Lesson Five: Piñata Party

Grade Level: 2nd Grade

Time: Part 1: 30 minutes; Part 2: 60 minutes; Part 3: 60 minutes

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

Objective: Students will:

- Simulate the mining process to understand how we extract natural resources and extraction's impact on land.
- Simulate the reclamation process to illustrate the complexity and environmental impact of remediating land disturbances from mining natural resources.

TEACHER NOTE: Connections from this lesson can be made to the terrain lessons from the 2nd Grade Outdoor Recreation & Tourism unit from the Wyoming Stewardship Project.

Purpose: Students learn that nonrenewable natural resources are mined from inside the earth; there are many stages of disturbance that take place for people to extract the nonrenewable natural resource, and how we can be stewards for Wyoming's nonrenewable natural resources for current and future generations by reclaiming mines when they are not being used.

Required Materials/Resources:

- Class/small group piñata materials: 1 empty tissue box/shoe box, tape, string, drawing paper, white paper, brown construction paper for the reclamation part of the lesson, art supplies: glue, construction paper, pipe cleaners, toilet paper tubes, tissue paper, etc. (one set of

TEACHER NOTE: Choosing a candy that students can eat will reinforce the idea that nonrenewable natural resources are consumed but not replenished.

supplies per small group unless the teacher chooses to make one piñata for the whole class)
- Extra crumpled paper placed inside the piñata to represent the earth that is removed during mining and replaced during reclamation
- White paper, markers, crayons, pencils (a set per student)
- "Natural Resource" for the piñata: candy or something useful to students such as erasers
- A tool to hit the piñata (baseball bat, broom stick, yard stick, etc.)
- Big pieces of butcher paper to collect the piñata pieces after they have been broken.
- Piñata Mining: Before Mining documentation sheet (one per student)
- Piñata Mining: After Mining documentation sheet (one per student)
- Piñata Mining: After Reclamation documentation sheet (one per student)
- "How is Coal Mined in Wyoming" PowerPoint presentation (Sources 3, 4)
- Video: https://www.youtube.com/watch?v=2LQwxTm94Ps *Take a Virtual Tour of Black Thunder Coal Mine* (Source 5) *Video length: 4 minutes 13 seconds*
- Video: https://www.youtube.com/watch?v=RRjZlYh0qM0 *Land Reclamation: The Process/Gold Rush.* (Source 2) *Video length: 2 minutes 24 seconds*
- Video: https://www.youtube.com/watch?v=3q1S-NOIwH8 *Reclamation*. (Source 1) *Video length: 1 minute 37 seconds*

Suggested Teacher Preparation:

- Decide whether you will make a class piñata or have small groups make their own. If you choose to do one for the whole class, this will adjust the format of the lesson.
- Gather materials for piñata(s).

- Preview the “How is Coal Mined in Wyoming” PowerPoint presentation. The first slide is a resource for students to use when designing the “before mining” landscape on their piñata(s).
- Preview and choose either the *Land Reclamation: The Process/Gold Rush* (Source 2) or *Reclamation* (Source 1) video to show to your students about reclamation in Part 3.

Standards:

Science: K-2-ETS1-2 (DCI, SEP)- (Explicit)
2-LS4-1 (DCI),2-ESS2-2, K-2-ETS1-1 (DCI)-(Practiced/Encountered),

Social Studies: SS2.5.4 (Explicit),
SS2.1.1(Practiced/Encountered)

ELA: 2.SL.1, 2.SL.2, 2.SL.6, 2.W.8 (Practiced/Encountered)

CVE: CV5.1.4, CV5.3.2 (Practiced/Encountered)

Vocabulary:

- **Coal** - a black/dark brown rock made from old plant matter found mainly underground. Coal is mined and used as fuel.
- **Conservation** - the careful utilization of a resource in order to prevent waste and leave some for future generations
- **Diversity** - a range of different things
- **Consumption** - using something up
- **Habitat** - the natural home or environment for a plant, animal or organism
- **Mine (mining)** – (verb) taking resources from the earth
- **Reclamation** - the act of returning something to a former, better state

Instructional Procedure/Steps:

PART 1: This activity gives an overview of the coal mining process.

1. Say: **"In this lesson, we are going to learn how some of Wyoming's nonrenewable resources are mined and the reclamation process which occurs after the resource is gone."** Review and discuss what nonrenewable natural resources we mine in Wyoming. *Coal, trona, bentonite, uranium.* Say: **"We are going to view a presentation that shows how coal is mined in Wyoming."** Show the "How is Coal Mined in Wyoming" PowerPoint presentation. When finished, ask students the following questions allowing them to respond before moving onto the next question:
    - **"What did you notice about the mining process?"**
    - **"What equipment did you notice?"**
    - **"Do you think they have always used that equipment in mining? Why or why not?"**
    - **"Why are we mining these resources?"** *Resources are used to make products that people use in their daily lives, mining benefits family and communities by providing jobs, etc.*

TEACHER NOTE: Teachers may want to document their students' thinking about mining and reclamation to serve as a resource for the final project. A possible tool could be another anchor chart.

