



Minnesota Children

Minnesota Department of Children, Families & Learning

Progress Report of Graduation Standards Project

Summary for Thursday, May 23, 1996

The public schools of Minnesota will begin full-scale implementation of both the Basic Standards and the High Standards (Profile of Learning) in the fall of 1996. The following aspects of the Graduation Standards policies and implementation will be overviewed at our session on May 23. At that time, Department of Children, Families, and Learning staff will provide further documents and details and will be happy to answer questions and to hear your comments and concerns.

Basic Standards

The State Board of Education has adopted rules which require all students entering 9th grade in the fall of 1996 and after to pass Basic Standards tests in both **reading** and **mathematics** unless their special needs circumstances provide otherwise through legal modification or exemption processes.

The State Board of Education is currently engaged in formal preparation for the rulemaking process to add a requirement that students entering ninth grade in the fall of 1997 and after pass Basic Standards in **writing** as well.

Under the Basic Standards rules, schools may begin giving graduation level tests in these Basic Standards tests as early as eighth and not later than tenth grade. Remediation plans must be developed for students who have not passed one or more of the tests by the end of tenth grade. Schools also have the option of using the state test or other tests which have been approved because those tests assess essentially the same skills. Schools which choose alternative tests are responsible, with technical assistance from the Department, for determining comparable passing scores.

Over eighty thousand students (both public schools and private) took the first state tests in reading and/or math in April, 1996, with local results reporting in early June. The writing tests will be field tested in May, 1996, with first statewide testing opportunities in 1997.

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Test dates for 1996-97 have been set and distributed to districts (See attachment A).

It is the goal of the Department that schools develop curriculum and instruction methods to ensure that all students are able pass the Basic Standards by the end of eighth grade.

High Standards (Profile of Learning)

A three year phase-in schedule for the High Standards was approved by the State Board of Education at their May, 1996, meeting (See Attachment B). All High Standards and all assessments for Phase I -- primary and intermediate grades, middle level, and high school level -- have been completed and distributed and are also available on the Internet (*Worldwide Web*). Suggestions for revisions continue to be received and considered for future annual revisions.

Training for Phase I is being offered this summer. This training for teachers is free of charge and will be presented at sites in all congressional districts. Schools are strongly encouraged to begin implementation of Phase I standards throughout their P-12 curricula during the 1996-97 school year.

In addition, training continues to be provided for school administrators, teachers, curriculum and assessment specialists, and each district's designated implementation technician through joint efforts of the Graduation Standards, Best Practice, and MEEP teams.

A recordkeeping system has been developed for schools and is in final stages of review and comment. Software vendors have received the specifications needed to provide effective recordkeeping and reporting programs for their client schools.

Collaboration continues with higher education, business, industry, policymakers, and local community organizations and citizens. Discussions also continue to make certain that the Graduation Standards work effectively with existing programs such as school-to-work, International Baccalaureate, Advanced Placement, Post-Secondary Enrollment Options, and other alternative programs.

Pilot sites are moving ahead of the rest of the state, choosing to implement Phase II or III or both during the 1996-97 school year and to gather data about student performance and the implementation of these additional standards.

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Winnipeg, Manitoba
Quebec, Canada
St. John's, Nfld.
Halifax, N.S.

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Attachment A

**BASIC STANDARDS TESTING SCHEDULE
SCHOOL YEAR 1996-97**

In accordance with the Rules relating to Graduation Standards students graduating in the class of 2000 must meet Basic Standards in reading and mathematics in order to be eligible for a diploma.

The following are the official testing dates for the administration of the State Tests of Basic Standards in Reading and Mathematics in the 1996-97 school year. In order to maintain security there are only two possible dates for each test. The first date listed is the official test date. The second date is the only possible date for make up tests.

READING: Tuesday January 28

Make-up date for Reading:
Wednesday January 29

MATHEMATICS: Thursday January 30

Make-up date for Mathematics:
Friday January 31

Students in grade 8 or above have a preliminary testing opportunity for the Basic Standard Test of Writing. In order to maintain security there are only two possible dates for the writing test. The first date listed is the official test date. The second date is the only possible date for make up tests.

WRITING: Tuesday February 25

Make-up date for Writing:
Wednesday February 26

Attachment A

In the event of emergency due to weather you must contact the Office of Graduation Standards to schedule an alternate date. Alternate dates will only be permitted after the official testing dates and must be noted on the students answer sheets.

Testing for the school year 1997-98 will be in December.

Schools giving a commercially published, norm referenced test to pass students on the Basic Standards may give these tests any time during the 1996-97 school year. Only the state tests must be given on the official testing dates. If you have any questions please call Cathy Wagner at (612) 282-6281.

**RECOMMENDED SCHOOL IMPLEMENTATION SCHEDULE
HIGH STANDARDS IN THE PROFILE OF LEARNING**

The State Board of Education recommends a three-year phase-in of the High Standards in the Profile of Learning for all Minnesota Public Schools. Schools may choose to implement the standards in a different order, but should be aware of training available and the expectation that all seventeen categories, which will be required of all students (plus the "Another Language" category), should be implemented in all schools by the end of the 1998-99 school year. **The Recommended Phase-In Schedule is shown on the reverse side of this sheet.**

All developmental standards and assessments should be implemented in primary (Grade 3 standards); intermediate (Grade 5 standards); and middle/junior high (Grade 8 Standards) levels as well as at least one standard in each of the seventeen categories required of all students plus the "Another Language" category at the high standard level in the high school. Sufficient numbers of standards must be implemented in each category and in a sufficient variety of areas of the local curriculum to give students appropriate choices for demonstrating their proficiencies at high levels.

The Board recommends that the following assumptions be used to guide implementation:

- Statewide minimum student graduation requirements be finalized as soon as possible as a result of data gathered and analyzed during the statewide school phase-in of these standards and assessments.
- Local districts may choose to set higher requirements for graduation.
- Students be required to complete a record of work and achievement scored against high standards in seventeen required categories before they graduate (the "Another Language" category will not be required of all students for graduation).
- Schools design opportunities in which several standards can be worked on and completed simultaneously within courses, programs, or performances.
- Students be offered choices among varied contexts in which to demonstrate their competence in each category, and that, in addition to the areas named in the categories themselves, students must include among their choices pre-high school and high school work in literature, U.S. history, an art form other than literature, multicultural perspectives, and technology.
- Each student's education be focused on the five Comprehensive Goals, preparing students to function successfully as:
 - Purposeful thinkers
 - Self-directed learners
 - Responsible citizens
 - Effective communicators
 - Productive group participants
- The state, in collaboration with other groups, organizations, institutions, and individuals, provide training, follow-up assistance, and materials to assist schools in effective implementation.

**RECOMMENDED SCHOOL IMPLEMENTATION PHASE-IN SCHEDULE
HIGH STANDARDS OF THE PROFILE OF LEARNING**

Phase One

1996-7/Element 5
16 Standards

•Inquiry A

(Published Sources):

Math Research
History of Science
Research Process
History through Culture
History of the Arts
Cultures across Time
Themes of U.S. History
Recorders of History
Issue Analysis

•Inquiry B

(Scientific Methods):

Scientific Investigation
Scientific Method

•Inquiry C

(Data Gathering):

Social Science Processes
Research and Create a
Business Plan
Market Research
Case Study
Product Development

Phase Two

1997-8/Elements 4,6,7,8,9
29 Standards

•Mathematics A:

Algebraic Patterns
Patterns and Discrete
Functions

•Mathematics B:

Shape and Space
Technical Applications
Chance and Data
Handling
Measurement.

•Sciences A and B

(2 categories):

Biological Concepts
Chemical Concepts
Earth and Space Systems
Laws of Physics
Environmental Systems
Technical Systems

•Decision Making A:

Phy. Ed. & Fitness

•Decision Making B:

Individual/Community
Health
Emergency Health Care
Nutrition

•Managing Resources:

Economic Systems
Natural/Managed
Systems
Personal Financial
Management
Business Management
Financial Systems
Family Resources
Career Investigation
Occupational Experience

•People and Cultures A:

U.S. Citizenship

•People and Cultures B:

Human Geography
Multiple Perspectives
Institutions/Traditions
in Society
Community Service

Phase Three

1998-9/Elements 1,2,3,10
19 Standards

•Read, Listen, View:

Scientific Reading
Reading Complex
Information
Interpreting Perspectives
Technical Reading

•Writing

Academic Writing
Technical Writing

•Speaking

Public Speaking
Parliamentary Procedure
Business Presentation
Interpersonal
Communication

•Arts A:

Artistic Performance
Creative Technology
Artistic Creation

•Arts B:

Artistic Interpretation

**•Another Language (to be
required of schools but not
of all students for
graduation)**

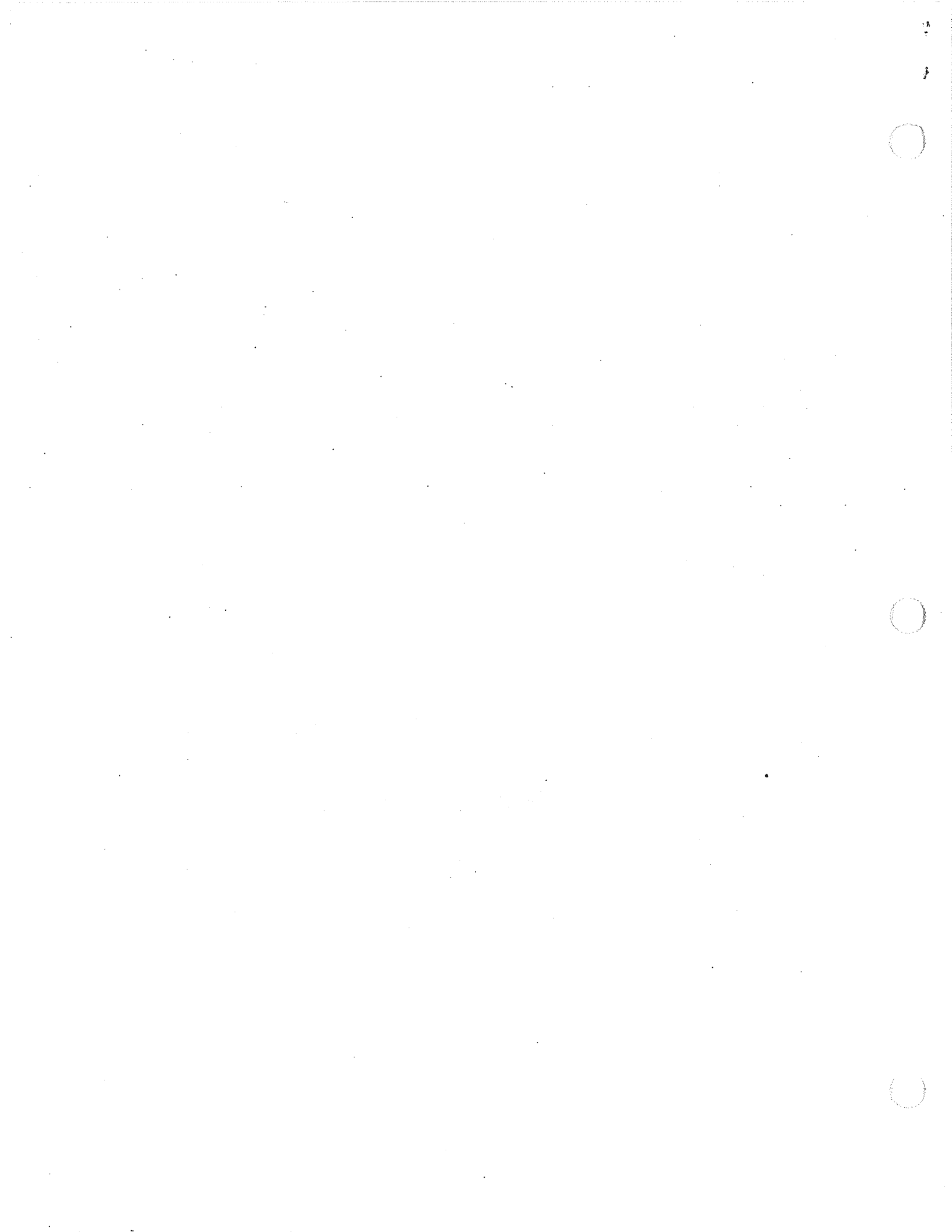
Symbol System in Drafting
World Languages
World Languages in the
Workplace
American Sign Language
American Sign Language
in the Workplace

**BASIC REQUIREMENTS IN READING
ASSESSMENT SPECIFICATIONS**

Minnesota Department of Education

February 24, 1995

DRAFT



Basic Requirement in Reading

Introduction

The specifications for reading competency have been shaped by two fundamental premises. First, reading is an integrated activity that is more than the accumulation of discrete reading skills. Readers may use a variety of techniques to find meaning; but the key question addressed by the State assessment is, "Can the student derive meaning (both literal and inferential) from the printed text?"

Second, reading comprehension is to be assessed from the perspective of real-world competencies. Extensive research conducted by the National Adult Literacy Survey (NALS) suggests that reading competency be defined as "using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential." This perspective is echoed by the International Association for the Evaluation of Educational Achievement (IEA) which, in the International Reading Literacy Study, defined reading literacy as "the ability to understand and use those written language forms required by society and/or valued by the individual."

The integrated nature of reading and the importance of assessing its application in real-world contexts have guided the development of the following specifications. Three broad categories explain these specifications: (1) passage specifications that outline the criteria for selecting texts; (2) readability specifications that explain the conditions that affect the level of difficulty of a passage; and (3) test items which identify the types of understandings that students are expected to show in responding to the texts. It is not the intent of this assessment to diagnose student strengths or weakness in a particular "reading skill." The test items will be geared to the information and intent of the specific article being read, rather than to a designated number of "types" of questions that focus on discrete reading skills or techniques.

A final section describes the packet specifications used in the State reading assessment packages.

SPECIFICATIONS FOR BASIC COMPETENCY READING TEST

I. Specifications for Passages

A. Genre - Selections are to be non-fiction prose that is either narrative or expository (this does not include technical writings). There are two reasons for limiting the assessment to non-fiction. First, most written information basic to functioning in society is non-fiction. Second, other types of reading will be assessed in the Profiles of Learning. Students will be expected to demonstrate their understanding of technical materials such as manuals and research documents; and they will interact with fiction genres through their understanding of the processes and meaning of artistic expression.

B. Standard English - Articles selected for assessment should be written in standard English. Passages with frequent use of words or phrases that are other than English, or passages that use dialect or unexplained technical jargon should be avoided unless such words are defined within the context of the passage.

C. Prior knowledge - The reader should be able to appreciate and understand the article on its own merit. References to people, places and events should either be explained within the article or be considered common knowledge that a reader would recognize without needing further explanation. This is also true of figurative language which often requires prior knowledge or a certain cultural background to be understood. (For example, some sports metaphors or allusions could be misinterpreted by readers who have not had a related experience.)

These criteria also apply to passages where the reader is expected to understand satire.

D. Relevancy - Students should be tested from "real world" readings commonly used by adults as sources of information. Articles from newspapers and general interest, high circulation magazines typically found at most newsstands are reasonable sources. The text should not be one specifically contrived for the test.

E. Subject of article

1) *Interest* - The topic of the passage should be of interest to an adolescent without being strictly geared to an adolescent audience. For example, "Can Fast Food Be Good Food?", an article in Consumer Reports (August 1994), has adult relevancy (making informed decisions about one's nutrition), and adolescent interest (even school cafeterias are bringing in fast foods to offer at lunch).

2) *Fluff factor* - Use this to weed out articles typically found in tabloids. "Aliens Who Eat English Teachers" may pique a student's interest, but not hold much relevancy for what understandings one must demonstrate in order to function in the adult world.

3) *Controversial issues* - Avoid material that focuses on volatile topics which might raise the concern of parents or citizen groups. Editorials and articles from the opinion pages, however, can be a good source for getting at inferential comprehension. Look for texts in which either both sides of an issue are presented in a well-written commentary, or multiple points of view are given in a clear and coherent way.

F. Bias -- Scan the article for bias based on sexual preference, race, gender, religion, or disability. Consider such things as the tone and nature of the article, values implicitly or explicitly conveyed, vocabulary or phrasing that may discriminate against a particular group, and traditional or nontraditional assumptions present in an article that would put one group at an advantage over another. Topics that may be offensive to test takers could be another source of bias. Notice omissions and stereotypes of minority or gender groups in both the article itself and in accompanying pictures or illustrations.

G. Pictures, Charts, Graphs - Visual aids where the written text is an important source of information may be used as part of the assessment.

