



— WYOMING —
STEWARDSHIP
PROJECT

3rd Grade
Agriculture Unit



3rd Grade Agriculture

TABLE OF CONTENTS

Standards Map

Educator Essentials

Lesson 1: Welcome to Wyoming

Lesson 2: Difficult Decisions

Lesson 3: Hooves on the Ground

Lesson 4: Stewardship Solutions

Lesson 5: Stewardship Spotlight - A Livestock Lifestyle

Lesson 6: Rancher Roundup

Glossary



3rd Grade Agriculture Standards

Day	Lesson Title	Science		Social Studies	
		Explicitly Taught	Practiced/ Encountered	Explicitly Taught	Practiced/ Encountered
1	Lesson 1: Welcome to Wyoming			SS5.1.1	SS5.3.1, SS5.5.2
2	Lesson 2: Do You See What I See?		3-LS4-3 (DCI)	SS5.5.2	SS5.5.1
3	Lesson 3: Hooves on the Ground	3-LS4-4 (DCI, CCC) 3-5-ETS1-2	3-LS4-3	SS5.5.4	SS5.4.1
4, 5	Lesson 4: Stewardship Solutions	3-LS4-4, 3-ESS3-1, 3-5-ETS1-2	3-LS4-3	SS5.4.1, SS5.5.4	
6	Lesson 5: Stewardship Spotlight - Livestock Lifestyle			SS5.5.4	SS5.6.1
7, 8	Lesson 6: Rancher Roundup			SS5.1.1	SS5.2.1, SS5.2.3



3rd Grade Agriculture Standards

Day	Lesson Title	ELA		Math	
		Explicitly Taught	Practiced/ Encountered	Explicitly Taught	Practiced/ Encountered
1	Lesson 1: Welcome to Wyoming		3.RI.1, 3.RI.4, 3.RI.7, 3.SL.1		
2	Lesson 2: Difficult Decisions		3.RI.1, 3.RI.4, 3.SL.1		
3	Lesson 3: Hooves on the Ground		3.SL.1		3.G.2
4, 5	Lesson 4: Stewardship Solutions		3.RI.3, 3.SL.1, 3.SL.2		3.MD.3, 3.NF.1, 3.NF.3d
6	Lesson 5: Stewardship Spotlight - Livestock Lifestyle	3.W.8	3.SL.1, 3.SL.2, 3.SL.3		
7, 8	Lesson 6: Rancher Roundup	3.W.2	3.L.3.a, 3.SL.1		



3rd Grade Agriculture Standards

Day	Lesson Title	CVE		Health	
		Explicitly Taught	Practiced/ Encountered	Explicitly Taught	Practiced/ Encountered
1	Lesson 1: Welcome to Wyoming				
2	Lesson 2: Difficult Decisions				
3	Lesson 3: Hooves on the Ground	CV5.3.1	CV5.2.1, CV5.2.2		
4, 5	Lesson 4: Stewardship Solutions		CV5.2.3, CV5.3.1		
6	Lesson 5: Stewardship Spotlight - Livestock Lifestyle	CV5.1.1	CV5.3.1		
7, 8	Lesson 6: Rancher Roundup		CV5.4.1		



Dear Educator,

I am honored to introduce you to the Wyoming Stewardship Project. I want you to know, this unit was written with you and your students in mind. Developing this project has been a thoughtful process and multi-year commitment to offer lessons for classrooms across the state.

Wyoming educators, in collaboration with field experts and the Wyoming Department of Education, wrote, piloted, and revised the unit you are about to teach in your classroom. We are tremendously grateful for their efforts. These units are not intended to be a burden but were created purposefully to be easy-to-use, cross-curricular, and comprehensive. Units build on each other throughout the grades. However, they can be used independently without loss of integrity.

Found in the Educator Essentials document is everything needed to be prepared to teach this unit. We outline the Higher Order Thinking Skills and how to identify them throughout the units. We have compiled a material list of everything you need to complete all lessons: worksheets, PowerPoints, and video links are included in individual lessons. Additionally, a '101' sheet has been included to give you background information for the highlighted industry in Wyoming.

Our hope for the Wyoming Stewardship Project is to empower students to be our critical thinkers and problem solvers of tomorrow. We believe the stewardship definition captures the overall intent: As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.

Thank you again for your effort in the classroom, presenting these lessons to your students, and helping advance this pivotal project for our state. Please don't hesitate to contact us with questions!





Jessie Dafoe

Executive Director
Wyoming Agriculture in the Classroom



Teacher Preparation and Required Materials

The critical work of Higher Order Thinking Skills (HOTS) involves breaking down complex material into parts, detecting relationships, combining new and familiar information creatively within limits set by the context, and combining and using all previous levels in evaluating or making judgments. Within each lesson you'll find reference to the Higher Order Thinking Skills that are part of the work students will be doing using language from Bloom's Taxonomy: Analysis, Synthesis, Application, and Evaluation.

- Analysis skills are used in areas with this symbol: 
- Synthesis skills are used in areas with this symbol: 
- Application skills are used in areas with this symbol: 
- Evaluation skills are used in areas with this symbol: 

The following ideas and content will be important to know for this unit:

- Basic map skills/features (Title, Key, Compass Rose)
- Meaning of stewardship (see included definition)
- Basic understanding of Wyoming agriculture
- Main types of livestock in Wyoming
- Main crops in Wyoming
- Basic knowledge of Wyoming counties
- How to write a friendly letter

- Become familiar with government agencies that deal with agriculture (Game and Fish Department, Conservation Districts, Animal Damage Management Board, etc.)
- Understanding of what predators and prey are
- Understanding of drought impacts

The following materials will be needed for this unit:

- Guest speaker from the agriculture Industry (if you choose this route instead of the videos) Refer to Lesson 5
- Index cards (3 per student)
- Poster-size sheets of paper
- Masking tape
- Purple paper to cut into strips
- A large space to play a tag game
- A whistle
- Markers (a different color per student)



AGRICULTURE 101

Wyoming Agriculture Statistics at a glance:

- The value added to Wyoming's economy by the agricultural sector totaled \$1.72 billion in 2016.
- Of that total, animals and animal products accounted for \$1.084 billion, crops totaled \$338 million, and farm-related income totaled \$300 million.
- In 2016, 11,600 farms and ranches used 30.3 million acres to raise agricultural products in Wyoming.
- Farmer and rancher cash receipts totaled \$1.39 billion.
- Cattle and calves ranked as the largest livestock commodity raised in the state, followed by miscellaneous livestock (mostly horses and sheep), and hogs.
- Hay was the largest crop raised based on cash receipts, followed by sugarbeets, and barley.

*Provided by the National Agricultural Statistics Service, Wyoming Annual Bulletin, 2017

Wyoming Agriculture Overview:

Wyoming farms and ranches provide food, fiber, and open space. Farmers and ranchers make daily stewardship decisions for water, soil, rangeland, and the agricultural commodities they raise/grow. Agriculturists support communities throughout Wyoming, and the culture of hard work and neighboring help is noteworthy. Wyoming agriculture is not an easy business but a necessary way of life that farmers and ranchers pursue to provide for the nation's people, open space, and wildlife.

The story of agriculture in Wyoming started in 1830, when the first five cattle were brought to the state. Even then, it took almost another 40 years of cattle moving through Wyoming before large herds were brought to stay. The arrival of the railroad in 1867 started off the cattle boom in Wyoming. Free grass, a country hungry for beef, and railroad access for shipping provided the chance for businessmen to make money raising cattle. Raising sheep was also big business, and the sheep industry grew along with the cattle ranches. In fact, by the early 1900s, there were more sheep in Wyoming than cattle!

About that same time, homesteading acts began allowing settlers to claim pieces of land across the West. As the settlers arrived, the large areas of free grazing land used by the cattle and sheep men were broken into smaller pieces. This led to conflict between the different groups over the best uses for the land and resources. This time in history is now known as “The Range Wars” and includes events and people such as the Johnson County War, Tom Horn, and “Cattle Kate.” The Taylor Grazing Act of 1934 changed the way grazing was managed on public lands and ended “The Range Wars.”

Many of the early settlers tried raising crops, as well as livestock. Farming in Wyoming was a unique challenge for the settlers because of the harsh weather conditions in our state. The rain water received each year is not enough to support most crops, and unless the settler was lucky enough to claim land near a stream or river, it was not possible to irrigate. Challenges in keeping crops watered led to building irrigation districts and water storage systems in several areas of the state. In areas without access to irrigation, dryland farming allowed farms to thrive.

By the 1920s, new farming equipment and technology encouraged the growth of larger farms and ranches and led to fewer small farms and ranches. Many are still family owned and operated today. As technology and culture have changed over the years, many people have moved into urban areas. In comparison, there are fewer farms and ranches remaining, but agriculture is still alive and well in Wyoming.

Today, dryland farming and irrigation have allowed Wyoming farmers and ranchers to raise crops that can thrive in our environment. Wyoming farmers raise hay, oats, barley, corn, beans, sugarbeets, and other crops. More than one million head of cattle, and over 350,000 sheep graze Wyoming’s grasslands, outnumbering the people here.

Wyoming is still one of the few states in the country with agriculture at its core, and our farmers and ranchers carefully steward the water, soil, and rangeland to make sure they are available for future generations.

Stewardship

As Wyoming citizens, we are entrusted with the responsible development, care, and use of our resources to benefit current and future generations.





Lesson 1: Welcome to Wyoming

Grade Level: 3rd Grade

Time: 30 minutes

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

Objectives: Students will:

- Identify the key on a map
- Locate and identify items on a map from the key
- Discuss similarities and differences on the Wyoming Resources Map
- Discuss what stewardship is
- Identify what agriculture is like in Wyoming

Purpose: Students will understand that we must be stewards of Wyoming. They will begin focusing on agricultural stewardship because of the important role that agriculture plays in Wyoming,

Required Materials/Resources:

- Random pencils, crayons, scrap paper (These items need to be scattered around the room to look messy.)
- Stewardship definition poster (will be used throughout the Agriculture in the Classroom Unit)
- Poster paper for "Class Stewardship" poster
- "What is Agriculture" poster
- Video: <https://youtu.be/GQ1pddhpQRk> *Agriculture in Wyoming: A Brief History* (source 1) *Video length: 5 minutes 34 seconds*
- Wyoming Resources Map

TEACHER NOTE:

The following lessons in the 3rd Grade Agriculture Unit strive to challenge our students to know more about the resources around them, how they rely on them, and what their future responsibility is.

