



Lesson Four: Stewardship Solutions

Grade Level: 3rd Grade

Time: 2 Days

Part 1- 45-60 Minutes

Part 2- 20-30 Minutes

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

Objectives: Students will:

- Identify cause and effect challenges of drought, grazing, and predators
- Discuss the difficulty associated with being a steward
- Recognize that stewards play an integral part in Wyoming's culture

Purpose: Students will understand that ranchers face multiple challenges in stewarding their livestock.

Required Materials/Resources:

Part 1:

- Drought! Now What? (one per student)
- A whistle
- *Coyote and Jackrabbit: Finding the Right Balance on the Range* booklet (one per student) - (Sources 1-4)

Part 2:

- Cause and Effect Assessment Pages

Suggested Teacher Preparation:

Part 1:

- Make copies of *Drought! Now What?*
- Find a space to play the tag game. A space the size of a basketball court works well.
- Make copies of *Coyote and Jackrabbit: Finding the Right Balance on the Range*.

Part 2:

- Copy Cause and Effect Assessment papers for students.

Standards:

Science: 3-LS4-4, 3-ESS3-1, 3-5-ETS1-2 (Explicit),
3-LS4-3 (Practiced/Encountered)

Social Studies: SS5.4.1, SS5.5.4 (Explicit)

Math: 3.MD.3, 3.NF.1, 3.NF.3d (Practiced/Encountered)

ELA: 3.RI.3, 3.SL.1, 3.SL.2 (Practiced/Encountered)

CVE: CV5.2.3, CV5.3.1 (Practiced/Encountered)

Vocabulary:

- **Canine distemper** - a contagious and serious viral illness that affects dogs and wildlife
- **Drought** - a period of below-average precipitation that could result in shortages of water supply and/or soil moisture, and could result in shortage of grass/forage
- **Ecosystem** - everything that exists in a particular environment (an ecosystem includes living things, such as humans, animals, and plants, and things that are not living, such as sunlight and water).
- **Overgraze** - a situation where too much of the forage in an area has been eaten, causing a negative effect on plants
- **Precipitation** - the amount of water an area receives through weather; example: rain and snow
- **Predator** - an animal that preys on other animals
- **Prey** - an animal taken by a predator as food


Instructional Procedure/Steps:

Part 1/Day 1: Drought and Predators (45-60 minutes)

1. Review the previous lesson. Say: **“The low population and the large area of land are part of what make Wyoming unique. We heard in previous lessons that our livestock need to graze in a way that keeps Wyoming’s land healthy for future generations. We learned through our game that there are many challenges that our rancher had to face. What were some of those challenges? Why were they a challenge?”** Have students share out these answers with the class, as a whole, in groups, or with a partner. *Answers should focus on the idea of proper grazing with rotating or splitting up the land, so that it has time to rest and regrow.* After letting the students discuss with each other, bring them back to a whole group discussion. Make sure to clarify any misconceptions.
2. Say: **“In the previous lesson, we talked about grazing challenges. Today, we will learn about two new challenges that ranchers and livestock have. The first challenge is drought. We are going to do an activity that will help us understand how drought affects livestock. Drought is a period of below average precipitation resulting in shortages of water supply and/or soil moisture and may cause a shortage of grass/forage.**
3. Give each student a handout “Drought! Now What?” Say: **“The circles on the handout will represent the crop production based on the rainfall of two different years in a rancher’s life: one with normal or average rainfall and one within a drought. The circle on the left represents the year a rancher received enough precipitation and irrigation water to grow hay to feed the livestock all winter, without needing to buy more**

hay. Read the first scenario for Rancher Bill and follow the directions.” Allow time for the students to read and graph the information. **“Answer the question at the bottom of the graph.”** Say: **“One way drought can affect livestock is by reducing the amount of water available for irrigation. On many ranches in Wyoming, irrigation is necessary for ranchers to raise the hay they will feed their cattle during winter months. Read the second-year scenario for Rancher Bill and follow the instructions.”** Allow time for the students to read and graph the information. **“Answer the question at the bottom of the graph.”**

4. Say: **“Rancher Ruth is also being a good steward on her land. Now let’s read the scenario for her and follow the instructions for the two years she experienced.”** Allow time for the students to read and graph the information. **“Answer the question at the bottom of each graph.”**

5.  Next, ask the following questions for your students to reflect on as pairs or small groups. Afterwards, pull the class back together and discuss the answers to the questions before moving on.