H) Contextual meanings - Some selections may have words or phrases that are specific to the articles and not part of common vocabulary. These articles may still be appropriate if the words and phrases can be understood from contextual definitions and references, or if the words/phrases are footnoted.

II. Readability Specifications

A. DRP level - The Degrees of Reading Power test of reading ability will index the reading difficulty of prose materials by examining such variables as length of words, length of sentences, and common or frequently used words. Articles should fall within a DRP level of 64-67.

B. Coherence - The DRP assesses linguistic variables as they relate to level of reading difficulty. It does not differentiate between scrambled and coherent prose; therefore, the assessment writer must check the article for organization, clarity of sentence structure, use of technical language, and adequate development of an idea.

C. Specialized language - Any vocabulary idiosyncratic to the topic of the article must be defined in the article. If an article meets all of the specifications, but uses a term which needs clarification, a footnote or preface explaining that term may be provided.

D. Length - The article should be long enough to engage the reader, and it should require the reader do more than simply identify the main idea. A length of 600-900 words could accommodate a standard feature article in the newspaper.

III. Test Items

A. Literal Comprehension (Literal items require a student to choose or compose an answer that is explicitly stated in the text but is expressed in words different from that of the item.)

In assessing a student's literal comprehension, the focus should be on broad, basic understanding, **not on obscure vocabulary and minute detail.**

1) *Reading for main idea* - The student can identify main ideas in the article.

2) *Understanding supporting ideas* - The student can recognize information that supports the main idea.

3) *Contextual meaning* - The student can understand the meaning of unfamiliar words and phrases from contextual definitions and references.

B. Inferential Comprehension (Inference items require the student to draw understanding from a text that is not explicitly stated in the text.)

The focus on inferential comprehension should stay within the clues and context of the article itself.

1) *Author's perspective* - The student can recognize the author's viewpoint even if it is not directly stated.

2) *Drawing conclusions* - The student can recognize a logical conclusion that one would draw from the reading.

3) *Fact/Opinion* - The student can understand when an author is using factual information and when the author expresses his/her own opinion, or that of someone else.

IV. Package Specifications for the State Assessment

The following describes the reading packages used in the State Assessment.

- A. Each package contains four articles.
- B. The total number of words to a package ranges from approximately 3100 to 3400 words.
- C. Packages have at least one narrative passage; the other selections are expository.
- D. Approximately 75% of the questions test for literal comprehension, and 25% test for inferential comprehension.
- E. The total number of questions asked in a package is 40.
- F. The average DRP falls within a range of 64-66.

02/24/95

Great blue heron!

By Tom Malone

When I first became interested in birds, in about 1959, Great Blue Herons were rare and very shy. They were rare because at that time they had not recovered from the massive killings of the late 19th and early 20th century. Such killings made the bird quite wary of humanity. Indeed, it was unusual to get within 300 yards of a heron in the 1950s and '60s.

The story of the Great Blue Heron is a case study of man's savagery toward Earth's fellow inhabitants: The birds were killed by the millions so ladies could have feathers in their hats. Worse, they were killed mainly during the breeding season, when adults sport the "nuptial plumes" for which the birds were hunted. As a result, not only were the adults slaughtered, the orphaned young died in the nest.

In the past 35 years, Great Blue Herons have recovered and have become commonly seen. Not only that, it seems the bird is no longer so terrified of people and can be more closely approached.

The present danger is not from men, with guns but from the bulldozers and housing developments of cities such as Rogers, a small western Hennepin County city that is determined to grow as fast as possible no matter the price. For the residents of short-sighted towns such as this the price will be higher taxes and reduced livability. For the wild creatures with whom we share our planet the price for "progress" may be extinction. How ironic if the heron survived the desire for feathers but succumbed to the economic realities of fast profits and increased governmental power that is the engine behind poorly planned development.

A Great Blue Heron is unmistakable. In flight, any very large, "short-necked," dark bird with long legs is this species. Herons pull their necks in while in flight; cranes



Illustration by Joy Messen

The great blue heron

stretch them out. This trait is quite distinctive.

Great Blue Herons nest in colonies, called "rookeries." The rookery may be made up of several or a few hundred birds; there may even be other types or egrets within the rookery. Herons are sociable birds.

A heron nest may be on the ground or many feet up in a tree. The bird is quite adaptable and no nest location is common or predictable. It is known, however, that a pair of herons may use the same nest site for many years.

Both parents incubate and feed the young. Feeding is accomplished by regurgitation directly into the mouth of the baby. When the young are older, the parent is more likely to regurgitate the food onto the floor of the nest, where the young scramble to eat it. Herons are not known for their impeccable nesting habits.

Herons are birds of wetlands and water. While they will frequent salt and fresh-water environments, they will not be found in dry areas. They are birds of where the water meets the land. Even their food is largely aquatic.

They are most active in hunting just before dawn and at dusk. Then, they often can be seen standing motionless, waiting for their food to

Once savaged for plumage, sharp-billed bird flocks to water

swim, walk or run by: With a quick flash of the sharp bill, the food is caught or speared and then eaten. Fish, crawfish, frogs, salamander and toads, small birds or mammals — if it is small enough to capture, it can and will be eaten.

Great Blue Herons occupy a wide range of North America. In summer they can be found from southern Alaska through southern Canada down through the United States to the Gulf Coast and southern Florida. In Minnesota, the herons nest throughout most of the state wherever there is suitable habitat. They are largely absent from the southwest corner of Minnesota. They withdraw into the Southern states during winter, although some birds are found in the southern part of the state.

It is wonderful to see this lovely bird making such a recovery. I have often seen them in Anoka County along the Mississippi River and in Minneapolis standing along that city's beautiful lakes. They also are common in Rogers and Hassan Township. Whether they stay is a question of whether those areas protect their numerous waterways and woodlands. So far the future is unclear but ominous.

Tom Malone is a partner with the Coon Rapids law firm of Barna, Guzy & Steffen and has studied birds for more than three decades.

Reprinted with permission from Tom Malone as published in the July 16, 1994 issue of the *Star Tribune*.

Great Blue Heron!

1. What is the biggest danger to survival facing the Great Blue Heron today?
 - A. Pollution of the water in its environment
 - B. Destruction of rookeries by feather collectors
 - * C. Development of land used by the Great Blue Heron
 - D. Increasing numbers of natural predators

2. While in flight, a Great Blue Heron can best be distinguished from a Crane by its --
 - * A. short-neck
 - B. long legs
 - C. wide wing-span
 - D. distinctive blue color

3. The author describes the Blue Heron as becoming wary after many had been killed off. Wary in this context means --
 - A. extinct
 - * B. cautious
 - C. aggressive
 - D. unfriendly

4. What is the author's attitude about the Great Blue Heron?
 - A. He is concerned that it has become a pest.
 - B. He thinks it is unusually intelligent for a bird.
 - * C. He thinks it is a beautiful animal.
 - D. He is sad to see so few places where it can be found.

5. The author describes the birds as "sociable" because they --
 - A. can be easily approached by humans
 - * B. live in rookeries that will include other birds
 - C. fly in groups
 - D. have several hundred birds to a rookery

6. How has the Great Blue Heron changed since the author first became interested in studying the bird?
- * A. It is easier to find and to approach closely.
 - B. It is less active and has adapted to living in trees.
 - C. It nests in smaller groups than before.
 - D. It occupies a smaller range in North America.
7. A Great Blue Heron is most likely to be found looking for food --
- A. in flight.
 - * B. at the water's edge.
 - C. from a tree in the forest
 - D. in the ocean's depths.
8. Which of the following expresses the author's opinion, not a fact about the Great Blue Heron?
- * A. The heron's story is a case study of man's savagery.
 - B. Herons nest in colonies called rookeries.
 - C. A heron may nest on the ground or in a tree.
 - D. A heron will eat any small animal it can catch and swallow.
9. What concern does the author have about the Great Blue Heron?
- A. No one is studying its mating and nesting habits.
 - * B. With destruction of its habitat, it may become scarce.
 - C. No area has been set aside for its preservation in Minnesota.
 - D. Laws regarding the collection of heron feathers are not being enforced.
10. According to the author, the future of the Great Blue Heron --
- A. is hopeful.
 - B. is discouraging.
 - C. is clear.
 - * D. is uncertain.

**SPECIFICATIONS FOR WRITING THE
MINNESOTA STATE
MATHEMATICS BASIC COMPETENCY REQUIREMENT TEST**

1. Tests must be generically constructed so that they are appropriate for use with any mathematics textbook.
2. When ever possible test items should be written in a "real world" context.
3. Use of a calculator.
 - calculators use is a STUDENT OPTION on the Mathematics Basic Competency Requirement Test
 - however, it will be to a student's advantage to use a calculator on the test
4. A METRIC and U.S. CUSTOMARY units of measurement conversion table and a geometric formula chart will be provided to students on a separate page in the test booklet.
5. Restrictions on sets of numbers:
 - * Fraction numbers will have:
 - denominators restricted to 2,3,4,5,6,8,10,12,16
 - a horizontal line will separate the numerator and denominator values
 - * Decimal numbers will have
 - fewer than six digits
 - unless the context of the problem makes it necessary for more digits
 - fewer than four digits to the right of the decimal point
 - a leading zero if less than one (e.g. 0.257 not .257)
6. Computations will be restricted to the fundamental operations of:
 - addition, subtraction, multiplication, and division
 - a lower case " x " will be used to indicate a multiplication problem
 - " ÷ " will be used to indicate a division problem
7. Computations involving exponents will be restricted to:
 - the base for the exponent must be a counting number less than 10
 - OR
 - multiples of 10 less than or equal to 100
 - the exponent must be a counting number less than 6

**SPECIFICATIONS FOR WRITING THE
MINNESOTA STATE
MATHEMATICS BASIC COMPETENCY REQUIREMENT TEST
part 2**

8. Test items should avoid topics which may be controversial or offensive to test takers.
9. Test items will be sensitive with regard to references to special populations of people with respect to age, disability, religion, gender, language, race, and ethnicity.
10. If you choose to design a multiple choice test:
Guidelines for writing multiple choice responses are as follows:
 - answers will be written in the same number format (e.g. same measurement unit)
 - all units of measure will be written out - no abbreviations
 - if numerical, answers will be given in ascending order with decimal points aligned unless the question refers to finding "the least" or "the greatest" value
 - each test item should have either three or four choices:
 - there will be only ONE correct answer
 - formulas for corrections for guessing should not be applied
 - such answers as "all correct," "A and B", or "not given" in most cases should not be used as a response choice
 - be sure that each option is plausible
11. In constructing a test be sure to have a sampling of content from each section (A-H). However, it is not necessary to test every item from every section on every form of the test.

MINNESOTA'S BASIC GRADUATION REQUIREMENT

Mathematics to solve problems in the language of
numbers, shapes, and symbols
commonly used in adult life

The Minnesota Basic Requirement Graduation Test has been divided into the eight separate sections listed below:

- A. Solve "real life" application problems involving:
whole numbers, fractions, decimals, and integers

- B. Solve "real life" application problems involving:
percents, rate, ratios, and proportions

- C. Use concepts of number sense, place value and number relationships to
compare, order, and determine equivalence of whole numbers, fractions,
decimals, percents and integers

- D. Use estimation in "real-life" context

- E. Applying measurement concepts to a variety of "real-life" situations

- F. Read, interpret and use one- and two- dimensional graphic forms such as tables,
charts, maps, and graphs to analyze data, identify patterns, and make
predictions

- G. Use elementary concepts of probability and statistics

- H. Apply geometric and spatial relationships to "real life" situations

The following pages contain the specifications of material to be included within each of the sections.

**A. Solve "real life" application problems involving:
whole numbers, fractions, decimals, and integers**

- * **test items may involve:**
 - real-life applications, such as making change, discount (using fractions), best buy (comparison shopping), writing a check, temperature changes, etc.
 - identification of extraneous information

- * **test item restrictions:**
 - no more than two different sets of numbers may be used in a test item
 - problems can be solved in fewer than three steps
 - conversion within measurement units will not be required (part of section E)
 - estimating conversions between metric and customary systems will not be required (part of section D)

**B. Solve "real life" application problems involving:
percents, rate, ratios, and proportions**

*** test items may involve:**

- real-life applications, such as: sales tax, discount (using percents), tips / gratuity, commission, simple interest, etc.
- real-life applications of scale, ratio, and proportions such as: blueprints, unit pricing, maps, recipes, etc.
- real-life applications of rate such as: miles per gallon, speed, etc.

*** test items restrictions:**

- no more than two different sets of numbers may be used in a test item
- problems will be solved in fewer than three steps
- percents
 - decimal percents may have one digit to the right of the decimal point
 - exception would be a percent such as $33\frac{1}{3}\%$
- ratios should be formatted as: "2 : 3" or "2 to 3" or " $\frac{2}{3}$ "
- conversion within measurement units will not be required (part of section E)
- estimating conversions between metric and customary systems will not be required (part of section D)

C. Use concepts of number sense, place value and number relationships to compare, order, and determine equivalence of whole numbers, fractions, decimals, percents and integers

*** test items may involve:**

- the use of $<$, $=$, $>$, \neq , \leq , or \geq
- ordering any group of numbers
 - listing in increasing or decreasing order
 - placing on a number line
- identification of equivalent forms of a number
 - counting numbers with exponents such as: 3^4
(see page 1 item #7 for restrictions)
 - percent as a decimal or a fraction
 - fractions as a percent or a decimal
 - decimals as a percent or a fraction
 - expressing a fraction in simplest form
- using correct order of operation procedures:
 - using 4 or fewer operations.
 - only counting numbers less than 10 may be used
- extending patterns and sequences of numbers
- identification of the place value of a digit in a particular position
- rounding of a number to a designated place value
- multiple representation of numbers
- use of appropriate rounding such as: nearest cent, nearest dollar, etc.
- a wide range of numbers including very large and very small numbers when the context warrants them such as:
 - millions of dollars for a school remodeling bond
 - one part per million for a toxic substance in tap water

*** test items restrictions:**

- in this test section several types of number formats may be included in a single test item
- rounding of numbers is restricted to:
 - thousands, hundreds, tens, ones, tenths, hundredths

***D. Use estimation in " real-life" context**

*** test items may involve:**

- determining the reasonableness of an answer
- using an appropriate estimation technique
 - range of estimations, rounding, overestimation, underestimation, etc.
- rounding where fractional parts, regardless of size, must be rounded to the next lower or higher whole number
- applying estimation in approximating area, volume, size of objects, distance, and financial transactions
- knowing when estimation is or is not appropriate
- estimating conversions between metric and customary systems
- estimation of sum and differences, products and quotients using whole numbers, fractions, decimals, and percents

*** test items restrictions:**

- testing to determine if students can label specific estimation techniques is not appropriate
- estimation of sums and differences: two numbers with less than five digits
- estimation of products and quotients: two numbers with less than four digits
- conversion within measurement units will not be required (part of section E)

*** This portion may be written so that calculators are NOT allowed.**

E. Applying measurement concepts to a variety of "real life" situations

* test items may involve:

- conversions within metric and customary measurement systems
- finding length, perimeter, angles, area, circumference, time, surface area, volume (capacity), weight (mass), etc.
- applying formulas in measurement situations
- selecting appropriate units of measurement
- making use of a ruler, protractor, balance scale, thermometer, etc.

* test item restrictions:

- if a problem requires a number to be squared, then use counting numbers less than 10 or a multiple of 10 less than or equal to 100
- ratio and proportion problems are NOT part of this section (part of section B)
- items will NOT require converting from one measurement system to another
- conversion within a measurement system and use of a formula will not be required in the same test item
- surface area and volume
 - use only with cube or rectangular solids
- items cannot be limited only to the customary measurement system
- decimal notation will be used for metric units (e.g. 1.25 grams instead of $1\frac{1}{4}$)
- the symbol for PI can be given in an answer response
 - an **approximation for PI** can be given as either $\frac{22}{7}$ or 3.14
 - indicate in the test item that an **approximation for PI** is being used
- rounding of answers will not be required (part of section C)

F. Read, interpret and use one- and two- dimensional graphic forms such as tables, charts, maps, and graphs to analyze data, identify patterns, and make predictions

*** test items may involve:**

- use of tables, charts, maps, circle graphs, bar graphs, line graphs, or number line
- use of whole numbers, percents, decimals, and integers
- identification of trends and patterns
- plotting and locating ordered pairs that represent "real world" data
 - select the correct coordinate value(s) given the item location
 - select the correct item given the coordinate value(s)
- solving problems using information presented in the graphs, which may have a key stating that all numbers are given in hundreds, thousands, millions, etc.