Suggested Teacher Preparation:

- Make Class Stewardship Poster. (Write/print "Class Stewardship" in the middle of the poster paper.)
- Post the "Stewardship," "What is Agriculture," and "Class Stewardship" posters on the wall
- Ensure that the *Agriculture in Wyoming: A Brief History* video works and is ready to view.

Standards:

Social Studies: SS5.1.1 (Explicit), SS5.3.1, SS5.5.2 (Practiced/Encountered)

ELA: 3.RI.1, 3.RI.4, 3.RI.7, 3.SL.1 (Practiced/Encountered)

Vocabulary:

- **Agriculture** - cultivating of the soil, producing of crops, and raising of livestock.
- **Stewardship** - As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.


Instructional Procedure/Steps:

Part 1:

1. Walk around the room and deliberately drop paper wads of varying sizes throughout the room. Open cabinet doors, move things around from the normal organization of the classroom, scribble on the whiteboard, have a student go get a pencil, having the pencil box empty or only pencil "nubs" left, etc.



In this task, students will be engaged in the higher order thinking skill of evaluation by deciding how the messy room could potentially affect their learning.

2.  Ask students, **"What do you notice about the room? How does this environment affect your ability to learn? If we left the room in this condition, how would this affect you and students in the future? Why is it important to keep things nice, but useable?"** Say: **"We are entrusted and responsible for making sure our room is a place to enjoy and learn successfully."**

3. Introduce the Class Stewardship poster. Discuss and brainstorm examples of rights and responsibilities of a steward and write them on that poster or around it for students to reference throughout the year. *Taking care of materials, respecting the space where we live and work, cleaning up after ourselves, creating a space where it's easy to learn, etc.*
4. Instruct students to practice stewardship by being responsible for the resources of the classroom by cleaning up the mess, sharpening a supply of pencils, etc.

Part 2:

1. For student reference, display the "What is Agriculture" poster. Make note that agriculture encompasses both livestock and crops. Our focus for this unit will be livestock.
2. Say: **"Wyoming is unique because we are surrounded by agriculture every day. I'm going to show you a quick video that will give you a history of our state's agriculture. Before we watch this, what do you picture when I say the word agriculture? Is it more than one thing? What do these things have in common?"**
3. Use the *Agriculture in Wyoming: A Brief History* video (<https://youtu.be/GQ1pddhpQRk>) as an introduction for what agriculture looks like in Wyoming.
4. Give the students the Wyoming Resources Map. This map will be used throughout multiple lessons in the unit, so make sure students put it in a safe place or collect it at the end of every lesson. Briefly go over the key parts of this map (Title, Key, and Compass Rose) to ensure they can effectively navigate the map.

TEACHER NOTE: Students should be able to discuss their discoveries with others. Allow about 5-10 minutes for student observations and discourse. Today isn't about fact checking right and wrong answers. Today is exploratory. Students should connect and make observations. Tomorrow's lesson will get into more fact-based details dealing with agriculture. Today's focus is for students to have a basic knowledge of map skills. Can they find the key? Do they understand that the sectioned areas are counties, not cities? These may need to be addressed. This would also be a great place for an extension to talk about differences between counties, cities, states, and countries.

5. Have students begin to explore both sides of the map. Guide them at the beginning of the observations. Ask: **"What features do you notice on the map?"** *Students should notice the key, the different counties, and county lines.* The backside might provide more new information or facts they find surprising. Ask the following questions about the county side of the map:

- **"What are similarities you notice among the counties?"**
- **"What are differences you notice among the counties?"**
- **"What connections do you see among the counties?"**
- **"What questions do you have after studying the map?"**

6. Next, discuss the following additional questions:

- **"Is there anything that stood out to you as interesting or surprising?"**
- **"What is something new you learned?"**
- **"What questions are still lingering for you?"**
- **"What connections did you make to this map and something in your life?"**
- **"Can you point to where we are on the map?"**

Assessment: Check-in with the students during this share-out to notice what they are thinking. Some things to look for include the following: *similarities between counties, and students' ability to name "home county."* *If students name something that is interesting or surprising, ask them to tell you why it was interesting or surprising.*

Credits/Sources:

1. Wyoming Agriculture in the Classroom. (2018, February 6). *Agriculture in Wyoming: A Brief History*. Retrieved February 6, 2018, from <https://youtu.be/GQ1pddhpQRk>

What is Agriculture?

Agriculture:

cultivating of the soil, producing of crops, and raising of livestock



photo by Patty Small

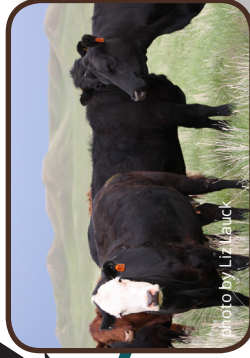
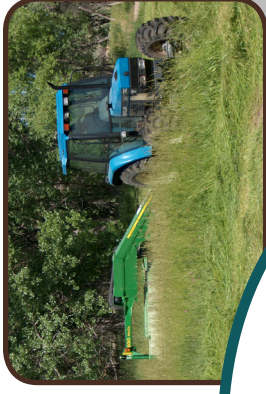


photo by Liz Lauck



photo by Liz Lauck



Crop:

a cultivated plant that is grown for food, fiber, medicine, or livestock feed



photo by Lacey Sims



courtesy of Wyoming Beer Council



photo by Liz Lauck



photo by Liz Lauck

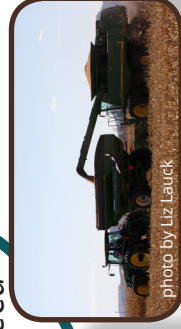
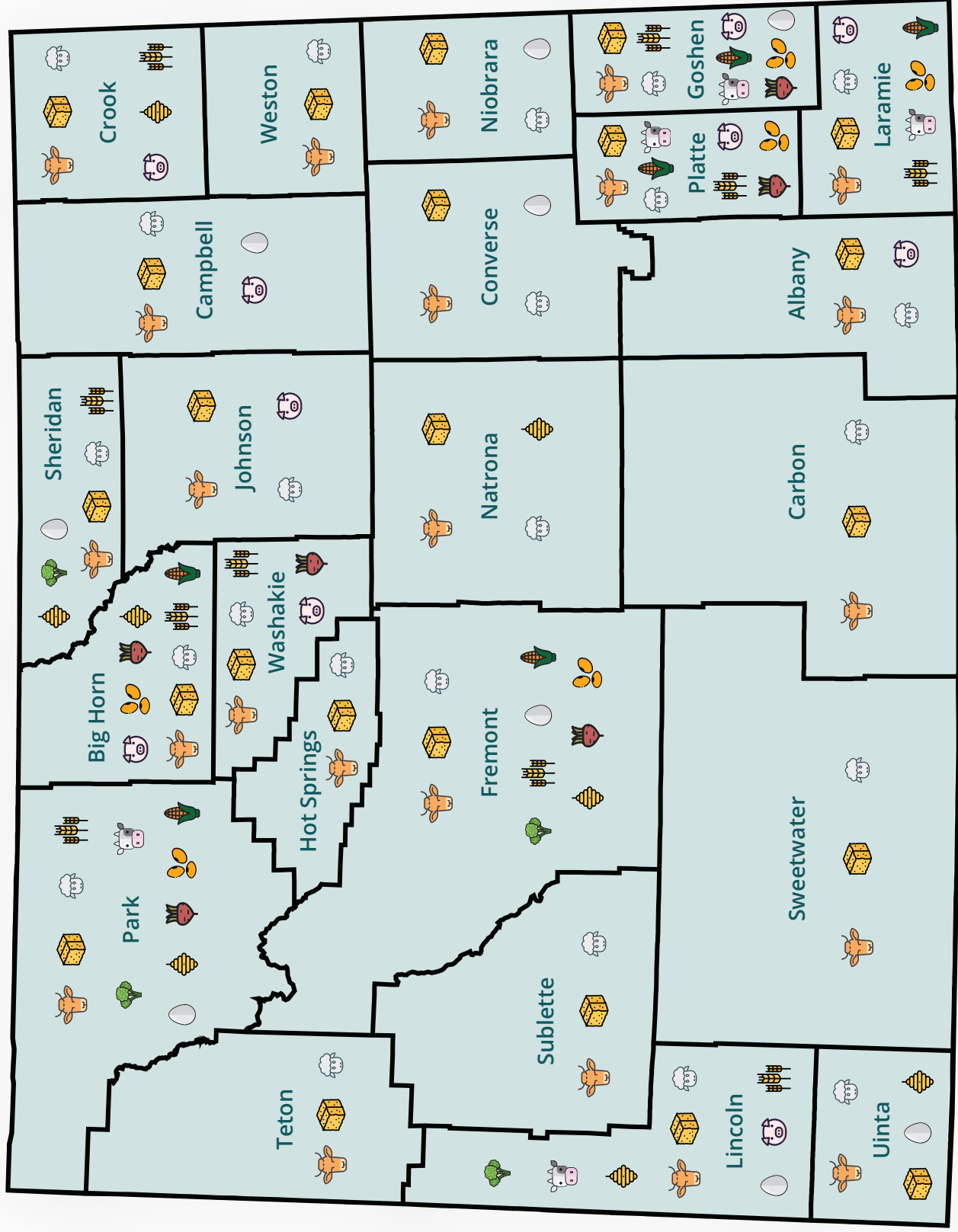
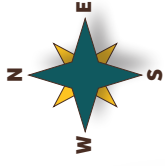


photo by Liz Lauck



Wyoming Agriculture Resources



Key

- Beans
- Beef
- Bees & Honey
- Corn
- Dairy
- Grain
- Hay
- Hogs & Pigs
- Poultry
- Sheep
- Sugarbeets
- Vegetables

Food for Thought

1. What county do you live in? _____
2. What crop of livestock provides an ingredient for your favorite meal? _____
3. Is there a crop that is grown in every county? If so, what is it? _____
4. Would you like to be a farmer or rancher? Why, or why not? _____



Lesson Two: Do You See What I See?

Grade Level: 3rd Grade

Time: 30 minutes

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

Objectives: Students will:

- Identify livestock in Wyoming by circling them on the Wyoming Resource Map
- Identify what products are livestock and which are not
- Identify two different types of livestock found in Wyoming

Purpose: Students will know what livestock is raised in Wyoming.

