



Lesson Five: Where Does the Wyoming Wind Blow?

Grade Level: 3rd Grade

Time: 45 minutes

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

Objective: Students will compare and graph the amount of wind in different Wyoming counties.

Purpose: Students learn that Wyoming has a lot of wind, so the state has the potential to generate additional electricity using wind.

Required Materials/Resources:

- Wind Prospector website (Source 1)
https://maps.nrel.gov/wind-prospector/#/?aL=Rh9Ekq%255Bv%255D%3Dt%26fW_HB8%255Bv%255D%3Dt%26fW_HB8%255Bd%255D%3D1%26W-cXK6%255Bv%255D%3Dt%26W-cXK6%255Bd%255D%3D2&bL=groad&cE=0&lR=0&mC=43.06086137134326%2C-107.237548828125&zL=7
- Blank Wyoming Map (one per student)
- Wyoming Energy Bar Graph (one per student)

Suggested Teacher Preparation:

- Load and practice with the Wind Prospector website (If it is not accessible, screen shots are available for use on a document camera or projector).

Standards:

Science: 3-ESS2-1 (Practiced/Encountered)

ELA: 3.RI.7 (Practiced/Encountered)

Math: 3.MD.3, MP4 (Practiced/Encountered)

CVE: CV5.3.3 (practiced/encountered)

Vocabulary: No new terms are introduced in this lesson.

Instructional Procedure/Steps:

1. Say: **“In our last lesson, we learned how a wind turbine works. Today, we are going to look at how much wind occurs in the different counties in Wyoming. We know that wind is a renewable resource. If Wyoming can generate more electricity using wind, we are being stewards for future generations of Wyoming citizens.”** Pass out the Blank Wyoming Maps. Project the Wind Prospector website.
https://maps.nrel.gov/wind-prospector/#/?aL=Rh9Ekq%255Bv%255D%3Dt%26fW_HB8%255Bv%255D%3Dt%26fW_HB8%255Bd%255D%3D1%26W-cXK6%255Bv%255D%3Dt%26W-cXK6%255Bd%255D%3D2&bL=groad&cE=0&lR=0&mC=43.06086137134326%2C-107.237548828125&zL=7
Click on the “Legend” tab to project the key for what colors represent the different wind speeds. Move the “Transparency” sliders for state and county borders and the Color to 100%. Pass out the Wyoming Energy Bar Graphs.
2. Say: **“Using your county map, find Campbell County on the Wind map. What color is the most in Campbell county?”** *Yellow.* **“Since it is mostly yellow and dark yellow, draw the bar for Campbell County to the 8 meters/second.”** Have students complete that bar.

TEACHER NOTE:
The website takes time to load.

TEACHER NOTE:
Refer to the highest whole number for the color shade.

3. Have students individually complete the remainder of the bar graph and answer the questions below it. For the last county, fill in your own. If your county is already listed, choose a different county for all of your students to use. *Answers are: Converse - 9 m/s, Sublette - 5 m/s, Uinta - 7 m/s, Washakie - 4 m/s. The answer for question 1 should be Converse unless your free choice county has more than it. The "why" should be it has the fastest wind. Answer for question 2 should be a county that has high wind speeds. Answer for question 3 should be yes because the majority of the state has fast winds.*

4.     When all students complete the bar graph and answer the questions, collect papers and reconvene the class. Say: **"We are now going to look at one more thing with this map."** Zoom out the map using the minus sign in the upper right-hand corner (2 clicks), so the western United States is visible. Say: **"What do we notice?"** *Students should see that Wyoming has some of the strongest winds.* Use Think-Pair-Share to facilitate a discussion with the following questions:
- **"Could Wyoming build more wind farms to produce electricity and be stewards?"**
 - **"Is there any way you could use wind power on a small scale at your home to run some of your personal electronic devices?"**
 - **"How could using more wind power help future generations?"**

Assessment: Wyoming Energy Bar Graph. Answers to questions 1 and 3 are the key checks for understanding. In addition, the bar graph should be completed correctly.



In this task, students will be engaged in the higher order thinking skills of application, analysis, synthesis, and evaluation as they apply the knowledge they are gaining from the map to analyze patterns so they can evaluate and predict new counties to place wind turbines in Wyoming.

Credits/Sources:

1. National Renewable Energy Library. (n.d.). *Wind Prospector: Map of Wyoming*. Retrieved June 28, 2017, from https://maps.nrel.gov/wind-prospector/#/?aL=Rh9Ekq%255Bv%255D%3Dt%26fW_HB8%255Bv%255D%3Dt%26fW_HB8%255Bd%255D%3D1%26W-cXK6%255Bv%255D%3Dt%26W-cXK6%255Bd%255D%3D2&bL=groad&cE=0&lR=0&mC=43.06086137134326%2C-107.237548828125&zL=7