AgMag 4 Spring 2021 Teacher's Guide

Why Ag in the Classroom?

Agriculture means survival. Over time, fewer and fewer people have close contact with farming and the total agricultural sector. They're not aware of their own and society's total dependence on agriculture. People must be agriculturally literate in order to make responsible decisions affecting this giant lifeline.

Teaching students to be agriculturally literate brings their learning to life. Helping students understand the farm-to-table connection is important in our consumer-driven society. That's what the student Minnesota AgMag Series is all about.

About Your AgMag

The AgMag is a great supplement to your social studies, science, or language arts curriculum. The AgMag has particular appeal to the study of Minnesota history and geography. You'll get three issues per school year: October, January, and March.

AgMag Theme: Caring for our Natural Resources

- **Overview of Minnesota's natural resources and how agriculture depends on those natural resources.**
- **Celebrating our natural resources**
- **The water cycle**
- **Digging deep into soil**
- **Meet the farmer**
- **Homegrown energy**
- **Renewable and non-renewable resources**
- **Cause and effect**
- **Making a bioplastic**

Integration Ideas

English Language Arts

- Ask students to identify key ideas and details and build their vocabulary through the AgMag's informational text.

- Use agriculture as an inspiration for creative writing activities and group discussions. Ideas: Stories from the points of view of plants or animals that depend on humans; predictions for agriculture in 2050 (or future years); letters to children in other countries with descriptions about agriculture here and questions about agriculture there.

Science and Math

- Have the students create a bioplastic (page 8) as an extension activity after learning about renewable and non-renewable resources.
- Take a hike! Go on an outdoor excursion and try and find signs of erosion, observe what caused the erosion, and come up with a plan to find out ways to stop the erosion from occurring in the identified area.
- When studying evaporation, refer to pages 2-3. Have students pour a cup of water outside on the sidewalk on a warm day and take field notes to observe what occurs. Discuss what part of the water cycle they are witnessing, and what happens next in the water cycle.

Glossary

Some words in your AgMag may be unfamiliar to your students. Many are defined in the articles. There is also a glossary on the AgMag website: http://mnagmag.org/glossary/ Words you might wish to pre-teach are:

AGRICULTURE: Growing plants and raising animals that people use for food, clothing and many other things every day. It's also harvesting those farm products and getting them to us so we can use them. Agriculture is the **industry** that grows, harvests, processes, and brings us food, **fiber**, fish, forests, sod, **landscaping materials**, and more. It uses soil, water, sun, and air to produce its products. The process starts on farms, **orchards**, gardens, and ranches with the growing and the harvesting of crops and **livestock**, then moves to **processing** plants before finally traveling as finished products to stores, farm markets, lumberyards, greenhouses, and more where **consumers** buy the products. Agriculture is connected in some way with almost everything we eat, wear, and use.

Quote from an Unknown Source: "Agriculture is not simply farming. It's the supermarket, the equipment factory, the trucking system, the overseas shipping industry, the scientist's laboratory, the houses we live in, and much more. It has an effect on the air we breathe, the ground we walk on, the water we drink, and the food we eat."

STEWARD: someone who is in charge of supervising or taking care of something, such as an organization or property.

EVAPORATION:the process of turning from liquid into vapor.

CONDENSATION:the conversion of a vapor or gas to a liquid.

PRECIPITATION:rain, snow, sleet, or hail that falls to the ground.

WATER CYCLE: The cycle of processes by which water circulates between the earth's oceans, atmosphere, and land, involving precipitation as rain and snow, drainage in streams and rivers, and return to the atmosphere by evaporation and condensation.

SUBLIMATION:When anything solid turns into a gas without first becoming liquid,

EROSION: The geological process in which earthen materials are worn away and transported by natural forces such as wind or water

NATURAL RESOURCE: A resource which comes from the natural environment such as water, soil, wind, solar energy, etc.

RENEWABLE RESOURCE A resource :that can be used repeatedly and does not run out because it is naturally replaced

NONRENEWABLE RESOURCE: A natural substance that is not replenished with the speed at which it is consumed. Ex: fossil fuels or petroleum.

Minnesota Academic Standards Connection

Subject	Standard Code	Benchmark
Science	4E.1.1.1.2	Ask questions about how water moves through the Earth system and identify the type of question. (P: 1, CC: 5, CI: ESS2) Emphasis is on the processes of evaporation, condensation, and precipitation. Examples of types of questions may include those that can be tested by an experiment, and questions that may answered from a text.
Science	4E.1.2.1.2	Plan and carry out fair tests in which variables are controlled and failure points are considered to improve a model or prototype to prevent erosion.* (P: 3, CC: 2, CI: ESS2, ETS1; ETS2) Examples of prototypes to prevent erosion include retaining walls, wind breaks, use of shrubs or other vegetation, and drainage systems

Science	4E.4.2.1.1	Read and comprehend grade appropriate complex texts and/or other reliable media to describe that energy and fuels are derived from natural resources and their uses affect the environment. (P: 8, CC: 2, CI: ESS3, ETS2) Examples of information about natural resources should include details about those found in Minnesota. Examples of renewable energy resources may include wind, water behind dams, and sunlight; non-renewable energy resources include fossil fuels and fissile materials. Examples of environmental effects may include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution and global warming from burning fossil fuels.
Science		
English Language Arts		

AgMag Cover (Social Studies): Caring For Our Natural Resources

Discussion Questions

- What are some examples of natural resources?
- What does it mean to be a good steward? Why is it important that we be good stewards of the land?