Required Materials/Resources:

- Wyoming Agriculture Resources Map
- "What is Agriculture?" handout
- Pencils
- "What is Agriculture?" PowerPoint
- 3 index cards per student

Suggested Teacher Preparation:

- Load PowerPoint on your Smart Board
- Print Wyoming Resource Maps and be ready to hand out
- Have enough index cards available for three per student. Either leave blank for students to label themselves, or prior to lesson, label them with "livestock," "crops," and "other."

Standards:

Science: 3-LS4-3 (DCI) - (Practiced/Encountered)

Social Studies: SS5.5.2 (Explicit), SS5.5.1 (Practiced/Encountered)

ELA: 3.RI.1, 3.RI.4, 3.SL.1 (Practiced/Encountered)

Vocabulary:

- **Crop** - a cultivated plant that is grown for food, fiber, medicine, or livestock feed
- **Farmer** - a person who cultivates land for crops and may also raise livestock
- **Livestock** - animals kept for use and profit
- **Rancher** - a person who raises livestock and may also cultivate the land for crops
- **Stewardship** - As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.

Instructional Procedure/Steps:

1. Display the "What is Agriculture?" PowerPoint on your Smart Board. Introduce the definition of livestock, crops, farmer, and rancher to your students through this PowerPoint. Reference the "What is Agriculture?" poster from the previous lesson, so students can see that livestock and crops are part of agriculture. Prior to starting the PowerPoint, pass out three index cards to each student and have them label them "livestock," "crops," and "other" (if you did not already pre-label them.) Say: **"Wyoming has a variety of livestock that are raised by ranchers and crops that are cultivated by farmers. Throughout this PowerPoint, you will see several examples of crops and livestock. These slides will ask you to identify if a picture is an example of livestock, a crop, or not either."** There are a few photos of wildlife and plants within the PowerPoint that won't fit in either the livestock or the crops categories. For each slide, have students hold up the card that they think the


TEACHER NOTE: If you would like to get your kids up and moving for this activity, do an around the room option rather than using the index cards. Designate three different areas of your room for "livestock," "crops," and "other." As you show each slide, students would move to the area of the room that represents that photo. Students would then discuss with their peers why they chose that category.

TEACHER NOTE: During this activity, you can decide whether you would like the students to work independently, with a partner, or in a group.

image represents. This should open up a discussion about why a deer could be found on a ranch but isn't an example of livestock.



TEACHER NOTE: It will be important to make sure that students see that hay, cattle, and sheep are produced in every county. This will lead to the second part of the PowerPoint.

2. After going through the PowerPoint, pass out the Wyoming Resource Map that was used in the previous lesson, or have students get it out if you had them keep their maps. Students need something to write with for the next step. Lead students in a map key review. As you go through the map key, have students circle the examples of livestock.

3.  Ask: **"Find the county we live in."** Check to make sure everyone is on the same county. Also, have students identify what part of the state your county is in directionally. Say: **"Our county is in the _____ part of the state."** As a class, circle the types of livestock within your county. After doing this example together, have students begin circling the examples of livestock within the entire state, one county at a time. After students have finished circling the examples of livestock, have them complete questions 1-4 on the back of their map.



In this task, students will be engaged in the higher order thinking skill of analysis by recognizing trends and analyzing patterns.

4.   Once the students complete the four questions, bring the class back together for a group discussion. Ask students:
 - **"What similarities did you notice between the counties?"**
 - **"What differences did you see?"**
 - **"What do all the counties have in common?"**
They all produce cattle, sheep, and hay.
 - **"What differences do you notice about the northern part of the state versus the southern part of the state?"**
 - **"What do you notice about the eastern part of the state versus the western part of the state?"**



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

5. Revisit the last slide of the PowerPoint that talks about cattle and sheep being the two main livestock produced. Say: **“Sheep and cattle are the types of livestock that are produced most in our state. Cattle and sheep are found in every county. Hay is the crop that is produced most in Wyoming. It is produced in every county in the state.”**

Assessment:

At the end of the lesson, have students list two types of livestock and one crop that is produced in Wyoming. Accept any type of livestock or crop from the map or PowerPoint to illustrate the variety of livestock and crops in Wyoming. This could either be a verbal check or written check (possibly on a sticky note).

Credits/Sources:

1. FarmCentric. (2018, July 12). *Top 10 States with the Most Sheep & Lambs*. Retrieved August 2, 2018, from <http://beef2live.com/story-top-10-states-sheep-lambs-0-117992>
2. FarmFlavor. (2018). *Wyoming Agriculture*. Retrieved August 5, 2018, from <https://www.farmflavor.com/wyoming-agriculture/>
3. United State Department of Agriculture. (2018, July 31). *Wyoming Agriculture*. Retrieved August 5, 2018, from https://www.nass.usda.gov/Statistics_by_State/Wyoming/About_Us/
4. United State Department of Agriculture. (2017). *2017 State Agriculture Overview: Wyoming*. Retrieved August 5, 2018, from https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=WYOMING
5. Photo credits are listed in the Power Point presentation.



Lesson Three: Hooves on the Ground

Grade Level: 3rd Grade

Time: 30-40 Minutes

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

Objectives: Students will:

- Identify how Wyoming is unique based on the livestock and the land
- Identify how Wyoming's livestock is cared for and looked after
- Identify who is involved with Wyoming livestock
- Identify the importance of Wyoming's land to the livestock
- Hypothesize what an increase in population would do to the land in Wyoming and how it would impact the livestock

Purpose: Students will understand that Wyoming is unique because of the amount of space available for our livestock.

Required Materials/Resources:

- "Land for Livestock" PowerPoint (Sources 1- 8)
- Materials for livestock simulation
- Masking tape for marking pastures in livestock simulation activity
- Assessment response cards A-D
- Purple strips of paper to represent larkspur

TEACHER NOTE:

Begin class with the Lesson 3: Land for Livestock PowerPoint pulled up. These slides will give your students background information and will talk about Wyoming's unique size and population. By the end of the lesson, students should see that the size and population of Wyoming make it possible for us to have such a successful livestock industry.

Suggested Teacher Preparation:

- Load PowerPoint on the Smart Board
- Copy, count out, and cut task cards
- Read through teacher script (embedded in the lesson plan)
- Prepare assessment cards (A, B, C, D).
- Print Larkspur poster

Standards:

Science: 3-LS4-4 (DCI and CCC), 3-5-ETS1-2 (Explicit),
3-LS4-3 (Practiced/Encountered)

Social Studies: SS5.5.4 (Explicit), SS5.4.1 (Practiced/Encountered)

Math: 3.G.2 (Practiced/Encountered)


ELA: 3.SL.1 (Practiced/Encountered)

CVE: CV5.3.1 (Explicit), CV5.2.1, CV5.2.2 (Practiced/Encountered)

Vocabulary:

- **Graze** - eat grass or forage in a pasture
- **Grazed** - pasture grass that has been partially eaten by livestock
- **Larkspur** - native plant with blue flowers that is poisonous when eaten by livestock
- **Livestock** - animals kept for use and profit
- **Pasture** - fenced-in area of grazing land
- **Rotational grazing** - the practice of moving grazing livestock between pastures as needed or on a regular schedule

Instructional Procedure/Steps:

1.  Present the first seven slides from the PowerPoint. Slide 8 poses the question: **Since we have so much space, and so few people, what do you think we use all this land for?** Stop on this slide and let the students generate conversation about the amount of space in



In this task, students will be engaged in the higher order thinking skill of synthesis by predicting, inferring, and imagining how the land would be used.

Wyoming and how the space is used. Emphasize the agricultural uses of the land: *houses, farming, ranching, schools, parks, etc.* Focus on the way our ranchers use the land of Wyoming for livestock. Finish showing the PowerPoint.

2. Next, introduce the Livestock Simulation Game. Assign each student a task card. (There are cows, sheep, a cattle rancher, and a sheep rancher). Use the teacher script to play the simulation.

TEACHER NOTE: Based on your class size, the cow task cards and the sheep task cards will be your most flexible. You can add as many of them as your class needs to ensure that each student gets one card. It is important that you make sure there are more cattle than sheep to make the simulation accurately represent Wyoming's ranchers. There can only be one cattle rancher and one sheep rancher in the game. The teacher's script is designed to introduce potential challenges that a rancher would face. The entire class will work together to create potential solutions. The teacher script will help guide you toward specific solutions to make the simulation accurate. Feel free to add in your own challenges to the simulation based on your experience level. However, the given challenges are set up purposefully and should not be replaced because they will help students reach the essential question of the lesson.

TEACHER NOTE: Slide 9 of the PowerPoint contains a land ownership map. In addition to private and federally owned lands, Wyoming also contains lands known as State Trust Lands. These are lands granted to Wyoming and designated to generate revenue for public schools and other state institutions. While they are owned by the State, public access is limited depending on location and designated use.

3. **LIVESTOCK SIMULATION GAME - TEACHER SCRIPT:**
Remember that the bold text is what teacher says to students! Students should stay seated until it is their time to enter the simulation. (This will be the sheep rancher and sheep.)

- Say: "**Welcome to _____ (teacher's last name) Ranch!**" **We have a great rancher and his/her job is to take care of the livestock. The entire classroom is our ranch, and the cattle rancher is going to graze his/her cattle anywhere inside the classroom. Cattle, please get started by walking around "grazing."**

Rancher, your job is to make sure you keep an eye on all of them.


Choose one or two "cattle" students who will continue to escape from the ranch by going into the hallway or another area outside of the classroom. Tell the student(s) to escape two to three times in order to give the rancher an idea of how hard it is to keep track of cattle. If your rancher doesn't realize that the cattle have escaped, remind him/her that his/her job is to keep the cattle together. The rancher should begin to feel a little overwhelmed by the idea of keeping all these cattle together in such a large space. This will lead us to our first "problem."

TEACHER NOTE: This would also be a great area to include some focus around the math standard 3.G.2. You can explain to students that you are partitioning your whole classroom into four equal parts to make each pasture $\frac{1}{4}$ of your whole grazing area.