2. Say: **"There are many things made from our nonrenewable natural resources in Wyoming. In this lesson, we are going to do an activity where we mine** _____ *(insert name of whatever "natural resource" you have chosen to place in the piñata)* **out of a piñata."**

3. Say: **"Today, we are going to create a model to represent the way people extract nonrenewable natural resources from mines. An important part of the mining process is to clean up after an area has been mined. Before mining, people study possible mining sites to see how much of the natural resource**

can be found. They will learn about the area and what needs to be done to restore it back to its original state. This is called reclamation. It is a Wyoming state law that all new mines are reclaimed."

4. Ask: **"What do you think the land looks like BEFORE it is mined?"** *There would be grasses, shrubs, and animals living there, etc*. Return to slide 1 of the PowerPoint presentation. Guide students to the idea that prior to mining, the land is most likely a habitat to plants and animals.

5. Say: **"When surface mining begins, the top layers of the land are removed or scraped away. Then, when they reach the hard coal, miners have to blast it to get it into movable pieces. The coal must be cleaned to remove rocks and other substances. We will model the scraping of the top layers of land and exploding our mine site to get to our resource, _____."** (*Insert your chosen "natural resource.")*

6. Ask: **"How many of you have ever been at an event where there was a piñata?"** Have students share out. Say: **"We are going to build a piñata to simulate our mine and inside will be materials including our valuable natural resource, _____."** (*Insert your chosen "natural resource.")*

PART 2: Building the piñata

1. Put students in groups or pairs and show them the supplies to make their piñatas. Say: **"Your groups will use these materials to create a landscape that is rich with natural resources."** Have students watch as you put the "natural resources" and cover them with crumpled paper to represent unwanted materials found

TEACHER NOTE: In Part 2, if you choose to do one piñata for the whole class, complete everything as a class instead of in groups.

when mining. When all materials are inside each box, close and tape them shut.

In this task, the students will be engaged in the higher order thinking skill of synthesis by designing a model of a landscape before the mining process, simulating the mining process, and modifying the model to show their understanding of reclamation.

2. Ask: **"What animals might be living on our land?"** *pronghorn, prairie dogs, snakes, birds, deer, skunks, raccoons, etc.* Ask: "**How might mining the land disturb their habitat?"** *Their homes are gone; their food is gone; they are exposed to predators, etc.* Ask: **"What plant life might be disturbed on your land?"** *trees, sagebrush, prairie grasses, etc.* Ask: **"How would the diversity of the area change?"** *There would be less diversity due to the changes of the habitat.*

3. Give groups 5-10 minutes to plan a landscape for their model. Pass out white paper to each student. Have each student sketch his/her own landscape idea. When time is up, have students bring their ideas back to their group.

4. After sketching time is up, have students reconvene in their small groups and share their drawings. Once students choose their landscape idea, say: **"It is important that we save these sketches to use in another part of this lesson. You will need to remember what your landscape looks like now."** Collect each group's chosen sketches. Next, give groups 10 minutes to explore their materials and make a plan to make their landscape. Make sure that groups use their planning time and do not dive into the building part right away. Teachers can check-in with groups during this time to monitor the planning process.

5. Pass out the closed and filled boxes and piñata supplies. Give students 25-30 minutes to build. All students should have access to the same materials and time. Groups need to work together to create the landscapes on their piñatas.

6. Once building is finished, pass out and have students complete the Before Mining documentation sheet. Students should draw what their piñata looks like before mining and answer the questions under their drawing.

PART 3: Piñata Mining, Reclamation, and Wrap-up

1. Say: **"Remember that valuable natural resources have been found in your land (piñata); miners are going to mine out those resources. Let's watch a video about the Black Thunder Coal Mine to review the mining process."** Play the mining video *Virtual Tour of Black Thunder Coal Mine* to review the mining process. Stop video at 2:52. It will be resumed later in the lesson. Have students model the process of removing the top layers of their piñata before exploding the area to get to the resources. Have students "scrape" (gently tear off) the top decorations off their piñata: trees, grasses, animals, etc. Ask: **"How do you usually get the candy out of a piñata?"** *Hit it.* Excitedly say: **"Yes! You hit the piñata. Hitting our piñata will simulate the explosion used to break up the hard ground to get to the resources deep in the earth."**

2. Give every student in each group an opportunity to swing at their piñata to try to get to the resources. Have one group mine their piñata at a time. They will need to try to keep their mining pieces in a particular area for the reclamation activity.

