clearly stated, and age and mathematically appropriate.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems	9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	Keep 8.G.C.9	Clearly stated, and age and mathematically appropriate.

Statistics and Probability – 8.SP

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Investigate patterns of association in bivariate data.	**A. Investigate patterns of association in bivariate data.**	Keep 8.SP.A	Clearly stated, and age and mathematically appropriate.
1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear	1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear	Keep 8.SP.A.1	Clearly stated, and age and mathematically appropriate.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
association, and nonlinear association.	association, and nonlinear association.		
2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Keep 8.SP.A.2	<u>Clearly stated, and age and mathematically appropriate.</u>
3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight	3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an	Keep 8.SP.A.3 New format 8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. ***Example**: In a linear model for a biology*	<u>Clearly stated, and age and mathematically appropriate.</u>

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
each day is associated with an additional 1.5 cm in mature plant height	additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height	*experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*	
4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data	4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	Keep 8.SP.A.4 New example 8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	Clarified the example to provide a variable that has three categories as opposed to two.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	***Example****: Collect data from students in your school on grade level (sixth, seventh, and eighth) and whether or not they have assigned chores at home (yes, no). Is there evidence that a particular grade level tends to have chores? (In this example the two variables are grade level and chores.)* Replace with: Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or	

Current Idaho Standards	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		columns to describe possible association between the two variables. For example, collect data from students in your school on grade level (sixth, seventh, and eighth) and whether or not they have assigned chores at home (yes, no). Is there evidence that a particular grade level tends to have chores? (In this example the two variables are grade level and chores.)	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

HIGH SCHOOL – GRADES 9-12 NUMBER AND QUANTITY

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Note: Standards with a ★ indicate a modeling standard. Standards with a + represent standards for advanced classes such as calculus, advanced statistics or discrete mathematics. Standards without a + are the present standards for all college and career ready students.

The Real Number System – N.RN

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Extend the properties of exponents to rational exponents.	**A. Extend the properties of exponents to rational exponents.**	Keep N.RN.A.	
1. Explain how the definition of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we	1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root	Revise Example N.RN.A.1 ***Example:*** *We define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	Corrected mathematical notation.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.	of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.		
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Revise N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents. ***Example:*** *Solving the volume of a cube formula,* $V = s^3$*, for* s *would involve rewriting the solution as either* $s = \sqrt[3]{V}$ *or* $s = V^{\frac{1}{3}}$*.*	Example added to give clarity to the meaning of the standard.
Use properties of rational and irrational numbers.	**B. Use properties of rational and irrational numbers.**	Keep N.RN.B	
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a	3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a	Keep. RN.B.3	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
nonzero rational number and an irrational number is irrational.	nonzero rational number and an irrational number is irrational.		

Quantities ★– N.Q

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Reason quantitatively and use units to solve problems.	**A. Reason quantitatively and use units to solve problems.**	Keep N.Q.A	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Keep N.Q.A.1	
2. Define appropriate quantities for the purpose of descriptive modeling.	2. Define appropriate quantities for the purpose of descriptive modeling.	Keep N.Q.A.2	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.★ a. Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements. Identify significant figures in recorded measures and computed values based on the context given and the precision of the tools used to measure.★	Revise N.Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.★ ~~Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements. Identify significant figures in recorded measures and computed values based on the context given and the precision of the tools used to measure.★~~	Removed part a to take the standard back to Idaho's current content standards. Reduces complex verbiage to simplify the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

The Complex Number System – N.CN

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Perform arithmetic operations with complex numbers.	**A. Perform arithmetic operations with complex numbers.**	Keep N.CN.A	
1. Know there is a complex number i such that i2 = –1, and every complex number has the form a + bi with a and b real.	1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real.	Revise N.CN.A.1 Know there is a complex number i such that $i^2 = -1$, and show that every complex number has the form a + bi with a and b real. ***Example:*** *Express the radical,* $\pm\sqrt{-24}$*, using the imaginary unit,* i*, in simplified form. Expressing the radical using* i *in simplified form results in the expression* $\pm 2i\sqrt{6}$.	The verbiage modification and example were added to add clarity to the meaning of the standard.
2. Use the relation i2 = –1 and the commutative, associative, and distributive properties to add, subtract, and	2. Use the relation i2 = –1 and the commutative, associative, and distributive properties to add, subtract, and	Revised N.CN.A.2 Use the relation i^2~~2~~ = –1 and the commutative, associative, and distributive properties to	Corrected mathematical notation.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
multiply complex numbers.	multiply complex numbers.	add, subtract, and multiply complex numbers.	
3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	Revise N.CN.A.3 (+) Find the conjugate of a complex number; use conjugates to find ~~moduli~~ absolute value and quotients of complex numbers.	Removed complex verbiage.
Represent complex numbers and their operations on the complex plane.	**B. Represent complex numbers and their operations on the complex plane.**	Keep N.CN.B	
4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	Keep N.CN.B.4	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
5. (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, (–1 + √3 i)3 = 8 because (–1 + √3 i) has modulus 2 and argument 120°.	5. (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, (*-1+√3i*)3=8 because *(-1+√3i)* has modulus 2 and argument 120°.	Revise N.CN.B.5 (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. ***Example***: $(1 + i\sqrt{3})^3 = 8$ *because* $\left(-1 + i\sqrt{3}\right)$ *has a radius of* 2 *and argument* $120°$.	Removed complex verbiage.
6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	Revise N.CN.B.6 (+) Calculate the distance between numbers in the complex plane as the ~~modulus~~ absolute value of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	Removed complex verbiage.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use complex numbers in polynomial identities and equations.	**C. Use complex numbers in polynomial identities and equations.**	Keep N.CN.C	
7. Solve quadratic equations with real coefficients that have complex solutions.	7. Solve quadratic equations with real coefficients that have complex solutions.	Revise N.CN.C.7 Solve quadratic equations with real coefficients that have complex solutions. ***Example:*** *Find the complex solutions of the quadratic equation* $5x^2 + 3x + 1 = 0$*, with the solutions of* $x = \frac{3}{10} + \frac{3i}{5}$ *and* $x = \frac{3}{10} - \frac{3i}{5}$.	Example added to give clarity to the meaning of the standard.
8. (+) Extend polynomial identities to the complex numbers. For example, rewrite x2 + 4 as (x + 2i)(x – 2i).	*8.* (+) Extend polynomial identities to the complex numbers. *For example, rewrite x 2 + 4 as (**x** + 2**i**) (**x** – 2**i**).*	Revise N.CN.C.8 ***Example****: Rewrite* $x^2 + 4$ *as* $(x + 2i)\ (x - 2i)$.	Corrected mathematical notation.
9. (+) Know the Fundamental Theorem of Algebra; show that it is	9. (+) Know the Fundamental Theorem of Algebra; show that it is	Keep N.CN.C.9	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
true for quadratic polynomials.	true for quadratic polynomials.		