- Say: **"Everyone freeze. Cattle, you did a marvelous job of grazing! In fact, you did so well, that all of the grass in the pasture has been grazed. Rancher, were you able to keep a close eye on all your cattle? *Make sure rancher mentions the escaped cattle he/she had to keep wrangling.* Part of how ranchers show their stewardship is by taking care of not only the cattle, but the land the cattle use. Is there a way we could let grass continue to grow, feed the cattle, and keep them together so we are being good stewards?"**



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

-  The whole class (including ones who have not entered the simulation) should participate in this problem-solving activity. Divide your classroom into four equal spaces with masking tape to create four pastures. Lead the discussion toward the idea of rotational grazing. Students should realize that grass needs time to grow, but the cows still must eat. If a rancher limits the grazing to one pasture at

a time, the cattle will be able to eat, as well as give the grass in the other pastures enough time to grow and the land time to rest.

- Say: **"Our new plan is to try rotational grazing; that means we graze one pasture at a time so that the other pastures can rest and grow. Rancher lead your cattle to their first pasture. Allow them to graze in our newly designated area. Make sure you keep a close eye on your cattle!"**
- Pull one cow aside and have them try to escape from the pasture up to two times.
- Ask: **"Rancher, what did you notice when you had your cattle grazing together in this pasture? When your cattle tried to escape, how was it different from when they were grazing all over the classroom?"** *Rancher should mention that it was easier to monitor the cattle in a smaller space.*
- Ask: **"The grass in our pasture is almost gone. What can we do to keep our cattle fed, but make sure our land gets time to rest and re-grow?"** *Students should suggest moving to the next pasture. Allow the rancher a moment to move the cattle to the second pasture.*
- Allow the students to graze for a couple of minutes in the second section. When time is up, have the rancher move the cattle to the third section where another problem will arise. While students are grazing in the second section, spread some purple paper strips in pasture 3 to represent larkspur and put up a sign in the third section that says "Caution: Larkspur Here! Deadly to Cattle!"

- Ask: **"Freeze! Half of your grass has been grazed. What should we do next?"** *Students will answer to go to the third pasture. Say: "Before our rancher moves on, we need to make sure that our next pasture is ready."* Point out the larkspur sign. Ask: **"Uh oh, larkspur is a plant that is deadly to cattle, and none of the other pastures are ready for grazing yet. What could we do?"** *At this point, your sheep should realize that their cards say that they eat larkspur. If not, encourage the students still seated to re-read their task cards for a helpful hint.*
- Say: **"The cattle rancher should now go talk with the sheep rancher and see if they can help clear the larkspur from pasture three."** Have the sheep rancher lead the sheep into pasture three to eat larkspur by picking up the shreds of purple paper while cattle finish grazing in pasture two.
- Ask: **"The larkspur has been cleared from pasture three. Great job, but now the grass and weeds in pasture four are too tall, and that is a big fire hazard. We don't want our grass to catch on fire because that is our food source, and we need it. What can we do?"** At this point, the students who are sheep should realize that they can move to pasture four to eat the tall grass and weeds as suggested on their task card. Then, the cattle can move into pasture three to eat the grass that remains.
- Say: **"Great idea! The sheep would be perfect to clear away those tall grass and weeds! Sheep rancher, why don't you move your sheep to the next pasture, and cattle rancher, you can also move your cattle."** Give students up to one minute to rotate and graze.

- Say: **"Great news! We have had enough rain for our grass to grow back in the other sections. Things are growing well, and your cattle and sheep are eating well! Your rotation is working the way it should!"** This is the end of the simulation.

Reshow slides 6, 7, and 10 from the PowerPoint. Discuss the following questions: **"After reviewing these slides, remember that Wyoming is the ninth largest state but the least populated state. How does our state's size and our small population help ranchers graze their livestock? Wyoming also has very large ranches. If our population grew as big as Colorado, how would this affect our ranch sizes?"** *Students should respond with the idea that a bigger population will lead to smaller available land space and vice versa. Make sure students see why it is important to have enough space to graze livestock properly. If we didn't have as much space, it would be harder to have a successful livestock industry.*

Say: **"Part of what makes Wyoming unique, is that the people who live here love the open space. We have always had great space for grazing, livestock, and ranches. We want that to continue in order to be good stewards of the land."** If time allows, the class could play another round of the game to give students an opportunity to have different roles.

4. Collect task cards from students. Pass out assessment questions.

TEACHER NOTE:
Please note, we are not discouraging responsible growth. We hope to encourage our students to find future opportunities in Wyoming. However, we also want to highlight how open spaces make Wyoming unique and allow ranching and other economic drivers to thrive.



In this task, students will be engaged in the higher order thinking skill of evaluation by evaluating outcomes and judging how ranchers are good stewards.



Assessment: Students will choose and respond to one of the four assessment questions. Say: "**Make sure to defend your answer with evidence from the activity.**" After about five minutes of writing, have the students find a partner who chose a different question and discuss their answers. Next, they could meet with someone who had the same question and see how their answers varied. Collect the responses to make sure students understand that land and livestock must be taken care of.

- A. How are ranchers in Wyoming good stewards of the land? Defend your answer by giving evidence from the activity.
- B. Why is Wyoming's land important to livestock? Defend your answer by giving evidence from the activity.
- C. If Wyoming grew in population, how would it affect the land and livestock? Defend your answer by giving evidence from the activity.
- D. How is Wyoming agriculture unique? Defend your answer by giving evidence from the activity.

Credits/Sources:

1. FarmCentric. (2018, June 28). *Cattle Inventory vs Human Population by State*. Retrieved August 2, 2018, from <http://beef2live.com/story-cattle-inventory-vs-human-population-state-0-114255>
2. FarmCentric. (2018, July 12). *Top 10 States with the Most Sheep & Lambs*. Retrieved August 2, 2018, from <http://beef2live.com/story-top-10-states-sheep-lambs-0-117992>
3. State of Wyoming. (2018). *Wyoming Facts and Symbols*. Retrieved August 2, 2018, from <http://www.wyo.gov/about-wyoming/wyoming-facts-and-symbols>
4. United States Census Bureau. (2017, July 1). *Quick Facts: Wyoming*. Retrieved August 2, 2018, from <https://www.census.gov/quickfacts/fact/table/wy/PST045217>

5. United States Census Bureau. (2017, July 1). *Quick Facts: Colorado*. Retrieved August 2, 2018, from <https://www.census.gov/quickfacts/fact/table/co/PST045217>
6. World Population Review. (2018). *US States – Ranked by Population 2018*. Retrieved August 2, 2018, from <http://worldpopulationreview.com/states/>
7. NSTATE,LLC. (2017, December 19). *Wyoming Economy*. Retrieved August 2, 2018, from http://www.netstate.com/economy/wy_economy.htm
8. Wyoming Association of Conservation Districts. (2017). *Wyoming Land Ownership Maps*. Cheyenne: Wyoming.

Livestock Simulation

Cattle Rancher

Your Job: Graze your cattle so they gain weight. Keep a close eye on them. You don't want to lose them!

Sheep Rancher

Your Job: Graze your sheep so they gain weight. You'll need to keep a close eye on them. **Don't forget, your sheep can eat larkspur.**

Cow

Your Job: Graze and gain weight.

Sheep

Your Job: Graze and gain weight. You can eat **tall grass, weeds, and larkspur.**

Cow

Your Job: Graze and gain weight.

Sheep

Your Job: Graze and gain weight. You can eat **tall grass, weeds, and larkspur.**



Livestock Simulation

Cow

Your Job: Graze and gain weight.

Cow

Your Job: Graze and gain weight.

Cow

Your Job: Graze and gain weight.

Cow

Your Job: Graze and gain weight.

Cow

Your Job: Graze and gain weight.

Cow

Your Job: Graze and gain weight.



Livestock Simulation

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**

Sheep

Your Job: Graze and gain weight.
You can eat **tall grass, weeds, and larkspur.**



Caution!
**Larkspur grows
in this pasture.
This plant is
deadly to cattle
if they eat it.**



Assessment Response Cards

A. How are ranchers in Wyoming good stewards of the land?

B. Why is Wyoming's land important to livestock?

C. If Wyoming grew in population, how would it affect the land and livestock?

D. How does Wyoming's land make it unique?





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.”**

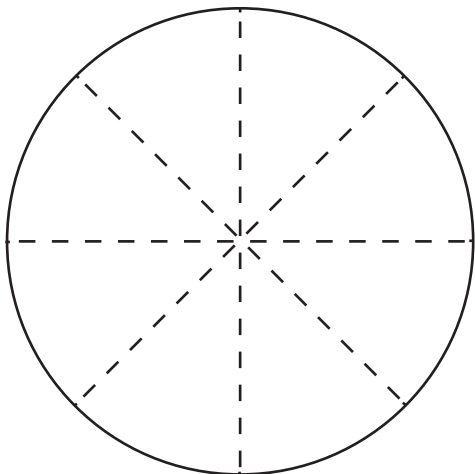
Assessment: Look over student responses on the cause and effect pages to check whether or not students understood the concepts.

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>

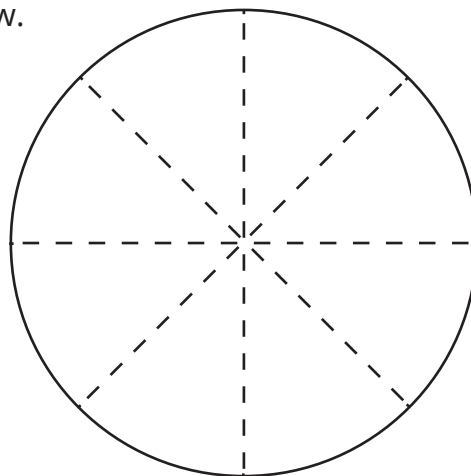
Drought! Now What?

On a normal year, Rancher Bill can grow a whole circle of hay. He needs $\frac{7}{8}$ of his field to feed his cattle through the winter. Color how much hay Bill needs to grow to feed his cattle.



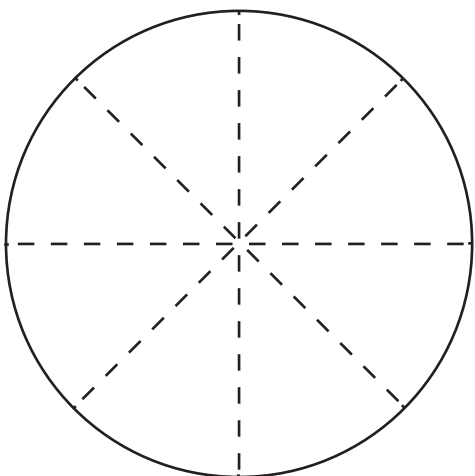
What fraction of the field of hay would he have left on a normal year?

