



Lesson Six: Wyoming Coal - Past, Present, and Future

Grade Level: 2nd Grade

Time: 1 hour

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

Objective: Students will identify similarities and differences between past, present, and possible future locations of one of Wyoming's nonrenewable natural resources, coal.

Purpose: Students learn that Wyoming's production and extraction of its unique natural resources, specifically coal, have changed over time.

Required Materials/Resources:

- Chart paper
- Past, Current, and Potential Maps of Wyoming Coal Mines (copies to display) - (Source 2)
- Past, Current, and Potential Mines in Wyoming Reflection sheet (one per student)
- Beach ball (optional)

Suggested Teacher Preparation:

- Become familiar with the Wyoming Coal Mines maps.
- Create an anchor chart titled "Wyoming's Past, Current, and Potential Coal Mines."

- Read through the following information if you need more background information about coal:
<http://www.wyomingmining.org/wp-content/uploads/2015/10/2015-16-Concise-Guide-to-Wyoming-Coal.pdf> (Source 1)
- Choose between the beach ball (Source 4) and snowball assessment methods (Source 3) and prepare necessary materials.
- Maps used in this lesson will be needed again for Lesson 7.

Standards:

Science: K-2-ETS1-1 (SEP) - (Practiced/Encountered)

Social Studies: SS2.5.1, SS2.5.4 (Explicit)

ELA: 2.W.8, 2.SL.1, 2.SL.6 (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
- **Consumption** - using something up
- **Mine (mining)** – (verb) taking resources from the earth
- **Natural resources** - sources of life, materials, or energy that we are able to get naturally from the earth
- **Nonrenewable resources** - resources that cannot be replenished (made again) in a short period of time
- **Reclamation** - the act of returning something to a former, better state
- **Renewable resources** - resources that are capable of being replenished

Instructional Procedure/Steps:

1. To review, say: **“We have previously learned how natural resources play an important role in our daily lives. We have also learned that restoring a mine to its original state is called reclamation.”** Reference anchor charts as needed.
2. Display the Past Map of Wyoming Coal Mines. With the whole group, discuss the following question: **“What does this map show us?”** Have students brainstorm, and add their ideas to the anchor chart. Ask: **“What do you wonder?”** Allow students to respond. Discuss how the map shows Past Wyoming Coal Mines, and explain about the key if necessary.
3. Ask: **“Do you think the reclaimed mines shown are the only mines that existed in Wyoming that are currently not being mined?”** Allow students to respond. Say: **“Companies were not always required to reclaim mines; this has actually only been required for the past 37 years.”** Ask: **“Does this change your thoughts on previous mines, and if there are more mines than just the reclaimed mines? Why or why not?”** *It is important for students to make the connection that there are many mines in Wyoming that are not being mined, how not reclaiming those mines is not being a good steward of the land, and how current generations can work to fix the previous generations mines to reclaim them.*
4. Display the map of Current Wyoming Coal Mines. With the whole group, discuss the following questions: **“What does this map show us? What questions do you have about the map?”**
Once again track students’ thoughts on the anchor chart. *Students should notice that the majority of coal mines in Wyoming are in the northeast portion of the state.*

5. Say: **“The final map we are going to examine is one with potential Wyoming coal mines. If you think this map will have more mines, stand up. If you think there will be fewer mines, stay seated.”** Record on the anchor chart students’ reasoning for both sides. Display the map of Potential Wyoming Coal Mines. With the whole group, discuss the following question: **“What does this map show us? What questions do you have about this map?”** Record student thinking on the anchor chart. *Students should notice that there very few potential mine sites.*

6. Ask: **“Remember our popcorn activity and our discussion about conservation. Why is conservation of coal important?”** *There are only four future coal mine sites. Therefore, coal supplies are limited. “How could being a good steward of Wyoming’s resources help ensure that coal and other natural resources will continue to be available in the future?”* Have students turn and talk to discuss their ideas then share out with the whole group.

7. Ask: **“Using your observations, how has mining in Wyoming changed over time?”** *Students should notice that there are many active mines currently, and there are not many future potential mine sites. They should also infer that only some mining sites have been reclaimed. Ask: “How does this affect the people and communities in those areas?”* *Students should begin to see connections between mining and the economy (jobs, number of people that live there, and how many aspects of the community could change when a mine stops mining). Students may also be able to share personal connections (family moved because Dad or Mom changed jobs). Be sure to include this point if it is not mentioned.*

8. Pass out the Past, Current, and Potential Mines in

Wyoming Reflection sheets. Have students refer to the anchor chart and discussion to complete the sheet. Collect them when finished and check for student understanding.

Assessment:

Use either the beach ball review or snowball method to check for students' understanding of concepts from the unit so far and today's lesson.

Beach Ball Review: On a beach ball, write the following questions for review:

- What are renewable natural resources?
- What are nonrenewable natural resources?
- What are 3 nonrenewable resources in Wyoming?
- What is 1 product we get from a nonrenewable natural resource?
- How do you use natural resources in your daily life?
- Where are the majority of active mines located in Wyoming?
- What is one way Wyoming is important because of its mineral and resource production?
- How can we be good stewards of Wyoming's natural resources for future generations?

The goal of this game is to go over questions while playing catch. The students pass the ball and when they catch it they answer the question where their right thumb is touching.

Snowball "Fight" assessment method: Write the questions listed above on pieces of paper and crumple them up into a ball. Students throw the "snowballs" until teacher calls time. When time is up, they open a "snowball" close to them and answer the question with the person standing next to them. Write only one question on each piece of paper. If necessary, make multiple copies of the questions so all students have a "snowball" to toss, open, and answer.

Credits/Sources:

1. Wyoming Mining Association. (2015-2016). *The 2015-2016 Concise Guide to Wyoming Coal*. Retrieved July 27, 2017, from <http://www.wyomingmining.org/wp-content/uploads/2015/10/2015-16-Concise-Guide-to-Wyoming-Coal.pdf>
2. Wyoming Mining Association. (n.d.) *Wyoming's Coal Mines*. Retrieved August 7, 2017, from <http://www.wyomingmining.org/wp-content/uploads/2013/10/131112-Wyoming-Coal-Mines.jpg>
3. youthgroupgames.com.au. (2018) *Snowball Fight*. Retrieved September 30, 2018, from <https://youthgroupgames.com.au/games/686/snowball-fight/>
4. Ideas for Teacher. (2011, March 16). *Beach Ball Review*. Retrieved September 30, 2018, from <http://www.ideasforteachers.org/classroom-activities/beach-ball-review>