Vector and Matrix Quantities – N.VM

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and model with vector quantities	**A. Represent and model with vector quantities.**	Keep N.VM.A	
1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).	1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).	Keep N.VM.A.1	
2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the	2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the	Keep N.VM.A.2	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
coordinates of a terminal point.	coordinates of a terminal point.		
3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.	3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.	Keep N.VM.A.3	
Perform operations on vectors.	**B. Perform operations on vectors.**	Keep N.VM.B	
4. (+) Add and subtract vectors.	4. (+) Add and subtract vectors.	Keep N.VM.B.4	
a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	a. (+) Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	Keep N.VM.B.4a	
b. Given two vectors in magnitude and direction form,	b. (+) Given two vectors in magnitude and direction form,	Keep N.VM.B.4b	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
determine the magnitude and direction of their sum.	determine the magnitude and direction of their sum.		
c. Understand vector subtraction v – w as v + (–w), where –w is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	c. (+) Understand vector subtraction $\boldsymbol{v} - \boldsymbol{w}$ as $\boldsymbol{v} + (-\boldsymbol{w})$, where $-\boldsymbol{w}$ is the additive inverse of $\boldsymbol{w}$, with the same magnitude as $\boldsymbol{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	Keep N.VM.B.4c (+) ~~Understand~~ Demonstrate understanding of vector subtraction $\boldsymbol{v} - \boldsymbol{w}$ as $\boldsymbol{v} + (-\boldsymbol{w})$, where $-\boldsymbol{w}$ is the additive inverse of $\boldsymbol{w}$, with the same magnitude as $\boldsymbol{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	Allows the standard to be student performance focused.
5. (+) Multiply a vector by a scalar.	5. (+) Multiply a vector by a scalar.	Keep N.VM.5	
a. Represent scalar multiplication	a. (+) Represent scalar multiplication	(+) Represent scalar multiplication graphically by	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c(vx, vy) = (cvx, cvy).	graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c(vx , vy) = (cvx , cvy).	scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c(vx , vy) = (cvx , cvy).	
b. Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠ 0, the direction of cv is either along v (for c > 0) or against v (for c < 0).	b. (+) Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠ 0, the direction of cv is either along v (for c > 0) or against v (for c < 0).	Keep N.VM.5b	
Perform operations on matrices and use matrices in applications	**C. Perform operations on matrices and use matrices in applications**	Keep N.VM.C	
6. (+) Use matrices to represent and manipulate	6. (+) Use matrices to represent and manipulate	Keep N.VM.C.6	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
data, e.g., to represent payoffs or incidence relationships in a network.	data, e.g., to represent payoffs or incidence relationships in a network.		
7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	Keep N.VM.C.7	
8. (+) Add, subtract, and multiply matrices of appropriate dimensions.	8. (+) Add, subtract, and multiply matrices of appropriate dimensions.	Keep N.VM.C.8	
9. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	9. (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a Commutative operation, but still satisfies the Associative and Distributive properties.	Revise N.VM.C.9 (+) ~~Understand~~ Demonstrate understanding that, unlike multiplication of numbers, matrix multiplication for square matrices is not a Commutative operation, but still satisfies the Associative and Distributive properties.	Allows the standard to be student performance focused.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	Revise N.VM.C.10 (+) ~~Understand~~ Demonstrate understanding that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	Allows the standard to be student performance focused.
11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.	11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.	Keep N.VM.C.11	
12. Work with 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	12. Work with 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	Keep N.VM.C.12	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

HIGH SCHOOL – GRADES 9-12 ALGEBRA

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Note: Standards with a ★ indicate a modeling standard. Standards with a + represent standards for advanced classes such as calculus, advanced statistics or discrete mathematics. Standards without a + are the present standards for all college and career ready students.

Seeing Structure in Expressions – A.SSE

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Interpret the structure of expressions	**A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions.**	Keep A.SSE.A	
1. Interpret expressions that represent a quantity in terms of its context.★	1. Interpret expressions that represent a quantity in terms of its context.★	Keep A.SSE.A.1	
a. Interpret parts of an expression, such as terms, factors, and coefficients.	a. Interpret parts of an expression, such as terms, factors, and coefficients.	Keep A.SSE.A.1a	
b. Interpret complicated expressions by	b. Interpret complicated expressions by	Keep A.SSE.A.1b	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.	viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.		
2. Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).	2. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.	Keep A.SSE.A.2	
Write expressions in equivalent forms to solve problems	**B. Write expressions in equivalent forms to solve problems.**	Keep A.SSE.B	
3. Choose and produce an equivalent form of an expression to reveal and explain properties of the	3. Choose and produce an equivalent form of an expression to reveal and explain properties of the	Revise A.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
quantity represented by the expression.★	quantity represented by the expression.	explain properties of the quantity represented by the expression.	
a. Factor a quadratic expression to reveal the zeros of the function it defines.	a. Factor a quadratic expression to reveal the zeros of the function it defines.	Revise A.SSE.B.3a	
b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Revise A.SSE.B.3b ***Example***: *A high school player punts a football, and the function* $h(t) = -16t^2 + 64t + 2$ *represents the height* h*, in feet, of the football at time* t *seconds after it is punted. Complete the square in the quadratic expression to find the maximum height of the football.*	Example added to give clarity to the meaning of the standard.
c. Use the properties of exponents to transform expressions for	c. Use the properties of exponents to transform expressions for	Revise A.SSE.B.3c ***Example***: *The expression* 1.15^t *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.012^{12t}$	Corrected mathematical notation.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	exponential functions. For example the expression 1.15t can be rewritten as (1.15 1/12)12t ≈ 1.012 12t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	*to reveal the approximate equivalent monthly*	
4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★	4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★	Keep Revise A.SSE.B.4	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Arithmetic with Polynomials and Rational Expressions – A.APR

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Perform arithmetic operations on polynomials	**A. Perform arithmetic operations on polynomials.**	Keep A.APR.A	
1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	1. Understand that polynomials form a system analogous to the integers, namely, they are closed under certain operations.	Revise A.APR.A.1 ~~Understand~~ Demonstrate understanding that polynomials form a system analogous to the integers, namely, they are closed under certain operations.	Allows the standard to be student performance focused. Creates a more concreate measurable standard.
	a. Perform operations on polynomial expressions (addition, subtraction, multiplication, division) and compare the system of polynomials to the system of integers when performing operations.	Keep A.APR.A.1a	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	b. Factor and/or expand polynomial expressions, identify and combine like terms, and apply the Distributive property.	Keep A.APR.A.1b	
Understand the relationship between zeros and factors of polynomials	**B. Understand the relationship between zeros and factors of polynomials.**	Keep A.APR.B	
2. Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).	2. Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).	Keep A.APR.B.2	
3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	Keep A.APR.B.3	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use polynomial identities to solve problems	**C. Use polynomial identities to solve problems.**	Keep A.APR.C	
4. Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 + y2)2 = (x2 – y2)2 + (2xy)2 can be used to generate Pythagorean triples.	4. Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.	Keep A.APR.C.4	
5. (+) Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.[1]	5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.[1]	Keep A.APR.C.5	
Rewrite rational expressions	**D. Rewrite rational expressions.**	Keep A.APR.D	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
6. Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	Revise A. APR.D.6 Rewrite simple rational expressions in different forms ~~write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x),~~ using inspection, long division, or, for the more complicated examples, a computer algebra system. ***Example:*** *Write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x).*	Restructuring the standard lessens the complex verbiage. This allows the "confusing part" to become an example and clears up the verbiage for the actual standard.
7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and	7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and	Revise A. APR.D.7 (+) ~~Understand~~ Demonstrate understanding that rational expressions form a system analogous to the rational numbers, closed under	Allows the standard to be student performance focused.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	