*** test item restrictions:**

- intervals on a given axis should be uniform.
- circle graphs will have less than 6 sectors
- line and bar graphs will have no more than two lines of sets of bars

G. Use elementary concepts of probability and statistics.

* test items may involve:

Probability

- placing events in the order of likelihood of occurrence
- finding the probability of the occurrence of a specific outcome including 0 and 1
- making a prediction from a **simple** sample
 - maximum sample size: 100
 - maximum number of objects in a sample: 5
 - maximum population size: less than 10,000

Statistics (mean, median)

- working with 10 or fewer values
 - whole numbers have a maximum of three digits
 - decimal numbers will have
 - less than three digits to the right of the decimal point
 - maximum of five digits
- use of statistics to make decisions
- recognizing the use of statistics to mislead

* test item restrictions:

- answer choices must be expressed in the same format

H. Apply geometric and spatial relationships to "real life" situations

* test items may involve:

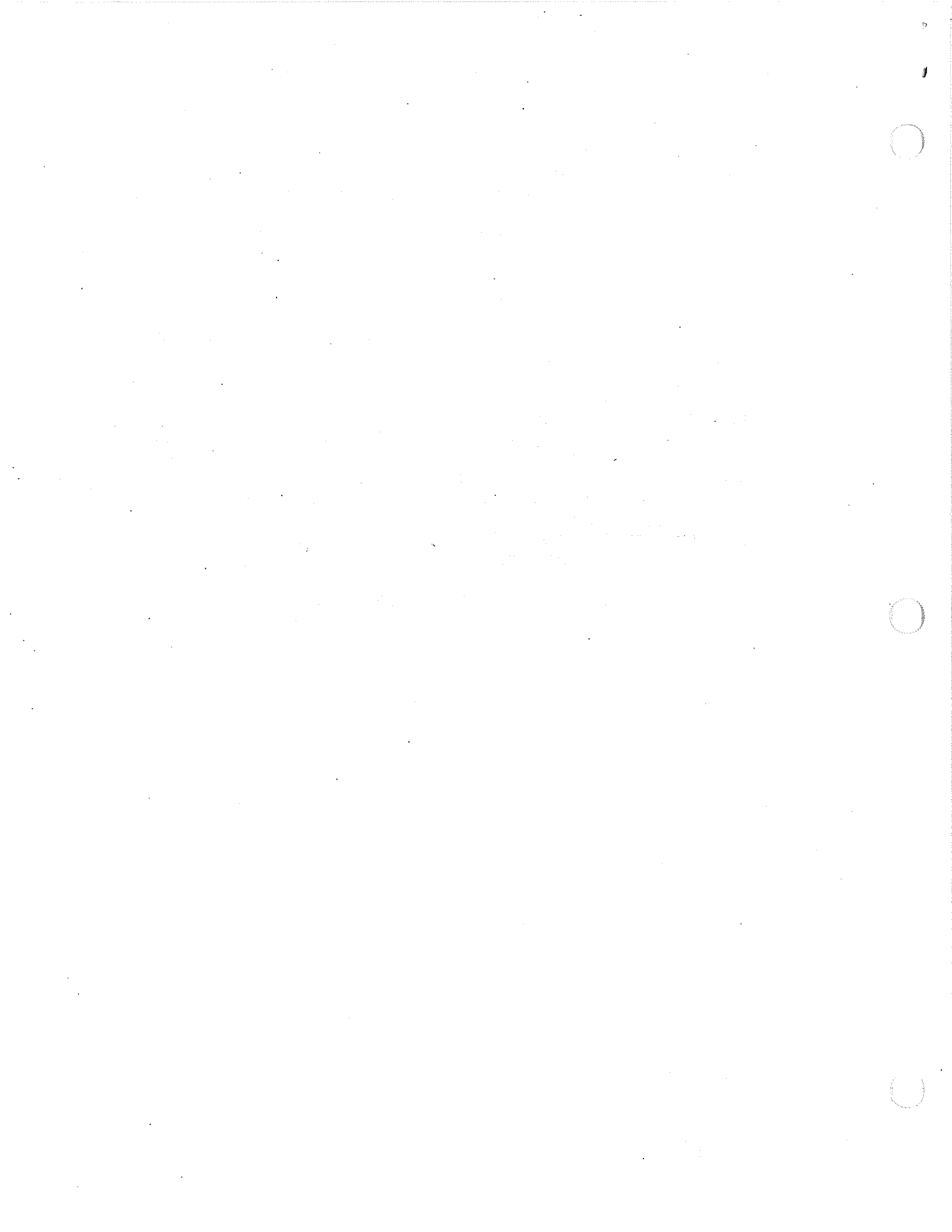
- geometric relationships of:
 - symmetry, parallel, right angle (perpendicular)
- plane geometric figures of:
 - parallelograms, triangles, circles, trapezoids, rectangles, squares, etc.
- solid geometric figures of:
 - rectangular solids, cubes, cylinders, cones, spheres, etc.

* test items may relate to:

- identification of a specific geometric figure such as circles, cones, squares, etc.
- using simple substitution into a formula
- analyzing the effects of combining, subdividing, and changing shapes
- determine the shortest path

* test item restrictions:

- use whole numbers or decimals
 - decimal numbers should have fewer than three digits to the right of the decimal point
- conversion within measurement units will not be required (part of section E)
- estimating conversions between metric and customary systems will not be required (part of section D)
- the symbol for PI can be given in an answer response
 - an **approximation for PI** can be given as either $\frac{22}{7}$ or 3.14
 - indicate in the test item that an **approximation for PI** is being used



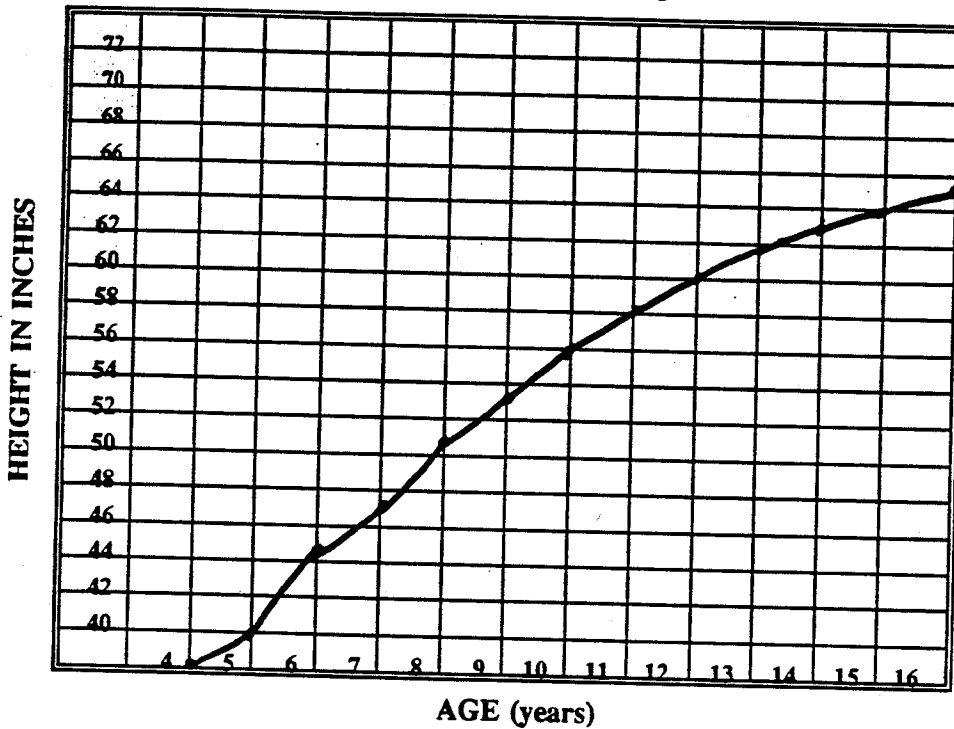
6. The auditorium has 30 rows of 48 seats each. About how many people can the auditorium seat?

- a. 150
- b. 1000
- c. 1500
- d. 2000

7. A bicycle tire has a diameter of 20 inches. What is its circumference? (Use 3.14 for π)

- a. 23.14 inches
- b. 62.8 inches
- c. 125.6 inches
- d. 314 inches

8. The following graph shows Simon's height from the age of 4 to the age of 16. According to the graph, how many inches tall was Simon at the age of 10?

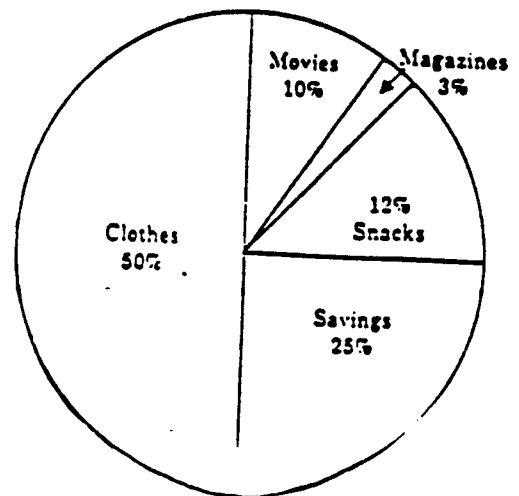


- a. 54 inches
- b. 56 inches
- c. 60 inches
- d. 62 inches

9. What percent of his total budget does Roberto spend on movies and savings?

- a. 22%
- b. 35%
- c. 62%
- d. 92%

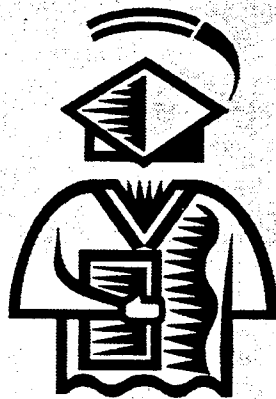
ROBERTO'S MONTHLY BUDGET



10. Nine applicants for a secretarial job typed the following words per minute on a typing test: 52, 48, 72, 65, 73, 76, 78, 63, 67. The employer will not hire anyone who scored below the median of the group. What is the median of the scores?

- a. 52
- b. 63
- c. 67
- d. 73

Minnesota's High Standards in the Profile of Learning



Primary Level



High Standards:

Profile of Learning

Each area of learning contains high standards that define expectations for teachers and students.

1. Read, view and listen to complex information in the English language
2. Write and speak effectively in the English language
3. Use and interpret the arts
4. Solve problems by applying mathematics
5. Conduct research and communicate findings
6. Understand and apply scientific concepts
7. Understand interactions between people and cultures
8. Use information to make decisions
9. Manage resources for a household, community or government
10. Communicate in another language



Description of a Content Standard

A content standard describes what students need to know and do. It extends the main ideas from the learning area and provides a plan for creating performance packages.

Learning Area Title

Learning Area Summary

Name of Content Standard

Summary of Content Standard:
a short definition of the entire standard.

mathematics

Solve problems by applying mathematics

Algebraic Patterns
Analyze mathematical patterns, relationships and functions to model and solve problems.

What students should know:

1. Identify rates of change in different models of linear relationships
2. Know characteristics of algebraic (i.e. polynomial) and transcendental (i.e. exponential, periodic functions and relations)
3. Know functional notation and terminology

What students should do:

1. Translate between real world situations and mathematical models using:
 - a. graphs
 - b. data tables and/or spread sheets
 - c. verbal descriptions
 - d. algebraic expressions
2. Generalize patterns and build mathematical models to describe and predict real world situations. Include the following situations:
 - a. linear
 - b. exponential growth/decay
 - c. periodic
3. Use properties of mathematics to synthesize the concepts of algebra or justify reasoning in a logical argument

Teacher notes:

1. Must include at least one form of technology.
2. Embed elements of reasoning, problem solving, connections and communication in assessments.

Mathematics 1.1

Office of Curriculum Standards, 360 Center Street, St. Paul, MN, 55101
March 1999

Declarative Knowledge describes what the student needs to know and understand. It is composed of facts, concepts, principles and generalizations. This type of knowledge is frequently assessed on written tests.

Procedural Knowledge describes what the student needs to do. It is composed of skills, strategies and processes. This kind of knowledge is typically assessed with a demonstration or performance.

Specifications describe conditions that could alter the nature of the performance (use of calculators, how much assistance students need in formulating a research question).

Examples of student work

These samples meet some of the content standards requirements, but not all of them.

Actual performance packages will include many more tasks. These are only examples of what could be included.

Standard Code Numbers give the title of the learning area (mathematics), discipline number (first number), and the standard number within the discipline (second number).

Discipline Numbers:	7	Business
1	Mathematics	8 Health
2	Sciences	9 Occupations
3	Language Arts	10 Family Consumer Sciences
4	Social Studies	11 Physical Education
5	Agriculture	12 Technology
6	Arts	13 World Languages

Primary Standards Table of Contents

Read, View, Listen - Read, view and listen to complex information in the English language

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G3.2:	Interpretation and Evaluation.....	2

Writing and Speaking - Write and speak effectively in the English language

G3.1:	Writing and Speaking.....	3
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Arts - Use and interpret the arts

G3.1:	Artistic Performance and Expression.....	4
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Mathematics - Solve problems by applying mathematics

G3.1:	Number Sense.....	6
G3.2:	Shape, Space, Measurement.....	7

Inquiry - Conduct research and communicate findings

G3.1:	Data Categorization, Classification and Recording.....	8
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Sciences - Understand and apply scientific concepts

G3.1:	Direct Science Experience.....	9
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People and Cultures - Understand interaction between people and cultures

G3.1:	Family, School and Community.....	10
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Decision Making - Use information to make decisions

G3.1:	Personal Health and Fitness.....	11
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Managing Resources - Manage resources for a household, community or government

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Languages - Communicate in another language

Exploratory work in a world language should begin in the elementary grade levels.

read, view, listen

Read, view and listen to complex information in the English language

Literal Comprehension

Comprehend literal meaning in reading, viewing and listening selections.

What students should do:

1. Read, view or listen to non-fiction selections and stories:
 - a. identify main ideas and some supporting details
 - b. retell main events or ideas in sequence
 - c. pronounce new words using phonic skills
 - d. read aloud fluently with appropriate expression
 - e. demonstrate appropriate techniques for learning new vocabulary (e.g., contextual clues, vocabulary journals, use of dictionary skills)
 - f. interpret presentations of data (e.g., charts, tables, graphs)

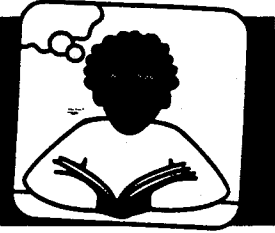
Students may be asked to . . .

- **Read a story and retell the main ideas or events in sequence**
- **Create a visual which compares and contrasts characters in the reading with people you know**

Teacher notes:

1. Reading selections may include grade-level selections from reading texts and/or trade books. Readability formulas may be used to establish level of difficulty.
2. Performance package must include non-fiction and technical selections. Package may combine standards Read, View, Listen G3.1 and G3.2.
3. Comprehension must be assessed on an independent basis.
4. Performance package must include listening, viewing and grade-level reading tasks.

Read, View, Listen G3.1

read, view, listen

Read, view and listen to complex information in the English language

Interpretation and Evaluation

Interpret and evaluate information in reading, viewing and listening selections.

What students should do:

1. Read, view or listen to age-appropriate non-fiction selections and stories:
 - a. understand ideas not explicitly stated
 - b. make predictions based on information in selection
 - c. draw conclusions based on information in selection
 - d. compare and contrast elements of the story or selection (e.g., characters, ideas, events)
 - e. distinguish facts from opinions
2. Summarize ideas and identify tone in persuasive, fictional and documentary presentations

Students may be asked to . . .

- **Compare and contrast information about an event in the news with information about the same topic from a documentary film**

Teacher notes:

1. Reading selections may include grade-level selections from reading texts and/or trade books. Readability formulas may be used to establish level of difficulty.
2. Performance package may combine standards Read, View, Listen G3.1 and G3.2.
3. Comprehension must be assessed on an independent basis.
4. Performance package must include listening, viewing and grade-level reading tasks.

Read, View, Listen G3.2

writing and speaking



Write and speak effectively in the English language

Writing and Speaking

Write and speak for a variety of academic and technical purposes.

What students should do:

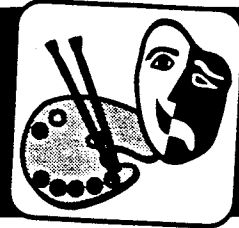
1. Teach someone how to perform an action or create a product:
 - a. write directions with multiple steps
 - b. sequence steps accurately
 - c. use task-specific vocabulary
 - d. write list of necessary materials (e.g., string, bag, wire)
 - e. use illustrations or visuals as a teaching aid
2. Write a story:
 - a. describe ideas or events from personal experiences, observation or imagination
 - b. sequence ideas or events (e.g., beginning, middle, end)
 - c. use details or examples to create images
3. Write a report to describe and give information about a person, an object or a situation
4. Give an informal oral presentation:
 - a. present an opinion or idea
 - b. use reasons or examples to explain it
 - c. respond to related questions from the audience

Students may be asked to . . .