Engagement Activity: What are Natural Resources?

- Bring to class a box of dirt, a bottle of water, a fan (turned on), and ask you students to touch, feel, and look at these 3 items. After the class has had a chance to observe the items, ask them what all three of these items have in common.
- Explain to your students that the items you've displayed are examples of natural resources (the fan is not a natural resource, but is mimicking the resource of wind) Explain that natural resources are resources that come from the natural environment such

as water, soil, wind, solar energy, etc. Come up together with a list of as many natural resources as you can.
    - After you've come up with a list of natural resources, follow up with these discussion questions:
    - What would we do if we ran out of one of those natural resources?
    - How can we take care of our natural resources?

Page 2-3: Celebrating our Natural Resources

Discussion Questions

Where does our water come from?
Why is soil important?
How can we keep our air fresh?

Wonderful Water Activity:

Use the pictures and questions to discuss and describe how water moves through earths systems. Encourage your students to come up with more examples of the water cycle occuring in your community.

Water Cycle Activity: Up Close Examples of the Water Cycle

Evaporation: If the weather is warm, take your class outside and pour a small amount of water on the sidewalk. Observe how the water begins to dry up. Explain that the water isn't disappearing, but turning from a liquid into a gas (water vapor).
Precipitation: Minnesota has a lot more precipitation that many parts of the country. When it does rain or snow, take the time to point out the precipitation to your class.
Condensation: Condensation occurs in more places than we think! In the morning dew on the grass, fogging up a mirror or window, visible breath in cold conditions, clouds in the sky. Choose one or multiple of these examples and show them to your students. Better yet, have them try to create or identify signs of condensation on their own.

- For a fun, musical explanation of the water cycle (that you're sure to have stuck in your head) show your students this video: https://www.youtube.com/watch?v=TWb4KlM2vts&ab_channel=HaveFunTeaching

- Another option of an engaging video that explains the water cycle: https://www.youtube.com/watch?v=ncORPosDrjI&ab_channel=PeekabooKidz

Page 4: Digging Deep into the Soil

Discussion Questions:

Why do we need soil? What does soil do?

Did you know dirt and soil are two different things? How are they different?

Why should we work to protect soil from erosion?

Erosion Prevention Activity:

Look at the picture at the bottom of page 4 with your class. Discuss what is happening in the picture, and brainstorm some possible ways that erosion could be prevented. Let students work on their own or in small groups to come up with a solution to the erosion problem. After some time has passed, have students share their solutions with a new partner or have a few share their work with the class.

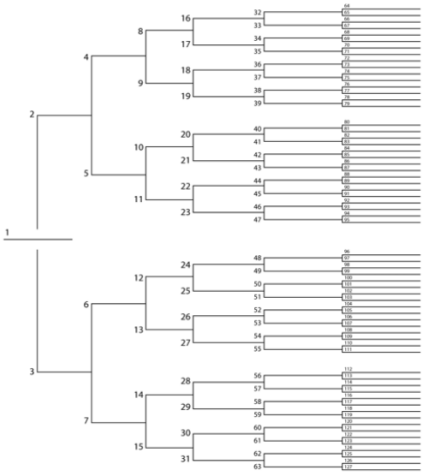
To give your students even more practice, look up a few more photos of erosion and have them repeat this activity over again but with a new picture of erosion.

Page 5: Meet The Farmer

Steve and Becky live on the Oneida Reservation. For more information about the Oneida people, visit https://wisconsinfirstnations.org/oneida-nation/

For 7 Generations Activity Extension:

- To help students understand the impact that one person can have on 7 generations into the future, have students chart out a family tree for 7 generations, or simply show them the following 7 generation pedigree chart.
- Look how many people are alive because of that first generation person? How many total people are in their family? The decisions of those who went before greatly influence the people who come after.



Page 6-7: Homegrown Energy

Discussion Questions

What types of energy can you think of?
Look around the room. Where is energy being used right now?
Have you ever wondered where fuel comes from?
Why is it important to have fuel that is renewable?

Renewable or Non-Renewable?
Answers:
Water: renewable
Sunshine: renewable
Soybeans: renewable
Coal: non-renewable
Oil: non-renewable
Corn: renewable

For an engaging explanation on renewable and non-renewable energy, watch this video:
https://www.generationgenius.com/videolessons/renewable-vs-nonrenewable-energy-for-kids/

Page 8: Making Bioplastic!

Discussion Questions

What are examples of things made of plastic?
Look around the room. What can you see that is made of plastic?
What could you make with your bioplastic?
What advantages are there to using renewable resources from corn to make plastic?

Materials needed:
Resealable plastic sandwich size bag
• Cornstarch
• Corn Oil
• Water
• Food Coloring