Creating Equations – A.CED

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Create equations that describe numbers or relationships	**A. Create equations that describe numbers or relationships.**	Keep A.CED.A	
1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple root and rational and exponential functions. ★	Revise A.CED.A.1 ~~Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.~~ Create one variable equations and inequalities to solve	Reduced complex verbiage. Simplifies it for understanding. Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		problems; including linear, quadratic, rational, and exponential functions. ★ ***Example:*** *Four people may be seated at one rectangular table. If two rectangular tables are placed together end-to-end, 6 people may be seated at the table. If 10 tables are placed together end-to-end, how many people can be seated? How many tables are needed for n people?*	
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ★	Revise A.CED.A.2, A.CED.A.2a, A.CED.A.2b ~~Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.~~ ★	Re-wrote the standard into two parts to give clarity on each concept. Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Interpret the relationship between two or more quantities: ★ a. Define variables to represent the quantities and write equations to show the relationship. ★ *For example, the cost of parking in the parking garage is $2.00 for the first hour and $1.00 for every hour after that. Write an equation in terms of x and y that shows the total cost for parking, y, for x hours. Use the equation to calculate the cost for parking in the garage for 5 hours.* b. Use graphs to show a visual representation of the relationship while adhering to	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		appropriate labels and scales. ★ *For example, using the equation from A-CED.2a, show how the graph of the equation can be used to predict the cost for a specified amount of time.*	
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. ★	Revise A.CED.A.3 and A.CED.A.4 Represent constraints ~~by~~ using equations or inequalities~~, and by systems of equations and/or inequalities,~~ and interpret solutions as viable or non-viable options in a modeling context. ~~For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.~~ ★	Re-wrote the standard into two standards to give clarity on each concept. Removed the example due to the fact that it creates more confusion.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		A.CED.A.4 Represent constraints using systems of equations and/or inequalities and interpret solutions as viable or non-viable options in a modeling context. ★	Re-wrote the standard into two standards to give clarity on each concept.
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. ★	Keep New Number is A.CED.A.5	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Reasoning with Equations and Inequalities – A.REI

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand solving equations as a process of reasoning and explain the reasoning	**A. Understand solving equations as a process of reasoning and explain the reasoning.**	Keep A.REI.A	
1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify or refute a solution method.	Keep A.REI.A.1	
2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	Keep A.REI.A.2	
Solve equations and inequalities in one variable	**B. Solve equations and inequalities in one variable.**	Keep A.REI.B	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Keep A.REI.B.3	
1. Solve linear equations and inequalities in one variable involving absolute value.	a. Solve linear equations and inequalities in one variable involving absolute value.	Keep A.REI.B.3a	
4. Solve quadratic equations in one variable.	4. Solve quadratic equations in one variable.	Keep A.REI.B.4	
a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form.	a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	Keep A.REI.B.4a	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	Keep A.REI.B.4b	
Solve systems of equations	**C. Solve systems of equations.**	Keep A.REI.C	
5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a	Revise A.REI.C.5 ~~Prove~~ Verify that, given a system of two equations in two variables, replacing one	Mirrors what is happening in current Idaho schools. Allows the introduction of verify as a vocabulary word that students use throughout their

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
multiple of the other produces a system with the same solutions.	multiple of the other produces a system with the same solutions.	equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	high school career. Allows for vertical alignment.
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	*Revise A.REI.C.6* *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.* **Example:** A school club is selling hats and t-shirts for a fundraiser. The group expects to sell a total of 50 items. They make a profit of 15 dollars for each t-shirt sold and 5 dollars for each hat sold. How many hats and t-shirts will the school club need to sell to make a profit of $300?	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.	7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle $x^2 + y^2 = 3$.	Keep A.REI.C.7	
8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.	8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.	Keep A.REI.C.8	
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	Keep A.REI.C.9	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Represent and solve equations and inequalities graphically	**D. Represent and solve equations and inequalities graphically.**	Keep A.REI.D	
10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). Show that any point on the graph of an equation in two variables is a solution to the equation.	Revise A.REI.D.10 ~~Understand~~ Demonstrate understanding that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. ~~, often forming a curve (which could be a line).~~ Show that any point on the graph of an equation in two variables is a solution to the equation.	Removes complex verbiage from the standard to aid in understanding. Allows the standard to be student performance focused.
11. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to	11. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to	Revise A.REI.D.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately.~~, e.g., using technology to graph the~~	Restructuring the standard lessens the complex verbiage. Restructuring allows the example to be placed at the end for consistent formatting.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	~~functions, make tables of values, or find successive approximations.~~ Include cases where *f*(*x*) and/or *g*(*x*) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★ ***Example***: *Use technology to graph the functions, make tables of values, or find successive approximations.*	
12. Graph the solutions to a linear inequality in two variables as a half- plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	12. Graph the solutions to a linear inequality in two variables as a half- plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Keep A.REI.D.12	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

HIGH SCHOOL – GRADES 9-12 FUNCTIONS

Note: Standards with a ★ indicate a modeling standard. Standards with a + represent standards for advanced classes such as calculus, advanced statistics or discrete mathematics. Standards without a + are the present standards for all college and career ready students.

Interpreting Functions – F.IF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand the concept of a function and use function notation	**A. Understand the concept of a function and use function notation**	Keep F.IF.A	
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of is the graph of the equation y = f(x).	Rewrite F.IF.A.1 Demonstrate understanding that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range: If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	Allows the standard to be student performance focused.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Demonstrate understanding that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. *For example, given a function representing a car loan, determine the balance of the loan at different points in time.*	Keep F.IF.A.2 Add example F.IF.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. ***Example**: Given a function representing a car loan, determine the balance of*	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		the loan at different points in time.	
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.	3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.*	Revise F.IF.A.3 Add example Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. ***Example**: The Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ *for* $n \geq 1$. ~~Recognize~~ Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	Allows the standard to be student performance focused.
Interpret functions that arise in applications in terms of the context	**B. Interpret functions that arise in applications in terms of the context (linear,**	**Revise F.IF.B** **Interpret functions that arise in applications in terms of**	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	quadratic, exponential, rational, polynomial, square root and cube root, trigonometric, and logarithmic functions).	**the context. Include linear, quadratic, exponential, rational, polynomial, square root and cube root, trigonometric, and logarithmic functions.**	
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	Keep F.IF.B.4 Add example For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	Formatting changes allow for separation between the actual standard and additional information. Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		***Example**: Given a context or verbal description of a relationship, sketch a graph that models the context or description and shows its key features.* For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* ★ *For example, given a context or verbal description of a relationship, sketch a graph*	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		that models the context or description and shows its key features.	
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★	6. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*★	Keep F.IF.B.5 New format F.IF.B.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.★ ***Example****: If the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*	
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified	6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified	Keep F.IF.B.6	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
interval. Estimate the rate of change from a graph.★	interval. Estimate the rate of change from a graph.★		
Analyze functions using different representations	**C. Analyze functions using different representations**	Keep F.IF.C	
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	Keep F.IF.C.7	
a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	Keep add ★ F.IF.C.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.★	
b. Graph square root, cube root, and piecewise-defined functions, including step functions and	b. Graph square root, cube root, and piecewise-defined functions, including step functions and	Keep add ★ F.IF.C.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.★	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
absolute value functions.	absolute value functions.		
a. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	Keep add ★ F.IF.C.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.★	
b. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	Keep add ★ F.IF.C.7d (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.★	
c. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing	e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing	Keep add ★ F.IF.C.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
period, midline, and amplitude.	period, midline, and amplitude.	functions, showing period, midline, and amplitude.★	
8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Keep F.IF.C.8	
a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	a. Use the process of factoring and/or completing the square in quadratic and polynomial functions, where appropriate, to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Rewrite F.IF.C.8a Add example Use the process of factoring and/or completing the square in quadratic and polynomial functions, where appropriate, to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. ***Example**: Suppose* $h(t) = -5t^2 + 10t + 3$ *represents the height of a diver above the water (in meters),* t *seconds after the diver leaves the*	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		springboard. What is the maximum height above the water the diver reaches? After how many seconds, t, does the diver hit the water? Use the process of factoring and/or completing the square in quadratic and polynomial functions, where appropriate, to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. *For example, suppose $h(t)=-5t^2+10t+3$ represents the height of a diver above the water (in meters), t seconds after the diver leaves the springboard. What is the maximum height above the water the diver reaches? After how many seconds, t, does the diver hit the water?*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.	*b.* Use the properties of exponents to interpret expressions for exponential functions. Apply to financial situations such as identifying appreciation and depreciation rate for the value of a house or car some time after its initial purchase. *For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, and y = $(1.2)^{t/10}$, and classify them as representing exponential growth or decay.*	Rewrite F.IF.C.8b New example Use the properties of exponents to interpret expressions for exponential functions. Apply to financial situations such as identifying appreciation and depreciation rate for the value of a house or car sometime after its initial purchase. ***Example**: The equation for radioactive decay is, $A = A_0 \left(\frac{1}{2}\right)^{t/h}$. When A_0 is the original amount of a radioactive substance, A is the final amount, h is the half-life of the substance, and t is time. Hagerman, Idaho is a hotbed of fossil hunting. The half-life of Carbon-14 is about 5730 years. If a fossil that was found in Hagerman contains 54 grams of*	Changed the example to relate better to Idaho students and teachers.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Carbon-14 at time $t = 0$, *how much Carbon-14 remains at time* $t =$ 17190 *years?* Use the properties of exponents to interpret expressions for exponential functions. Apply to financial situations such as identifying appreciation and depreciation rate for the value of a house or car some time after its initial purchase. ~~*For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, and y = (1.2)*$^{t/10}$*, and classify them as representing exponential growth or decay.*~~ *For example, the equation for radioactive decay is,* $A = A_0\left(\frac{1}{2}\right)^{t/h}$. *When* A_0 *is the original amount of a radioactive substance, A is the*	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		final amount, h is the half-life of the substance, and t is time. Hagerman, Idaho is a hotbed of fossil hunting. The half-life of Carbon-14 is about 5730 years. If a fossil that was found in Hagerman contains 54 grams of Carbon-14 at time t=0, how much Carbon-14 remains at time t=17190 years?	
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	9. Translate among different representations of functions (algebraically, graphically, numerically in tables, or by verbal descriptions). Compare properties of two functions each represented in a different way. For example, given a graph of one polynomial function and an algebraic expression for another, say which has the	Revise F.IF.C.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). ***Example**: Given a graph of one polynomial function and an algebraic expression for another, say which has the larger/smaller relative*	Restructured and removed complex verbiage to clarify.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	larger/smaller relative maximum and/or minimum	*maximum and/or minimum.* ~~Translate among different representations of functions (algebraically, graphically, numerically in tables, or by verbal descriptions).~~ Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). ***For example, given a graph of one polynomial function and an algebraic expression for another, say which has the larger/smaller relative maximum and/or minimum.***	
	10. Given algebraic, numeric and/or graphical representations of functions, recognize the function as polynomial, rational, logarithmic,	Add F.IF.C.10 New to Idaho Given algebraic, numeric and/or graphical representations of functions, recognize the function as	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	exponential, or trigonometric.	polynomial, rational, logarithmic, exponential, or trigonometric.	

