



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 3.

Produced by Washington Ag in the Classroom, Ag@School is designed to help teachers meet student educational goals as well as develop agricultural literacy. The teacher guide connects information to specific standards that will help your students meet state requirements.

This issue is designed to help students understand:

- High-yield agriculture has allowed us to feed the world without bringing more land into production
- Washington's location on the Pacific Rim is advantageous for international trade which fuels our state's economy
- Technology is using scientific knowledge to find a better way of doing a job
- Taking responsibility for food choices improves health and well-being

Reproducible activities in the teacher guide expand on concepts covered in the magazine. Included in the guide are instructions for a visual activity (The Earth as an Apple), vocabulary activities, answers to questions in the magazine, and post tests.

The Earth as an Apple

Environmental benefits of high-yield agriculture

Agriculture's relationship to the economy and our standard of living is important. But, equally important is the environmental impact of modern agriculture. Food production impacts the global environment more than any other human activity.

World population, land-use, food demand and how extensively high-yield agriculture methods are embraced will determine what happens in the future to the remaining wild lands on the planet.


We suggest that teachers do the "Earth as an Apple" (page 5 in this guide) prior to handing out this issue. Please read the background information prior to presenting the activity.

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 of a dairy cow, you scan the picture with your phone or tablet, and it will play a short video about milk's journey.

While you read you will see pictures with the Aurasma logo on them. Scan the  using the Aurasma app and enjoy the video. It's free to use. Instructions can be found on line and in previous teacher guides.

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

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

Annual Grant Opportunity

Next Submissions Accepted September 2016

Washington Ag in the Classroom is pleased to offer a grant opportunity for up to \$500. This money is available to groups or individuals sponsoring programs or projects that promote agricultural literacy. The proposal must target young people between 5 and 18 years of age and should enhance knowledge of a contribution made by agriculture. Students, teachers, or other community members who are involved in agriculture are encouraged to apply.

Visit our website,
<http://www.waic.net>
for more information and to apply.

Washington Standards

Science:

EALR 3 – APPA, APPG, AND APPH

EALR 4 – ES1A

Math:

4.1.1 4.2.D TG page 6

Social Studies:

EALR 2.1, 2.2, 2.4, 3.3, and 4.1

Health and Fitness:

EALR 1.5

Reading:

CCSS RI.4.4, and RI.4.7

Writing:

The post test is designed to help prepare students to write. The prompts include the four modes of writing: expository, narrative, descriptive and persuasive.

Vocabulary Words

- Each issue will introduce several words or word combinations that may be unfamiliar to students. These will appear in bold type the first time they are used.
- Words in this issue are: haymow, technology, agrarian, urban, high-yield agriculture, weaned, tariffs, Free Trade Agreements, Pacific Rim, import, export, beta-carotene, root vegetables.

Cover

HAY -During the cold winter months hay is the mainstay diet for goats, horses, sheep, and cattle. Grass, legumes, and cereal grain straw are some of the categories of hay. Legumes used for hay include alfalfa, lespedeza, vetch, soybeans, cowpeas, and various types of clover. Legume hay has slightly higher levels of digestible energy, vitamin A, more protein, and it contains three times the level of calcium than grass hay. Alfalfa is often fed to animals that need more protein and minerals. Alfalfa accounts for about 65% of all the types of hay grown in Washington. Alfalfa is considered to be the most important hay and pasture plant in the North America.

Technology is the Key

There are five outstanding technological developments in the last 60 years that have led US agriculture to its current production levels:

- 1) Mechanized equipment (tractors and combines rather than horses and mules);
- 2) widespread use of man-made fertilizers;
- 3) chemical pesticides;
- 4) computers and Global Positioning technology;
- and 5) advances in genetics of crops and animals either through cross breeding or biotechnology.

Scientists – Engineers – Specialists:

Farmers depend upon scientists of all sorts to do research adding to our knowledge of the world around us, engineers translate that knowledge into new equipment and processes, and specialists assist farmers with problems in the field. These men and women do not necessarily have farm backgrounds, nor do they live on farms. They are employed by universities and other industries and are a huge part of the success of American agriculture.

Careers in Agriculture are vast. The link below lists and defines many jobs related to agriculture.

<http://jobs.lovetoknow.com/career-fields/list-agriculture-careers>

Page 2

Discussion Starters

1. What does it mean to be an agrarian society? Have students discuss the changing US population demographics listed across the top of the cover. There are very few people living and working on farms today, so we have shifted from being agrarian to being urban.

2. What is "high-yield agriculture"? Farmers grow more food on each acre by using technology. They choose 2

improved seeds and plants, add plant food (fertilizer) to the soil, manage pests, and use better equipment and techniques to increase production on fewer acres.

