



## Welcome to Ag@School!

Class sets of this magazine, aimed primarily at 4th grade level, are **FREE** to subscribing Washington teachers. Instructions for subscribing are on Page 6.

This is the last of three issues for 2022-2023. **Your subscription for next year will NOT be automatically renewed.** We need to hear from you that you would like to continue receiving the subscription. **PLEASE RENEW NOW** for next school year, and **NO LATER** than mid-September to insure you receive the 1st issue! Renew at [www.waic.net](http://www.waic.net) under subscription button!

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:

- farmers and ranchers are caretakers for soil and water resources, so every day is Earth Day for them, not just one day a year
- what the term “sustainable agriculture” means
- the water cycle and soil components
- the importance of ruminant animals
- the role of agriculture in the conservation of our natural resources and its importance to the industry
- the economic and environmental impact of various agricultural commodities in Washington

## Teacher Guide

- 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.

### Why Agriculture?

Teaching about agriculture is an ideal way for students to make real-life connections to science, math, and social studies concepts. Agriculture is relevant because students encounter it daily. Who doesn’t enjoy talking about food? Nearly everything we eat, wear, use- even some fuel that powers cars and buses, comes from plants and animals grown on farms. Agriculture provides perfect real-world connections to STEM and makes learning relevant to students.

Helping students understand the farm-to-table connection is important in our consumer-driven society. Teaching students to be agriculturally literate connects their learning to everyday life.

### 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.



### Farming in a Glove (grades 3-5)

This activity allows students to see the life cycle of plants and learn what seeds need to germinate and grow. It is important to understand how seeds become plants because they product food, shelter and oxygen – we need and use these things every day!

<https://washington.agclassroom.org/matrix/lesson/831/>

### Vocabulary Words

Each issue will introduce several words that may be unfamiliar to students. These words will appear in **bold** type the first time they are used.

Words in the this issue include:

**natural resources, renewable natural resources, conservation, sustainable agriculture, organic agriculture, conventional agriculture, organic agriculture, water cycle, condensation, evaporation, groundwater, aquifers, percolation, precipitation, transpiration, pollination, stamen, pollen, pistil, stigma, ovule, self-pollination, cross-pollination, nectar, humus, ruminants, grazing, parent rock, weathering, watershed, tokul, andisols, stone fruit.**

Definitions can be found scattered throughout the magazine.

## Ag@School Funding

Many businesses, organizations, public agencies and individuals contribute money and time to providing you this magazine at no cost. They are listed on Pages 5 and 6 along with a suggested activity for research and writing letters of thanks. We suggest using the activity as a small group project both for internet research practice and, of course, letter writing experience.

## Standards Alignment

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

### Social Studies EARLS (Essential Academic Learning Requirement) –

Economics 2.2.1, 2.4.1

Geography 3.1.2

### 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, Text Structures and Features – RI.4.5, Points of View/Purpose – RI.4.6,

Visual/Auditory Media and Information Sources – RI.4.7, Augment and Reasoning – RI.4.8, Fluency – RF.4.4a.

#### Writing –

Argumentative- W.4.1b, Informative/Explanatory – W.4.2, Narrative – W.4.3, Task, Purpose and Audience –W.4.4 , Technology –W.4.6, Research – W.4.7, 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

Reference materials – L.4.5c

#### Math –

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

#### Science (Next Generation Science Standards -NGSS):

Energy 4-ESS3-1, Structure, Function and Information Processing – 4-LS1-1, Earth and Human Activity 4-ESS3, Engineering Design 3-5-ETS1-1.

## Cover – Every Day is Earth Day

April 22 is Earth Day—a day intended to inspire awareness and appreciation for the earth’s natural environment.

Farmers understand that the bounty of crops they are able to produce is dependent upon the sun’s energy, adequate water, and a healthy soil ecosystem. Sustainable agriculture must be environmentally friendly by taking care of the soil and using water efficiently, but it must also be profitable enough to keep farmers in business, and able to improve the quality of life for the farmer, farm workers, and all of society.

