



Welcome to Ag@School!

Class sets of this magazine, aimed primarily at the 4th grade level, are FREE to subscribing Washington teachers. Instructions for subscribing are on page 4. Back issues are available at www.waic.net.

This is the first of three issues for 2016-2017. Delivery of the next two issues will be in January and April.

Produced by Washington Ag in the Classroom, Ag@School is designed to help teachers meet student educational goals as well as develop agricultural literacy.

This issue is designed to help students understand:

- The economic importance and diversity of Washington agriculture
- The importance of agriculture to their lives
- Washington geography and climate and how these influence agriculture
- The benefits of dams and how locks enable river transportation

Reproducible activities in the teacher guide expand on concepts covered in the magazine.

Why Agricultural Literacy?

Agriculture is society's lifeline and an integral part of our heritage. Unfortunately as our country moved from agrarian to urban, people lost contact with the main industry necessary for survival—food production. America's largest industry has dropped from public discourse except for the occasional media splash. Yet we all eat, and it is important that we have an understanding of where our food is produced and who we depend upon to deliver it to our tables.

Less than 2% of the US population is involved in agriculture production (farming) yet 24 million American jobs are dependent upon it. Agriculture is more than working the land and tending the animals. This huge industry—production, processing, transportation, and marketing—generates billions of dollars each year. Agriculture is vital to national security, a stable economy, and the US trade balance.

Augmented Reality

Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. (Wikipedia)

Ag@School has added this feature using the Aurasma platform. In this issue, and future issues, you will be able to scan a photo that will lead you to a video. That video will hopefully enhance understanding of a concept. For example, there will be a picture with an A in the corner, scan the picture with your phone or tablet, and it will play a short video demonstration of how the locks work.

While you read you will see pictures with the Aurasma logo on them. Those are the pictures that have a video attached. Scan it using the Aurasma app (it's free and directions will be on page 5 of this teacher's guide for how to use it) and enjoy the video.

You can also look online at <http://www.waic.net> under publications for the online version of this magazine. With the online version you can simply click on the picture to show the videos to the class.

We hope you enjoy this feature, it's a work in progress but we think that it will be a great way to make connections to this magazine and to agricultural information.

Browse the Matrix!

Visit our website at <http://www.waic.net> and browse the National Ag in the Classroom link to the Curriculum Matrix

The Agricultural Literacy Curriculum Matrix is an online, searchable, and standards-based curriculum map for K-12 teachers. The Matrix contextualizes national education standards in science, social studies, and nutrition education with relevant instructional resources linked to Common Core Standards.



Search our instructional, classroom-ready resources now! After you find what you need, consider storing them in your personal binder — MyBinder! Create a MyBinder profile now, or login.

Standards Alignment

This publication is aligned with 4th grade standards for Washington students

Essential Academic Learning Requirement – EARLS for Social Studies –

EALR 2: Economics 2.1.1, 2.2.1, 2.2.2, 2.4.1, EALR 3: Geography 3.1.2

EALR 5: Social Studies skills 5.1.1

Common Core State Standards (CCSS)

Reading –

Questioning, Inference, and Interpretation - RI.4.1, Themes and Central Ideas –RI.4.2

Connections - - RI.4.3 , Academic Vocabulary – RI.4.4, Point of View/Purpose – RI.4.6

Visual/auditory Media and Information Sources – RI.4.7, Argument and Reasoning – RI.4.8

Fluency – RF.4.4a

Writing –

Argumentative – W.4.1b, Informative /Explanatory – W.4.2, Technology – W.4.6

Access and Organize information – W.4.8

Speaking and Listening –

Collaborative discussions – SL.4.1, Evaluate Presented Information – SL.4.2; SL.4.3

Language –

Language conventions – L.4.3

Math –

Multiplication and Division - 4.NBT.B.5, Measurement – 4.MD.A.2

Next Generation Science Standards (NGSS) –

4-PS3 Energy, 4-LS1 From Molecules to Organisms: Structures and Processes, 4-ESS3 Earth and Human Activity, 3-5-ETS1 Engineering Design.