Rancher Bill has been watching the weather reports and conditions. Based on the predicted precipitation for this year, Bill is facing a drought. He will have enough irrigation water to grow hay on $\frac{5}{8}$ of his field. Color in how much hay Bill will be able to grow.



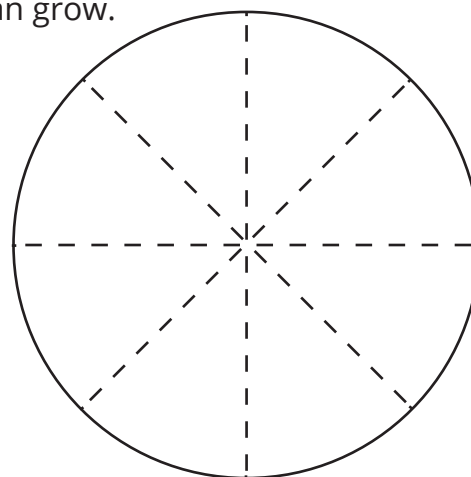
How many sections of hay will Bill need to replace to feed his cattle?

Rancher Ruth can also grow a whole circle of hay on a normal year. She feeds 10 cows with each section of her hay crop. Ruth currently has 60 cows. Color in the amount of hay Ruth uses.



What fraction of the field of hay would she have left on a normal year?

Ruth is also facing a drought. She will only have enough irrigation water to grow hay on $\frac{4}{8}$ of her field. Color in the amount of hay she can grow.



If each section feeds 10 cows, how many cows can Ruth feed? _____

How many cows will she need to sell because she won't have enough hay for them? _____

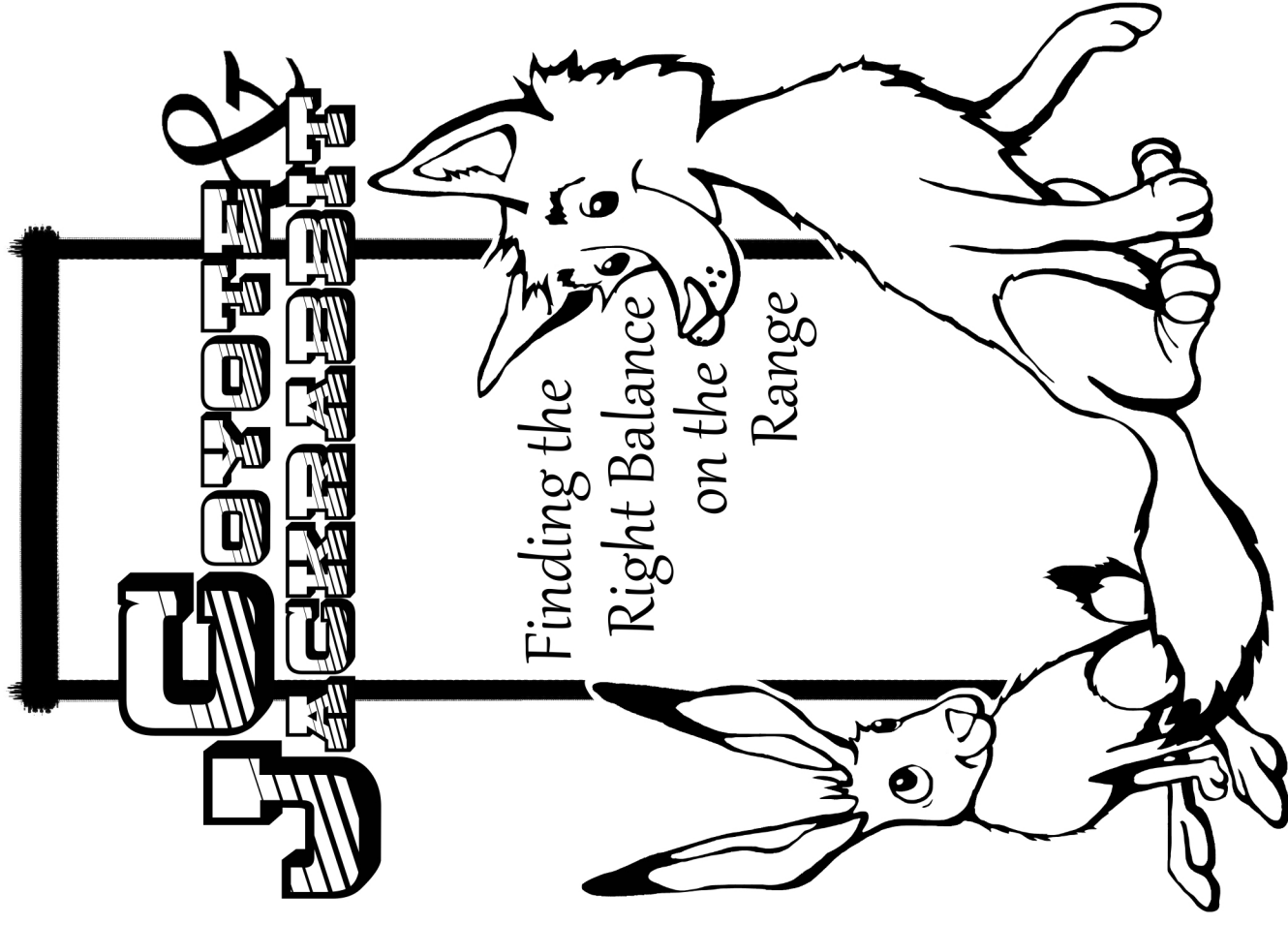




Illustrations by Marie Burghard

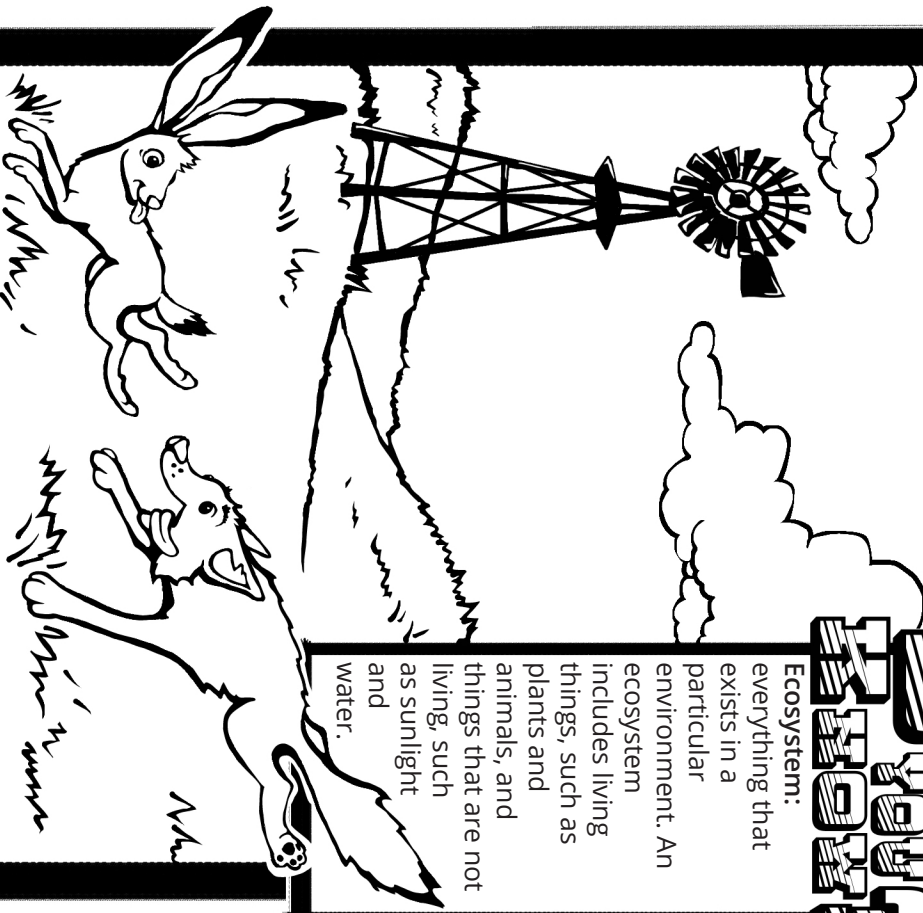
“Did You Know” Sources:

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>



COYOTES

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.

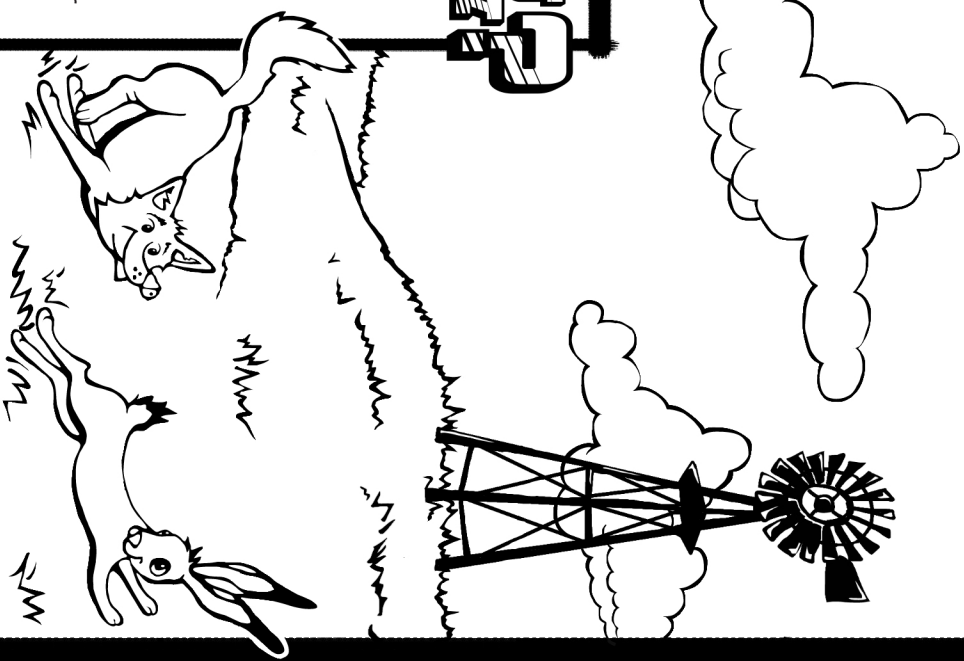


Coyotes and jackrabbits are two animals that have lived in Wyoming a long time. Coyotes are predators. That means they prey on other animals for food. The jackrabbits are prey. That means they are hunted by predators. They keep each other's population numbers in balance. This creates a healthy **ecosystem**.