- **Give a presentation to the class describing how to construct a kite**
- **Write a story about your favorite summertime activity**

Teacher notes:

Final written products must be easily read. A few errors in mechanics and spelling may be tolerated if they occur in newly learned or complex structures.



Use and interpret the arts

Artistic Performance and Expression

Create and describe a variety of artistic works.

What students should know:

1. Describe selected art works using the vocabulary of the art form
2. Describe similarities and differences between different art forms (e.g., visual art, music, dance, theater)

What students should do:

Dance

1. Demonstrate basic movements (e.g., run, bend, swing, roll) in musical or rhythmic contexts
2. Use movement to respond to selected assignments and problems
3. Create sequences of movement to communicate an original story or an experience

Visual or Media

1. Use appropriate tools and processes of at least three different media to communicate ideas
2. Use elements of visual art to communicate ideas
3. Identify works and styles of art belonging to different cultures and times

—continued next page—

Students may be asked to . . .

- **Tell a story through a dance sequence**
- **Sing a variety of songs with the class**

Artistic Performance and Expression continued

Music

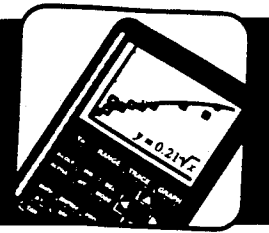
1. Sing in a group with accurate pitch and rhythm
2. Sing a varied repertoire of songs from memory
3. Play simple rhythms and melodies on classroom instruments
4. Improvise simple rhythms and melodies
5. Use a system (e.g., syllables, numbers) to read basic music notation

Theater

1. Use movement, sound and language to create images, express emotions and imitate animals, objects, or shapes
2. Use elements of environment, costume and props to communicate story and character

Teacher notes:

1. Students must produce or perform in at least three areas at the appropriate achievement level of the Frameworks for Arts Curriculum Strategies (FACS).
2. May generate collaborative projects but assessment must reflect individual work.
3. Art works studied must represent a variety of cultures and historical periods.



Solve problems by applying mathematics

Number Sense

Use number relationships to represent information and solve problems.

What students should know:

1. Add and subtract single-digit numbers

What students should do:

1. Use whole numbers in a variety of contexts:
 - a. represent numbers in more than one way (e.g., manipulatives, pictures, diagrams, symbols)
 - b. count
 - c. order
 - d. name
 - e. locate
 - f. measure
 - g. describe and extend pattern
2. Demonstrate an understanding of place value, number relationships, relative size and reasonableness of answers in problem-solving situations
3. Solve problems and justify thinking:
 - a. select appropriate numbers and representations
 - b. use operations, patterns and estimation
 - c. generate multiple solutions
 - d. organize data using pictures and charts
 - e. apply organized counting procedures and data techniques to situations involving networks or combinations

Students may be asked to . . .

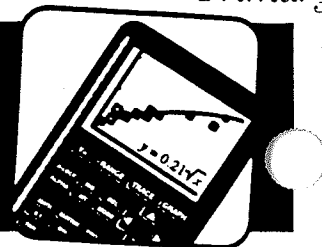
- **Plan an order for refreshments needed for a class party**
- **Solve a mystery number puzzle**

Teacher notes:

1. Performance packages may allow the use of non-standard procedures (e.g., adding from the left rather than the right).
2. May use calculator or computer in problem-solving situations.

Mathematics G3.1

mathematics



Solve problems by applying mathematics

Shape, Space, Measurement

Apply concepts of shape, space and measurement to solve problems involving two- and three-dimensional shapes.

What students should do:

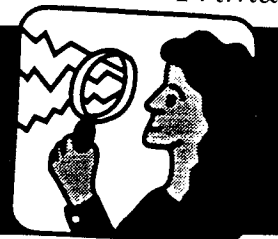
1. Demonstrate an understanding of patterns:
 - a. describe, extend and complete existing patterns
 - b. create new patterns
 - c. represent spatial patterns pictorally and numerically
 - d. identify and/or create symmetrical patterns
2. Demonstrate an understanding of measurement, given familiar objects:
 - a. identify type of measurement required
 - b. estimate measurement
 - c. select appropriate tools and units of measurement
 - d. measure accurately
 - e. use measurements to order a group of objects according to size
3. Demonstrate an understanding of familiar two- and three-dimensional shapes:
 - a. identify shapes in real world contexts
 - b. draw and/or build familiar shapes
 - c. sort and classify shapes
 - d. predict the results of flipping, sliding or turning a shape
4. Use geometric terms to describe spatial relations

Students may be asked to . . .

- **Design a quilt pattern and describe its symmetry**
- **Determine the length of fence needed to enclose the school playground**

Teacher notes:

1. Allow the use of a calculator or computer in problem-solving situations.
2. Geometric and visual patterns must be included

inquiry

Conduct research and communicate findings

Data Categorization, Classification and Recording

Gather information to answer questions.

What students should do:

1. Gather information to answer questions through the following methods:
 - a. media sources
 - b. direct observation
 - c. interviews
 - d. experiment or investigation
2. Record information (e.g., graphs, diagrams, maps)
3. Display information using the appropriate format (e.g., graphs, diagrams, maps)
4. Explain the answer(s) to the question

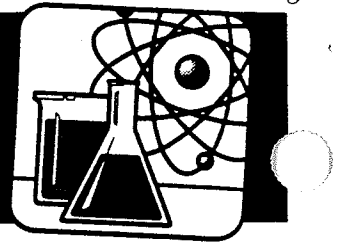
*Students may
be asked to . . .*

- **Survey students in the school to determine students' favorite activities by grade level and create a chart to display the results**

Teacher notes:

1. Use appropriate technology to handle and display data.
2. Teacher should provide guidance in framing questions.
3. Performance package must include at least three tasks; each task must ask a different question and use a different information-gathering method.
4. Tasks may be combined with standard in Writing and Speaking in order to communicate findings.
5. Students must demonstrate basic safety.

sciences



Understand and apply scientific concepts

Direct Science Experience

Understand basic science concepts through direct experience.

What students should know:

1. Understand concepts related to everyday life:
 - a. characteristic properties of objects
 - b. patterns and how they repeat
 - c. cycles (e.g., water, plant, life)
 - d. how basic needs of organisms are met (e.g., space, food, light)
 - e. response of organisms to changes in the environment
2. Know how personal use of materials, energy and water impact the environment

Students may be asked to . . .

- **Create a visual display which illustrates the life cycle of monarch butterflies that have been living in the classroom**

What students should do:

1. Observe and describe characteristics of objects or phenomena
2. Measure changes that occur in objects or phenomena as a result of interaction
3. Sort and classify objects based on one or two properties
4. Display information using graphs (e.g., histograms, charts, pictures, narratives)
5. Describe how previously learned concepts apply to new situations

Teacher notes:

Performance package should include tasks from earth, life and physical science.

people and cultures



Understand interactions between people and cultures

Family, School and Community

Understand the interaction of location, family, school and community.

What students should know:

1. Understand how wants and needs are responsibly met in the home, school and community
2. Understand reasons for location of communities or features of communities
3. Know the ethnic/national backgrounds of community members
4. Know the location of major places and geographic features of the earth's surface

What students should do:

1. Create mental maps of the local community and country in relation to larger geographic units
2. Understand that different people may respond differently to the same event
3. Create a personal history showing change over time
4. Describe how your home region has changed over time
5. Work to improve the school, community or environment

Students may be asked to . . .

- **Create a map of the world showing major geographical features**

decision making



Use information to make decisions

Personal Health and Fitness

Understand and participate in activities that promote personal fitness, health, nutrition and safety.

What students should do:

1. Show evidence of healthy choices in real or simulated situations:
 - a. interpersonal conflict
 - b. proper care of the body
 - c. nutrition
 - d. safety (e.g., bicycle, water, poison, pedestrian)
 - e. drugs, tobacco and alcohol
 - f. exercise and recreation
2. Show evidence of work to improve physical fitness as assessed by:
 - a. age-appropriate National Fitness Standards
 - b. participation in a daily fitness plan
 - c. demonstration of motor skills required for individual and team activities
 - d. appropriate competitive and cooperative participation in physical education activities

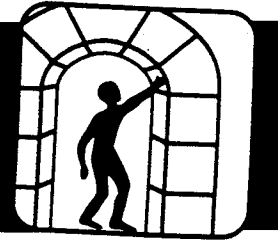
Students may be asked to . . .

- **Describe which foods are best for children of your age to eat for a week**

Teacher notes:

Activities outside of the school setting may be documented as part of the performance task.

managing resources



Manage resources for a household, community or government

Introduction to Technology

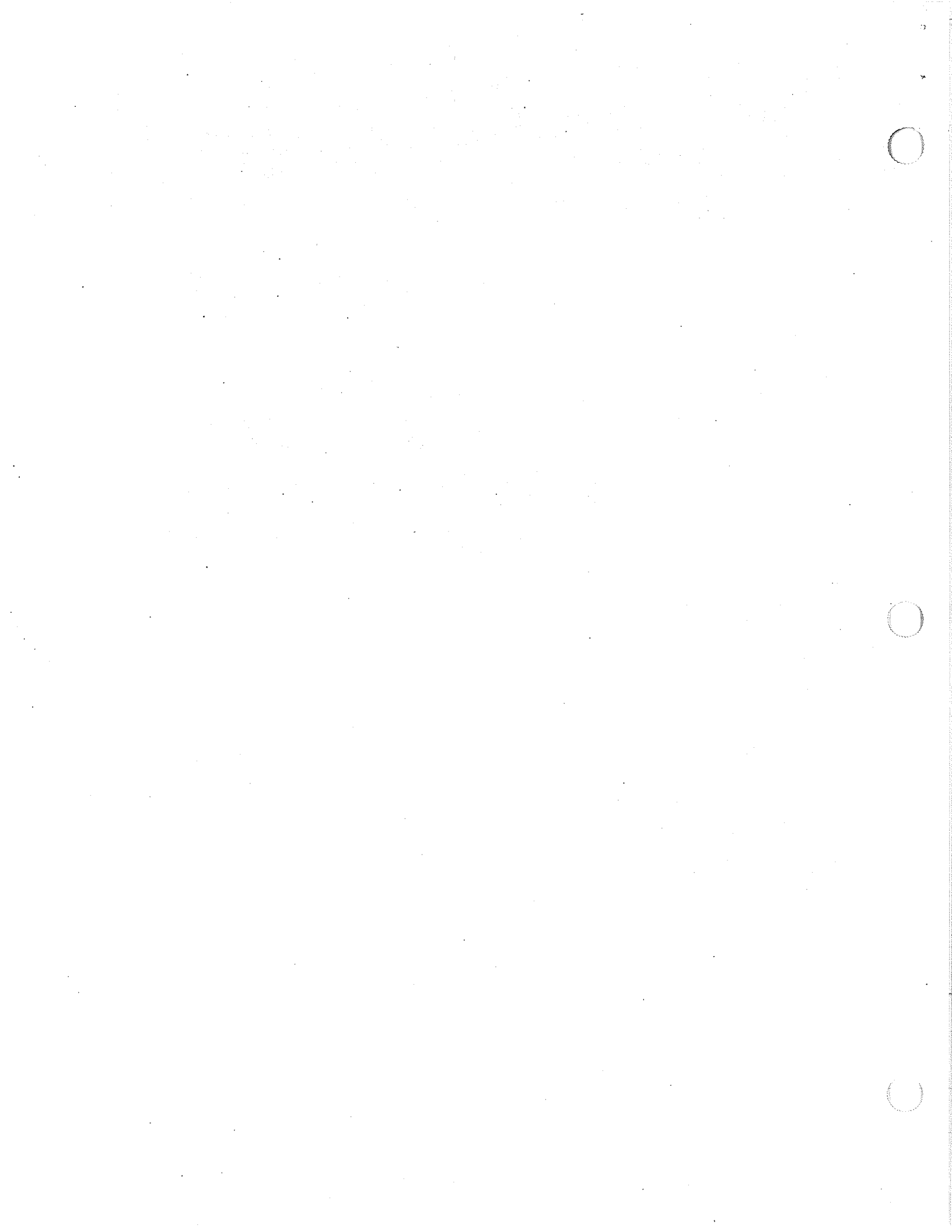
Use appropriate computer technology.

What students should do:

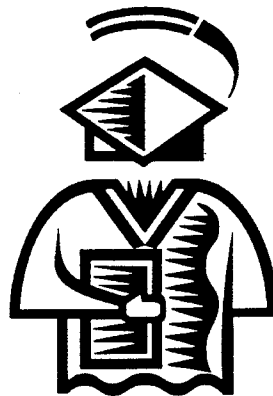
1. Use word processing software to produce products
2. Use graphic software or educational games to demonstrate computer literacy
3. Use software involving pull-down menus or other instructions within programs
4. Access information through media computer search

*Students may
be asked to . . .*

- **Use the World Wide Web to access information on the history of the United States**



Minnesota's High Standards in the Profile of Learning



Intermediate Level



High Standards:

Profile of Learning

Each area of learning contains high standards that define expectations for teachers and students.

1. Read, view and listen to complex information in the English language
2. Write and speak effectively in the English language
3. Use and interpret the arts
4. Solve problems by applying mathematics
5. Conduct research and communicate findings
6. Understand and apply scientific concepts
7. Understand interactions between people and cultures
8. Use information to make decisions
9. Manage resources for a household, community or government
10. Communicate in another language



Description of a Content Standard

A content standard describes what students need to know and do. It extends the main ideas from the learning area and provides a plan for creating performance packages.

Learning Area Title

Learning Area Summary

Name of Content Standard

Summary of Content Standard:
a short definition of the entire standard.

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Standard Code Numbers give the title of the learning area (mathematics), discipline number (first number), and the standard number within the discipline (second number).

Examples of student work
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mathematics
Solve problems by applying mathematics

Algebraic Patterns
Analyze mathematical patterns, relationships and functions to model and solve problems.

What students should know:

1. Identify rates of change in different models of linear relationships
2. Know characteristics of algebraic (i.e. polynomial and transcendental) (i.e. exponential, periodic) functions and relations
3. Know functional notation and terminology

What students should do:

1. Translate between real world situations and mathematical models using:
 - a. graphs
 - b. data tables and/or spread sheets
 - c. verbal descriptions
 - d. algebraic expressions
2. Generalize patterns and build mathematical models to describe and predict real world situations. Include the following equations:
 - a. linear
 - b. exponential growth/decay
 - c. periodic
3. Use properties of mathematics to synthesize the concepts of algebra or justify reasoning in a logical argument.

Teacher notes:

1. Must include at least one form of technology.
2. Embed elements of reasoning, problem solving, connections and communication in assessments.

Students may be asked to...

- Collect data on postage stamp costs for a one hundred year period of time and predict future values
- Analyze patterns for sunrise and sunset to make conclusions or predictions

Mathematics 11
Office of Curriculum Standards, 380 Carter Street, St. Paul, MN, 55101
March 1998

- Discipline Numbers:**
- | | |
|----|--------------------------|
| 7 | Business |
| 1 | Mathematics |
| 2 | Sciences |
| 3 | Language Arts |
| 4 | Social Studies |
| 5 | Agriculture |
| 6 | Arts |
| 8 | Health |
| 9 | Occupations |
| 10 | Family Consumer Sciences |
| 11 | Physical Education |
| 12 | Technology |
| 13 | World Languages |

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Writing and Speaking - Write and speak effectively in the English language

G5.1:	Writing.....	3
G5.2:	Speaking.....	4

Arts - Use and interpret the arts

G5.1:	Artistic Performance and Expression.....	5
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Mathematics - Solve problems by applying mathematics

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G5.2:	Number Sense.....	8
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Inquiry - Conduct research and communicate findings

G5.1:	Media, Observation and Investigation.....	10
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Sciences - Understand and apply scientific concepts

G5.1:	Living and Non-Living Systems.....	12
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People and Cultures - Understand interaction between people and cultures

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Decision Making - Use information to make decisions

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G5.2:	Physical Education and Fitness.....	17

Managing Resources - Manage resources for a household, community or government

G5.1:	Technology Skills.....	18
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Languages - Communicate in another language

Exploratory work in a world language should begin in the elementary grade levels.

read, view, listen



Read, view and listen to complex information in the English language

Literal Comprehension

Comprehend literal meaning of information received through reading, viewing and listening selections.