Building Functions ★– F.BF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Build a function that models a relationship between two quantities	**A. Build a function that models a relationship between two quantities**	Keep F.BF.A	
2. Write a function that describes a relationship between two quantities.★	2. Write a function (linear, quadratic, exponential, simple rational, radical, logarithmic, and trigonometric) that describes a relationship between two quantities.★	Keep F.BF.A.1 Add example F.BF.A.1 Write a function that describes a relationship between two quantities. Functions could include linear, exponential, quadratic, simple rational, radical, logarithmic, and trigonometric.★ Write a function that describes a relationship	Restructured to clarify.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		between two quantities. Functions could include linear, exponential, quadratic, simple rational, radical, logarithmic, and trigonometric.★ Write a function ~~(simple rational, radical, logarithmic, and trigonometric)~~ that describes a relationship between two quantities. Functions could include linear, exponential, quadratic, simple rational, radical, logarithmic, and trigonometric.★	
3. Determine an explicit expression, a recursive process, or steps for calculation from a context.	4. Determine an explicit expression, a recursive process, or steps for calculation from a context. ★	Keep F.BF.A.1a	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
4. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.	b. Combine standard function types using arithmetic operations. ★ *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	Keep F.BF.A.1b New format F.BF.A.1b Combine standard function types using arithmetic operations.★ ***Example***: *Build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	
c. (+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the	c. (+) Compose functions.★ For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the	Keep add ★ New format F.BF.A.1c (+) Compose functions.★ ***Example***: *If $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
location of the weather balloon as a function of time.	location of the weather balloon as a function of time.	*time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.*	
2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	c. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.⋆	Keep F.BF.A.2 Add example F.BF.A.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.⋆ ***Example**: If the U.S. Census Bureau wrote the following recursive equation to represent how they estimate Idaho's population will grow each year after 2019:* $P(n) = 1.023 \cdot P(n-1)$, $P(0) = 1{,}787{,}000$. $P(n)$ *represents Idaho's population at the end of*	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		the n^{th} year in terms of Idaho's population at the end of the $(n-1)^{th}$ year, $P(n-1)$. Predict Idaho's population in 2040.	
Build new functions from existing functions	**B. Build new functions from existing functions**	Keep F.BF.B	
3. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	3. Identify the effect on the graph of replacing *f*(*x*) by *f*(*x*) + *k*, *kf*(*x*), *f*(*kx*), and *f*(*x* + *k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs.(Include, linear, quadratic, exponential, absolute value, simple rational and radical, logarithmic and trigonometric functions.) Utilize using technology to experiment with cases and illustrate an explanation of the effects on the graph. (*Include recognizing even*	Keep Massachusetts Standard F.BF.B.3	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	and odd functions from their graphs and algebraic expressions for them.)		
4. Find inverse functions.	4. Find inverse functions algebraically and graphically.	Keep Massachusetts Standard F.BF.B.4	
a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x^3 or f(x) = (x+1)/(x–1) for x ≠ 1.	a. Solve an equation of the form *f*(*x*) = *c* for a simple function *f* that has an inverse and write an expression for the inverse. (Include linear and simple polynomial, rational, and exponential functions.) *For example, f(x)* ***=2****x*^{3} ***or*** *f(x)****=*** $^{(x+1)}/_{(x-1)}$ ***for*** *x* **≠** ***1.***	Keep Massachusetts Standard F.BF.B.4a Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. Include linear and simple polynomial, rational, and exponential functions. ***Example:*** $f(x) = 2x^3$ *or* $f(x) = \frac{x+1}{x-1}$ *for* $x \neq 1$	
b. (+) Verify by composition that one	b. (+) Verify by composition that one	Keep F.FB.B.4b	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
function is the inverse of another.	function is the inverse of another.		
c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	Keep F.FB.B.4c	
d. (+) Produce an invertible function from a non-invertible function by restricting the domain.	d. (+) Produce an invertible function from a non-invertible function by restricting the domain.	Keep F.FB.B.4c	
11. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	10. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	Keep F.FB.B.5	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Linear, Quadratic, and Exponential Models – F.LE