Where it's Grown: - Lil Fred, "Cups" Parody - Anna Kendrick "When I'm Gone"

<https://www.youtube.com/watch?v=qCnTfEQRGDu>

Page 2 - Word Fill In

years, feed, horses, minutes, seed, earth, pipe, circle

Page 3 - Livestock

Goat meat is consumed by the most number of people worldwide. Those who choose to eat goat meat usually eat less meat compared to those living in what we refer to as the more developed parts of the world. By weight, pork is the most consumed meat followed by poultry then beef.

Idioms - An **idiom** is a word or phrase which means something different from its literal meaning.

Examples of Animal idioms.

A bull in a china shop

A cash cow

Have a cow

Hit the bulls-eye

Holy cow

As fat as a pig

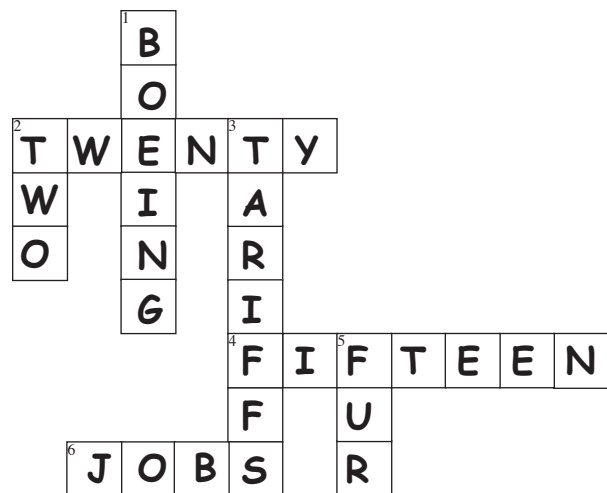
Eat high on/off the hog

Go hog-wild

Go whole hog

Page 4/5 - Washington and Trade.

Crossword Solution



Page 6 Carrots

Carrots are different colors. The different colored carrots are popular in different parts of the world. We are most familiar with the orange carrot. People in Turkey are more familiar with black carrots. Carrots were not originally orange. They have been bred to become the orange ones we are most accustomed to. Other root vegetables include potatoes, turnips, beets, and onions. It is important to note that the dye used to put a logo or symbol on edible things such as meat must be all natural. Video of carrots being cleaned and processed <https://www.youtube.com/watch?v=idCLcXNyOtc>

Page 7 - Identify and Color Answers

cow, Christmas tree, apple, grapes, potato, carrots, cherries, raspberries, mint, pig, corn, wheat

Page 7 - Dairy Life

Answer Key: 1856, 72, 3, 100, 350, 3, 99, 25, 400

Milk's Journey video: <http://youtu.be/wiy17JXlptg>

Page 8 Staying Healthy

Choices - Choices

The obesity rate in American children has tripled over the past 30 years, and their expected lifespan is now less than their parents! Go to:

<http://www.choosemyplate.gov>

Think and Discuss

Review the definition of technology on the front cover. Ask the students for their ideas. Examples, pencils are used for school work and farms use them to make supply lists. What was used before pencils were invented? Students use computers and farmers use computers during planting and harvesting. What was used before computers were invented? Farmers use pumps to run their irrigation, pumps are used to turn on/off faucets and drinking fountains. How were fields watered and how did faucets work before this technology?



The Ten Tips Nutrition Education pages are perfect for posting on a refrigerator. They are a starting point to get students and families moving toward a healthy diet (also available in Spanish).

Plants Need Food Too! Answers TG page 4

Field A: Corn, Potatoes, Wheat

Field B: Corn

Field C: Corn, Wheat

A Cornerstone of Washington's Economy

Answer Key - 1) 10 2) Any five of these; apples, wheat, milk, potatoes, hay, cattle/calves, cherries/nursery greenhouse, grapes, and pears. 3) 2012 from the Census of Agriculture 4) Answers will vary 5) Answers will vary

Visit www.waic.net

FOR LINKS TO:

- Lessons
- Activities
- Information
- Student Websites
- and more!

Washington Ag in the Classroom
is your launch pad for information and activities about all fields of agriculture!

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 our WA Dept. of Agriculture, WSU, commodity commissions, farm organizations, agribusinesses and individuals, support the mission. Teachers may reproduce any pages for use.

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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

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Thank you in advance for your feedback.



(Post-Test) TELL WHAT YOU LEARNED!

1. HOW HAS TECHNOLOGY CHANGED OR IMPROVED PRODUCTION FOR FARMERS? GIVE TWO EXAMPLES. WHICH INNOVATION DO YOU THINK IS THE MOST VALUABLE? WHY?
2. PERSUADE THE READER THAT EXPORT TRADE IS IMPORTANT TO WASHINGTON. GIVE REASONS TO SUPPORT YOUR POINT OF VIEW.
3. DESCRIBE THE FIVE SECTIONS OF MY WASHINGTON PLATE. WHY IS IT IMPORTANT TO EAT ACCORDING TO THIS PLAN?
4. CHOOSE A JOB THAT AGRICULTURE DEPENDS UPON AND EXPLAIN WHY SCIENCE IS AN IMPORTANT SUBJECT TO INCLUDE IN STUDIES FOR THAT CAREER.