1

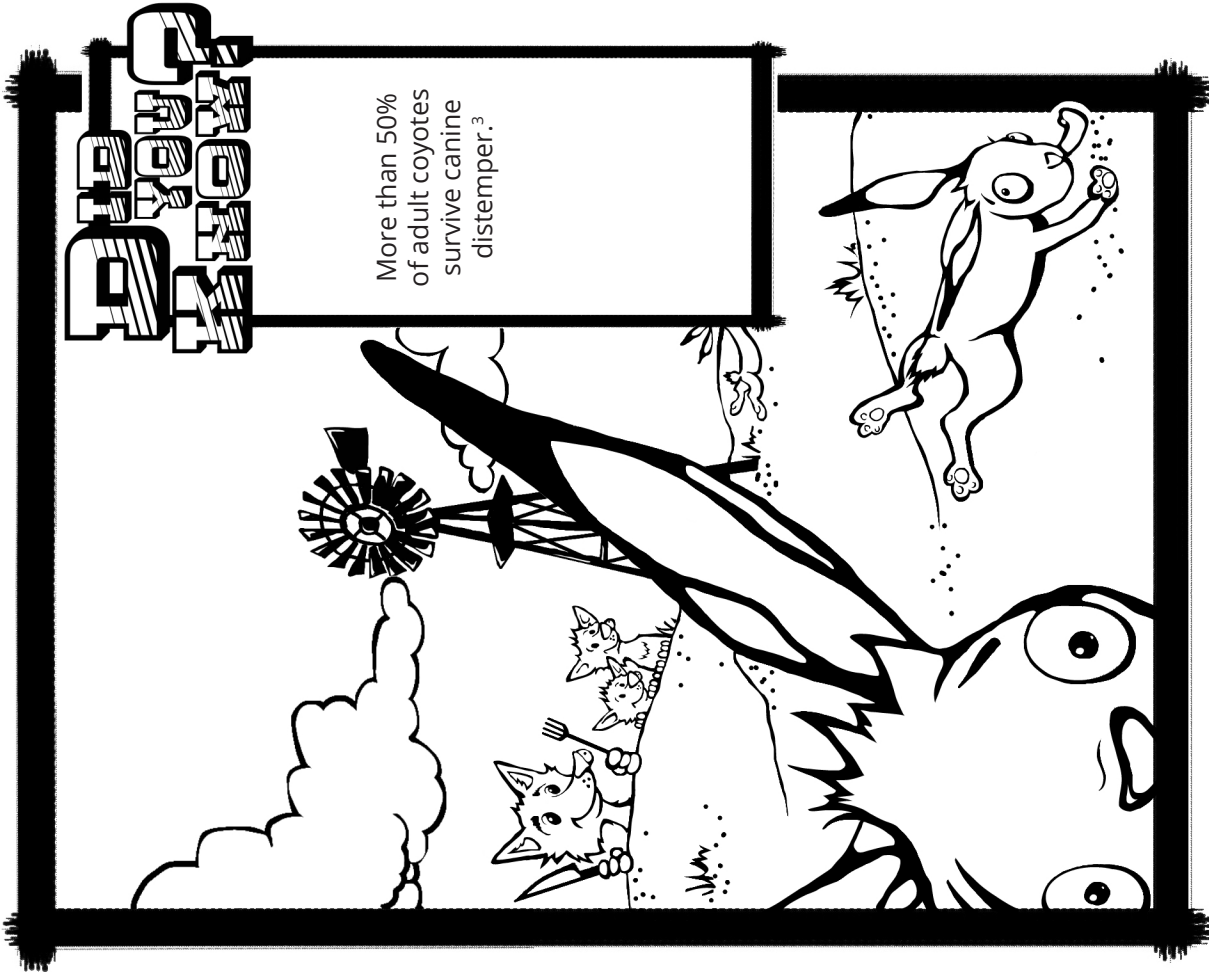
COYOTES

Most of Wyoming's rangeland is classified as either shortgrass prairie or mixed-grass prairie. Shortgrass prairie occurs mainly in the southeast corner of the state and extends south into Colorado.⁴

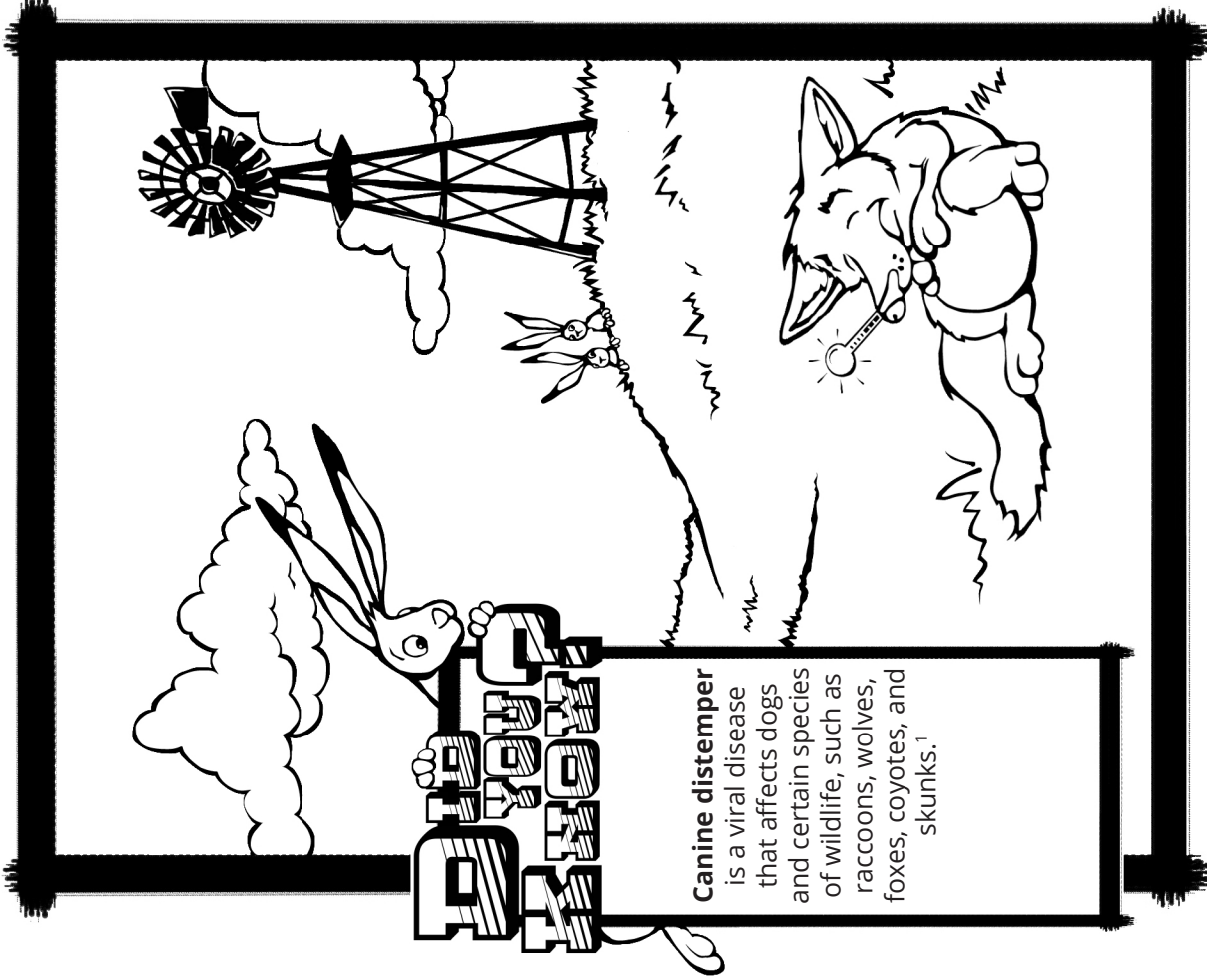


With the jackrabbit population in check, the rangeland thrived. Jackrabbits had enough to eat, and so did the coyotes, wildlife, and livestock. The ecosystem was in balance once again!

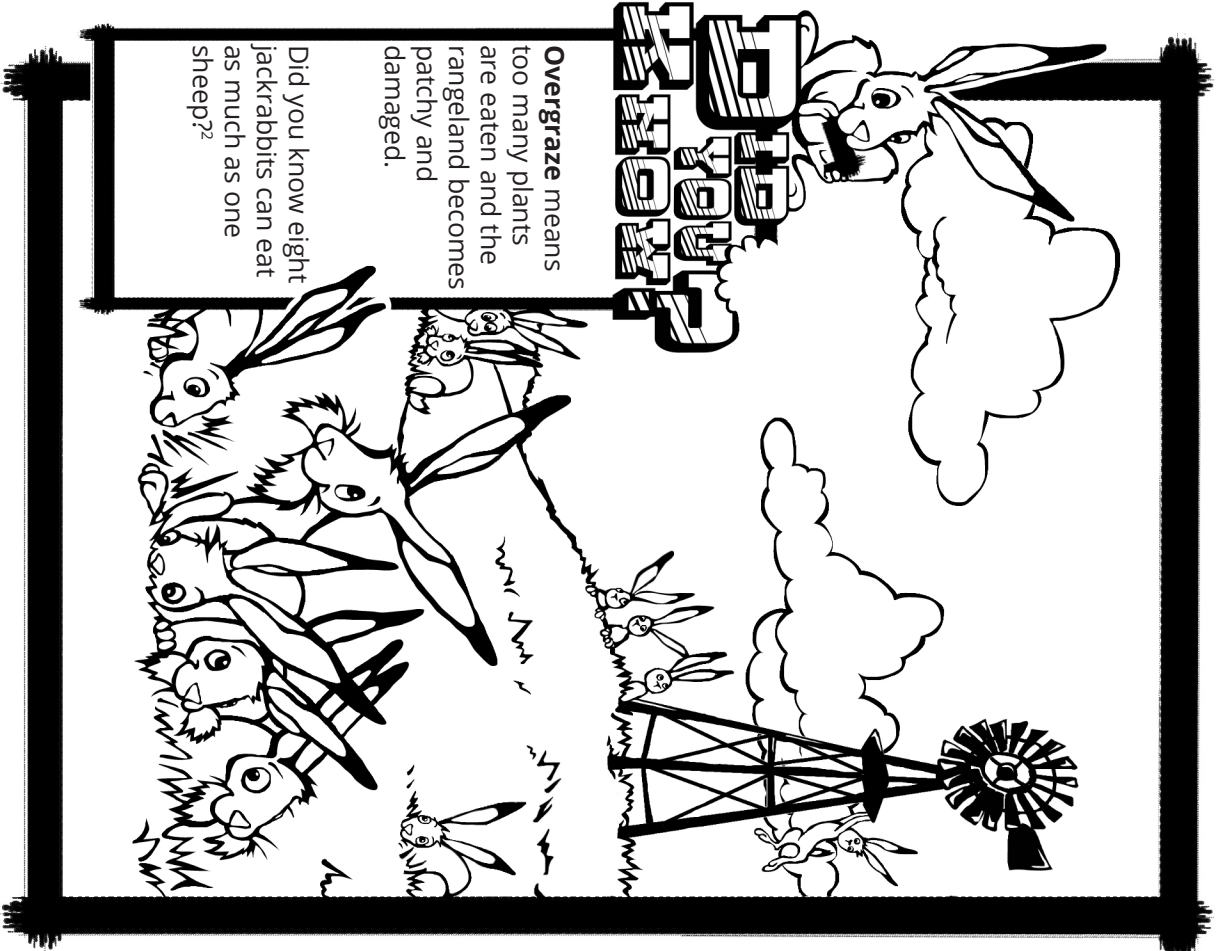
6



Eventually, most of the coyotes recovered from canine distemper. The surviving coyotes had a lot of jackrabbits to eat, so their population quickly grew.