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Construct and compare linear, quadratic, and exponential models and solve problems	**A. Construct and compare linear, quadratic, and exponential models and solve problems**	Keep F.LE.A	
1. Distinguish between situations that can be modeled with linear functions and with exponential functions.	1. Distinguish between situations that can be modeled with linear functions and with exponential functions.★	Keep F.LE.A.1	
a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.★	Revise F.LE.A.1a add ★ Demonstrate that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.★ ~~Prove~~ Demonstrate that linear functions grow by equal differences over equal intervals, and that exponential functions grow	Allows the standard to be student performance focused. Moves the standard into student performance focus.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		by equal factors over equal intervals.★	
b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.★	Revise F.LE.A.1b add ★ Identify situations in which one quantity changes at a constant rate per unit interval relative to another.★ ~~Recognize~~ Identify situations in which one quantity changes at a constant rate per unit interval relative to another.★	Simplifies the verbiage on the standard.
c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.★	Revise F.LE.A.1c add ★ Identify situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.★ ~~Recognize~~ Identify situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.★	Simplifies the verbiage on the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (including reading these from a table).★	Keep F.LE.A.2 Add ★ Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (including reading these from a table).★	
3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	3. Observe, using graphs and tables, that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★	Revise F.LE.A.3 Add example Use graphs and tables to demonstrate that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★ ***Example****: Becca's parents are saving for her college education by*	Allows the standard to be student performance focused. Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		putting $3,000/year in a safe deposit box. Becca's grandpa is also saving for her college education by putting $2,000/year in an IDeal (Idaho college savings) account with an APR of 6.17%. Build tables to show which account has the most money after 10 years, and how much more? How many years will it take for the total in her grandpa's account to exceed the total in her parents' safe deposit box? ~~Observe, using~~ Use graphs and tables to demonstrate that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.★	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		For example, Becca's parents are saving for her college education by putting \$3,000/year in a safe deposit box. Becca's grandpa is also saving for her college education by putting \$2,000/year in an IDeal (Idaho college savings) account with and APR of 6.17%. Build tables to show which account has the most money after 10 years, and how much more? How many years will it take for the total in her grandpa's account to exceed the total in her parents' safe deposit box?	
4. For exponential models, express as a logarithm the solution to ab^{ct} = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	4. For exponential models, express as a logarithm the solution to *ab^ct = d* where *a*, *c*, and *d* are numbers and the base *b* is 2, 10, or *e*; evaluate the logarithm using technology.★	Keep F.LE.A.4 Add example F.LE.A.4 For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is	Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		2, 10, or e; evaluate the logarithm using technology.★ ***Example**: Mr. Rico has a savings account that has an interest rate of* 7% *compounded continuously. The amount in the account is calculated using* $A = Pe^{rt}$. *If Mr. Rico invested* $\$30,000$ *on January 1, 2020, when will he have* $\$100,000$ *in the account?* For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.★ *For example, Mr. Rico has a savings account that has an interest rate of 7% compounded continuously. The amount in the account is*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		calculated using A = Pert. If Mr. Rico invested $30,000 on January 1, 2020, when will he have $100,000 in the account?	
Interpret expressions for functions in terms of the situation they model	**B. Interpret expressions for functions in terms of the situation they model**	Keep F.LE.B	
5. Interpret the parameters in a linear or exponential function (of the form $f(x) = b^x + k$) in terms of a context.★	5. Interpret the parameters in a linear or exponential function (of the form $f(x) = b^x + k$) in terms of a context.	Keep add ★ F.LE.B.5 Interpret the parameters in a linear or exponential function (of the form $f(x) = b^x + k$) in terms of a context.★	

Trigonometric Functions – F.TF

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Extend the domain of trigonometric functions using the unit circle	**A. Extend the domain of trigonometric functions using the unit circle**	Keep T.TF.A	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	Revise T.TF.A.1 Add example Demonstrate radian measure as the ratio of the arc length subtended by a central angle to the length of the radius of the unit circle. a. Use radian measure to solve problems. ***Example:*** *You live in New Meadows, Idaho, which is located on the 45th parallel ($45°$ North latitude). Approximately how far will you drive, in miles, to attend the Calgary Stampede? Calgary is located at $51°$N latitude, almost due North of New Meadows. (Use $r = 3960$ miles for the radius of the Earth.)* ~~Understand Use radian measure of an angle as the~~	Rewrote the standard to removed complex verbiage, and mirror what is happening in Idaho schools. Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		~~length of the arc on the unit circle subtended by the angle.~~ Demonstrate radian measure as the ratio of the arc length subtended by a central angle to the length of the radius of the unit circle. a. use radian measure to solve problems. *For example, you live in New Meadows, Idaho, which is located on the 45th parallel (45° North latitude). Approximately how far will you drive, in miles, to attend the Calgary Stampede? Calgary is located at 51°N latitude, almost due North of New Meadows. (Use r = 3960 miles for the radius of the Earth.)*	
2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to	2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to	Keep T.TF.A.2	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.		
3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x, where x is any real number.	3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x, where x is any real number.	Keep T.TF.A.3	
4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	Keep T.TF.A.4	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Model periodic phenomena with trigonometric functions.	**B. Model periodic phenomena with trigonometric functions.**	Keep T.TF.B	
5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.★	5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.★	Revise T.TF.B.5 Add example Model periodic phenomena using trigonometric functions with specified amplitude, frequency, and midline.★ ***Example**: This past summer you and your friends decided to ride the Ferris wheel at the Idaho State Fair. You wondered how high the highest point on the Ferris wheel was. You asked the operator, and he didn't know, but he told you that the height of the chair was* 5 *ft off the ground when you got on and the center of the Ferris wheel is* 30 *ft above that. You checked your phone when*	Allows the standard to be student performance focused. Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		you got on and figured out that it took you 12 mins to make one full revolution. Create a model to show your height from the platform at any given time on the Ferris wheel. ~~Choose trigonometric functions to~~ Model periodic phenomena using trigonometric functions with specified amplitude, frequency, and midline.★ *For example, this past summer you and your friends decided to ride the Ferris wheel at the Idaho State Fair. You wondered how high the highest point on the Ferris wheel was. You asked the operator and he didn't know, but he told you that the height of the chair was 5 ft off the ground when you get on and the center of the Ferris wheel is 30 ft above that. You*	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		checked your phone when you get on and figured out that it took you 12 mins to make one full revolution. Create a model to show your height from the platform at any given time on the Ferris wheel.	
6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	Keep T.TF.B.6	
7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.★	7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.★	Keep T.TF.B.7	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Prove and apply trigonometric identities	**C. Prove and apply trigonometric identities**	Keep T.TF.C	
8. Prove the Pythagorean identity sin2(θ) + cos2(θ) = 1 and use it to find sin(θ), cos(θ), or tan(θ) given sin(θ), cos(θ), or tan(θ) and the quadrant of the angle.	8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find sin(θ), cos(θ), or tan(θ) given sin(θ), cos(θ), or tan(θ) and the quadrant.	Rewrite Add example T.TF.C.8 Relate the Pythagorean Theorem to the unit circle to discover the Pythagorean identity $sin^2(\theta) + cos^2(\theta) = 1$ and use the Pythagorean identity to find the value of a trigonometric function $(sin(\theta), cos(\theta), or\ tan(\theta))$ given one trigonometric function $(sin(\theta), cos(\theta), or\ tan(\theta))$ and the quadrant of the angle. ***Example***: *Suppose that* $\cos(\theta) = \frac{2}{5}$ *and that* θ *is in the* 4^{th} *quadrant. Find the exact value of* $\sin(\theta)$ *and* $\tan(\theta)$.	Clarifies the current standard and mirrors current practice in Idaho classrooms. Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		~~Prove~~ Relate the Pythagorean Theorem to the unit circle to discover the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use ~~it~~ the Pythagorean identity to find the value of a trigonometric function ($\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$) given one trigonometric function ($\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$) and the quadrant of the angle. *For example, suppose that $\cos(\theta) = \frac{2}{5}$ and that θ is in the 4th quadrant. Find the exact value of $\sin\theta$ and $\tan\theta$.*	
9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	Keep T.TF.C.9	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

HIGH SCHOOL – GRADES 9-12 GEOMETRY

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

And Note: Standards with a ★ indicate a modeling standard. Standards with a + represent standards for advanced classes such as calculus, advanced statistics or discrete mathematics. Standards without a + are the present standards for all college and career ready students.