Cover - Food Needed for Life

US consumers spend just 10% of their disposable income on food; 50% is for food eaten at home and 50% is for food eaten away from home. In comparison other counties spend much more: New Zealand 15%, Venezuela 20%, India 30%, Guatemala 40% and Kenya 47%. (source: USDA-ERS)

Washington ranks second only to California to the number of crops that can be raised. Washington can produce over 300 different commodities and all the food groups on "our plate" can be Washington grown.

Discussion starters:

1. Which of the crops or products around the edges of the cover have you seen growing? What crops and animals are raised where you live?
2. How does your county rank in ag value and food processing value? Go to the Washington Dept. of Ag website to download useful maps for the answers: www.agr.wa.gov/http://agr.wa.gov/AgInWA/

Page 2 - Ag is Science & Technology

Agriculture is responsible for the food we eat. Food comes from farms; it doesn't just magically appear in grocery stores or restaurants. Farmers and ranchers depend on a wide variety of ag-related careers. Have students brainstorm jobs that are needed to bring food to their tables. Have them research related ag careers like agronomist, entomologist, mechanic, irrigation manager, satellite guidance technician, or food photographer.

Think, Discuss and/or Writing Prompts

If we had no farmers, how would your life be different? Would your parents have the same jobs as today? Would you have different chores? If we didn't have semi-trucks would your diet be the same? Would the foods you eat change with the seasons?

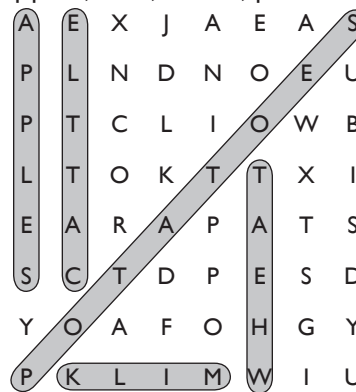
Page 3 - Climate

Discussion starters:

1. Why are different crops and animals raised in different regions of Washington? (They all have unique requirements for climate, rainfall, terrain, and soil to thrive)
2. What is meant by a "rain shadow"? (as clouds rise they lose moisture causing a dry region east of the Cascades) How does it affect the types of crops grown east of the Cascades? (With irrigation, anything can be grown, without irrigation farmers are limited to grain, grass seed, legumes, and some oil seed crops) Using the precipitation map, have students find rain shadow areas caused by the Olympic Mountains. Watch the aurasma video on the page with students and/or type in rain shadow on You tube to find some great videos.
3. Track the fruit growing areas in Washington. They follow the banks of major rivers and lakes and the Columbia Basin Irrigation Project. There is enough water in these areas to make "micro-climates" that are warmer in the winter and cooler in the summer.

Washington's Top Five

Answers are apples, milk, wheat, potatoes, cattle



To learn more about Washington diversity and our top commodities visit:

Washington Department of Agriculture at <http://agr.wa.gov/AgInWA/>

USDA National Agricultural Statistical Service at https://www.nass.usda.gov/Statistics_by_State/Washington/

For more on my plate nutrition and the USDA go to:

<https://www.choosemyplate.gov/> and

<https://www.choosemyplate.gov/washington>

Your Food For Life

Students can compare the cover graphic with the Choose My Plate food plan. Nutrition is essential to health. Food supplies the energy we need to build and maintain our bodies. Making good food choices is a personal responsibility that should be fostered even in elementary school. Have students keep food diaries and then chart how their actual diet compares to My Plate. Which food groups have insufficient entries (i.e. are you eating your veggies?)? Make a plan to improve, and then do another food diary. Stress that we need to eat the foods in our plan first, before we have extras (like desserts). It would also be a good idea to keep track of minutes of physical activity. Students should be familiar with the terms "empty calories" (too many calories; too few nutrients) and "nutrient dense" (lots of nutrition for the calories involved). Encourage students to try new foods, especially fruits and vegetables. Have students compare the variety in their diets. Which of the foods consumed is produced in Washington state?

