



Lesson Two: Ecosystems 101

Grade Level: 5th Grade

Time: 45 minutes

Essential Question: How can we be stewards of Wyoming's agriculture to benefit current and future generations?

Objectives: Students identify the visible and invisible components of an ecosystem and define ecosystem.

Purpose: Students will apply the definition of stewardship in order to identify and understand the importance of considering both visible and invisible aspects of an ecosystem.

Required Materials/Resources:

- Large Class Agricultural Stewardship Game Board (6 sheets should be taped together or attached to poster board in the correct order. Each game space should be large enough to hold a sticky note for each student/pair playing) OR Individual Agricultural Stewardship Game Boards (one per student or pair)
- Sticky notes (One per student or pair. These will be the students' game pieces. Teacher may choose to use something other than sticky notes for game pieces.)
- Document camera (optional)
- Blank sheets of lined paper (one per student)
- Ag Ecosystem graphic (one per student)
- *Agricultural Ecosystems in Wyoming* text with maps (Sources 1, 2)

Suggested Teacher Preparation:

- If you have not already done so, familiarize yourself with the instructions for the Master Stewards Board Game in the Educator Essentials.
- Decide whether you will have students play individually or as pairs.
- Choose whether you will use the Class Agricultural Stewardship Game Board or Individual Agricultural Stewardship Game Boards. Prepare the chosen game board(s) as directed.
- If using the Class Agricultural Stewardship Game Board, post/place it in the classroom where it can be visible throughout the unit.

Standards:

Science: 5-LS2-1 (Explicit)

Social Studies: SS5.5.2 (Practiced/Encountered)

ELA: 5. L.6 (Explicit), 5.RI.1 (Practiced/Encountered)

Vocabulary:

- **Dryland farming** - growing crops with naturally occurring moisture, not using irrigation
- **Ecosystem - everything** that exists in a particular environment; an ecosystem includes living things, such as plants and animals, and things that are not living, such as sunlight and water
- **Forage** - vegetation that is used primarily for grazing by livestock or wildlife
- **Irrigated farming** - process of raising crops with water in addition to natural precipitation
- **Model** - a simplified representation of a system that can explain and help make predictions regarding a phenomenon
- **Organism** - an individual animal, plant, or single-celled life form
- **Pasture** - fenced-in area of grazing land
- **System** - a group of individual parts and/or processes that function together

Instructional Procedure/Steps:



1. Introduce the Agriculture Stewardship Game. Show students the game board. Say: **“In Lesson 1, we learned what a steward is. For the remainder of this unit, you will be working your way to becoming a master steward. You will earn points by completing tasks throughout the unit.”** Give each student or team a sticky note and provide students 3 minutes to decorate it to represent them. Say: **“These sticky notes will be your game pieces. When you are finished decorating your sticky note, please place it at the start of the game board.”**
2. Say: **“Share with a neighbor what you remember from yesterday’s lesson.”** *Students should emphasize the definition of a steward and the complexity of making stewardship decisions.* Have students share the sentences they wrote from the previous lesson describing stewardship using the words decision, care, use, and multiple. You may choose to hand out all the sentences from Lesson 1 or keep a few as examples to share and review as a class. Award a game point to any students who can successfully recap the main points of the lesson. (It is helpful to keep track of points in case the sticky notes fall off, or students forget to move their piece.)
3. Say: **“Starting today, we will be doing some activities to teach us about scientific ideas that can help us make agricultural stewardship decisions.”**
4. Write the word “system” on the board, or display using a document camera. Say: **“System is a word that can have multiple meanings. For example, I might say that I have a system for sorting your papers after I grade them. I could also switch back and forth between using the metric system of measurement and the U.S. Customary system of measurement. For**

TEACHER NOTE:
The use of a riparian community and a digestive system will only work in this setting if your students have some basic background knowledge of these two systems. If they do not, use different systems for practice. If you replace these two systems with those of your own, be conscientious of not using only mechanical systems. An elementary school could be a possible non-mechanical system. A forest or prairie would also work and would be examples for the next part of the lesson.

today's work, we'll be using the definition of system that means a group of individual parts and/or processes that function together." Write that definition after the word, so it is visible on the board/document camera. Underneath the word system, write "pencil sharpener." Say: **"Turn to a partner and tell them how a manual (hand crank) pencil sharpener is a system."** If students struggle with this initial prompt, rephrase it by asking: **"What parts of the pencil sharpener work together to make it one functional object?"** As you listen to students' responses, make sure they are naming parts of the pencil sharpener and the processes that allow it to function. When students are finished discussing, write the words "riparian community" underneath "pencil sharpener." Say: **"With your neighbor, explain how a riparian community is a system."** Again, after students are finished, add the words "digestive system" to the list, and have students discuss how it is a system, as well.

5. Add the prefix eco- to the beginning of system and ask students to read aloud the new word that has been formed: **"ecosystem."** Say: **"The prefix eco- means the relations of organisms to one another and to their environment. If students are unfamiliar with the term organism, share that definition with them at this point. Therefore, an ecosystem is everything that exists in a particular environment. An ecosystem includes living things, such as plants and animals, and things in the environment that are not living, such as sunlight and water. Of the three systems on our list, which one would be considered an ecosystem?"** *The riparian community.*
6. Pass out the Ag Ecosystem graphics. Say: **"Look at the picture and identify what exists in the environment. Record your thinking as a list in the graphic**

organizer.”

7.   When students finish making their lists, ask: **“What parts of the ecosystem might not be visible in the picture?”**
- Start with living things. Ask: **“What animals are likely to be found in this ecosystem that are not necessarily depicted here?”** *Animals could include deer, mice, rabbits, insects, microorganisms, etc.*
 - Ask: **“What about plants?”** *Examples might include weeds, flowers, grasses, etc.*
 - Ask: **“What could be some physical attributes of the ecosystem?”** *Examples could include air, water, sunlight, soil, rocks, hills, ponds, etc.*
 - *The students’ lists should focus on things that either affect or are affected by other components of the ecosystem. They should not include anything that might happen to be found in the setting. The emphasis isn’t on proximity; it’s on interactions.*
8. Ask: **“Are there other parts anyone would like to add now that we have thought about different categories of components in an ecosystem?”** Allow students to share then say: **“Please add these components to the ecosystem graphic.”**
9. Collect students’ lists and graphics, and say: **“You will now receive game points based on your completion and accuracy of the plant and animal categories.”** Award 1 point for each completed category. Keep these as students will need them again in Lesson four.



In

this task, students will be engaged in the higher order thinking skill of analysis and synthesis by inferring what is in the ecosystem that is not seen.

10. Say: **“For the last part of this lesson, we’re going to examine some of the types of agricultural ecosystems in Wyoming.”** Display for students or pass out the *Agricultural Ecosystems in Wyoming* text. Introduce each one by reading the brief description and showing the map detailing the amount of production for each type of ecosystem in Wyoming’s counties. Ask: **“What conclusions can we make about Wyoming’s agricultural ecosystems?”** *Students should note that while the majority of Wyoming is suitable for rangeland and growing hay, only certain areas of the state are able to produce large amounts of other crops.*

Assessment: See step 9.

Credits/Sources:

1. University of Wyoming, Department of Plant Science, Dr. Andrew Kniss.
2. US Department of Agriculture. (2016). *Wyoming Agricultural Statistics*. Retrieved August 26, 2017, from https://www.nass.usda.gov/Statistics_by_State/Wyoming/Publications/Annual_Statistical_Bulletin/WY_2016_Bulletin.pdf