FEEDING PEOPLE – THE BIG FOUR

List foods you've seen or eaten this week.
Which of them - plain or processed - came from
THE BIG FOUR?

RICE

WHEAT

CORN

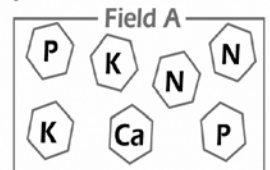
POTATOES

PLANTS NEED FOOD TOO!

Just as we need vitamins and minerals from our bodies to grow, plants need nutrients from the soil to grow. Nitrogen, phosphorus, potassium and calcium are some of the nutrients that food crops need. About 50 years ago scientists learned how to test soil to see what was missing. Farmers could then apply the missing nutrients in fertilizer. This increased yields.

Using the key decide which crops you could plant in each field.

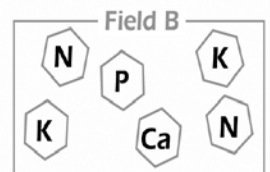
Key:
Ca = Calcium
N = Nitrogen
P = Phosphorus
K = Potassium



Crops I could plant:

Corn needs:

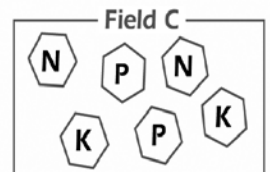
2 Ns
1 P
1 K



Crops I could plant:

Potatoes need:

2 Ps
2 Ns
1 Ca
2 Ks



Crops I could plant:

Wheat needs:

1 N
1K
1-1/2 P

Earth as an Apple

MATERIALS REQUIRED: Large apple and paring knife

OVERVIEW: Cut an apple into smaller and smaller fractions to visually demonstrate how the earth's surface is used. All the people on earth, nearly 7 billion, live on 1/8th of the surface. Only 1/32 of the surface is now used for growing food.

OBJECTIVE: Understanding why high-yield agriculture (growing more on less land) is necessary to avoid plowing more land to feed a growing population demanding better food.

Explain that the apple represents the earth

Cut apple into four quarters:

- Three of those represent the oceans. Set those 3 quarters aside
- Remaining quarter represents total land area of planet.

Cut the land quarter into two pieces:

- One piece (1/8) is inhospitable to people. People can't live there. It includes polar regions, deserts, swamps, and very high or rocky mountains. Set it aside.
- Remaining 1/8 is land where all the people live, nearly 7 billion.

Cut the 1/8 where people live into four pieces (4/32nds):

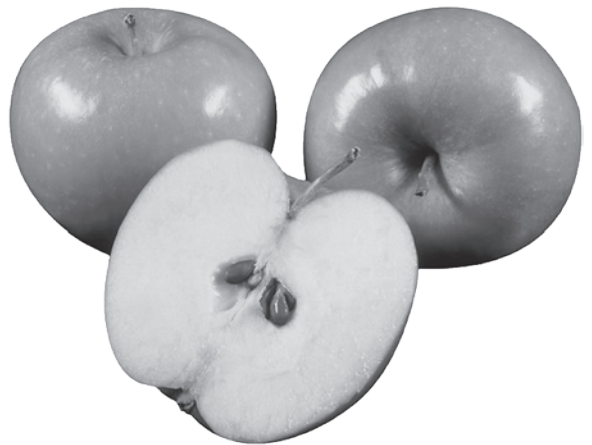
Three of these are land that does not grow food.

- Land that is too wet, too dry, too cold, too steep, or the soil is too poor.
- Land covered by cities, shopping centers, freeways, and all the things we have built on the earth.
- Land now used for other things like parks, rainforest, wildlife habitat, wetlands and recreation areas.

Set those 3 sections aside.

Carefully peel the last 1/32 slice:

- This tiny bit of peeling represents the topsoil, the thin skin of the earth's crust upon which man depends.
- Less than 5 feet thick, it is a very fixed amount of food-producing land



Perpetual Farm Project

The Perpetual Farm - Growing Sustainable agriculture in Washington

Can we farm forever? Come explore this question and more! <http://www.agforestry.org/perpetual-farm>

Also available online: a Teacher's Guide, aligned to the Common Core State Standards for English Language Arts and Literacy in History, Social Studies, Science and Technical subjects for grades 9 through 12. Help teach the next generation about critical thinking, the future of agriculture and sustainability.



1. How many commodities is Washington State ranked #1? _____

2. Please list half of the top ten commodities in Washington State.

1. _____
2. _____
3. _____
4. _____
5. _____

3. What year, and from where, was this information collected? _____

4. How many farms are in your county that you live in, and what commodities are produced there?

5. Write your own question about this map and ask a partner? _____