Page 4/5 - Grown in Washington

Discussion starters:

1. What geographical features make WA such a diversified agricultural state? (Next to the Pacific Ocean; deep-water ports in Puget Sound; Columbia River for navigation, irrigation and power generation; Cascades split the state; volcanoes have provided the rich ash component of our soils; elevation goes from sea level to the top of Mt. Ranier)
2. Discuss individual growing regions and what factors make each an ideal place to grow specific crops or products (have students refer to the boxes on pages 4-5)
3. Why is a location on the Pacific Rim so important? (Closer to trading partners, especially around the Pacific Ocean)

Page 6 - Gateway to the Pacific

Remind students that **technology involves changing the natural world to meet human needs or wants**. Our rivers are excellent examples of this. With our system of dams and locks, we provide water for irrigation, electricity production, recreation, cities and industry. We have flood control, transportation, and still provide for the needs of salmon. Discuss how engineers found solutions to many problems to better serve our citizens and our economy. This in turn has improved the quality and quantity of crops we can raise. Ballard Locks videos can be found on Youtube.

Background:

1. Rock Island dam was the first large dam on the Columbia (1933). Bonneville Dam was second, built in 1938 for electricity generation. Grand Coulee was authorized as one of the many projects to put men back to work after the depression and was built to supply irrigation water for the Columbia Basin Project, using the sale of electricity generated by the dam to pay for the construction of the dam and the irrigation delivery system. In 1948 the Snake and Columbia Rivers crested simultaneously and created a flood that wiped out a section of Portland. River-use planners turned their attention to flood control (as well as navigation and power generation) as the remaining dams were completed on the two rivers.
2. Deep water ports are those capable of handling a fully laden Panamax ship. That is a ship that is the maximum size that can still fit through the Panama Canal. As the Panama Canal undergoes its current expansion, the list of ports will change. It is also important that we dredge the Columbia River Channel to keep the necessary depth clear for these huge ships to reach the largest Columbia ports. Other ports like Bellingham and Olympia are not equipped to handle Panamax ships. Bremerton is a large port for the US Navy.
3. Discuss the different ways people use and depend upon the Columbia and Snake Rivers (recreation, irrigation, water supply, power generation, flood control, wildlife habitat, transportation and commerce. Can the students think of more?)

Think & Discuss:

Have students name three renewable energy sources. (hydro-electric power, wind power, and solar power). Why is hydroelectric energy the most reliable?



3

Discussion starters:

Hydroelectric power is the most reliable because water behind the dams can be released through the generators at any time to supply electricity. If the sun is not shining or the wind is not blowing, solar and wind energy do not produce electricity. In fact, hydroelectric power is called upon to deliver electricity when these other power sources wane.

Hydro-electric power is possible on the Snake-Columbia System because of the drop in altitude between the source of these rivers and the ocean. A large river like the Mississippi is unable to use hydro-electric generators because it is relatively flat along its' length.

Fossil fuels, such as coal, oil, and natural gas are sources of energy derived from plants and animals that lived long ago. They are carbon based and release carbon dioxide into the atmosphere when burned. Our clean, renewable hydropower keeps the Northwest's carbon footprint at half that of the rest of the nation. Removal of the Snake River dams would add 5.4 million tons of carbon dioxide into the atmosphere each year. Replacing the energy capacity lost by Snake River dam removal would take at least three nuclear power plants or six coal-fired or fourteen natural gas-fired plants.

It would also take an additional 120,000 rail cars or more than 700,000 semi-trucks annually to move the cargo that now travels by barge on the Snake-Columbia river system. That traffic would stress already overtaxed bridges and highways.

Sensible solutions have been found and implemented to benefit fish and protect the value of the Columbia-Snake River System to Northwest families and businesses. Additional hydropower generation would seem to be logical.