What students should do:

1. Read, view and listen to non-fiction selections and stories:
 - a. identify main ideas and supporting details
 - b. retell main events or ideas in sequence
 - c. pronounce new words using phonics
 - d. demonstrate techniques of improving and expanding vocabulary (e.g., contextual clues, personal word list, dictionary skills, flash cards)
 - e. demonstrate age-appropriate reading rate
2. Read and apply technical instructions to perform an action (e.g., set up a lab, put together a model)
3. Use presentations of data to understand scientific or mathematical information
4. Summarize ideas and information from visual presentations

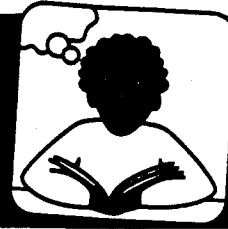
Students may be asked to . . .

- **Read about how wolves adapt to winter, describe various strategies used**

Teacher notes:

1. Performance package may combine tasks from Read, View, Listen G5.1 and G5.2. Package must include non-fiction and technical tasks.
2. Readings may include grade-level selections from reading texts and/or trade books. Readability formulas may be used to establish level of difficulty.
3. Performance package must include tasks in reading, viewing and listening.

Read, View, Listen G5.1

read, view, listen

Read, view and listen to complex information in the English language

Interpretation and Evaluation

Interpret and evaluate information in reading, viewing and listening selections.

What students should do:

1. Read, view or listen to age-appropriate non-fiction selections and stories:
 - a. distinguish fact from opinion in non-fiction selections
 - b. interpret figurative language
 - c. make predictions based on information in the selection
 - d. compare and contrast settings, ideas or actions
 - e. understand ideas not stated explicitly in the selection (e.g., point of view, allusion, tone)
2. Interpret effects of persuasive visual messages

Students may be asked to . . .

- **Create a logical ending to the story The Cay based on the information in the previous chapters**
- **Read a poem containing similes and metaphors, and explain them in your own words**

Teacher notes:

1. Performance package may combine tasks from Read, View, Listen G5.1 and G5.2. Package must include non-fiction and technical tasks.
2. Readings may include grade level selections from reading texts and/or trade books. Readability formulas may be used to establish level of difficulty.
3. Performance package must include tasks in reading, viewing and listening.

Read, View, Listen G5.2

writing and speaking



Write and speak effectively in the English language

Writing

Write for a variety of academic and technical purposes and audiences.

What students should do:

1. Write a story based on direct experience or observation. Story must include:
 - a. a problem solved, a conflict resolved or a lesson learned
 - b. a description of setting using vivid details
 - c. a flow of action leading to a logical ending
 - d. an image of at least one character
 - e. dialogue that captures authentic oral expression
2. Write to request an action or a product. Final edit must be suitable for a real world audience and should include:
 - a. necessary information and detail using appropriate vocabulary
 - b. use of formal structures and courteous conventions
3. Edit finished products for correct mechanics and spelling

Students may be asked to . . .

- **Write a letter requesting information about a toy you have purchased for a younger sibling**

Teacher notes:

Performance package should include tasks which require multiple examples of writing.

writing and speaking



Write and speak effectively in the English language

Speaking

Speak to an audience or interact with a group.

What students should do:

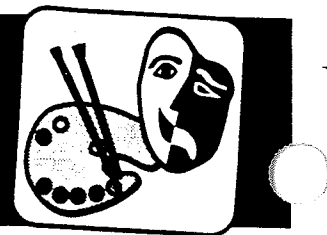
1. Plan and carry out an event in a small group:
 - a. construct a flow chart of work to be done
 - b. implement a group work plan
 - c. demonstrate a variety of cooperative group roles in discussion situations
 - d. take responsibility for obtaining, organizing and using materials
2. Prepare and give a demonstration to an audience:
 - a. describe a step-by-step procedure to complete an action
 - b. use visuals or manipulatives to illustrate ideas
 - c. demonstrate effective delivery techniques (e.g., eye contact, appropriate volume, appropriate expression)
 - d. answer questions from audience concerning demonstration

Students may be asked to . . .

- **Plan and organize a class field trip with a small group of classmates**

Teacher notes:

Consider cultural differences affecting interpersonal and personal communication styles when constructing performance tasks.



Use and interpret the arts

Artistic Performance and Expression

Create, interpret and evaluate a variety of artistic expressions.

What students should know:

1. Know elements and principles of at least three art forms

What students should do:

Dance

1. Demonstrate characteristic dance styles from more than one form or tradition
2. Observe and discuss how dances are similar in terms of elements of dance (e.g., shape, action, rhythm)
3. Demonstrate more than one solution for creative movement problems
4. Use basic movements to create and perform a sequence with a beginning, middle and end—with or without music

Visual or Media Art

1. Communicate ideas effectively through at least three different media and techniques
2. Use elements and principles of art to effectively communicate ideas
3. Associate art works with various cultures or historical periods
4. Describe selected works of art in terms of the elements and principles of visual or media art

Students may be asked to . . .

- **Create pictures with pastels, water-colors and chalk**
- **Re-enact a scene using dramatic conventions**

—continued next page—

Artistic Performance and Expression continued

Music

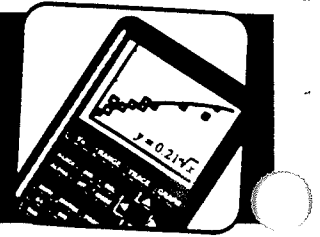
1. Sing alone with accurate pitch and rhythm
2. Sing rounds and part songs in a group
3. Perform simple rhythmic, melodic and harmonic patterns accurately on classroom instruments
4. Improvise melodies and accompaniments using classroom instruments and/or voice
5. Use a system to read musical notation (e.g., standard notation at elementary level)

Theater

1. Interpret and/or perform a story based on an existing piece of literature
 - a. adapt plot, characters and language for theatrical purposes
 - b. evaluate plot, character, theme, language, sound and spectacle
2. Create characterization(s) based on fiction or real-life experience

Teacher notes:

1. Must produce or perform in at least three areas at the appropriate achievement level of the Frameworks for Arts Curriculum Strategies (FACS).
2. May generate collaborative projects but assessment must reflect individual work.
3. Art works studied must represent a variety of cultures and historical periods.



Solve problems by applying mathematics

Shape, Space, Measurement

Describe and analyze two- and three-dimensional shapes and spaces.

What students should know:

1. Understand appropriate whole and partial units (including metric) to measure length, time, weight, volume, temperature, angle and area
2. Understand names and properties of common two- and three-dimensional shapes

What students should do:

1. Describe and compare two- and three-dimensional geometric figures existing in the physical world
2. Analyze and create new shapes by combining, dissecting or transforming existing shapes
3. Extend or create geometric patterns to solve problems
4. Represent a three-dimensional space in two-dimensional view (e.g., draw a floor plan of your bedroom, draw a cube)
5. Given measurement projects:
 - a. identify type of measurement required
 - b. select appropriate tools and units of measurement
 - c. measure accurately
6. Estimate measurements by using appropriate units and comparisons to known objects or quantities (e.g., about as tall as a two-story house, about 20 feet)

Students may be asked to . . .

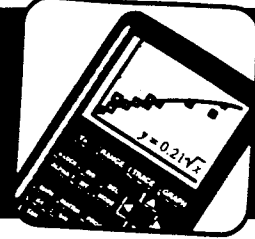
- **Create a floor plan for your classroom**
- **Design patterns for "jackets" to cover three-dimensional shapes**

Teacher notes:

1. Use appropriate technology.
2. Performance package must include metric measurements.
3. Performance package should include both two- and three-dimensional shapes.

Mathematics G5.1

mathematics



Solve problems by applying mathematics

Number Sense

Use number concepts and a variety of math operations to represent information and solve problems.

What students should know:

1. Understand concepts of place value, variables and equations
2. Understand when and how to use number operations (e.g., addition, subtraction, multiplication and division)
3. Understand when and how to use a variety of estimation strategies
4. Add, subtract, multiply and divide by single-digit numbers
5. Add, subtract and multiply single-digit multiples of powers of ten (e.g., 30×200)

What students should do:

1. Solve a variety of multiple-step problems using:
 - a. number relationships and properties
 - b. number patterns (e.g., counting, arithmetic, geometric, visual)
 - c. an appropriate computation or estimation procedure(s)
2. Generate and describe more than one method to solve problems
3. Evaluate the reasonableness of calculator results
4. Use whole numbers, simple fractions and money amounts to quantify, label, measure and locate numerical information
5. Represent real-life situations mathematically
6. Represent patterns using words, pictures and numbers

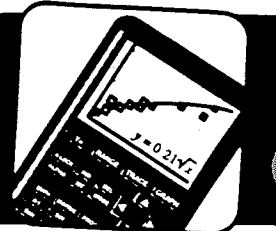
Teacher notes:

Allow the use of a calculator or computer in problem-solving situations.

Students may be asked to . . .

- **Play a numbers game for two people and determine a strategy to win**
- **Use numerical information to complete a story**

mathematics



Solve problems by applying mathematics

Chance and Data Handling

Apply concepts of chance and data analysis to evaluate information and solve problems in a familiar context.

What students should know:

1. Understand how to find range, mean and median
2. Understand simple concepts of likelihood: impossible, unlikely, equal chance, likely, certain, fair and unfair
3. Understand information displayed in graphs, tables and charts

What students should do:

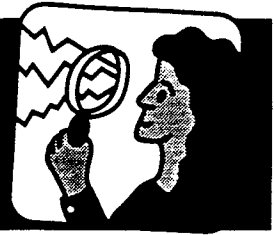
1. Answer questions:
 - a. collect and organize data
 - b. represent data (e.g., graphs, charts)
 - c. communicate results
2. Conduct experiments involving uncertainty (e.g., use spinners, number cubes, M&M's)
 - a. list possible outcomes
 - b. tally, record and explain results
 - c. use the results to predict future outcomes
3. Describe patterns, trends or relationships in data displayed in graphs, tables and/or charts
4. Represent data using at least two graphic forms (e.g., graphs, tables, charts, pictures)

Students may be asked to . . .

- **Develop a profile of an "average" fifth grader**
- **Design a simple game for two people that is fair to both players**

Teacher notes:

Performance package must use one or more forms of technology.



inquiry

Conduct research and communicate findings

Media, Observation and Investigation

Answer questions using information gathered through direct observations, experiments and other sources.

What students should do:

1. Gather information from direct observations or experiments with a variable:
 - a. frame a question
 - b. collect, record and display data
 - c. identify patterns
 - d. compare individual findings to large group findings
 - e. identify areas for further investigation
2. Gather information from media sources:
 - a. select a topic and frame a question
 - b. access information from electronic media, print, interviews and/or other sources
 - c. record and organize information
 - d. report findings in written, oral or visual presentation
3. Gather information through direct observation and interviews:
 - a. identify a topic or area for investigation
 - b. write a rich and detailed description of the observation
 - c. conduct an interview with follow-up questions or design and conduct a survey
 - d. record and organize information
 - e. evaluate the findings to identify areas for further investigation

Students may be asked to . . .

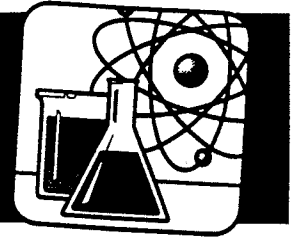
- **Design and conduct an experiment to determine if students eat more food if recess is scheduled before or after lunch. Display the findings in a graph or a chart and present them to the student council**

—continued next page—

Inquiry G5.1

inquiry**Conduct research and communicate findings****Media, Observation and Investigation** continued**Teacher notes:**

1. Use appropriate technology to handle and display data.
2. Provide guidelines for topic selection, number, variety and types of sources as well as organization of information.
3. Tasks may be combined with standards in Writing and Speaking in order to communicate findings.
4. Students must demonstrate basic safety procedures and skills when using tools and equipment.



sciences

Understand and apply scientific concepts

Living and Non-Living Systems

Understand how individuals and objects interact in life, earth/space systems and physical systems.

What students should know:

1. Understand characteristics of organisms:
 - a. plants
 - b. animals
 - c. micro-organisms
2. Understand basic structures and functions of the human body
3. Understand cycles and patterns in:
 - a. living organisms
 - b. earth systems
 - c. physical systems
4. Understand how human behavior and technology impact the environment
5. Understand characteristics of the physical world (e.g., land forms, solar system, electro-magnetism, chemical reactions)

Students may be asked to . . .

- **Design and build a model environment in which people can survive in space for an extended period of time**

What students should do:

1. Measure and classify objects, organisms and materials on the basis of their properties and relationships
2. Make systematic observations of objects, events and/or phenomena:
 - a. record data
 - b. predict change
3. Create a model to illustrate a concept, law, theory or principle
4. Identify personal behaviors and use of materials which have a positive impact on the environment

—continued next page—

Sciences G5.1

sciences

Understand and apply scientific concepts

Living and Non-Living Systems continued

Teacher notes:

1. Performance package should include tasks which address earth, life and physical science.
2. Whenever possible this standard should be combined with the Inquiry standard.
3. Tasks should be related to students' environment.
4. Students must demonstrate basic safety procedures and skills when using tools and equipment.



Understand interactions between people and cultures

Historical Events

Understand historical events and contributions of key people from different time periods.

What students should know:

1. Read and construct timelines of key events and the actions of important people
2. Understand the contributions of key historical people
3. Explain cause and effect relationships of events over an extended period of time

What students should do:

1. Describe a past event from the point of view of a local community member
2. Reconstruct a historical account of an event using primary and secondary sources (e.g., documents, letters, diaries, maps, textbooks, photographs)
3. Describe how technology has changed the lives of people in the home, at work, in transportation and communication
4. Give examples of conflict, cooperation and interdependence among individuals, groups and nations

Teacher notes:

Presentations should be accompanied by timelines.

Students may be asked to . . .

- **Create a history of your town using letters, photographs and other documents**

people and cultures



Understand the interactions between people and cultures

Geography and Citizenship

Understand the interaction of people, places and locations.

What students should know:

1. Know how to locate regions of the United States and selected regions of the world
2. Identify geographic features and cultural characteristics of regions

What students should do:

1. Understand characteristics of various world regions:
 - a. interpret and use information based on maps and graphic representations
 - b. create mental maps or graphic representations showing knowledge of location
 - c. compare ways in which people from different cultures deal with their physical environment
2. Understand characteristics of the students' local community:
 - a. describe how local resources and products are used in the region or the world
 - b. research the origins of groups represented in the local community
 - c. participate in an activity which contributes to the improvement of your community

Students may be asked to . . .

- **Identify where early settlers in your community came from and describe why they chose to settle in your area**

Teacher notes:

One of the cultures included in the performance task should be a Native American tribal culture.

decision making



Use information to make decisions

Personal Health and Nutrition

Use a decision-making model to promote personal health, nutrition and safety.

What students should know:

1. Know how to recognize and get help in situations involving abusive or harassing behaviors
2. Know the consequences of using drugs, alcohol and tobacco
3. Know strategies to prevent the spread of communicable diseases
4. Know strategies for preventing accidents
5. Know age-appropriate nutritional requirements

What students should do:

1. Use a decision-making model to promote healthy behaviors
2. Use a decision-making model to prevent or reduce the risk of unhealthy behaviors
3. Demonstrate what to do in case of sudden illness or injury
4. Use a decision-making model to select foods that contribute to a healthy diet
5. Analyze issues of safety in a school or community situation

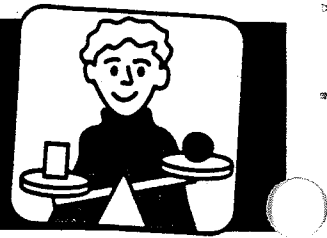
Teacher notes:

Adjust instruction or modify assignments in regard to an individual student's health status, culture and values.

Students may be asked to . . .

- **Role play situations involving safety and first aid techniques**

decision making



Use information to make decisions

Physical Education and Fitness

Understand and participate in physical activities that develop motor skills and physical fitness.