**Cover – answers:** 1. solar energy 2. soil 3. water 4. air

## Page 2 – Farmers are Environmentalists Think and Discuss

### Discussion starters:

1. *Why are farmers important environmentalists?* It is the right thing to do and they know that they need to care for the land and livestock in order for it to be productive and prosperous in the future. Farmers are “caretakers” of the land. Their livelihood depends on keeping the soil, water, and air clean and healthy.
2. Talk about the true definition of sustainable agriculture. *What would happen if people could not make a living? If all US farmers went out of business what would replace agriculture on the land? Where would people get their food? How secure would our food supply be if we had to rely on other countries to grow it for us?*
3. *What are Washington’s natural resources?* Brainstorm a list of all the wonderful things that occupy our land, air and water. Don’t forget people! *Why is it necessary to protect these treasures?*

## Page 3 – Sustainable Agriculture

### Discussion starters:

1. **Why are farmers our most important environmentalists?** (Because they manage such a large amount of land—over 46% nationally and they know that caring for the land means having the resource in the future.)
2. **Why must farmers make a profit?** (Farmers are self-employed, so when they sell their crops and animals, that money is used for paying their expenses, investing in their business, and is also their paycheck to pay for their own personal expenses like food, clothing, shelter—as well as benefits like vacation time and health insurance. Farmers must earn a profit in order to stay in business.)

## Page 4/5 – Pollination

There are many lessons, videos, resources and books available on the curriculum matrix on pollination. This issues library corner highlights a book as well on the importance of bees.

Great site for video and activities is <https://www.neok12.com/Pollination.htm>

National pollinators week June 19-23, 2023

<https://www.pollinator.org/pollinator-week>

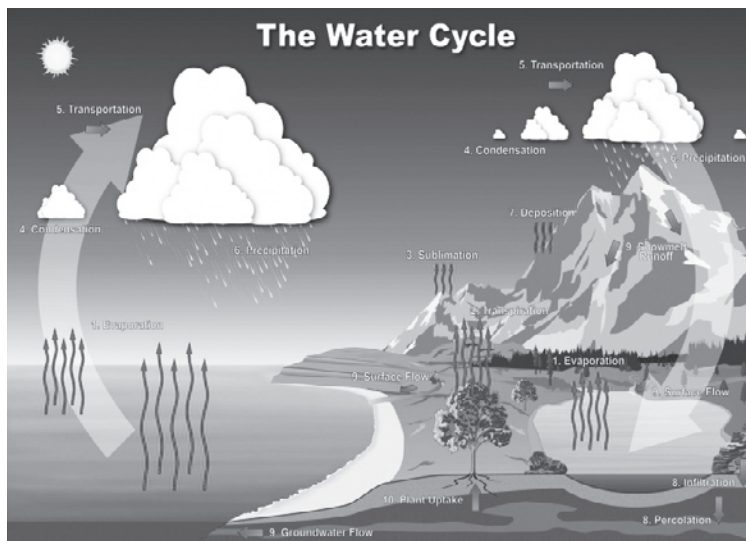
### Pollination Crossword

Across: 3- nectar 5 – pollination 7 - pollen 8 – bees 9 – ovule

Down: 1 – seed 2 – stamen 4 – stigma 6 – anther 7 – pistil

## Page 6 – Water...

The most common material on earth



### Discussion starters:

- How is water cleaned through the water cycle (evaporation---also large particle contaminants like silt are trapped in percolation process)
- What impurities might be left behind when water evaporates?
- What can people do to prevent impurities from getting into the water in the first place?

Reinforce that salt water cannot be used for drinking water or to water plants and animals. The amount of water in the world is constant although it changes location and physical form.

Water in the atmosphere is mostly in the form of water

vapor. If it all fell as precipitation at once, the Earth would be covered with only about 1 inch of water. Students should recognize that each zero to the right of a decimal point is also a factor of 10. For instance, if told that all plants and animals contain 0.0001% of the total water, they should reason that the atmosphere contains 10 times as much (0.001%). They should also be able to recognize that 0.001% is the same as 1/1000 of 1%.