More info at:

www.nwriverpartners.org/

That's a Lot of Wheat

60# is the standard for a bushel of wheat and total production of wheat was 108,460 million bushels (or 108.460 billion bushels)

That's $108,460,000,000$ bushels \times 60# = $6,507,600,000,000$ # (6 trillion, 507 billion, 600 million pounds)

How many pounds are in a ton? 1 US ton = 2000 pounds

3500 tons on 1 barge = 7,000,000 pounds of wheat in 1 barge



Writing Prompts

1. Tell why weather and climate are important to farmers. For instance, which fruits can we raise in Washington, and which ones will not survive here?
2. What is your favorite food grown in Washington? Describe how it looks, smells, and tastes. What color and texture does it have?
3. Some people believe that the lock and dam system on the Snake and Columbia Rivers should be removed. Do you agree or disagree? Write to persuade a friend of your opinion. Give reasons to support your position.

Learn More About Nutrition

Excellent materials are available at the dairy council website www.eatsmart.org Check it out: WA teachers can receive **\$20.00 FREE materials** each calendar year.

Get the Facts

www.nass.usda.gov/wa/ - WA State agricultural statistics

Become a Washivore

Visit WA grown for excellent videos on the diversity of WA agriculture

<http://www.wagrown.com/>

Check out the brand new website www.washivore.org for fun facts and profiles of Washington Ag products.

Visit the Washington Ag in the Classroom web site at: <http://www.waic.net/>

Publication and Credits

Ag@School is a publication of Washington Agriculture in the Classroom, a non-profit entity created in 1981 to encourage and help teachers increase agricultural literacy in their students. Both public and private groups including the WA Dept. of Agriculture, WSU, commodity commissions, farm organizations, agri-businesses and individuals, support this mission. Teachers may reproduce any pages for use.

Graphic design is by Mike Hendricks, Hendricks Design. Edited by Kristen Hinton-Vanvalkenburg, Robyn Meenach and Cheryl DeHaan.

WHERE DO YOUR FOOD DOLLARS GO?

- Bring a Newspaper grocery ad to class.
- Write a shopping list for at least eight items from your grocery ad.
- You must purchase at least one fresh fruit, one vegetable, and some meat. The other items are your choice.

<u>Shopping list</u>	<u>Price per unit</u>	<u>How many?</u>	<u>Your cost</u>
(fruit) _____	_____	_____	_____
(vegetable) _____	_____	_____	_____
(meat) _____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Add up your purchases to get the total spent at the store: \$ _____

Subscribe to Ag@School

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- Your name, grade you teach, and number of students in your class
- Your school's full name (no abbreviations please)
 - School mailing address (for postal delivery)
 - The county in which your school is located
 - School phone number including area code

You may also subscribe via postal mail by sending the above information to:

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Thank you in advance for your feedback. Sorry, subscriptions are not accepted by phone