What students should know:

1. Know rules, skills, strategies and etiquette associated with various physical education activities

What students should do:

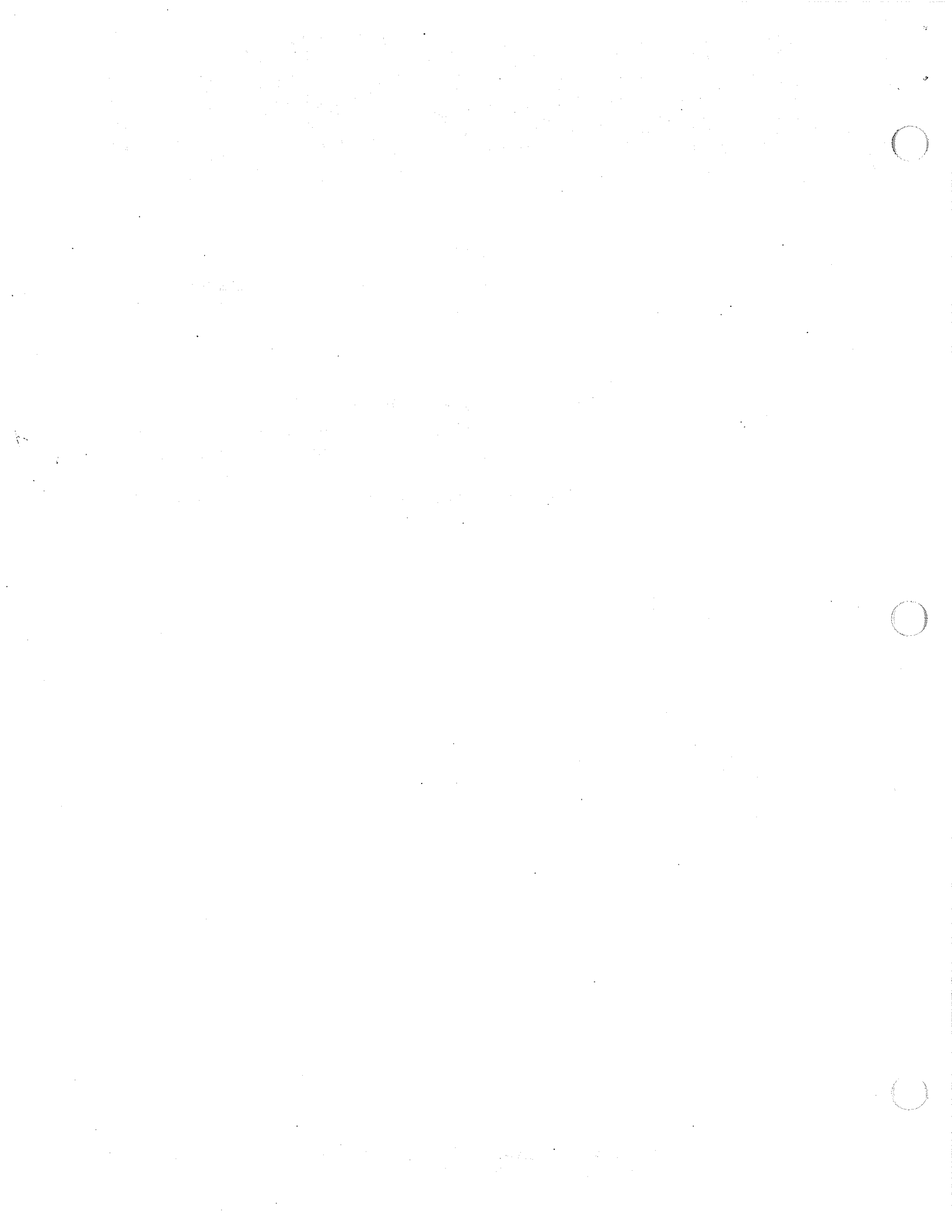
1. Show evidence of participating in a daily fitness plan
2. Meet age-appropriate National Fitness Standards (FITNESS GRAM, Presidential Fitness Program, etc.)
3. Demonstrate motor skills required for individual and team activities
4. Display etiquette and team-building skills in physical education activities

Students may be asked to . . .

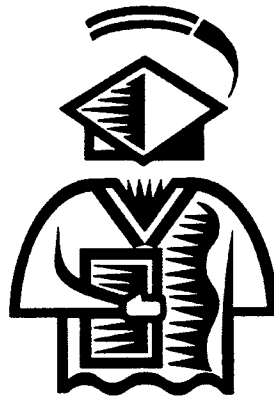
- **Create a daily fitness log to evaluate and categorize fitness activities**

Teacher notes:

Activities outside of the school setting may be documented as part of the performance task.



Minnesota's High Standards in the Profile of Learning



Middle Level



High Standards: Profile of Learning

Each area of learning contains high standards that define expectations for teachers and students.

1. Read, view and listen to complex information in the English language
2. Write and speak effectively in the English language
3. Use and interpret the arts
4. Solve problems by applying mathematics
5. Conduct research and communicate findings
6. Understand and apply scientific concepts
7. Understand interactions between people and cultures
8. Use information to make decisions
9. Manage resources for a household, community or government
10. Communicate in another language



Description of a Content Standard

A content standard describes what students need to know and do. It extends the main ideas from the learning area and provides a plan for creating performance packages.

Learning Area Title

Learning Area Summary

Name of Content Standard

Summary of Content Standard:
a short definition of the entire standard.

mathematics

Solve problems by applying mathematics

Algebraic Patterns
Analyze mathematical patterns, relationships and functions to model and solve problems.

What students should know:

- Identify rates of change in different models of linear relationships
- Know characteristics of algebraic (i.e. polynomial) and transcendental (i.e. exponential, periodic functions and relations)
- Know functional notation and terminology

What students should do:

- Translate between real world situations and mathematical models using:
 - graphs
 - data tables and/or spread sheets
 - verbal descriptions
 - algebraic expressions
- Generalize patterns and build mathematical models to describe and predict real world situations. Include the following situations:
 - linear
 - exponential growth/decay
 - periodic
- Use properties of mathematics to synthesize the concepts of algebra or justify reasoning in a logical argument.

Teacher notes:

- Must include at least one form of technology.
- Embed elements of reasoning, problem solving, connections and communication in assessments.

Students may be asked to...

- Collect data on postage stamp costs for a one hundred year period of time and predict future values
- Analyze patterns for sunrise and sunset to make conclusions or predictions

Mathematics 1.1

Office of Graduate Standards, 560 Colby Street, St. Paul, MN, 55101
March 1999

Declarative Knowledge describes what the student needs to know and understand. It is composed of facts, concepts, principles and generalizations. This type of knowledge is frequently assessed on written tests.

Procedural Knowledge describes what the student needs to do. It is composed of skills, strategies and processes. This kind of knowledge is typically assessed with a demonstration or performance.

Specifications describe conditions that could alter the nature of the performance (use of calculators, how much assistance students need in formulating a research question).

Examples of student work

These samples meet some of the content standards requirements, but not all of them.

Actual performance packages will include many more tasks.

These are only examples of what could be included.

Standard Code Numbers give the title of the learning area (mathematics), discipline number (first number), and the standard number within the discipline (second number).

Discipline Numbers:	7	Business
	1	Mathematics
	2	Sciences
	3	Language Arts
	4	Social Studies
	5	Agriculture
	6	Arts
	7	Business
	8	Health
	9	Occupations
	10	Family Consumer Sciences
	11	Physical Education
	12	Technology
	13	World Languages

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Decision Making - Use information to make decisions

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read, view, listen

Read, view and listen to complex information in the English language

Non-Fiction: Reading, Viewing, Listening

Comprehend, interpret and evaluate information from a variety of non-fiction formats in reading, viewing and listening.

What students should do:

1. Comprehend information from selections which address some abstract or complex ideas:
 - a. identify main ideas and supporting details
 - b. interpret presentations of data in connection with other information in the text (e.g., tables, charts, drawings, graphs)
 - c. compare and contrast information on the same topic from different types of sources
 - d. given more than one selection on the same topic, identify differences in the points of view of the authors
 - e. identify statements of fact and opinion within a selection
 - f. use structural organizers within a selection to aid comprehension

Students may be asked to . . .

- **Compare information about the Civil War in a social studies textbook with information contained in diaries from the era**
- **View an eyewitness report of an event and identify statements of fact and opinion within the selection**

Teacher notes:

1. Teacher may provide assistance with specialized vocabulary.
2. Teacher may provide background information when issues analyzed are outside of students' experience.
3. Performance packages must include tasks in reading, viewing and listening.

Read, View, Listen G8.1

read, view, listen



Read, view and listen to complex information in the English language

Fiction: Reading, Viewing, Listening

Comprehend, interpret and evaluate information in fictional reading, viewing and listening selections.

What students should do:

1. Retell a story including major characters, setting, sequence of events and conflicts
2. Show evidence of an ongoing process for expanding vocabulary
3. Interpret literal and figurative language/images
4. Categorize events, behavior or characters
5. Predict logical cause/effect sequence
6. Evaluate fiction according to pre-established criteria

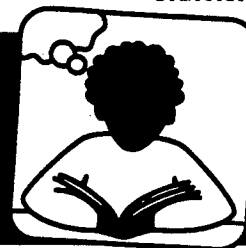
Students may be asked to . . .

- **Read a novel and interpret the literal and figurative images**

Teacher notes:

1. Performance packages must include tasks requiring independent reading of age-appropriate fiction.
2. Performance packages must include tasks in reading, viewing and listening.

Read, View, Listen G8.2

read, view, listen

Read, view, and listen to complex information in the English language

Technical Reading

Comprehend technical information from documents or electronic media.

What students should know:

1. Know relevant technical vocabulary, use of tools and safety procedures

What students should do:

1. Apply step-by-step directions using appropriate tools and safety procedures (e.g., set up a lab, assemble/construct a product)
2. Understand information from visual or graphic data (e.g., graphs, charts, tables, technical drawings, flow charts)

Students may be asked to . . .

- **Repair a small engine based on instructions in a repair manual**

Teacher notes:

1. Performance package must be based on authentic sources such as owner's manuals, assembly procedures, instructions for age-appropriate models, computer manuals, multi-step procedures such as complete lab directions, complex recipes, clothing patterns and schedules.
2. Students must perform at least two different applications to meet the standard.



writing and speaking

Write and speak effectively in the English language

Writing

Write for a variety of academic and technical purposes, situations and audiences.

What students should do:

1. Write a technical procedure or set of directions that includes:
 - a. technical terminology and/or use of tools to perform an action
 - b. original visual representations to support text, such as illustrations, diagrams, charts or technical drawings
 - c. sequenced steps using a numbered, bulleted or outlined format
 - d. precise wording and objective style
 - e. a glossary of technical terms used in text
2. Write a narrative:
 - a. describe events from direct experience or observation
 - b. use relevant detail and figurative language to create an image of setting, characters and events
 - c. include dialogue between characters
 - d. show sequence of events or ideas leading to a logical ending
3. Write about an idea or an opinion:
 - a. give a rationale which includes reasons to support or oppose the opinion
 - b. use evidence (e.g., factual information, expert opinion) to support ideas
4. Finished products should have correct spelling and mechanics

Students may be asked to . . .

- **Write a story about two people who have been friends since they were small children**

Teacher notes:

1. Document the student writing process through observations and/or conferences.
2. Collect rough drafts along with final products.

Writing and Speaking G8.1

writing and speaking



Write and speak effectively in the English language

Interpersonal Communications

Communicate effectively in a small group of familiar people.

What students should know:

1. Know models for conflict resolution, problem-solving and mediation

What students should do:

1. In a small group:
 - a. solve a problem or settle a dispute
 - b. give a demonstration or present new information
2. Interact and communicate appropriately with individuals of different gender, age, culture and points of view
3. Adjust communication on the basis of verbal and non-verbal feedback
4. Express feeling, tone, mood and vocabulary appropriate for situation

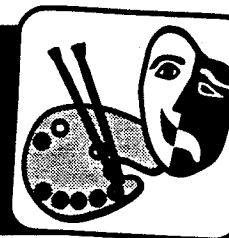
Students may be asked to . . .

- **Determine the best way to resolve a classroom conflict with a group of peers**

Teacher notes:

1. Simulations may be structured by teacher.
2. Group participants may be younger children, familiar adults or peers.

arts



Use and interpret the arts

Artistic Performance

Demonstrate knowledge of art forms through artistic process and presentation.

What students should know:

1. Know the expressive and technical elements of an art form
2. Know basic conventions of the creative decision-making process

What students should do:

1. Perform or present an art form:
 - a. use principles and elements of the art form
 - b. demonstrate fundamental skills
 - c. use improvisation to generate and communicate artistic intent
 - d. create original works in a variety of contexts

Students may be asked to . . .

- **Improvise a series of dance movements**
- **Read standard notation to play an instrument**

Teacher notes:

1. Music students must interpret standard notation symbols.
2. Music, dance, media arts and theater students, must perform independently and in a group.
3. Students should perform at the appropriate achievement level of the Frameworks for Arts Curriculum Strategies (FACS).



Use and interpret the arts

Artistic Interpretation

Interpret and evaluate a variety of art works, performances or presentations.

What students should know:

1. Know elements, principles and styles of an art form
2. Demonstrate knowledge of social, historical and cultural context of work of art

What students should do:

1. Analyze art works using the elements, principles and styles of the art form
2. Evaluate works of art according to pre-established criteria
3. Describe personal reaction to a work of art
4. Explain the connection between a work of art and its social, cultural or historical context

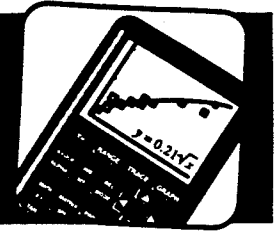
Students may be asked to . . .

- **Evaluate a short story according to pre-established criteria**
- **Describe a personal reaction to a group of paintings**

Teacher notes:

Performance package must include several examples and selections from diverse cultures.

mathematics



Solve problems by applying mathematics

Shape, Space, Measurement

Apply concepts of shape and space to describe and measure the physical world to solve problems.

What students should know:

1. Understand basic concepts of coordinate systems
2. Know precise mathematical names and properties of two- and three-dimensional shapes
3. Convert common measurement units within the metric system (e.g., length, volume, capacity)

What students should do:

1. Represent shapes from various points of view (e.g., above, side, front)
2. Given a need to measure:
 - a. identify what to measure
 - b. select appropriate measurement tools
 - c. measure accurately
3. Create complex designs using transformations and tilings to generalize properties of shapes
4. Given groups of related shapes (e.g., rectangles, squares, trapezoids):
 - a. identify relationships and patterns
 - b. make and test conjectures
5. Translate between simple functional relationships and coordinate graphs
6. Describe how changes in the dimensions of figures affect perimeter, area and volume

Students may be asked to . . .

- **Build a scale model of your classroom**
- **Select a country and analyze its flag, stamps, art, architecture and famous sights from a geometric point of view**

Teacher notes:

1. Performance packages must include at least one form of technology.
2. Embed communication, problem solving and reasoning in task.
3. Consider cultural perspectives of shape and space in task.

Mathematics G8.1

mathematics



Solve problems by applying mathematics

Number Sense

Use number concepts, relationships and computational procedures to communicate, solve problems and evaluate results.

What students should know:

1. Understand number concepts including: place value, exponents, prime and composite numbers, multiples and factors
2. Understand fractions, decimals, percents, integers and numbers in scientific notation:
 - a. translate among equivalent forms
 - b. compare and order numbers within a set

What students should do:

1. Solve a variety of problems:
 - a. represent numbers efficiently (e.g., percents, fractions and/or ratios)
 - b. select appropriate operations
 - c. select appropriate methods to estimate or compute
 - d. generate and describe more than one method to solve problems
2. Given problems with proposed solutions:
 - a. analyze and justify operations and methods used
 - b. evaluate the reasonableness of computed results
3. Apply proportional reasoning to solve a variety of problems using rates, ratios, proportions and percents
4. Create a real world communication that demonstrates the ability to use a variety of numbers in context (e.g., create a skit, write a story)

Students may be asked to . . .

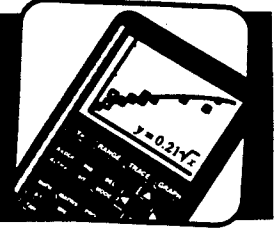
- **Answer the question: Could you carry a suitcase filled with one million dollars?**
- **Predict election results from census and poll data**

Teacher notes:

1. Performance packages must include at least one form of technology.
2. Embed communication, problem solving and reasoning in performance task.

Mathematics G8.2

mathematics



Solve problems by applying mathematics

Chance and Data Handling

Apply concepts of chance and techniques of data handling to evaluate and solve problems.

What students should know:

1. Calculate basic measures of center and variability (e.g., mean, median, mode, range, quartiles)
2. Understand basic concepts of probability (e.g., experimental/theoretical, 0-1 scale, random sampling, outcomes, fairness)
3. Calculate simple probabilities

What students should do:

1. Formulate a question and design an appropriate data investigation
2. Organize raw data and represent it in more than one way
3. Analyze data by selecting and applying appropriate data measurement concepts (e.g., measure of center, variability)
4. Critique various representations of data
5. Devise and conduct a simulated probability situation
6. Predict future results based on experimental results

Students may be asked to . . .