One year, the coyote population decreased because of an illness called **canine distemper**. Without predators, the jackrabbit population grew larger than ever before!

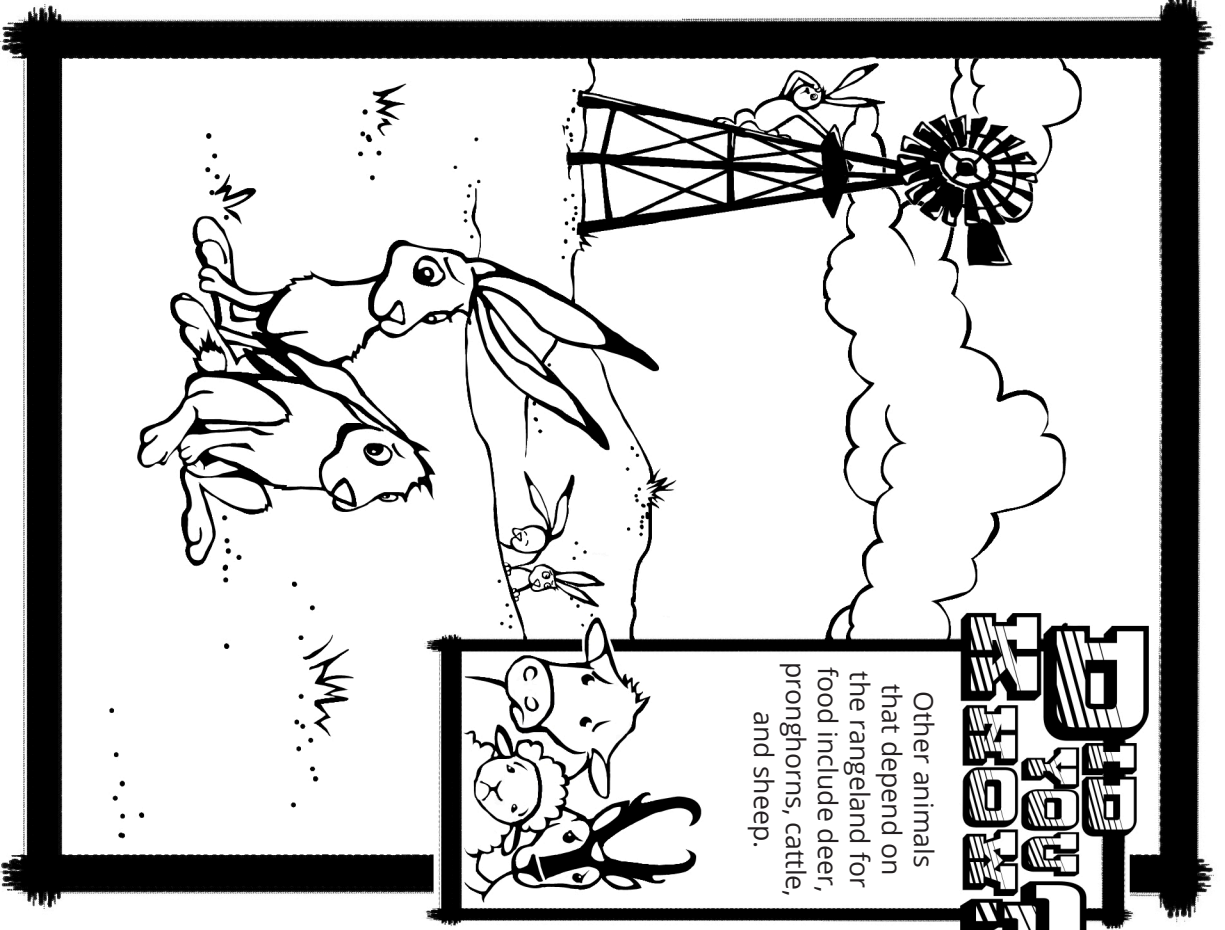


Overgrazing

Overgraze means too many plants are eaten and the rangeland becomes patchy and damaged.

Did you know eight jackrabbits can eat as much as one sheep??

All those jackrabbits were hungry, so they ate and ate and ate! In fact, they ate so much they **overgrazed** the rangeland.



Overgrazing

Other animals that depend on the rangeland for food include deer, pronghorns, cattle, and sheep.

Because the jackrabbits overgrazed, other animals weren't able to eat the grass they needed to survive. It was getting harder and harder for the jackrabbits, wildlife, and livestock to find food.

Cause and Effect Assessment Pages

Cause:

A rancher is facing a drought year.

Effects:

1. _____

2. _____

3. _____

Cause:

A rancher has noticed an increased number of predators on his ranch.

Effects:

1. _____

2. _____

3. _____



Cause and Effect Assessment Pages

Cause:

A rancher creates a plan for livestock grazing.

Effects:

1. _____

2. _____

3. _____





Lesson Five: Stewardship Spotlight - A Livestock Lifestyle

Grade Level: 3rd Grade

Time: 30-60 Minutes (Depending on Speaker/Videos Used)

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

Objectives: Students will:

- Identify the people who deal with livestock challenges on a regular basis
- Discuss the difficulty associated with being a steward
- Recognize that stewards play an integral part in Wyoming's culture
- Listen to interviews of Stewards of Wyoming and reflect on their impact on Wyoming

Purpose: Students will understand that livestock face multiple challenges and many people are involved in solving those challenges.

Required Materials/Resources:

- Video: <https://www.youtube.com/watch?v=p0Ga-yGn6kU> *Padlock Ranch Video*. (Source 5) *Video length: 5 minutes 32 seconds*
- Video: <https://youtu.be/ZZ848JGdTLE> *Kent Drake, Predator Management Coordinator* (Source 1) *Video length: 2 minutes 14 seconds*
- Video: <https://youtu.be/Gw2Drm1b7X8> *Justin Derner, Rangeland Research Scientist* (Source 2) *Video length: 2 minutes 3 seconds*

TEACHER NOTE: If you would like to have guest speakers come to your classroom instead of watching the videos, that would also be beneficial. Potential guest speakers include: veterinarians, ranchers, Game and Fish employees, and grazing (range) managers. The videos are between 5-10 minutes each. Depending on available time, watch as few or as many as you'd like.

- Video: <https://youtu.be/u3-MHRCppXY> Brian Nesvik, Chief Game Warden (Source 3) Video length: 5 minutes 33 seconds
- Video: <https://youtu.be/ANcyHq2daJ8> Monte Lerwick, Rancher (Source 4) Video length: 5 minutes 55 seconds
- Interview Questions
- Guest speaker from agriculture industry for live interview (if available, use videos if not)
- Reflection posters with questions
- Markers (a different color per student)
- Ranch Stewardship Note Taking page (Use for Padlock Ranch video)
- Wyoming Stewards Note Taking page (Use for the other 4 videos)
- Guest Speaker Note Taking page

Suggested Teacher Preparation:

- Have supplied videos of interview candidates ready to show. Ensure that they work and are not blocked. **If not using videos**, arrange guest speaker(s) to visit prior to the day of the lesson. Provide the guest speaker(s) with the four questions listed below ahead of time in order to guide the discussion for the lesson.
 - **How are you a steward of Wyoming's agriculture? (How do you develop, use, and care for agriculture in our state?)**
 - **What challenges do you face that directly impact livestock?**
 - **How do you deal with the challenge of predators, drought, and/or grazing? Are there other challenges their job specifically deals with?**
 - **What advice can you give to future generations about being prepared for these challenges?**
- Make copies of the note taking pages for each student.
- Have a different color marker per student for poster activity.

- Create posters with questions below on the top. Have one poster for each question.
 - How do these jobs/stewards help make Wyoming unique?
 - What would happen if these jobs/stewards were to go away?
 - How is being a steward a challenge?
 - Why is being a steward important?

Standards:

Social Studies: SS5.5.4(Explicit), SS5.6.1 (Practiced/Encountered)

ELA: 3.W.8 (Explicit), 3.SL.1, 3.SL.2, 3.SL.3
(Practiced/Encountered)

CVE: CV5.1.1 (Explicit), CV5.3.1 (Practiced/Encountered)


Vocabulary: No new vocabulary for this lesson.

Instructional Procedure/Steps:

1. Today students will get the chance to listen to people who work on addressing the problems and challenges that arise within their agricultural jobs. Students will either watch the provided videos or listen to the guest speaker(s). Refer to the list of guiding questions for the guest speaker(s) included to ensure that all the students are getting consistent information that aligns with the previous lessons.