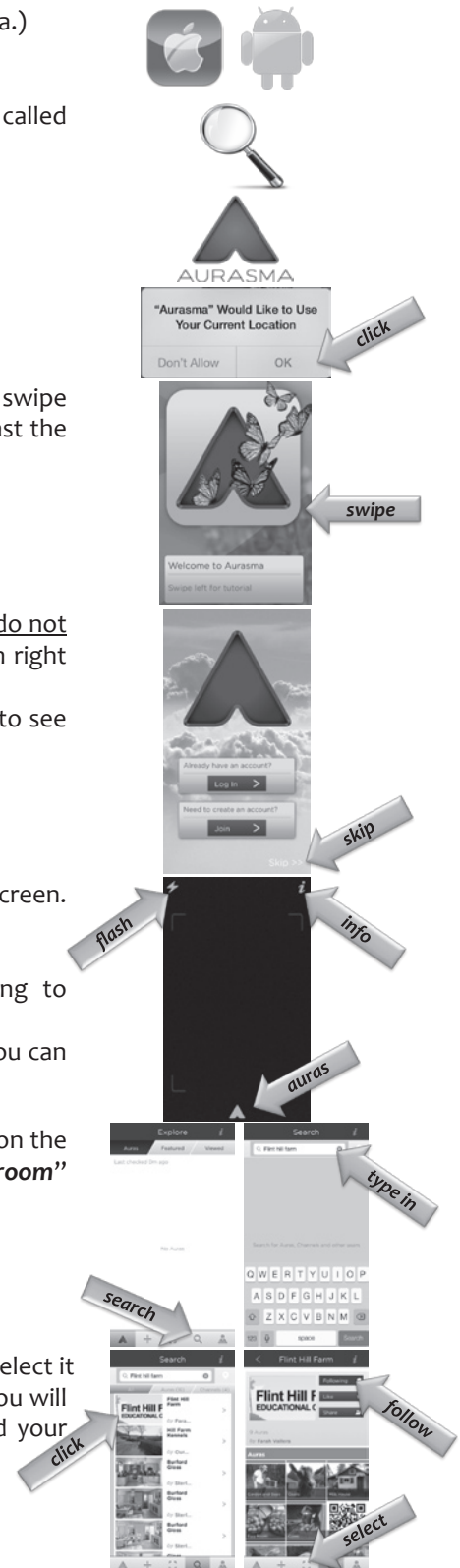
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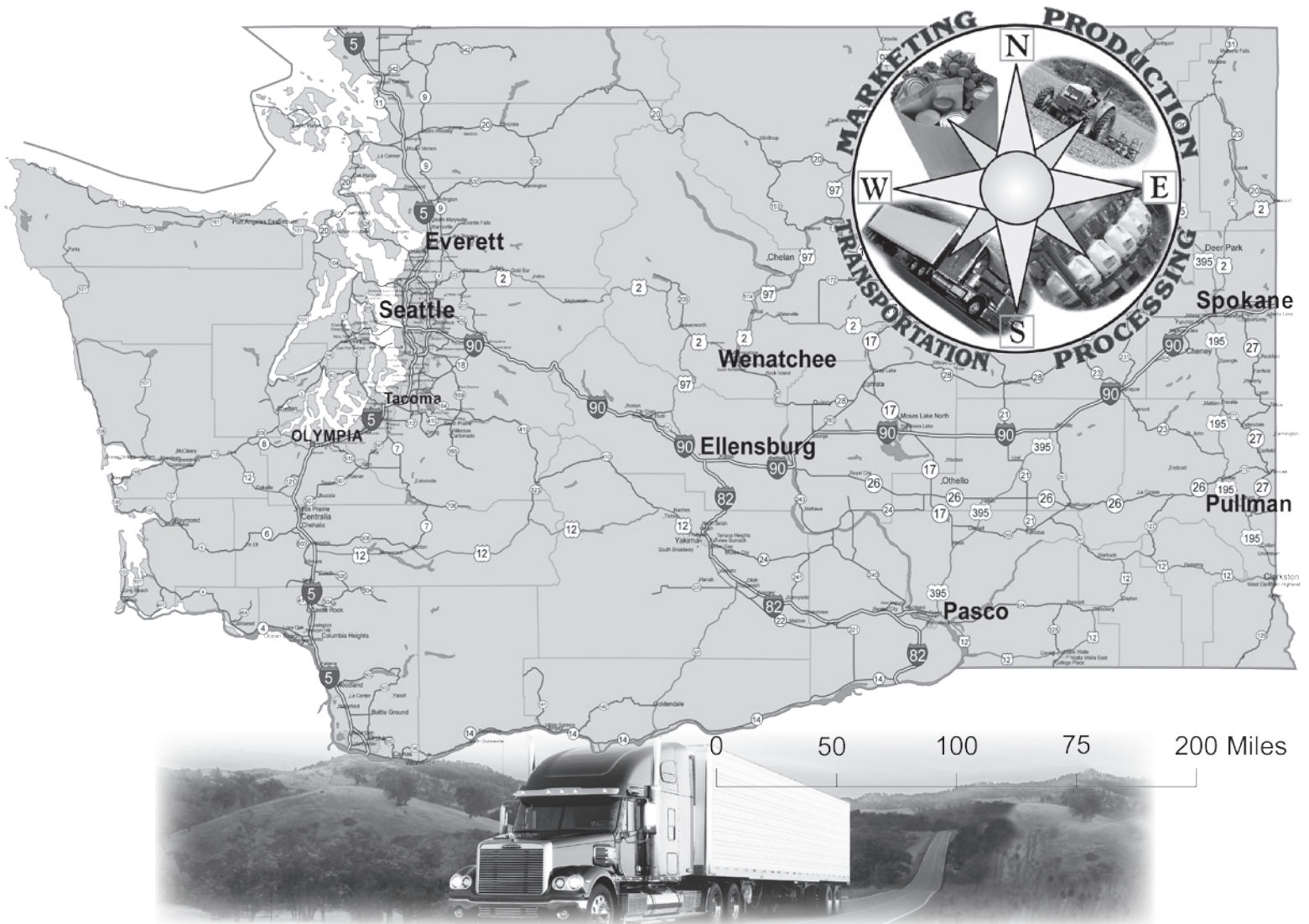
An Augmented Reality