- **“What challenge did the ranchers face?”**
Supplying their land and livestock with enough water and being able to feed their animals through the winter months.
- **“When dealing with an issue like drought, how does it affect livestock?”** *It affects the livestock’s water and food supply. It affects the land by not giving it enough water, which enables it to grow and feed the cattle. It also limits the rancher’s ability to plan ahead and provide enough food for the winter months when the cattle aren’t able to graze. Cattle lose weight affecting their quality of life. Cattle are sold by*



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

their weight. If they weigh less, the rancher will get less money.

- **“What possible solutions to the drought would allow the ranchers to be good stewards?”** *Buying extra feed, selling off some cattle, keeping an extra supply of feed.*

6. Say: **“Drought is one challenge that affects livestock in Wyoming. Another big challenge is predators. To learn about our predators, we’re going to play a tag game involving predators and prey. The prey in this game will be livestock, and they can be eaten. Predators are an animal that preys on/eats other animals.”** This is an activity that requires room to run. It can be done outside or in a gym. Create an environment for the interactions to occur. A space the size of a basketball court works well.
7. Line all students up at one end of the court/area. These students will be the prey. Choose 2-3 students to be predators. Say: **“Our prey are all sheep, and our predators will be coyotes. It’s lambing season. That means many little lambs will be out in the pastures. These lambs are still young, so they make a perfect target for hungry coyotes.”** Choose students to be lambs. Have these students crab or bear walk to show that they are slower and younger. Say: **“When I blow the whistle, sheep/lambs need to run from one end to the other without being tagged/eaten by a coyote. Any sheep/lambs tagged must immediately freeze and sit down so that any other coyotes do not eat them.”** Play a round of the game. Once all untagged sheep/lambs make it to the other side of the court/area, that concludes the round. These are surviving sheep/lambs that were not eaten by the coyotes.
8. Gather the students back together and discuss what they noticed during the Predator and Livestock tag. *Students’ initial response might be to get rid of the predators completely.* This is a misconception, but let students believe it for the moment because it will be resolved with

information from the next part of the lesson. Remain unbiased toward any conclusion that students come to at this point.


9. Give each student a copy of the *Coyote and Jackrabbit: Finding the Right Balance on the Range* booklet. Have the students read the booklet either individually or in partners or groups. After reading the short story about predators and prey in Wyoming, discuss with students the importance of maintaining a balance between predators and prey. Say: **“In the story, we saw that the coyotes didn’t only create a balance with the jackrabbits; they also created a balance between the jackrabbits and the rangeland. Every animal plays its own important part, and if one animal is taken away, it impacts all animals, trees, insects, rivers, soil, and plants. Knowing that there needs to be a balance of predators and prey, how can we adjust our tag game to protect the sheep while keeping the predators in the game?”**

Possible solutions:

- i) *Have a student assigned as a rancher for the next portion of the game. This rancher can tag sheep/lambs before the coyote, and those sheep/lambs tagged by the rancher get a safe passage to the “barn” where they sit on the outside of the tag area. This shows that the rancher has to be a steward and help maintain the balance of their livestock and the predators within their environments. In this variation of the game, there could also be another food source available for the coyotes to eat. Half of the students would be rabbits and the other half would be sheep/lambs. The rancher is still introduced to save the sheep/lambs, but this would show more of an equal balance between livestock and other species available in the coyote’s habitat.*

- ii) *Another solution would be the idea of having some students act as sheep dogs to protect the sheep/lambs. If a sheep/lamb has a sheep dog with it, the coyotes are not allowed to tag that sheep/lamb.*

10. Play another round of the game, so students can see how their solution affected the number of sheep/lambs that make it to the other side.