- **Conduct a survey of student lunch preferences and make recommendations for menus**
- **Simulate a study of gender in birth order using coin tosses**

Teacher notes:

1. Performance package must include at least one form of technology.
2. Embed communication, problem solving and reasoning in performance task.

mathematics



Solve problems by applying mathematics

Patterns and Functions

Analyze patterns and use concepts of algebra to represent mathematical relationships.

What students should know:

1. Understand the concepts of variables, expressions and equations

What students should do:

1. Given visual, arithmetic and geometric sequences:
 - a. identify patterns
 - b. formulate a prediction or make a decision
2. In real-world situations:
 - a. identify and label patterns of change
 - b. connects patterns of change to their graphic representations
 - c. represent change using ordered pairs, tables, graphs and equations
3. Generate algebraic expressions to represent real-life situations or problems

Students may be asked to . . .

- **Discover a pattern relating car speed and stopping distance**
- **Predict the number of games played in a round robin tournament**

Teacher notes:

1. Performance package must include at least one form of technology.
2. Embed communication, problem solving, connections and reasoning in performance task.



Conduct research and communicate findings

Direct Observation

Gather information to answer scientific or social science questions.

What students should do:

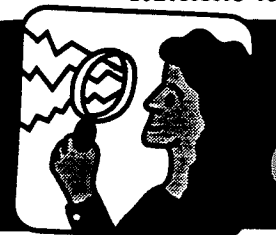
1. Gather information from direct observations:
 - a. frame a question
 - b. collect and record data
 - c. display data in appropriate format (e.g., graphs, tables, charts, diagrams)
 - d. look for patterns in observable data
 - e. relate findings to new situations or large group findings
 - f. answer question or present position using data
 - g. identify areas for further investigation
2. Gather information through direct observation, interviews or surveys:
 - a. frame a question
 - b. collect data through observation, interviews or surveys
 - c. record and organize information
 - d. evaluate the question based on findings

Students may be asked to . . .

- **Interview grandparents to examine their experiences during the Vietnam war**

Teacher notes:

1. Teachers may help students define and limit research questions.
2. Students may work independently or in groups.

inquiry**Conduct research and communicate findings****Accessing Information**

Access information and use a variety of sources to answer a question or support a position.

What students should do:

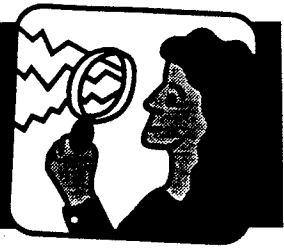
1. Generate a question to be answered or a position to be supported through investigation
2. Use electronic media or other available means to access relevant information
3. Determine how to record and organize information
4. Gather information from multiple sources (e.g., print, media or interviews with experts)
5. Evaluate the relevance of the information
6. Answer the question or support a position by synthesizing information

Students may be asked to . . .

- **Use the Internet to research how architecture reflects its geographic location**

Teacher notes:

1. Teachers will provide guidelines as to the number, variety and types of sources needed.
2. Teachers will provide guidelines on topic selection.



Conduct research and communicate findings

Controlled Experiments

Design a new product and conduct a controlled experiment or investigation and interpret the results.

What students should do:

1. Given a topic, use relevant information to generate a hypothesis or frame a question
2. Define the control(s), variable and sample size (or number of repetitions)
3. Set up a method to test the hypothesis
4. Determine how to record and organize data
5. Conduct experiment and record data
6. Analyze data and evaluate hypothesis
7. Identify areas for further investigation

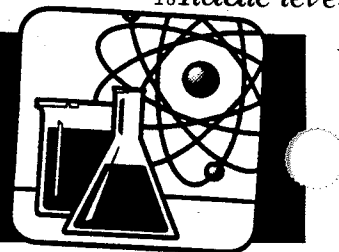
Students may be asked to...

- **Determine the rate of germination of seeds, controlling for light, moisture and temperature**

Teacher notes:

1. Use appropriate technology to handle and display data.
2. Teachers may give feedback on each step of the process.
3. Students may work in small groups.

sciences



Understand and apply scientific concepts

Living Systems

Understand interactions and interdependence of living systems.

What students should know:

1. Understand the human body:
 - a. heredity and reproduction
 - b. regulation and behavior
2. Understand plants, animals and micro-organisms:
 - a. diversity and adaptation of organisms
 - b. populations and ecosystems
3. Understand the dynamic effect of humans interacting with the environment

Students may be asked to . . .

- **Analyze and compare results from a field study revealing abnormalities within an animal population**

What students should do:

1. Formulate questions to be answered based on systematic observations
2. Design and conduct investigations and field studies
3. Analyze data to support or refute hypotheses:
 - a. identify patterns in data
 - b. compare results to known scientific theories, current models and/or personal experience
 - c. consider multiple interpretations of data
4. Describe how a premise (e.g., medical procedures, inventions, claims) is supported by scientific concepts, principles, theories or laws
5. Create a model to illustrate a contemporary or historical concept, principle, theory or law

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sciences

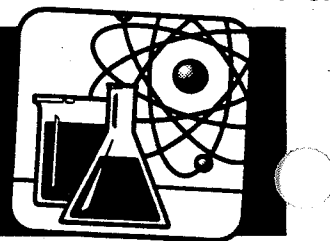
Understand and apply scientific concepts

Living Systems continued

Teacher notes:

1. Students should work with teacher guidance.
2. This standard should be paired with an Inquiry standard whenever appropriate.
3. When possible, students should be given opportunities to work in authentic settings.
4. Students must demonstrate basic safety procedures and skills when using tools and equipment.
5. Tasks should address environmental concerns whenever appropriate.

sciences



Understand and apply scientific concepts

Earth Systems

Recognize concepts and evaluate interactions of earth/space systems and the impact upon human life.

What students should know:

1. Understand the structure of earth systems including:
 - a. geosphere (e.g., plate tectonics, volcanoes, earthquakes, earth layers, soil development)
 - b. hydrosphere (e.g., water cycle, erosion, water bodies)
 - c. atmosphere (e.g., weather, climate)
2. Understand concepts of change and consistency in the Earth's history through evidence found in:
 - a. fossils
 - b. theories of origin
 - c. land forms
 - d. natural events (e.g., volcanic eruptions, meteorites)
3. Understand the relative position and motion of objects in the solar system:
 - a. moon phases, tides
 - b. seasons
 - c. eclipses
 - d. gravitational force
 - e. planetary motion

Students may be asked to . . .

- **Select a feature of the landscape and describe how it is changed by water in the environment**

What students should do:

1. Formulate questions to be answered based on systematic observations
2. Design and conduct investigations and field studies

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Sciences G8.2

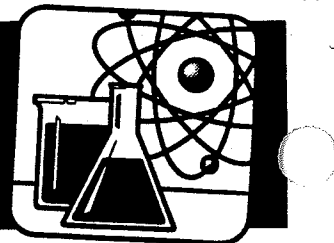
sciences**Understand and apply scientific concepts****Earth Systems** continued

3. Analyze data to support or refute hypothesis:
 - a. identify patterns in data
 - b. compare results to known scientific theories, current models and/or personal experience
 - c. consider multiple interpretations of data
4. Describe how a premise (e.g., medical procedure, invention, claim) is supported by scientific concepts, principles, theories or laws
5. Create a model to illustrate a contemporary or historical concept, principle, theory or law

Teacher notes:

1. Students should work with teacher guidance.
2. This standard should be paired with an Inquiry standard whenever appropriate.
3. When possible, students should be given opportunities to work in earth systems from the local region.
4. Students must demonstrate basic safety procedures and skills when using tools and equipment.
5. Tasks should address environmental concerns whenever appropriate.

sciences



Understand and apply scientific concepts

Physical Systems

Evaluate interactions between physical systems encountered in everyday life.

What students should know:

1. Understand the fundamental laws and concepts of the physical world including:
 - a. properties of matter
 - b. physical and chemical changes
 - c. transfer of energy (e.g., solar radiation, convection, electrical circuits)
 - d. force and motion

Students may be asked to . . .

- **Determine if a substance such as "Silly Putty" is a solid, liquid or something else**

What students should do:

1. Formulate questions to be answered based on systematic observations
2. Design and conduct investigations and field studies
3. Analyze data to support or refute hypothesis:
 - a. identify patterns in data
 - b. compare results to known scientific theories, current models and/or personal experience
 - c. consider multiple interpretations of data
4. Describe how a premise (e.g., medical procedure, invention, claim) is supported by scientific concepts, principles, theories or laws
5. Create a model to illustrate a contemporary or historical concept, principle, theory or law

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Physical Systems continued

Teacher notes:

1. Students should work with teacher guidance.
2. This standard should be paired with an Inquiry standard whenever appropriate.
3. When possible, students should be given opportunities to work in authentic settings.
4. Students must demonstrate basic safety procedures and skills when using tools and equipment.
5. Tasks should address environmental concerns whenever appropriate.

people and cultures



Understand interaction between people and cultures

Current Issue Analysis

Defend a position concerning a current event or issue.

What students should know:

1. Know the history, facts and controversy regarding an issue
2. Know the values, beliefs and emotions surrounding an issue

What students should do:

1. Identify specific events or situations illustrating the impact of the issue
2. Describe a range of opinions or positions on the issue
3. Select and defend a position based on information
4. Describe the responsibilities of citizens involved with the issues
5. Summarize the findings in a written, oral or role-play presentation

Students may be asked to . . .

- **Role play a debate concerning issues of importance in the local community**

people and cultures



Understand interactions between people and cultures

Geography and Culture

Understand how events or actions of people are influenced by physical and cultural geography.

What students should know:

1. Understand how regions of the world are defined in terms of:
 - a. location
 - b. resources
 - c. people and culture
 - d. physical features
2. Understand how global systems are interconnected

Students may be asked to . . .

Examine how the conflict in Bosnia is affected by the geography of the region and culture of the groups involved

What students should do:

1. Identify a current or historical issue or conflict that involves a particular region:
 - a. use mental maps to show location of region
 - b. describe the physical and cultural characteristics
 - c. describe the economic development
 - d. describe how the issue or conflict is influenced by location, physical and cultural geography
 - e. describe how the issue or conflict influences the location, physical and cultural geography

Teacher notes:

1. Performance packages should address a number of issues or conflicts in a variety of regions.
2. One of the situations examined must involve the sovereignty and treaty rights of Native American tribes.
3. Use a variety of print and non-print sources for background information.

people and cultures



Understand interactions between people and cultures

History and Citizenship

Understand historical events and the roles of individuals within them.

What students should know:

1. Know the facts and sequences of historical events
2. Understand the origins and shaping influences of various points of view
3. Understand historical events in relationship to themes of change and migration

What students should do:

1. Understand several historical events from the point of view of participants
2. Illustrate a theme of change or migration that encompasses several events
3. Construct a history of a local community, institution or the role(s) of individuals to illustrate a continuum of change
4. Understand how citizens contribute to a changing community through participation

Students may be asked to . . .

- **Write a history of your town from the point of view of the founding mayor, a farmer's wif, and a school child**
- **Compare how each person's point of view, from the same time period, can be different**



decision making

Use information to make decisions

Career Exploration

Explore career and education options to make informed decisions for future life choices.

What students should do:

1. Determine areas of individual interest and ability
2. Determine at least two possibilities for career/education options which reflect personal interests and abilities
3. Gather information for career options from a variety of sources (e.g., print sources, interviews, simulations, mentoring)
4. Describe how each career might affect personal, family and community life

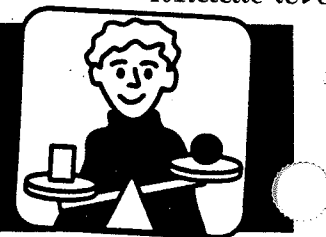
Students may be asked to . . .

- **Make a presentation on two career options you have researched**

Teacher notes:

Presentation may be written or oral.

decision making



Use information to make decisions

Personal Health

Make informed decisions based on information to promote personal health and nutrition.

What students should know:

1. Know the impact of nutrition, food selection and eating patterns on health
2. Know how to recognize abusive or harassing behaviors
3. Know the consequences of using tobacco, alcohol and drugs
4. Know how to prevent communicable diseases, HIV/STD infection and pregnancy
5. Know strategies for preventing accidents and environmental hazards
6. Know what to do in case of sudden illness or injury
7. Know signs and symptoms of health problems that affect adolescents (e.g., chemical abuse, infections, HIV, eating disorders)
8. Understand sexual responsibility
9. Know basic structures and systems of the human body

Students may be asked to . . .

- **Role play scenarios involving the use of refusal skills in situations with peers**
- **Create a nutritional plan including dietary recommendations and actual menus**

What students should do:

1. Analyze the relationship of physical, social and mental health during adolescence
2. Apply a decision-making process to analyze health issues and attain personal goals
3. Analyze how health-related decisions are influenced by internal and external factors (e.g., ability, risk, family, peers)
4. Demonstrate communication skills (e.g., refusal, negotiation, listening) to express needs and enhance health

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Decision Making G8.2

decision making

Use information to make decisions

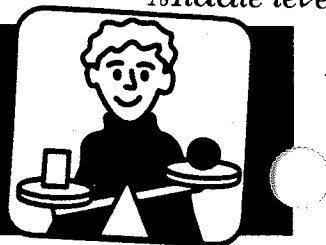
Personal Health continued

5. Create and implement a nutritional health plan using a decision-making process:
 - a. determine dietary recommendations with respect to age, gender and activity level for a specific person
 - b. create menus for a specified period of time
 - c. prepare food based on menus

Teacher notes:

1. Performance tasks may include role plays, timelines, scenarios, journaling, documentation, dietary or food preparation plans.
2. Teacher will specify amount of food to be prepared and time period for menu planning.

decision making



Use information to make decisions

Physical Education and Fitness

Understand and participate in physical activities that develop motor skills and physical fitness.

What students should know:

1. Know rules, skills, strategies and etiquette associated with physical education activities
2. Understand the benefit of daily participation in physical activities
3. Know the components of fitness planning

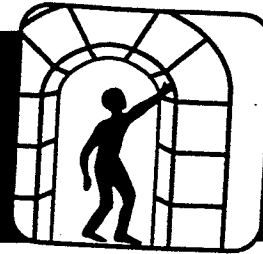
What students should do:

1. Show evidence of implementing a fitness plan
2. Meet age-appropriate National Fitness Standards (e.g., President's Challenge)
3. Demonstrate motor skills required for individual, dual and team activities
4. Display proper etiquette and team-building skills in dual and group activities

Students may be asked to . . .

- **Demonstrate skills in volleyball, tennis and soccer**

managing resources



Manage resources for a household, community or government

Personal Resources

Effectively manage personal resources to meet a goal or solve a problem.

What students should do:

1. Identify a problem, issue or situation
2. Identify personal resources relevant to the situation (time, money, energy, skills, etc.)
3. Examine problem, issue or situation in light of personal goals
4. Generate options or solutions
5. Identify consequences of proposed solutions in a variety of areas
6. Create and implement an action plan
7. Evaluate the effectiveness and/or impact of the use of personal resources in a variety of areas

Students may be asked to . . .

- **Create a plan to assist a neighbor with household tasks**

Teacher notes:

1. Teacher will help define problem, situation or issue and provide background information.
2. Teacher will specify the areas of impact to be examined.
3. Situations may be authentic or simulated.

managing resources



Manage resources for a household, community or government

Group Resources

Manage resources as a team to produce a product or service.

What students should know:

1. Know background information about the product or service to be produced
2. Know basic principles of teamwork
3. Know basic material/processing options

What students should do:

1. Students work as a group to:
 - a. identify and describe a product or service to be produced by creating a model, prototype or plan
 - b. identify the resources of the team members involved
 - c. list the other human and non-human resources required
 - d. compare available resources with needs
 - e. determine how to get needed resources or revise plan
 - f. assign work roles to each member of the team
 - g. create a flow chart or schedule describing how the task will be structured and specific work assigned to each member of the team
 - h. create the product or service as a group
 - i. evaluate effectiveness of the team's management of resources

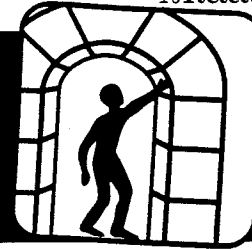
Students may be asked to . . .

- **Organize a clean-up project with a group of classmates to improve the water quality of the pond located next to your school**

Teacher notes:

Teacher will provide, or develop with students, the criteria for evaluating effective team management.

managing resources



Manage resources for a household, community or government

Informed Consumerism

Understand the impact of purchases in the areas of household, business, community and environment.