Congruence – G.CO

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Experiment with transformations in the plane	**A. Experiment with transformations in the plane**	Keep G.CO.A	
1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Keep G.CO.A.1	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	Revise G.CO.A.2 Represent transformations in the plane and describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.	Restructured the standard to follow common format throughout the standards.
3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	Revise G.CO.A.3 Describe the rotations and reflections that carry a given figure (rectangle, parallelogram, trapezoid, or regular polygon) onto itself.	Allows the standard to be student performance focused.
4. Develop definitions of rotations, reflections, and translations in terms of	4. Develop definitions of rotations, reflections, and translations in terms of	Keep G.CO.A,4	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
angles, circles, perpendicular lines, parallel lines, and line segments.	angles, circles, perpendicular lines, parallel lines, and line segments.		
5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	Revise G.CO.A.5 and G.CO.A.6 Draw the transformation (rotation, reflection, or translation) for a given geometric figure. ***Example:*** *Given quadrilateral $TMEJ$ with vertices $T(0,-1)$, $M(3,-2)$, $E(-1,-5)$, and $J(-3,-2)$, reflect the shape across the x-axis.*	Restructured to put student action first. Separated the standard into two standards to allow additional clarification. Example added to give clarity to the meaning of the standard.
		New Standard G.CO.A.6 Specify a sequence of transformations that will carry a given figure onto another.	Separated the standard into two standards to allow additional clarification.
Understand congruence in terms of rigid motions	**B. Understand congruence in terms of rigid motions**	Keep G.CO.B	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	New Standard Number Keep G.CO.B.7	
7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	New Standard Number Keep G.CO.B.8	
8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of	8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of	New Standard Number Revise G.CO.B.9 Explain how the criteria for triangle congruence (ASA,	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
congruence in terms of rigid motions.	congruence in terms of rigid motions.	SAS, and SSS) follow from the definition of congruence in terms of rigid motions. ***Example:*** *In ΔABC and ΔABD (with shared side $\overline{AB}$), we are given that $\angle BAC \cong \angle BAD$ and $\angle ABC \cong \angle ABD$. What pair(s) of corresponding parts is needed to ensure the triangles are congruent by either ASA, SAS, or SSS? What rigid motion would show the triangles are congruent?*	
Prove geometric theorems.	**C. Prove geometric theorems and, when appropriate, the converse of theorems.**	Keep G.CO.C	
9. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent;	9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles	Keep G.CO.C.10	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	are congruent and corresponding angles are congruent; and conversely prove lines are parallel; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.		
10. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; and conversely prove a triangle is isosceles; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	Keep G.CO.C.11	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. a. Prove theorems about polygons. Theorems include the measures of interior and exterior angles. Apply properties of polygons to the solutions of mathematical and contextual problems.	New Standard Number Keep G.CO.C.12 and G.CO.C.12a	
Make geometric constructions	**D. Make geometric Constructions.**	Keep G.CO.D	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle;	12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Constructions include: copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	New Standard Number Revise G.CO.D.13 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.) Constructions include: copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	Changed the second part to be italics to give guidance to where the actual standard ends.
13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	Keep G.CO.D.14	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Similarity, Right Triangles, and Trigonometry ★– G.SRT

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand similarity in terms of similarity transformations	**A. Understand similarity in terms of similarity transformations**	Keep G.SRT.A	
1. Verify experimentally the properties of dilations given by a center and a scale factor:	1. Verify experimentally the properties of dilations given by a center and a scale factor:	Keep G.SRT.A.1	
a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	Keep G.SRT.A.1a	
b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	Keep G.SRT.A.1b	
2. Given two figures, use the definition of similarity in terms of similarity	2. Given two figures, use the definition of similarity in terms of similarity	Revise G.SRT.A.2	Restructured to put student action first. Removed some

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	Use the definition of similarity to decide if two given figures are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	complex verbiage to simplify for understanding.
3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	3. Use the properties of similarity transformations to establish the Angle-Angle (AA) criterion for two triangles to be similar.	Revise G.SRT.A.3 Use the properties of similarity transformations to establish the Angle-Angle (AA) criterion for two triangles to be similar. ***Example:*** Given ΔABC *and* ΔDEF, $\angle A \cong \angle D$, *and* $\angle B \cong \angle E$, *show that* $\Delta ABC \sim \Delta DEF$ *using a sequence of translations, rotations, reflections, and/or dilations.*	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Prove theorems involving similarity	**B. Prove theorems involving similarity**	Keep G.SRT.B	
4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	Keep G.SRT.B.4	
5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Revise G.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. ***Example:*** *A high school student visits a giant cedar tree near the town of Elk River, Idaho and the end of his shadow lines up with the end of the tree's*	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		shadow. The student is 6 feet tall and his shadow is 8 feet long. The cedar tree's shadow is 228 feet long. How tall is the cedar tree?	
Define trigonometric ratios and solve problems involving right triangles	**C. Define trigonometric ratios and solve problems involving right triangles**	Keep G.SRT.C	
6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Revise G.SRT.C.6 Demonstrate understanding that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Allows the standard to be student performance focused.
7. Explain and use the relationship between the sine and cosine of complementary angles.	7. Explain and use the relationship between the sine and cosine of complementary angles.	Keep G.SRT.C.7	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★	8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★	Revise G.SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★ ***Example:*** *Mark and Ruth are rock climbing in the Snake River Canyon. Mark is anchoring the rope for Ruth. If the length of the rope from Mark to Ruth is* $60\ ft$*, with an angle of elevation of* $23°$*, how far is Mark from the base of the cliff?*	Example added to give clarity to the meaning of the standard.
Apply trigonometry to general triangles.	**D. Apply trigonometry to general triangles.**	Keep G.SRT.D	
9. (+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	9. (+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	Revise G.SRT.D.9 (+) Derive the formula $A = \frac{1}{2} absin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex	Corrected mathematical notation.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		perpendicular to the opposite side.	
10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.	10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.	Keep G.SRT.D.10	
11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	Keep G.SRT.D.11	

Circles – G.C

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand and apply theorems about circles	**A. Understand and apply theorems about circles**	Keep G.C.A	
1. Prove that all circles are similar.	1. Prove that all circles are similar.	Keep G.C.A.1	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	Revise G.C.A.2 Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	Changed the second part to be italics to give guidance to where the actual standard ends.
3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral and other polygons inscribed in a circle	Revise G.C.A.3 Prove properties of angles for a quadrilateral and other polygon inscribed in a circle, by constructing the inscribed and circumscribed circles of a triangle.	Allows the standard to be student performance focused.
4. (+) Construct a tangent line from a point outside a given circle to the circle.	4. (+) Construct a tangent line from a point outside a given circle to the circle.	Revise G.C.A.4	Rearranged the standard to support vertical alignment at upper levels.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		(+) Construct a tangent line to a circle from a point outside the given circle.	
Find arc lengths and areas of sectors of circles	**B. Find arc lengths and areas of sectors of circles**	Keep G.C.B	
5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	Keep G.C.B.5	