How to Participate:

- 1 You must have a smart phone or tablet with a data plan.* (This app uses minimal data.)
- 2 From your “App Store” or “Google Play”, search for and download the app called **Aurasma**. (It is free, fun, and takes up little space on your device.)
- 3 Once Aurasma is downloaded (which only takes a few minutes), open the **icon**.
- 4 You will be asked to **share your location**. You should click “**OK**”. (You must also have your **Location Services** turned on in your phone’s settings.)
- 5 You will then see Aurasma’s **Welcome Screen**. You will be offered a tutorial if you swipe left, but you can quickly skip past these steps (and revisit them later) by swiping past the five tutorial screens.
- 6 Once you swipe to the left past the tutorial, you will get to the **Log In Screen**. You do not have to create an account for this experience – instead, click “**Skip**” in the bottom right hand corner. (They hide it because they want you to sign up, but you may want to sign up later to see what other things are in there!)
- 7 You will then see your camera is activated and only three icons are present on the screen. (Here, the image is black so you can better see the icons.)
 - a. The top left is the **flash** icon and can be used if it is dark where you are playing.
 - b. The top right is the **information** icon, which gives you information relating to everything on your screen at the time.
 - c. The bottom icon allows you to find **auras**, or the augmented reality programs you can use. You will click the **auras** icon.
- 8 The **Explore** auras tab will open. There are thousands! To find this classroom, click on the search icon on the bottom menu bar, and then type in “**Washington Ag in the Classroom**” into the search bar at the top. (It does not have to be capitalized for it to work.)
- 9 When you click search, **Washington Ag in the Classroom** should be your top result. Select it by clicking on the icon or name. Click “**Follow**” at the top right of the screen, and you will then be “Following” the aura. Select the **camera** icon at the bottom center and your camera will again be activated. You are now ready to play!

What You Will See:





Imagine you are a truck driver and your office is in Seattle. Your boss gives you the following work schedule. Trace your driving route on the map. In the blanks, write the name of the highway you would use to get to that stop and how many miles you traveled.

1. Pick up raspberry jam from a processor in Everett.
Highway _____ for about _____ miles
2. Pick up fresh apples at a fruit packing plant in Wenatchee.
Highway _____ for about _____ miles
3. Deliver the apples and the jam to a supermarket in Spokane.
Highway _____ for about _____ miles
4. Pick up a load of wheat flour near Pullman.
Highway _____ for about _____ miles
5. Drop off flour in Pasco; pick up sweet corn.
Highway _____ & _____ & _____ for about _____ miles
6. Deliver corn to processing plant in Ellensburg.
Highway _____ for _____ miles
7. Pick up hay and deliver to port of Seattle for shipment to Japan.
Highway _____ for about _____ miles
8. What is the total number of miles traveled?
_____ miles
9. How many different highways did you travel? _____
10. How many cities did you visit? _____

Answers to questions on the cover:

1. 5, 30 2. 2, 125 3. 195, 75 4. 195, 26, 395, 135 5. 82, 120
6. 90, 110 7. About 755 8. 9 9. 7