

Lesson Seven: Plotting Progress

Grade Level: 2nd Grade

Time: 45-60 minutes

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

Objectives: Students will:

- Describe and sequence the evolution of tools and equipment (technology) used in farming.
- Discuss how the equipment has changed.

Purpose: Students learn how farming has changed over time and how technology enhances the tools that farmers use enabling them to be even better stewards of the land.

Required Materials/Resources:

- Video: <https://www.youtube.com/watch?v=eYHeUSrjpxE> *All I Do Is Farm (All I Do is Win Parody) - Feat. Lil' Fred and Farmer Derek.* (source 1) Video length: 5 minutes 2 seconds.
- Video: <https://www.youtube.com/watch?v=3TLt5I-YFbU> *Farmers Take a Big Leap with Self-Driving Tractors* (source 2) Video length: 1 minute 51 seconds.
- Photo cards with images of machines used in crop production for each category: plowing, planting, irrigation, and harvesting. (one set per group and a set to model the process)
- Envelopes
- Evolution of Tools Grid (one per group and one to model the process in step 3)
- Evolution of Tools Grid answer key
- Chart paper to record the students' compare and contrast observations during discussions.

- White paper (one piece per student)
- Individual group charts (one per group)
- Optional text: *Big Tractors: With Casey & Friends* by Holly Dufek
- Optional resource to be found in your own community: Farm equipment dealerships such as John Deere, Ford New Holland, Case International to contact for speakers or field trips.

TEACHER NOTE:

Monitor the small group discussions, and prompt students towards those ideas if they are not getting to them by themselves.

Suggested Teacher Preparation:

- Preview the two videos used during the lesson. The *All I Do is Farm...* video shows many aspects of modern farm life. Students will enjoy the song, and the video includes subtitles. However, it is a parody of a rap song that many students might not be familiar with or is not necessarily age-appropriate. This should not distract from the content though.
- Decide how many small groups you will have.
- Cut card sets apart for small groups. Place cards in envelopes labeled by process: plowing, planting, irrigation, harvesting.
- Review the Evolution of Tools Grid answer key.

Standards:

Science: K-2-ETS1-2 (Practiced/Encountered)

Social Studies: SS2.3.3, SS2.4.2 (Explicit)

CVE: CV5.2.2 (Practiced/Encountered)

Vocabulary: (use as a reference as needed)

- **Farmer** - a person who cultivates land or crops and may also raise livestock
- **Harvest** - gather a crop
- **GPS** - (Global Positioning System) a navigational system using satellites and computers
- **Plow** - (verb) turn up an area of land so it is ready to be planted

Instructional Procedure/Steps:

1. Say: **“In our previous lesson, we learned about pollination and how seeds and pollen can be dispersed by animals and wind. Today, we will learn how tools can also be used to plant and disperse seeds.”**


TEACHER NOTE: If it is available, also read the book *Big Tractor: With Casey & Friends* by Holly Dufek.

2. Play the *All I Do is Farm...* video <https://www.youtube.com/watch?v=eYHeUSrjpxE>. After viewing the video, ask the students to pair share the following questions:
 - **“What did you notice?”**
 - **“What did you find interesting?”**
 - **“What questions do you have?”**

3. Place students into small groups. Say: **“We are going to look at different examples of farming tools that farmers use for the important tasks they do. We are going to put them in order from the earliest tool to the one made most recently.”** Students will be placing their card sets on their Evolution of Tools grids to show the evolution of tools and equipment over time. First, discuss what each category/tool does: plowing, planting, irrigation, harvesting then model placing the tools on the chart. Choose a category, take a photo from the appropriate envelope, vocalize what attributes of the photo you are attending to, and place it on a section of the grid, noting that you might move it as you look at the additional pictures. For example, say **“This is a tractor that is getting the land ready to be planted by plowing. The tractor in this picture looks big and seems to be complicated. I’m guessing that it’s fairly modern, so I’m going to place it on the right-hand side of my chart. However, I might move it if I find a photo of a tractor that looks newer.”** Practice with a different photo from another category if students seem confused about the task.

4. Pass out photo sets and Evolution of Tools grids to each small group. Have students compare the photos for each category: plowing, planting, irrigation, harvesting. Encourage students to vocalize their reasoning since it will be needed for the next activity. Monitor students to ensure that photos are being placed in the correct categories. When all groups are finished, reconvene the class, and confirm photo order with the answer key.

5. When finished with the sorting activity, say: **“Now, we are going to learn about the modern advances in farm technology. Today’s tractors use GPS systems and in-cab computers for many farm tasks. They navigate in fields, calculate the most efficient patterns for field work, and measure the amount of seed or fertilizer needed. This allows farmers to tend to their crops more efficiently. We will now watch a video to see an example of GPS in tractors.”** Play the *Farmers Take a Big Leap with Self-Driving Tractors* video. <https://www.youtube.com/watch?v=3TLt5I-YFbU>

6. When the video is finished, have small groups compare and contrast the ways that the tools/equipment of different categories have evolved or changed over time noting which stages are the same and which are different. Students should focus on the ideas of human power, horse power, and mechanized equipment. When small groups are finished discussing, say: **“Although some tools are more modern than others, many of the older tools/methods could still be used by farmers today if farmers chose or needed to use them.”**
7. Reconvene the whole class for a discussion, and record students’ observations on chart paper. Ask the following questions:
 - **“When looking at the equipment over time, what does the equipment have in common?”**
 - **“How are pieces of equipment different from one another?”**
 -  **“Why did these changes occur in the farming equipment?”** *Possible answers include: To produce more crops, to get work done faster, to use less fuel, to use less water, to make farming easier for people, to help farmers produce more crops on less land.*
 - **“How does the evolution of tools (how tools change over time) help us to be good stewards of Wyoming?”** *Possible answers include: it lets us use the land more efficiently; it lets us not waste water; and it allows us to continue agriculture for future generations.*
 - **“How might tools and equipment change in the future?”** *Possible answers include: they have less need for humans; they are safer; they produce more food.*
8. **Assessment:** Pass out white paper. Say: **“On your paper, draw a picture of a piece of farm equipment. This could be one we studied or one of your own invention. Label the different parts of your equipment and what they do. Explain what farming task your piece of equipment makes easier, more efficient, or how it helps farmers be better stewards.”** Collect the drawings. Do not evaluate drawings on artistic ability but how strong explanation to stewardship is.



In this task, students will be engaged in the higher order thinking skill of synthesis.

Credits/Sources:

1. Peterson Farm Bros. (2014, July 14). *All I Do Is Farm (All I Do is Win Parody) - Feat. Lil' Fred and Farmer Derek*. Retrieved June 22, 2017, from: <https://www.youtube.com/watch?v=eYHeUSrjpxE>
2. CBS FS Bay Area. (2016, September 14). *Farmers Take a Big Leap with Self-Driving Tractors*. Retrieved June 22, 2017, from: <https://www.youtube.com/watch?v=3TLt5I-YFbU>
3. Dufek, Holly. (2015). *Big Tractors: With Casey & Friends*. Austin, Texas: Octane Press.
4. Photo credits are listed on photos.