



## Lesson Five: A New Way of Thinking

**Grade Level:** 4<sup>th</sup> Grade

**Time:** 1 Day: 45-60 minutes

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

**Objectives:** Students will:

- Discuss how technology has changed and is helping farming and ranching.
- Identify examples of good stewardship decisions made by farmers and ranchers.

**Purpose:** Students can identify ways farms and ranches use technology to sustain, care for, and develop their crops and livestock.

**Required Materials/Resources:**

- Computer to play videos
- "Technology, Conservation and Sustainability" video sheet (1 per student and teacher answer sheet)
- 4 Corners examples sheet for the teacher
- 4 Corners posters
- 2015 Wyoming Leopold Conservation Award Recipient - King Ranch <https://youtu.be/OjeB38cmF9c> Video Length: 5 minutes 37 seconds
- *Brandon Hessenthaller | Soil Management on Wyoming Farms and Ranches* <https://youtu.be/PcK2ioOxOxA> Video Length: 5 minutes 56 seconds
- *Technology catches up to cows: US ranchers turn to 'precision livestock'* <https://youtu.be/CqFBjyvjltc> Video Length: 2 minutes 21 seconds

- *Farming by GPS Saves Money, Environment.* <https://youtu.be/qeyjSN9ANyY> Video Length: 2 minutes 26 seconds
- *Norman Borlaug Documentary* <https://youtu.be/fd6YmVnwNJ0> Video Length: 6 minutes 43 seconds (May stop video at 2 minutes and 55 seconds)

### **Suggested Teacher Preparation:**

- Preview the videos and make sure they play.
- Decide whether or not to show the whole *Norman Borlaug Documentary* video or only part of the video
- Hang/place 4 Corners Posters in four different locations of your classroom.
- Review the example scenarios. (Teacher may cut out cards or select from page)
- Copy “Technology, Conservation and Sustainability” sheet (1 per student)

### **Standards:**

Social Studies: SS5.1.1, SS5.2.1, SS5.3.3, SS5.4.2 (Explicit)

ELA: 4.RI.7, 4.SL.1, 4.SL.2 (Practiced/Encountered)

CVE: CV5.1.4 (Practiced/Encountered)

### **Vocabulary:**

- **Sustainable** - able to be maintained, able to last or continue for a long time
- **Tillage** - the preparation of land for growing crops
- **Technology** - the application of scientific knowledge for practical purposes, especially in industry.

### **Instructional Procedures/Steps:**

Students will watch a selection of videos about technology and stewardship of Wyoming’s agriculture.


1. Review the answers from students’ sticky notes from the previous lesson that addressed the question, “What do you think farmers and ranchers do to be good stewards of their resources?” Ask: **“If you ask your grandparents how they got their food, they might have a different answer than you think. How do you think your grandparents or great-grandparents got their food?”**

Give students a chance to answer. *Responses may include: milking a cow, gathering eggs from chickens each morning, growing vegetables, etc.* **“How do most people get their food today?”** Responses may include going to the store, gardens, etc. If gardens are mentioned, discuss how they do not supply a year’s worth of food for a whole family like they would have in the past. **“The reason we get our food in a different way today is because agriculture has changed through the development of new technology and better stewardship practices. Today, we are going to watch several videos about how technology is helping both farmers and ranchers, as well as how farmers and ranchers are taking care of their land.”**

2. Hand out the video sheets. **“While we watch the videos, you are going to listen for specific information about either the technology or stewardship practices of each video to record on your note sheet.”**
3. **“We are going to start with a video that looks at farming practices on a farm here in Wyoming.”** Go over the things that they need to watch for in order to fill out their sheet for this video. Show (*Brandon Hessenthaller | Soil Management on Wyoming Farms and Ranches*, <https://www.youtube.com/watch?v=PcK2ioOxOxA>)
4. After the video, discuss with students their answers before moving on to the next video. (Refer to teacher answer sheet as needed)
5. **“In the next video, we are going to look at the various technologies that farmers are now using to make their work easier and to increase their yields.”** Go over the things that they need to watch for in order to fill out their sheet for this video. Show (*Farming by GPS Saves Money, Environment*, <https://youtu.be/qeyjSN9ANyY>)
6. After the video, discuss with students their answers before moving on to the next video. (Refer to teacher answer sheet as needed)