11.  Bring the students back together for a discussion about predators and their impacts on livestock. Discuss the following points:

- Ask: **“After the first round, the class suggested that predators were a bad thing, and that we should get rid of them to protect our livestock. What happens to an ecosystem when all the predators are gone?”**
Removing predators impacts a lot more than only livestock. The plants, other animals, and land can be affected by the loss of these predators. They play a big part in keeping the balance in our environment.
- Ask: **“When the rancher entered the game, how did he/she help maintain that balance?”**
He/she protected the sheep/lambs from the coyotes.
- Ask: **“How was the rancher a steward in this game?”** *The rancher protected the livestock while also understanding the importance of maintaining a balance by not eliminating all the predators. As a rancher, one needs to understand the importance of the other animals, land, weather, and plants around you. A rancher must have knowledge about*



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

all of these to be an effective steward. Say: “Think about what we have learned about grazing, drought, and predator management. Ranchers have to juggle many challenges in order to be an efficient and effective steward.”

TEACHER NOTE:

Based on your students’ background knowledge of cause and effect, you may need to do a small lesson on exactly what that is. In addition, if they forget some of the knowledge from yesterday, you can have those students work with you in a small group or place them in partnerships so that they are able to be successful on the assessment.



12. Explain how overpopulation or underpopulation of some species makes an observable impact on others and the environment. Say: **“There needs to be a balance in nature. We don’t want the predators to wipe out all the animals they hunt, but we also don’t want the predators to disappear completely. They serve a purpose, too. We will continue talking about the cause and effect of balancing these challenges in the next lesson.”**

Part 2/Day 2: Cause and Effect Assessment

Time: (20-30 minutes)



In this task, students will be engaged in the higher order thinking skill of analysis and evaluation by evaluating outcomes, judging rancher choices, and recommending solutions.

1.   Pass out the Cause and Effect Assessment pages to the students. Say: **“Today, we’re going to examine the different causes and effects of challenges that ranchers face.”** Have students fill out the effects for their causes.
2. When students have finished listing the effects, collect the assessment pages. Bring the class back together and have them share the different effects they listed for each of the causes given. A way to add an extension to this activity would be to allow the students to develop their own causes with effects.

3. Say: **“Now that we have listed the cause and effects of these challenges, let’s brainstorm some ways that we could potentially solve these problems.”** *Potential solutions are listed below:*
 - *Sell some cattle during a drought to keep your land and cattle healthy.*
 - *Fence pastures and graze in a rotation for the land to rest and regrow.*
 - *Balance the predator/prey population.*

4. Say: **“Remember, all of these decisions impact future generations, so the actions we take have a direct impact on the future.”**

Assessment: Look over student responses on the cause and effect pages to check whether or not students understood the concepts.

Credits/Sources:

1. American Veterinary Medical Association. (2018). *Canine Distemper*. Retrieved September 20, 2017 from <https://www.avma.org/public/PetCare/Pages/Canine-Distemper.aspx>
2. Knight, James E. University of Nebraska, Lincoln. (1994, January). *Jackrabbits and Other Hares*. Retrieved September 20, 2017 from <https://digitalcommons.unl.edu/icwdmhandbook/54/>
3. Cornell Wildlife Health Lab. (2016, November 4). *Canine distemper*. Retrieved September 20, 2017 from <https://cwhl.ahdc.vet.cornell.edu/disease/canine-distemper>
4. Wyoming Game and Fish. (2017). *Wyoming State Wildlife Action Plan pages III-7-1*. Retrieved September 20, 2017 from <https://wgfd.wyo.gov/Habitat/Habitat-Plans/Wyoming-State-Wildlife-Action-Plan>