Expressing Geometric Properties with Equations – G.GPE

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Translate between the geometric description and	**A. Translate between the geometric description and**	Keep G.GPE.A	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
the equation for a conic section	**the equation for a conic section**		
1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	Keep G.GPE.A.1	
2. Derive the equation of a parabola given a focus and directrix.	2. Derive the equation of a parabola given a focus and directrix.	Keep G.GPE.A.2	
3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant. a. (+) Use equations and graphs of conic sections to model real-world problems.★	Keep G.GPE.A.3 and G.GPE.A.3a	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Use coordinates to prove simple geometric theorems algebraically	**B. Use coordinates to prove simple geometric theorems algebraically**	Keep G.GPE.B	
4. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).	4. Use coordinates to prove simple geometric theorems algebraically including the distance formula and its relationship to the Pythagorean Theorem. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1,\sqrt{3})$ lies on the circle centered at the origin and containing the point (0, 2).	Keep G.GPE.B.4	
5. Prove the slope criteria for parallel and perpendicular lines and use them to solve	5. Prove the slope criteria for parallel and perpendicular lines and use them to solve	Revise G.GPE.B.5 Prove the slope criteria for parallel and perpendicular	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	lines and use them to solve geometric problems. ***Example**: Find the equation of a line parallel or perpendicular to a given line that passes through a given point.*	
6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	Keep G.GPE.B.6	
7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★	7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★	Keep G.GPE.7	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Geometric Measurement and Dimension – G.GMD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Explain volume formulas and use them to solve problems	**A. Explain volume formulas and use them to solve problems**	Keep G.GMD.A	
1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	Keep G.GMD.A.1	
2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	Keep G.GMD.A.2	
3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★	3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★	Revise G.GMD.A.3 Use volume formulas for cylinders, pyramids, cones,	Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		and spheres to solve problems.★ ***Example**: The tank at the top of the Meridian Water Tower is roughly spherical. If the diameter of the sphere is 50.35 feet, approximately how much water can the tank hold?*	
Visualize relationships between two-dimensional and three- dimensional objects	**B. Visualize relationships between two-dimensional and three- dimensional objects**	Keep G.GMD.B	
4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	Keep G.GMD.B.4	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Modeling with Geometry – G.MG

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Apply geometric concepts in modeling situations	**A. Apply geometric concepts in modeling situations**	Keep G.MG.A	
1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★	1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★	Keep G.MG.A.1	
2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).★	2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).★	Keep G.MG.A.2	
3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid	3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid	G.MG.A.3	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
systems based on ratios).★	systems based on ratios).★		
	4. Use dimensional analysis for unit conversions to confirm that expressions and equations make sense.★	Keep G.MG.A.4	

HIGH SCHOOL – GRADES 9-12 STATISTICS AND PROBABILITY

The Mathematics Standards Working group chose to use the Massachusetts standards as a starting place for reviewing, revising and rewriting the Idaho Content Standards in Mathematics. These comparison charts show both the current Idaho standard as well as the Massachusetts standard wording.

Note: Standards with a ★ indicate a modeling standard. Standards with a + represent standards for advanced classes such as calculus, advanced statistics or discrete mathematics. Standards without a + are the present standards for all college and career ready students.

Interpreting Categorical and Quantitative Data – S.ID

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Summarize, represent, and interpret data on a single	**A. Summarize, represent, and interpret data on a single count or measurement**	Keep S.ID.A	

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
count or measurement variable	**variable. Use calculators, spreadsheets, and other technology as appropriate.**		
	1. Differentiate between count data and measurement variable.★	Added Standard	
1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	2. Represent data with plots on the real number line (dot plots, histograms, and box plots). ★	Revise S.ID.A.1 and S.ID.A.2 S.ID.A.1 Differentiate between count data and measurement variable. S.ID.A.2 Represent measurement data with plots on the real number line (dot plots, histograms, and box plots). ★ ***Example:*** *Construct a histogram of the current population size in each of Idaho's counties.*	Standard added to address the cluster heading of the fact that we are looking at both categorical and quantitative data.
2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean)	3. Use statistics appropriate to the shape of the data distribution to compare center (median, mean)	Revise S.ID.A.3 ~~Use statistics appropriate to the shape of the data distribution to~~ Compare	Added verbiage to better clarify what students are working with.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
and spread (interquartile range, standard deviation) of two or more different data sets.	and spread (interquartile range, standard deviation) of two or more different data sets. ★	center (median, mean) and spread (interquartile range, standard deviation) of two or more different variables ~~data sets,~~ using statistics appropriate to the shape of the distribution for measurement variable. ★ *__Example:__ Compare the histograms of the annual potato yields over the last*	
		25 *years for Idaho and Maine using the correct measures of center and spread for the shape of the histograms.*	
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	4. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★	Revise S.ID.A.4 Interpret differences in shape, center, and spread in the context of the variables data sets, accounting for possible effects of extreme data points (outliers) for	Restructured into student focused. Changed the verbiage to address quantitative data.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		measurement variables.★ *Example: Describe differences in distributions of annual precipitation over the last 100 years between Boise and Seattle using shape, center, spread and outliers.*	
4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population	5. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize	Revise S.ID.A.5 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. ★ ***Example:*** *Estimate the percentage of all Idaho elk hunters who successfully filled their tag last year, using the results from*	Changed the verbiage to address quantitative data.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		Washington County hunters.	
Summarize, represent, and interpret data on two categorical and quantitative variables	**B. Summarize, represent, and interpret data on two categorical and quantitative variables.**	Keep S.ID.B	
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	6. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. ★	Revise S.ID.B.6 Represent data on two categorical variables on a clustered bar chart, and describe how the variables are related. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. ★ ***Example:*** *Represent the relationship between*	Gives guidance to how to represent data. Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		student effort (on a scale of 1 – 5) and letter grade in a math class with a clustered bar chart and describe the relationship using a relative frequency table.	
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	7. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. ★	Keep S.ID.B.7	
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	a. Fit a linear function to the data and use the fitted function to solve problems in the context of the data. Use functions fitted to data or choose a function suggested by the context (emphasize linear and exponential models). ★	Revise S.ID.B.7a Fit a linear function to data where a scatter plot suggests a linear relationship and use the fitted function to solve problems in the context of the data. ★	Merged 7a and 7c to be able to lessen the number of standards and give structure to what students are actually doing.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
b. Informally assess the fit of a function by plotting and analyzing residuals.	a. Informally assess the fit of a function by plotting and analyzing residuals. ★	Revise S.ID.B.7b ~~Informally assess the fit of a function by plotting and analyzing residuals. ★~~ (+) Use functions fitted to data, focusing on quadratic and exponential models, or choose a function suggested by the context. Utilize technology where appropriate.★ ***Example:*** *Use technology to fit a function of the relationship between the board-feet (measured in volume) of trees and the diameter of the trunks of the trees.*	Added a plus standard to address other models than just linear models. Example added to give clarity to the meaning of the standard.
c. Fit a linear function for a scatter plot that suggests a linear association.	c. Fit a linear function for a scatter plot that suggests a linear association. ★	Revise S.ID.B.7c ~~Fit a linear function for a scatter plot that suggests a linear association. ★~~ Informally assess the fit of a	Moved from b to c.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		function by plotting and analyzing residuals. ★	
Interpret linear models	**C. Interpret linear models.**	Keep S.ID.C	
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	8. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ★	Revise S.ID.C.8 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ★ *For example, explain why the y-intercept of a linear model relating the volume production of sugar beets to size of farm has no meaning whereas the y-intercept of a linear model relating the volume production of sugar beets related to minimum temperature does have meaning.* ***Example:*** *Explain why the y-intercept of a linear model relating the volume production of sugar beets*	Example added to give clarity to the meaning of the standard.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		to size of farm has no meaning whereas the y-	
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	9. Compute (using technology) and interpret the correlation coefficient of a linear fit. ★	Revise S.ID.C.9 Compute (using technology) and interpret the linear correlation coefficient. ~~the correlation coefficient of a linear fit.~~★ *For example, find the correlation coefficient between the number of hours firefighters sleep each night and the length of fireline they construct each day. Use the correlation coefficient to explain whether sleep is important.* ***Example:** Find the correlation coefficient between the number of hours firefighters sleep each night and the length of fireline they construct each day. Use the*	Restructured to remove complex verbiage. Example added to give clarity to the meaning of the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		correlation coefficient to explain whether sleep is important.	
9. Distinguish between correlation and causation.	10. Distinguish between correlation and causation. ★	Revise S.ID.C.10 Distinguish between (linear) correlation and causation.★	Added linear to reiterate that the focus is on linear models.