7. Ask: **“How has farming changed from the past?”** (pose the question, and let students do a short Mingle or Think, Pair, Share)
8. **“Not only are farmers using new technology and managing their resources better, but so are ranchers. This next video is going to show a ranch in Wyoming who is practicing good stewardship of their land in various ways.”** Go over the things that they need to watch for in order to fill out their sheet for this video. Show (2015 Wyoming Leopold Conservation Award Recipient - King Ranch, <https://youtu.be/OjeB38cmF9c>)
9. After the video, discuss with students their answers before moving on to the next video. (Refer to teacher answer sheet as needed)
10. **“Ranchers also have new technologies that are making their jobs easier and more efficient. This video shows just one.”** Go over the things that they need to watch for in order to fill out their sheet for this video. Show (Technology catches up to cows: US ranchers turn to 'precision livestock', <https://youtu.be/CqFBjyvjltc>)
11. After the video, discuss with students their answers before moving on to the next video. (Refer to teacher answer sheet as needed)
12. Ask: **“How has ranching changed from the past?”** (pose the question and let students do a short Mingle or Think, Pair, Share)
13. Now that students have watched all of the videos and have pulled out what technologies and good stewardship practices are being used, it's time to check their understanding with a round of Four Corners.
14. Assign one corner of the room to be Farming, one to be Ranching, one to be Both and the last corner to be Neither. Tell students you are going to give them a variety of examples of either technology or practices used by farmers and ranchers. They need to decide if it is something used in farming, ranching, both, or neither and then move to the corner of their decision. Give students

examples at random from the Teacher Example Sheet. How many examples you give is up to you and your available time.

15.  Lead a short discussion about how technology has helped change stewardship in ranching and farming. In the discussion, have students predict where technology might go in the future to continue helping agriculture practices. Ask students to provide reasoning for their predictions.
16. **“To wrap up today, we will watch one last video that shows an example of someone who used both technology and good stewardship practices in order to help advance wheat production in many countries.”** Show the video (*Norman Borlaug Documentary*, <https://youtu.be/fd6YmVnwNJ0>). Feel free to stop video at 2:55 if you are short on time.
17. After the video ask: **“How has technology changed the way we ranch and farm today?”** Look for examples from the videos and previous discussion. **“Do you think technology has improved agriculture? Why or why not?”** Make sure students are supporting their claim with valid reasons.

**Assessment:** The Four Corners activity provides a good check for student understanding. Pay attention to the discussion for any misconceptions. Make sure students are able to make the connection between new technologies and good stewardship practices.

**Credits/Sources:**

1. CGTN.(2017). *Technology catches up to cows: US ranchers turn to 'precision livestock'*. Retrieved on July 11, 2019 from <https://youtu.be/CqFBjyvjltc>
2. *Everything About Wyoming - New History- Water and Irrigation*. (2017). Retrieved on July 11, 2019, from [http://wyomingalmanac.com/history\\_of\\_wyoming/new\\_history- water and irrigation](http://wyomingalmanac.com/history_of_wyoming/new_history- water and irrigation)



In this task, students will be engaged in the higher order thinking skill of synthesis by combining information to make a new prediction about future technology.

3. *Norman Borlaug Documentary*. (2015). Retrieved on July from <https://youtu.be/fd6YmVnwNj0>
4. SandCountyFdn. (2015). *2015 Wyoming Leopold Conservation Award Recipient - King Ranch*. Retrieved from <https://youtu.be/OjeB38cmF9c>
5. UWyoExtension. (2016). *Brandon Hessenthaller | Soil Management on Wyoming Farms and Ranches*. Retrieved on July 11, 2019, from <https://youtu.be/PcK2ioOxOxA>
6. VOA News. (2012). *Farming by GPS Saves Money, Environment*. Retrieved on July 11, 2019 from <https://youtu.be/qeyjSN9ANyY>