



## Lesson Two: Hills and Valleys

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

- Understand which crops and livestock are produced in our state.
- Apply information of topography, irrigation, and precipitation to draw conclusions about crops or livestock.

**Purpose:** Students make the connection between the geography/climate and success of agriculture in Wyoming.

**Required Materials/Resources:**

- Video: <https://www.youtube.com/watch?v=K-UXrpAjyI0>  
*What is Topography (Source 4) Video length 1 minute 52 seconds*
- Wyoming Student Atlas (project the different pages below and have at least one student book per group/pair for step 13) - (Source 1)  
<http://uwmaps.wygisc.org/studentAtlas/index.html?page=1>
  - Physiographic Features (page 11)
  - Precipitation (page 16)
  - Livestock map (page 37)

TEACHER NOTE: If you need additional information, support, or conversation starters, use the captioned information accompanying each map. If using the Electronic Version, the "Go Interactive" button is available for even more information, pictures, and videos to support these maps.

- Major Crops map (page 38)
- Irrigation map (one per student) - (Source 2)  
[http://wwdc.state.wy.us/surveys/PWS\\_IS\\_Large.html](http://wwdc.state.wy.us/surveys/PWS_IS_Large.html)
- 2015 Wyoming Cropland Map - (digital copy to display) - (Source 3, page 51)  
[https://www.nass.usda.gov/Statistics\\_by\\_State/Wyoming/Publications/Annual\\_Statistical\\_Bulletin/WY\\_2016\\_Bulletin.pdf](https://www.nass.usda.gov/Statistics_by_State/Wyoming/Publications/Annual_Statistical_Bulletin/WY_2016_Bulletin.pdf)
- 3-2-1 exit ticket (one per student)

### **Suggested Teacher Preparation:**

- Become familiar with the Kagan strategy Whip Around. Watch video for the Whip Around strategy if you are not familiar with it.  
<http://www.theteachertoolkit.com/index.php/tool/whip-around> (Source 5)
- Become familiar with the Kagan strategy Inside/Outside Circle and make a space large enough in your room to enact it with your students. Watch video for the “Inside/Outside” strategy if you are not familiar with it.  
<http://www.theteachertoolkit.com/index.php/tool/inside-outside-circles> (Source 6)
- Practice flipping through the electronic version of the Wyoming Student Atlas if you did not make copies for your students.
- Preview *What is Topography?* video and have it ready for students to view during lesson.
- Review all maps used in the lesson.
- Save all the maps at the end of the lesson, as students will need them again in Lesson 6.

### **Standards:**

Science: 4-ESS2-2 (Explicit)

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

#### **TEACHER NOTE:**


Whip Around strategy: Pose a question to the whole class. Allow think time for students to formulate an answer. Then, students quickly share an idea with either their small group or whole class. Students must respond quickly and with a new idea though ideas can be reworded. After every student has responded, share common ideas from the Whip Around as a class.

## Vocabulary:

- **Crop** - a cultivated plant that is grown for food, fiber, or livestock feed
- **Irrigation** - the process of delivering water to crops
- **Livestock** - animals kept for use and profit
- **Precipitation** - the amount of water an area receives through weather, example: rain and snow
- **Topography** - the features such as mountains and rivers in an area of land

## Instructional Procedure/Steps:

1. Pass out or display the Wyoming's Physiographic Features map (page 11 of the Wyoming Student Atlas) for students to utilize when focusing on the topography. Allow time for students to explore the map.


2.  Ask: **“What do you think topography is?”** After students share their ideas, play the *“What is Topography?”* video.

3. Discuss the definition of topography. Say: **“Topography is the features such as mountains and rivers in an area of land.”** Using the map, help students build an understanding of the information about Wyoming's topography that can be gathered from it.

4. Say: **“The definition of a crop is a cultivated plant that is grown for food, fiber, or livestock feed. The definition of livestock is animals kept for use and profit.”** Using the Using the Whip Around Strategy, have students discuss this question:



**“How could topography potentially affect what crops/ livestock are produced in Wyoming?”** Some ideas for students to think about while they discuss are:



-  *If people grow crops there, what features make it possible?*



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




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

-  *Why is it possible or not to have livestock/crops in the given topography?*
-  *Does the topography dictate what kind of livestock someone would choose to raise?*

5. Pass out or display the Wyoming's Precipitation map (page 16 of the Wyoming Student Atlas) for students to utilize when focusing on precipitation. Allow time for students to explore the map.
6. Discuss the definition of precipitation. Say: **"Precipitation is the amount of water an area receives through weather, like rain or snow."** Using the map, help students build an understanding of the information about Wyoming's precipitation that can be gathered from it.