3. Have each group explode their mine and collect the "natural resource." Students can eat the natural resource if you have chosen a type of candy! Remind students that they need to "clean" the natural resource by separating the candy from the crumpled paper. Eating the candy provides an opportunity to bring forward the idea that nonrenewable natural resources are consumed and not replenished. Make sure students collect and keep the

TEACHER NOTE: Teacher will need to determine the best and safest way to have each group "explode" their piñata.

TEACHER NOTE: Students can explode their "mine" over a big piece of butcher paper, trash bag, or tablecloth to catch mining pieces for reclamation.

crumpled paper and all parts of piñata including what is left of the landscape and return them to their butcher pieces of paper.

4. Have each group examine their piñata now that it has been mined. Ask: **"How has it changed?"** Allow students to respond. Pass out the After Mining documentation sheets. Have students gather around their butcher paper with their collected mining site pieces. Students draw what their mining site looks like now. Pass back their Before Mining documentation sheets to compare how this mining site has changed. Have students answer questions at the bottom of the After Mining documentation sheet.

5. Debrief the activity by having students share their observations. When finished, say: **"It is a law that mining sites that stop mining natural resources must be reclaimed, so we are going to watch some videos that demonstrate the reclamation process."** Continue watching the video of the *Virtual tour of Black Thunder Coal Mine* from 2:52. When finished, play either the *Land Reclamation: The Process/Gold Rush* (Source 2) or *Reclamation* (Source 1) video. When both videos are done, ask students the following questions, allowing students to respond before moving on to the next one:
    - **"What did you see?"**
    - **"What equipment did you notice?"**
    - **"How was the equipment used in the reclamation process?"**

    Say: **"You now need to try and put your mining site piñata as close as possible to the way it was before mining. Make sure to also use your sketch to help you remember what it looked like. Remember, this was not always the process; miners didn't always have to reclaim mines. There are mines in the state that are not currently being mined but have also not been**

reclaimed. How can you be a steward in Wyoming and reclaim your mine?"

6. Give students time to examine their mined site and their materials for reclamation including their initial sketches. Provide students with tape, glue, string, brown construction paper, crumpled paper, markers, and crayons. These materials have been chosen, so students do not get the idea that they can just put back trees and established vegetation immediately. Also emphasize that students will have to use more crumpled paper than they took out of the ground to replace the space the natural resource occupied. Students should NOT have access to toilet paper tubes, pipe cleaners, etc. with which they could make trees. Have groups discuss their plans for reclamation.

7. When students are finished discussing, provide groups 15-20 minutes to "reclaim" their mining site. They must work on the butcher paper and can only use the materials specified in step 6.

8. As groups complete the reclamation of their mining piñata, pass out the After Reclamation documentation sheets, and have students draw what their reclaimed site looks like now. Pass back the previous documentation sheets for students to make comparisons. Have students complete the questions on the bottom of the After Reclamation documentation sheet.

9. **Assessment:** Have students review their responses from the Before Mining, After Mining and After Reclamation documentation sheet questions. Add new vocabulary terms: Reclamation, Consumption, and Habitat onto vocabulary anchor chart. Ask students the following questions allowing students to respond before moving on to the next one:

- **"Why do we mine?"**
- **"What do you notice about the mining process from beginning to end?"**
- **"How did this activity help you understand that nonrenewable natural resources are inherently limited?"**
- **"How did this activity help you understand the importance of land reclamation?"**
- **"How can we be stewards of Wyoming's minerals and energy to benefit current and future generations?"**

Listen to students' responses to check for understanding that nonrenewable resources (their candy) do not come back once they are mined (eaten). Yet, we mine the resources because they are valuable, and we need them. Reclamation is a time-consuming and expensive, but necessary process in order to be good stewards. If mines are not reclaimed, animals and plants will lose their habitats, and those resources will be lost for future generations.

10. When finished discussing, say: **"In a later lesson, we will learn about who is responsible for the taking out and selling of nonrenewable natural resources, and what role this plays in Wyoming's economy and culture."**

Credits/Sources:

1. University of Wyoming Extension: Exploring the Nature of Wyoming. (2013, December 16). *Reclamation*. Retrieved July 27, 2017, from https://www.youtube.com/watch?v=3q1S-NOIwH8
2. Discovery. (2015, December 8). *Land Reclamation: The Process/Gold Rush.* Retrieved July 27, 2017, from https://www.youtube.com/watch?v=RRjZlYh0qM0
3. PowerPoint images taken from the Wyoming Mining Association

4. Wyoming Mining Association. (2016). *2016 Wyoming Coal Overview*. Retrieved September 29, 2018, from http://www.wyomingmining.org/wp-content/uploads/2013/10/2016-WCIC-Wyoming-Coal-Overview_FINAL.pdf
5. archcoalcares. (2011, February 14). *Take a Virtual Tour of Black Thunder Coal Mine*. Retrieved September 29, 2018, from https://www.youtube.com/watch?v=2LQwxTm94Ps