What students should know:

1. Know consumer rights and responsibilities
2. Know factors which affect consumer decisions
3. Know the impact of consumer decisions in a global context
4. Know how to access information about consumer products

What students should do:

1. Describe a variety of personal or household purchases over a period of time
2. Compare wants, needs and available resources
3. Use information to compare and contrast potential purchases
4. Evaluate the quality of product/services according to criteria
5. Evaluate the impact of the total purchases on the total household budget
6. Evaluate how consumer choices affect the community according to criteria
7. Evaluate the affect of the purchases on the environment according to criteria

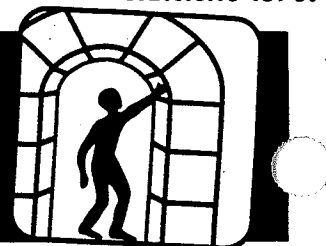
Students may be asked to . . .

- **Evaluate the effect of household purchases on the family budget**

Teacher notes:

Teacher will provide, or develop with students, the criteria for evaluating purchases and the environmental effect.

managing resources



Manage resources for a household, community or government

Technology Applications

Select and use technology appropriately.

What students should do:

1. Enter data with speed and accuracy
2. Utilize spreadsheets, databases, graphics, word processing and desktop publishing
3. Utilize basic telecommunications technology and computer-operating systems
4. Select and use appropriate software to solve problems
5. Select appropriate equipment and tools
6. Apply equipment and technology process to specific tasks
7. Maintain and troubleshoot technology systems (e.g., software program, communication, transparency production)

Students may be asked to . . .

- **Use a spread sheet to track purchases made at your school for a three-month period of time**

Teacher notes:

Teachers will specify the level of speed and accuracy for data entry.



Communicate in another language

Communicating in a language other than English

Communicate appropriately and effectively in a language other than English.

What students should know:

1. Understand how events and products are influenced by culture
2. Know cultural customs related to gender, class, values, beliefs, traditions, age, time and personal space

What students should do:

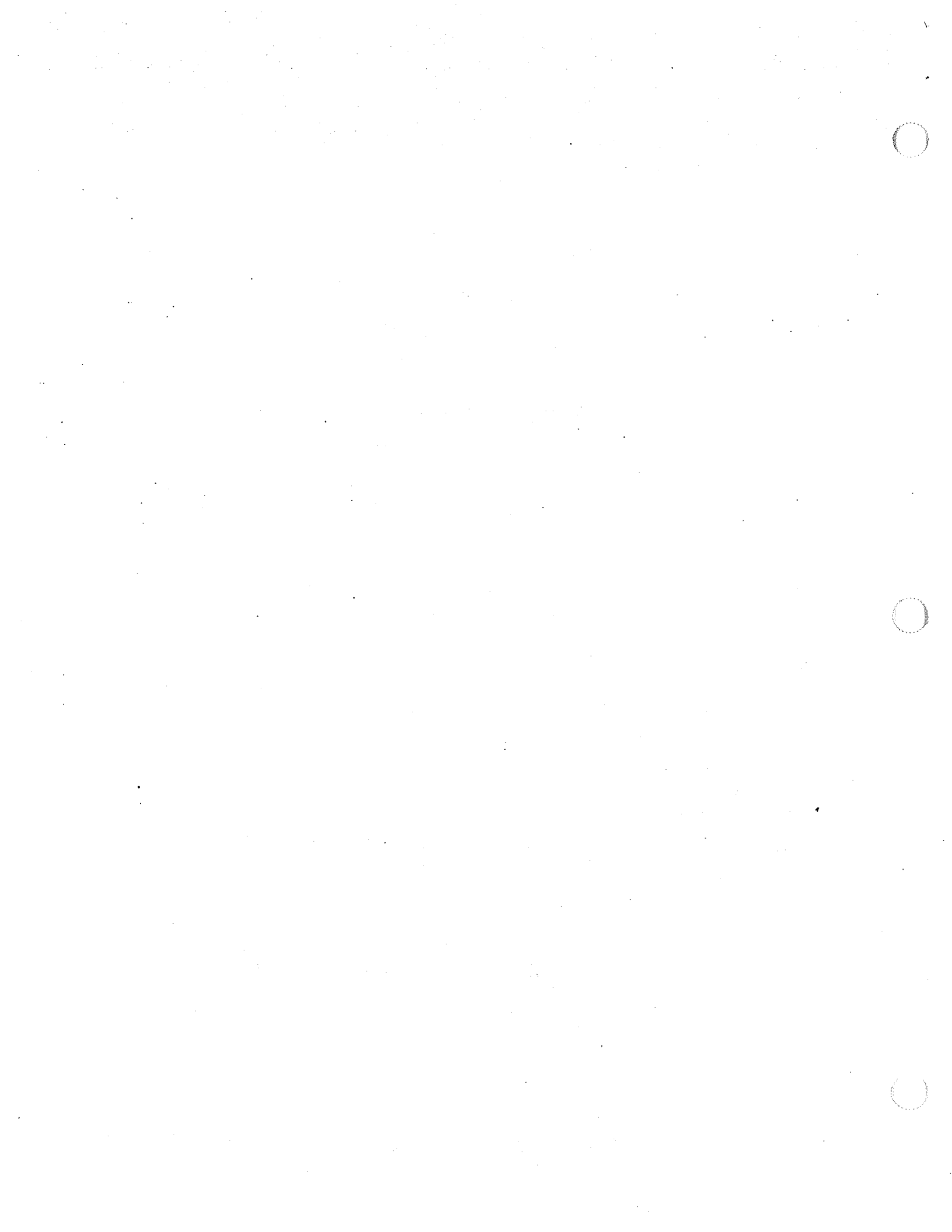
1. In a language other than English:
 - a. comprehend written and oral information relating to decisions about every-day living
 - b. express ideas, opinions and experiences through writing and speaking
 - c. interact in situations relating to personal needs and interests
 - d. communicate a procedure or set of directions for creating a product or performing an action
 - e. communicate using appropriate cultural customs (e.g. formal/informal forms of address, personal space)

Teacher notes:

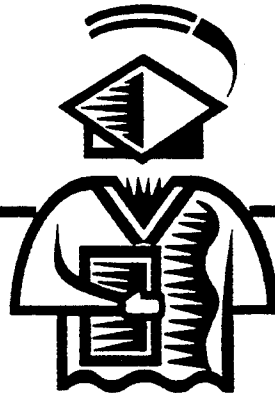
1. Performance tasks must be, or must simulate, culturally authentic communication situations.
2. Performance tasks should be in the range of novice-high to intermediate-low of the ACTFL guidelines.

Students may be asked to . . .

- **Discuss planning a birthday celebration for a sibling or grandparent, including descriptions of customs and traditions**



Minnesota's High Standards in the Profile of Learning



High School Level

Upon request, this document can be made available in alternative formats including Braille, audio tape or computer disk.

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High Standards: Profile of Learning

Each area of learning contains high standards that define expectations for teachers and students.

1. Read, view and listen to complex information in the English language
2. Write and speak effectively in the English language
3. Use and interpret the arts
4. Solve problems by applying mathematics
5. Conduct research and communicate findings
6. Understand and apply scientific concepts
7. Understand interactions between people and cultures
8. Use information to make decisions
9. Manage resources for a household, community or government
10. Communicate in another language



Description of a Content Standard

A content standard describes what students need to know and do. It extends the main ideas from the learning area and provides a plan for creating performance packages.

Learning Area Title

Learning Area Summary

Name of Content Standard

Summary of Content Standard:
a short definition of the entire standard.

Declarative Knowledge describes what the student needs to know and understand, It is composed of facts, concepts, principles and generalizations. This type of knowledge is frequently assessed on written tests.

Procedural Knowledge describes what the student needs to do. It is composed of skills, strategies and processes. This kind of knowledge is typically assessed with a demonstration or performance.

Specifications describe conditions that could alter the nature of the performance (use of calculators, how much assistance students need in formulating a research question).

mathematics
Solve problems by applying mathematics

Algebraic Patterns
Analyze mathematical patterns, relationships and functions to model and solve problems.

What students should know:

1. Identify rates of change in different models of linear relationships
2. Know characteristics of algebras (i.e. polynomial and transcendental (i.e. exponential, periodic functions and relations)
3. Know functional notation and terminology

What students should do:

1. Translate between real world situations and mathematical models using
 - a. graphs
 - b. data tables and/or spread sheets
 - c. verbal descriptions
 - d. algebraic expressions
2. Generate patterns and build mathematical models to describe and predict real world situations. Include the following scenarios:
 - a. linear
 - b. exponential growth/decay
 - c. periodic
3. Use properties of mathematics to synthesize the concepts of algebra or justify reasoning in a logical argument.

Teacher notes:

1. Meet students at least one form of technology.
2. Embed elements of reasoning, problem solving, communication and connections in assessments.

Students may be asked to . . .

- Collect data on postage stamp costs for a one hundred year period of time and predict future values
- Analyze patterns for sunrise and sunset to make conclusions or predictions

Mathematics 1.1
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March 1999

Examples of student work

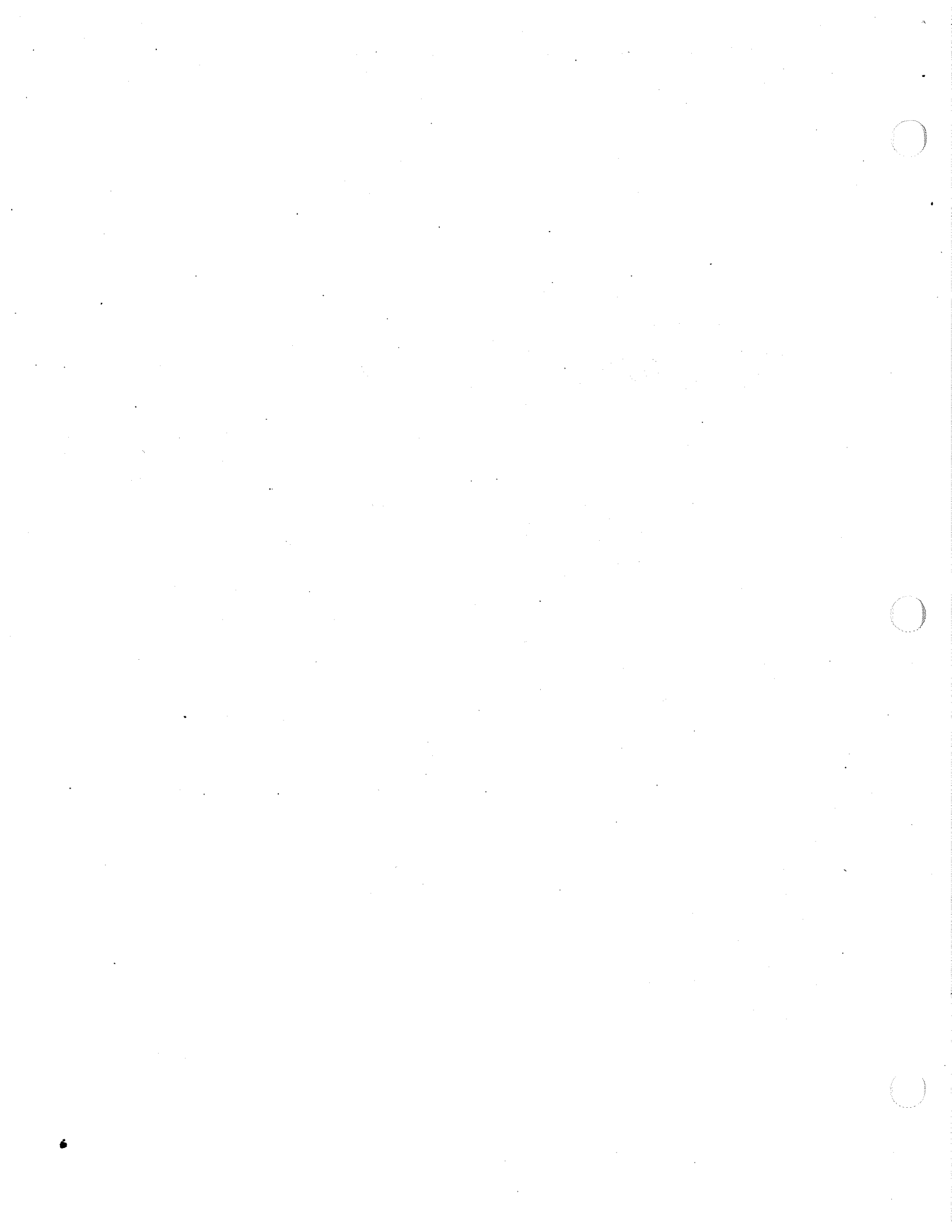
These samples meet some of the content standards requirements, but not all of them.

Actual performance packages will include many more tasks.

These are only examples of what could be included.

Standard Code Numbers give the title of the learning area (mathematics), discipline number (first number), and the standard number within the discipline (second number).

Discipline Numbers:	7	Business
1	Mathematics	8 Health
2	Sciences	9 Occupations
3	Language Arts	10 Family Consumer Sciences
4	Social Studies	11 Physical Education
5	Agriculture	12 Technology
6	Arts	13 World Languages



read, view, listen

Read, view and listen to complex information in the English language

Scientific Reading

Comprehend and evaluate reports of events or ideas in the context of scientific knowledge.

What students should do:

1. Read, view and listen to reports about ideas or events which contain scientific information.
For each report:
 - a. explain main ideas or claims
 - b. explain scientific concepts
 - c. evaluate the accuracy of the information
 - d. identify contradictions and inconsistencies
 - e. identify bias and point of view
 - f. identify purpose and intended audience
2. Compare and contrast information from different reports
3. Explain the implications of the information

Teacher notes:

1. Consider using reports of events and ideas from different times, diverse cultures and diverse geographic locations.
2. Use a variety of sources to provide contrasting types of information.

Students may be asked to . . .

- Create a portfolio of original reviews of scientific articles
- Read and compare scientific articles on global warming from the mass media and from scientific publications

Read, View, Listen 2.1

read, view, listen

Read, view and listen to complex information in the English language

Reading Complex Information

Comprehend and evaluate complex information in non-fiction reading, viewing and listening selections.

What students should do:

1. Read, view and listen to selections containing complex information:
 - a. identify main ideas and supporting information
 - b. distinguish fact from opinion and/or fiction from non-fiction
 - c. identify bias, point of view and author's intent
 - d. identify relevant background information
2. Analyze and evaluate:
 - a. credibility of evidence and source
 - b. logic of reasoning
 - c. how the type of communication (e.g., format, visual images, sound effects) shapes or limits information

Teacher Notes:

1. The ability to comprehend, interpret and evaluate information is the focus of the assessment. Students may demonstrate competence in a variety of ways.
2. Selections should reflect a range of viewpoints.
3. Selections should represent the level of difficulty found in professional publications, reports of international and national affairs or reports of business trends.

Students may be asked to . . .

- Survey information about an issue affecting youth and collect notes in a reading file

Read, View, Listen 3.1

read, view, listen

Read, view and listen to complex information in the English language

Interpreting Perspectives

Interpret fiction and/or non-fiction selections from a variety of perspectives.

What students should do:

1. Read, view and listen to selections representing various cultural, economic, social, environmental and/or political perspectives
2. Analyze how an idea is represented:
 - a. compare viewpoint(s) within the selection to relevant background information (e.g., cultural, historical, environmental)
 - b. identify relevant information which is omitted
 - c. propose logical reasons for omitting information
3. Analyze how meaning is affected by the purpose of the information and the intended audience
 - a. investigate reasons (e.g., race, class, gender) for identified points of view(s)
 - b. investigate reasons for alternate viewpoints (e.g., race, class, gender)

Students may be asked to . . .

- Write chapter introductions for an anthology

Teacher notes:

1. Selections should represent diverse points of view.
2. Consider non-fiction selections on history, social studies or political topics.

Read, View, Listen 3.2

read, view, listen

Read, view and listen to complex information in the English language

Technical Reading

Read and apply technical information from documents or electronic media.

What students should do:

1. Apply information from a technical reading, viewing or listening selection in two of the following applications:
 - a. build or assemble from a plan
 - b. operate, maintain or repair from a technical manual
 - c. analyze a situation based on technical information
 - d. create a design based on technical reading
2. Identify and select relevant information for the given need
3. Interpret specialized vocabulary
4. Interpret information found in charts, graphs, tables and other visual/graphic representations of data
5. Apply step by step procedures

Teacher notes:

1. Instructor will provide technical documents such as:
 - a. code books
 - b. plat books
 - c. manuals
 - d. maps
 - e. government regulations
 - f. nutrition standards
 - g. product plans
 - h. environmental impact statement

Students may be asked to . . .

- Read computer software directions to create business products
- Read and use technical manuals to repair a car
- Adjust and maintain service equipment based on information in the manual

Read, View, Listen 12.1