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

7.  Using the Whip Around strategy, have students discuss this question: **"How could precipitation potentially affect what crops and livestock are produced in Wyoming?"** Some ideas for students to think about while they discuss are:



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


-   *Why is it possible or not to have livestock/crops in the given area based on the precipitation?*
-  *Does the amount of precipitation dictate what kind of crop someone would choose to grow?*





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

8. Pass out or display the Wyoming's Irrigation map for students to utilize when focusing on precipitation. Allow time for students to explore the map.
9. Discuss the definition of irrigation. Say: **"Irrigation is the process of delivering water to crops."** Using the map,

help students build an understanding of the information about Wyoming's irrigation that can be gathered from it.

10.  Using the Whip Around strategy, have students discuss this question: **“How could irrigation potentially affect what crops and livestock are produced in Wyoming?”** Some ideas for students to think about while they discuss are:

-  *Why does irrigation allow for crops to be grown where they might not otherwise grow?*
-  *Are there areas in the state where irrigation might be needed for livestock?*

11. Pass out or display the Wyoming Livestock map (page 37 of the Wyoming Student Atlas) for students to utilize when focusing on livestock. Allow time for students to explore the map.

- Ask: **“Look at Carbon County and Park County. Compare the amount of livestock in each. What do you notice?”** *Carbon County has a high number of livestock. Park County has fewer livestock.*

12. Pass out or display the Major Crops and USDA Wyoming Cropland maps (page 38 of the Wyoming Student Atlas) for students to utilize when focusing on Wyoming's major crops. Allow time for students to explore the maps.

- Starting with the Major Crops map, ask: **“Again, look at Carbon County and Park County. Compare the amount of crops grown in each. What do you notice?”** *Park County grows a high number of crops. Carbon County has no crops. Park County has a dot for all 6 crops, and most of them are large dots.*



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





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




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

**TEACHER NOTE:**  
 Inside/Outside Circle Directions:  
 One-half of the participants stand and form a circle facing OUT. The other half of the participants form a circle around (outside) the first group, facing IN. Now each participant is facing a person from the 'other' circle. Next, the teacher instructs one circle to rotate. For example, the teacher may say, **"Outside circle move two persons to your right."** The newly formed partners then respond to a question/ statement. Rotate a couple of times so students may have the opportunity to discuss with different students.

-  Ask: **"What does this tell us about Park County?"** *Many crops are grown there. Park County is one of the top five producers of each crop.*
- Next, draw their attention to the Cropland map. Ask: **"Looking at Park County on this map, what do you notice?"** *Students should be able to see that it's only a small portion of the county that has colors indicating agricultural crops.*
-  Revisit the irrigation map and compare it to the Cropland map. Ask: **"Using your topography map and irrigation maps, can anyone propose an explanation why there are only crops in the northeast portion of Park County?"** *The mountains and lack of irrigation in the western half of the county make it ill-suited for cropland. Students should note that the part of the county where crops are grown is flatter and has access to irrigation water. Point out that this is the case with other counties, as well. Fremont County is another good example. It's the largest county in the state, but looking at the topography and irrigation information, it's clear why only a portion of the county is shaded for crop production.*

13. Say: **"In preparation for the next activity, think about the discussions we have had about topography, precipitation, and irrigation and how they affect Wyoming's crops and livestock."** Allow students think time.

14.  Use the Inside/Outside Circle strategy for the following activity. Set up the inside/outside circles. Students on the inside circle are responsible for discussing crops; students on the outside circle are

responsible for discussing livestock. Once the circles are ready, have students discuss this question: **“What have you learned today that helps you understand the effects topography, precipitation, and irrigation have on our state’s livestock and crop production?”** Have students rotate and discuss two to three times.

15. Reconvene the whole class and have a group discussion about the information gathered from all the maps studied during the lesson. *Students should connect that certain crops are grown in certain areas due to irrigation, low land, and location near natural water sources. It’s important to note that for the majority of crops, irrigation is a much more important factor than precipitation. They should also connect that ranchers are able to produce livestock in a wider variety of topographic locations. Ranchers are not as limited by terrain or the need for as much water.*

**Assessment:** Pass out the 3-2-1 exit slips. Students are instructed to record the following: **THREE factors that impact where crops are grown; TWO facts about what livestock are most common; and ONE summary sentence about how the topography of our state effects where livestock and crops are raised.** Collect the slips when all students are finished. Use the information to differentiate instruction or clear up any misconceptions that students may have. Collect all the maps at the end of the lesson since students will need them again in Lesson 6.

## Credits/Sources:

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