## Water Cycle Song

(to the tune of

“She’ll Be Coming

‘Round the Mountain)



Water travels in a cycle yes it does,

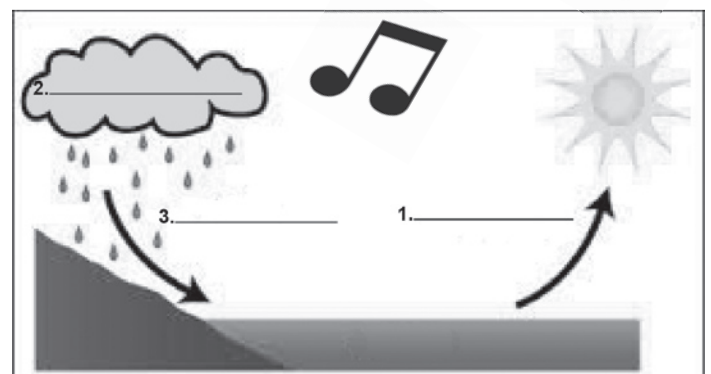
Water travels in a cycle yes it does,

It goes up as **evaporation**

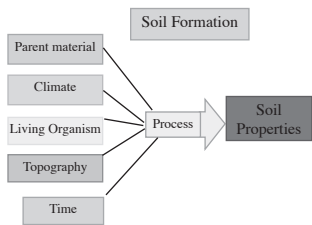
Forms clouds as **condensation**

And comes down as **precipitation**

Yes it does!



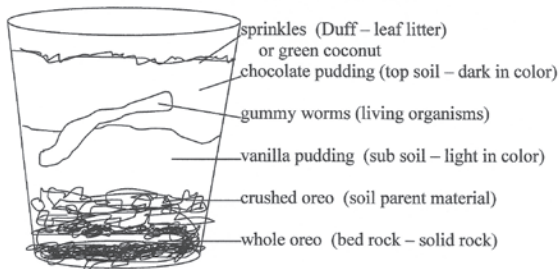
## Page 6 - Can you dig it?



The soil is home to an incredible number of organisms, most of them so tiny we cannot see them without a microscope.

They decompose organic matter, take nitrogen from the air and make it available to plants, improve soil structure, and control crop pests. There are all manner of creepy-crawlies---algae, bacteria, rotifers, fungi, protozoa, nematodes, arthropods, earthworms---all part of the soil food web. The human food system would collapse without the complicated food web that exists in the soil. We are totally dependent upon the soil web to provide and maintain the growing environment for larger plants that feed us and the animals we use for food. Farmers understand this delicate balance. They know if they treat the soil well, it will be able to keep giving back...not just for us today, but for future generations too. If microscopes are available for your use, it is well worth the effort to examine soil samples under magnification. Observing this fascinating world may be just the impetus students need to encourage further scientific investigation. There are also short YouTube videos of soil microbes and pond water organisms.

**SOIL PROFILE - SERVE EDIBLE DIRT:** Explain the significance of each layer.....



## Page 7 - our state soil - tokul

Great article on our state soil

<https://www.soils4teachers.org/files/s4t/k12outreach/wa-state-soil-booklet.pdf>

## Page 8 - "Fruitful State" answers

1. Apple Capital of the World

2. Eastern WA has less precipitation (and irrigation is controlled water application)
3.  $9600 \times 8070 = 77,472,000 \#$  or 38,736 tons (2000 lbs in a ton)
4. Whole grapes have more fiber than juice; both juice and whole grapes are much superior nutritionally than sugar-packed jelly

## Writing prompts for this issue:

- How would you describe the role of agriculture in managing or taking care of natural resources?
- Persuade the reader that the goal of agriculture should be to grow more food on less land. Give reasons to back up your argument.
- Explain the importance and the process of the water cycle in detail.
- Describe the importance and process of pollination for food production.

**Visit**  
**[www.waic.net](http://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 the WA Dept. of Agriculture, WSU, commodity commissions, farm organizations, agri-businesses and individuals, support this mission. Teachers may reproduce any pages for use.

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