Making Inferences and Justifying Conclusions – S.IC

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand and evaluate random processes underlying statistical experiments	**A. Understand and evaluate random processes underlying statistical experiments. Use calculators, spreadsheets, and other technology as appropriate.**	Keep S.IC.A	
1. Understand statistics as a process for making inferences about population parameters based on a random	1. Understand statistics as a process for making inferences about population parameters based on a random	Keep S.IC.A.1	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
sample from that population.	sample from that population. ★		
2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?	2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? ★	Revise Keep S.IC.A.2 Decide if a specified model is consistent with results from a given data-generating process. For example, using simulation or validation with given data. ~~(e.g., using simulation).★~~ ***Example**: A model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	Restructured to mirror formatting from the rest of the standards.
Make inferences and justify conclusions from sample surveys, experiments, and observational studies	**B. Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**	Keep S.IC.B	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. ★	Keep S.IC.B.3	
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. ★	Revise S.IC.B.4 Use data from a sample survey to estimate a population mean or proportion and a margin of error. ~~develop a margin of error through the use of simulation models for random sampling.~~ ★	Removed complex verbiage to simplify understanding.
5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between	5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between	Revise S.IC.B.5 Use data from a randomized and controlled experiment to compare two treatments; use ~~simulations~~ margins of error to decide if differences	Restructured to fully encompass what should be happening within the standard.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
parameters are significant.	parameters are significant. ★	between ~~parameters~~ treatments are significant.★	
6. Evaluate reports based on data.	6. Evaluate reports based on data. ★	S.IC.B.6 Evaluate reports of statistical information based on data.★ *For example, students may analyze and critique different reports from media, business, and government sources.* ***Example**: Students may analyze and critique different reports from media, business, and government sources.*	Example added to give clarity to the meaning of the standard.

Conditional Probability and the Rules of Probability – S.CP

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Understand independence and conditional probability and use them to interpret data	**A. Understand independence and conditional probability and use them to interpret**	Keep S.CP.A	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	data from simulations or experiments.		
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). ★	Keep S.CP.A.1	
2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. ★	Revise S.CP.A.2 ~~Understand~~ Demonstrate Understanding that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.*	Allows the standard to be student performance focused.
3. Understand the conditional probability of	3. Understand the conditional probability of	Revise S.CP.A.3	Mathematical notation corrected

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. ★	Understand the conditional probability of A given B as P(A and B)/P(B)$\frac{P(A \cap B)}{P(B)}$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. ★	
4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on	4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on	Keep S.CP.A.4 ***Example**: Collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other*	Example added for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results. ★	*subjects and compare the results.*	
5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.	5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer. ★	Keep S.CP.A.5 ***Example**: Compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*	Example added for clarity
Use the rules of probability to compute probabilities of	**B. Use the rules of probability to compute probabilities of compound**	Keep S.CP.B	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
compound events in a uniform probability model	**events in a uniform probability model.**		
6. Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.	6. Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model. ★	Keep S.CP.B.6	
7. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.	7. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. ★	Revise S.CP.B.7 Apply the Addition Rule, ~~P(A or B) = P(A) + P(B) – P(A and B)~~ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$, and interpret the answer in terms of the model. ★	Mathematical notation corrected
8. (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.	8. (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model. ★	Revise S.CP.B.8 (+) Apply the general Multiplication Rule in a uniform probability model, ~~P(A and B) = P(A)P(B|A) = P(B)P(A|B)~~ $P(A \cap B) = P(A)P(B\|A) = P(B)P(A\|B)$,	Mathematical notation corrected

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
		and interpret the answer in terms of the model. ★	
9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems.	9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems. ★	Keep S.CP.B.9	

Using Probability to Make Decisions – S.MD

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
Calculate expected values and use them to solve problems	**A. Calculate expected values and use them to solve problems.**	Keep S.MD.A	
1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical	1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical	Keep S.MD.A.1	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
displays as for data distributions.	displays as for data distributions. ★		
2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.	2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. ★	Revise S.MD.A.2 (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution of the variable.★	Gives additional clarity to what the standard is actually addressing.
3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected	3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected	Keep S.MD.A.3 ***Example****: Find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.*	Example added for clarity.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
grade under various grading schemes.	grade under various grading schemes. ★		
4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?	4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households? ★	Revise S.MD.A.4 ***Example**: Find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*	Example added for clarity.
Use probability to evaluate outcomes of decisions.	**B. Use probability to evaluate outcomes of decisions.**	Keep S.MD.B	
5. (+) Weigh the possible outcomes of a decision by	5. (+) Weigh the possible outcomes of a decision by	Revise S.MD.B.5	

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
assigning probabilities to payoff values and finding expected values.	assigning probabilities to payoff values and finding expected values. ★		
a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast- food restaurant.	a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast- food restaurant. ★	Revise S.MD.B.5a ***Example**: Find the expected winnings from a state lottery ticket or a game at a fast- food restaurant.*	Reformatted example to be consistent with other examples.
b. Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.	b. Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident. ★	Revise S.MD.B.5b ***Example**: Compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*	Reformatted example to be consistent with other examples.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
6. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast- food restaurant.	6. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast- food restaurant. ★	Revise S.MD.B.6 (+) Use probabilities to make ~~fair~~ objective decisions. ~~(e.g.,~~ For example, the Idaho Department of Transportation classifies highways for overweight loads based on the probability of bridges on a highway failing under given vehicle weights. ~~drawing by lots or using a random number generator).~~ ★ ***Example**: The Idaho Department of Transportation classifies highways for overweight loads based on the probability of bridges on a highway failing under given vehicle weights.*	Removed complex verbiage and simplified understanding. Changed the example to align better with Idaho.
6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a	Revise S.MD.B.6 (+) Use probabilities to make ~~fair~~ objective decisions. ~~(e.g.,~~	Removed complex verbiage and simplified understanding. Changed the example to align better with Idaho.

Note: The tables below show the proposed revisions to the 2017 Idaho Content Standards in Mathematics.

Current Idaho Standard	Current Massachusetts Standard	Proposed Revision	Rationale for Revision
	random number generator). ★	For example, the Idaho Department of Transportation classifies highways for overweight loads based on the probability of bridges on a highway failing under given vehicle weights. ~~drawing by lots or using a random number generator)~~.★	
7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game and replacing the goalie with an extra skater.) ★	S.MD.B.7 (+) Analyze decisions and strategies using probability concepts. ~~(e.g.,~~ For example, product testing, medical testing, or pulling a hockey or soccer goalie at the end of a game and replacing the goalie with an extra player~~)~~.★ ***Example**: Product testing, medical testing, or pulling a hockey or soccer goalie at the end of a game and replacing the goalie with an extra player.*	Restructured to mirror common formatting throughout the standard. Adjusted the example to relate better with Idaho individuals.