



Lesson Three: Abundant Energy Resources

Grade Level: 4th Grade

Time: 60 minutes. This could be extended into two days. (Group research occurs on the first day; presentations occur on the second day.)

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

Objective: Students will gain an understanding about Wyoming's minerals and energy resources by creating anchor charts for future work.

Purpose: Students learn about Wyoming's different minerals and energy resources.

Required Materials/Resources:

- Mineral and Natural Resource cards (one per student)
- Wyoming Energy Resources graphic organizer (one per student)
- Map of Wyoming Hydropower plants (one copy for every student in the group) (Source 2)
- Chart paper (one per group)
- Markers, colored pencils, etc.

TEACHER NOTE:
Save the Resource Cards. They will be used again in Lesson 5.

- Resource Maps from the Wyoming Student Atlas (one copy of a group's map for every student in a group) - (Source 1). Page numbers are located in the upper right-hand corner.
<http://uwmaps.wygisc.org/studentAtlas/index.html?page=1>
 - Oil - page 39
 - Natural Gas - page 39
 - Coal - page 40
 - Uranium - page 41
 - Wind - page 42

Suggested Teacher Preparation:

- Familiarize yourself with the Resource Maps from the Wyoming Student Atlas about each mineral or energy resource. Request hard copies in advance from the Wyoming Geographic Alliance (wga@uwyo.edu, 307-766-3213) if you want to have them for future use or if you cannot access the digital version.
- Have groups access their resource maps on electronic devices OR make copies of each resource map for its matching student group. (For example, each student in the coal group receives a copy of the coal map.)
- Copy and cut apart enough Mineral and Natural Resource cards, so there is one for each student. (You may need to make multiple copies of some images based on the size of your class. These cards will determine small groups and the resource that each group is studying. The cards have 6 energy sources (groups) with four pictures/members for each group.)

Standards:

Social Studies: SS2.5.2 (Practiced/Encountered)

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


CVE: CV5.2.2 (Practiced/Encountered)

Vocabulary:

- **Energy** - power derived from the utilization of natural resources, especially to provide light and heat or to power machines; useable power
- **Natural resources** - sources of life, materials, or energy that we are able to get naturally from the earth

Instructional Procedure/Steps:

1. Ask: **“What does the term ‘natural resources’ mean?”**
After allowing students to respond, provide students with the definition: **“Natural resources are sources of life, materials, or energy that we are able to get naturally from the earth.”**
2. Ask: **“What does the word energy mean?”** After allowing students to respond, provide students with the definition: **“Energy is usable power.”** Connect this definition to students’ previous responses.
3. Pass out a Mineral and Natural Resource card to each student. Have students move around the room to find other students who have an image related to the same natural resource. This will determine the small groups students will work in.

4.  Once students are in groups, give every student a copy of their resource map. The resource map each group receives should be the one related to their Mineral and Natural Resource card. Have groups analyze their map and the text on it to become experts on their Wyoming resource. When groups are finished learning about their resource, pass out a piece of chart paper to each group. Each group should create a poster to share their findings with the rest of the class. Posters should include:
 - A description about what the resource is.
 - Facts about how the resource is unique or important to Wyoming, and
 - Primary locations in Wyoming where the resource is found.

TEACHER NOTE:
Students may name resources such as water, plants, etc. If they haven't named any mineral or energy resources, ask them to think back to the text they read in Lesson 2, and name resources that were mentioned there.



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

TEACHER NOTE: In order to maximize engagement, teachers may opt to assign “jobs” within groups such as secretary, time manager, discussion director, etc. For the location aspects, it is acceptable for students to only name the region: northwest, southwest, etc.

TEACHER NOTE:

Teachers may want to discuss with students that the term energy can have multiple meanings. "Useable power" is the definition used in this unit.

TEACHER NOTE: As groups are sharing, point out that the locations of mineral resources are determined by geology. Humans can't control where they are located.

Students do not need to provide in-depth information about their assigned resources at this point. This activity just provides an overview. More in-depth information will be added in Lesson 4.

5. After posters are completed, pass out the Wyoming Energy Resources graphic organizers. Have groups either present their poster to the whole class, or have students complete a gallery walk (Source 3). As students learn about the various resources, they should complete their graphic organizers with information from the other groups' posters.
6. Display posters throughout the classroom as anchor charts.

Assessment: Collect students' completed graphic organizers. Check them for accuracy of information. For group posters, use the requirements listed in step four as a checklist to evaluate posters for correct information.

Credits/Sources:

1. Hammerlink, J.D., Webster, G.R., & Berendsen, M.E. (2014). *Wyoming Student Atlas: Exploring our Geography*. Laramie:Wyoming: University of Wyoming.
<http://uwmaps.wygisc.org/studentAtlas/index.html?page=1>
2. Stafford, J. Wyoming State Geological Survey (2012, February). *Wyoming's Electrical Generation: Summary Report*. Retrieved June 22, 2017, from <http://www.wsgs.wyo.gov/products/wsgs-2012-electricalgeneration-summary.pdf>
3. Facing History and Ourselves. (2018). *Gallery Walk*. Retrieved October 2, 2018, from <https://www.facinghistory.org/resource-library/teaching-strategies/gallery-walk>
4. Photo credits are listed on images.