In this task, students will be engaged in the higher order thinking skill of application by using and applying knowledge from the videos to answer/decide how the individuals are good stewards

2.  Pass out the note taking pages. Watch the videos or listen to the guest speaker(s). Here are the guiding questions that will shape the video interviews and should shape the live interview, if you choose that route.
 - **How are you a steward of Wyoming's agriculture? (How do you develop, use, and care for agriculture in our state?)**
 - **What challenges do you face that directly impact livestock?**
 - **How do you deal with the challenge of predators, drought, and/or grazing? Are there other challenges their job specifically deals with?**
 - **What advice can you give to future generations about being prepared for these challenges?**

3. After the videos and/or guest speaker(s) are finished, set up four posters around the room with a question written on each. Assign each student a different colored marker to answer the questions. This is to keep track of student accountability and monitor their understanding. Students will go to each poster and record their answers. Students should use their notes to help answer the questions. Answers will vary based on what the students take away from the previous lessons and interviews. The four poster questions are listed below:
 - **How are these jobs/stewards important to Wyoming?** *Wyoming is known for their livestock industry. Since we produce such a large amount of livestock, it shapes our entire state. Without these stewards who protect the balance of all these challenges, we wouldn't have the booming livestock industry we have. Our families would suffer, our*

lands would suffer, and our state as a whole would suffer.

- **What would happen if these jobs/stewards were to go away or no longer be around?** *If we didn't have predator management, there would be too many or too few predators. Students could list the specific details of those repercussions. If we didn't have grazing management, the rangeland would not be as healthy. Some areas would be overused, and others wouldn't be grazed. If we didn't have ranchers, we wouldn't be able to produce the number of livestock we do every year. This would hurt our state by reducing the number of livestock products our state produces and depends on. It would also make meat and other by-products rare, which would likely raise the price for consumers.*
- **How is being a steward a challenge?** *Ranchers not only have to maintain their cattle in a healthy way, they have to worry about predators, droughts, and other challenges. They need to be able to tend to the livestock's medical needs, as well as make sure they have enough money to keep their ranch running smoothly.*
- **Why is being a steward important?** *Being a steward creates a beautiful and healthy place for both us and future generations. It allows us to recognize the great things Wyoming offers and realize that we are in charge of keeping it in that great condition. If we don't care about Wyoming now, how can we expect the future generations to care about Wyoming?*

4. After all students have responded to each poster, bring the students back together and have them each share out what they have written on the posters. If new ideas are introduced by students through the discussion, add those to the posters, as well. Say: **“Being a good steward of our state, while difficult at times, is important. Maintaining the balance of predators and prey, caring for livestock well-being, and studying proper grazing techniques helps Wyoming agriculture. Stewards play an important role for current and future generations in Wyoming.”**

Assessment: After the lesson, read each student’s poster responses to check their understanding.

Credits/Sources:

1. Wyoming Agriculture in the Classroom. (2018, January 10). *Kent Drake, Predator Management Coordinator*. Retrieved January 11, 2018 from <https://youtu.be/ZZ848JGdTLE>
2. Wyoming Agriculture in the Classroom. (2018, January 10). *Justin Derner, Rangeland Research Scientist*. Retrieved January 11, 2018 from <https://youtu.be/Gw2Drm1b7X8>
3. Wyoming Agriculture in the Classroom. (2018, January 10). *Brian Nesvik, Chief Game Warden*. Retrieved January 11, 2018 from <https://youtu.be/u3-MHRCppXY>
4. Wyoming Agriculture in the Classroom. (2018, January 14). *Monte Lerwick, Rancher*. Retrieved January 16, 2018 from <https://youtu.be/ANcyHq2daJ8>
5. Environmental Stewardship. (2013, October 25). *Padlock Ranch-2013 Region V Environmental Stewardship Award Winner*. Retrieved August 20, 2017 from <https://www.youtube.com/watch?v=p0Ga-yGn6kU>

Ranch Stewardship

Note Taking Page

Managing Land

-
-

Managing Water

-
-

Managing Crops

-
-



Wyoming Stewards

Note Taking Page

Video #1

-
-
-

Video #2

-
-
-

Video #3

-
-
-

Video #4

-
-
-



Guest Speaker

Note Taking Page

Guest Name:

Job:

How is this person a steward of Wyoming agriculture?

Stewardship challenges:

-

-

-





Lesson Six: Rancher Roundup

Grade Level: 3rd Grade

Time: 1-2 days of 30-45 minute lessons, depending on how detailed you would like to be for your friendly letter instruction.

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

Objectives: Students will:

- Define agricultural stewardship
- Write a letter using a heading, greeting, body, closing, and signature
- Identify agricultural stewardship in Wyoming
- Write a letter explaining what stewardship is, and how the person they are writing to is an example of a steward

Purpose: Students will show their appreciation for ranchers who are good stewards when being responsible with their livestock and land.

Required Materials/Resources:

- *Rancher Directory* found as a separate document in the teacher resources section
- Wyoming Stewardship Teacher Cover Letter (provided as a .doc file for you to edit)
- *Stewardship* definition poster from earlier lessons
- Student letter template

TEACHER NOTE: For the following lesson, we have provided you with a directory of ranchers and agriculture community members to contact. The idea of this project is to give the students a chance to personally thank a member of their community that deals with agriculture and specifically with livestock.

Suggested Teacher Preparation:

- Using the *Rancher Directory*, choose a rancher from your community to be the focus of the writing project.
- Make copies of the student letter template for each of your students.
- Personalize the Wyoming Stewardship Teacher Cover Letter.
- Optional: Create an example letter to use as a guide for students.

Standards:

Social Studies: SS5.1.1(Explicit), SS5.2.1, SS5.2.3 (Practiced/Encountered)

ELA: 3.W.2 (Explicit), 3.L.3.a, 3.SL.1 (Practiced/Encountered)

CVE: CV5.4.1(Practiced/Encountered)

Vocabulary:

- **Stewardship** - As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.

Instructional Procedure/Steps:

1. Ask: **“We have used the word stewardship multiple times during this unit. What does it mean?”** If necessary, refer students back to the definition poster in the room. *Stewardship: “As Wyoming citizens, we are entrusted with the responsible development, care, and use of our resources to benefit current and future generations.” – Wyoming Stewardship Project.*



In small groups or partners, have students answer the following question: **“What does agricultural stewardship mean to you?”** Possible responses: *proper grazing practices, predator/prey management or balance, drought challenges and preparation.* This just serves as a quick refresher to get brains moving toward stewardship.

2. Say: **“Throughout this unit, we’ve learned about the livestock branch of the agriculture industry. We may**



In this task, students will be engaged in the higher order thinking skill of evaluation by defending their opinions of agricultural stewardship.

not be ranchers ourselves, but we know that, all over our state, we have people who are directly working with livestock. This is our opportunity to show them what we know and our appreciation for their stewardship in our state. We're going to complete a project called 'Appreciate A Rancher.' We'll take the opportunity to write to a rancher and tell him/her how much we value his/her stewardship in our community and offer our encouragement. The work ranchers do is tough, and we want them to know how much we appreciate the responsibilities they've taken on to help the future generations of Wyoming."



Say: **"The rancher we are going to appreciate is _____."** Tell your students about the rancher that you have chosen. After providing the rancher background information, if necessary, teach the students about writing a friendly letter. Make sure students include all the components of a friendly letter: Heading, Greeting, Body, Closing, and Signature. Possibly, provide an example letter as a model.

3. When students are ready to move forward, have students begin drafting their letters. The following are sentence stems are provided to help guide students' letter writing.
 - I learned that a steward is...
 - We learned about livestock. Livestock is...
 - We learned ranchers face many challenges when caring for livestock such as...
 - Thank you for...
 - One way you're a great steward in our state is...

Within the student letters, students need to not only mention what they have learned about livestock and the challenges that the stewards face, but we want students to acknowledge how this specific person is showing stewardship in our state. Individual students may or may not need more coaching around these ideas. Either assist these students in small groups or one-on-one.

TEACHER NOTE: If you choose to send photos or videos of students, remember to get parent/guardian approval.

4. After students have completed letter drafts, conference with students and/or use peer editing to improve letters before students make their final copies. Print your personalized copy of the Wyoming Stewardship Teacher Cover Letter, which explains to the rancher why he/she is receiving letters from the class and mail it along with the student letters to your chosen rancher. Some possible extension activities are listed below:

- Rather than sending your student letters, invite the rancher in personally to accept the letters and show him/her what the children have learned through a presentation of some sort.
- Send a DVD of your students thanking the rancher.
- Plan a trip to the local ranch and thank the rancher for his/her stewardship and hard work.
- Contact the rancher to see if there is a way that your class can come volunteer with him/her.
- Possibilities are endless, based on the available resources in your community. Go as in-depth with these projects as you want. The directory includes ranchers from all over the state including every county. In the directory, any rancher marked with an * means that they are Centennial Ranchers, and their ranches have been running for over one hundred years. That's an amazing feat to recognize also! Be creative and, most importantly, have fun!

Assessment:

Read through the letters before they are sent in order to assess if the students are able to demonstrate the following criteria:

- Student shows an accurate understanding of the meaning of stewardship.
- Student provides an accurate list of the livestock in our state, with a focus on cattle and sheep.
- Student names various challenges that stewards of livestock face.
- Student identifies the way the letter recipient is a steward of Wyoming. *This answer should be focused around how the steward addresses the challenges within his/her field.*

Credits/Sources:

Not applicable

Student Letter

_____ (Heading)

(Greeting)

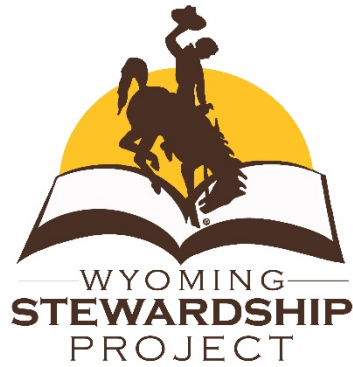
(Body)

_____ (Closing)

_____ (Signature)







Glossary

Agriculture	cultivating of the soil, producing of crops, and raising of livestock
Canine distemper	a contagious and serious viral illness that affects dogs and wildlife
Crop	a cultivated plant that is grown for food, fiber, medicine, or livestock feed
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.)
Farmer	a person who cultivates land for crops and may also raise livestock
Graze	verb: eat grass or forage in a pasture
Grazed	pasture grass that has been partially eaten by livestock
Larkspur	native plant with blue flowers that is poisonous when eaten by livestock
Livestock	animals kept for use and profit

Overgraze	a situation where too much of the forage in an area has been eaten, causing a negative effect on the plants
Pasture	fenced-in area of grazing land
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
Rancher	a person who raises livestock and may also cultivate the land for crops
Rotational grazing	the practice of moving grazing livestock between pastures as needed or on a regular schedule
Stewardship	As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations