

Title: *Is there a WIN-WIN?*

Overview/Annotation: Students will learn the meaning of both natural renewable and nonrenewable resources. Students will work in pairs to research uses of energy from these types of resources. Students will also deliberate the affects these types of resources may have on our environment.

Associated Standards and Objectives

Content Standard(s): SC2015 (4) 5. Compile information to describe how the use of energy derived from natural renewable and nonrenewable resources affects the environment (e.g., constructing dams to harness energy from water, a renewable resource, while causing a loss of animal habitats; burning of fossil fuels, a nonrenewable resource, while causing an increase in air pollution; installing solar panels to harness energy from the sun, a renewable resource, while requiring specialized materials that necessitate mining).

Local/National Standards: [W.4.7] Conduct short research projects that build knowledge through investigation of different aspects of a topic.

Primary Learning Objective(s): **Learning Targets**

I can:

- Define a natural renewable resource and give an example.
- Define a natural nonrenewable resource and give an example.
- Describe a type of energy gained from at least one renewable and nonrenewable resource.
- Build knowledge about a topic through research.
- Develop a logical argument about how a natural renewable resource or nonrenewable resource can harm or not harm our environment.
- Develop a technology based presentation (Discovery Education board, Prezi, PowerPoint, Wiki) referencing your thoughts and opinion on how these resources harm or do not harm our environment.

Preparation Information

Total Duration: 91 to 120 Minutes

Materials and Resources: White board or chart paper (teacher choice)

Science notebooks/journals

Technology Resources Needed:

- Interactive white board
- PBS Learning video – [Energy Sources](#)
- Wordle - free word cloud site
- Classroom Wiki (optional) - free
- [Prezi Presentation](#)
- Kahoot.it [Assessment](#)

- Laptop, computer, or tablet (1 per 2-3 students)
- Computer lab (if available)

Background/Preparation:

- Students must be knowledgeable about energy having the ability to change from one form to another. This should be a natural follow-up from standard 4.
- Students should be capable of using a computer/laptop and appropriate search engines.
- Students should have knowledge of making an interactive presentation (PowerPoint, Prezi, Discovery Ed board, etc.).

Procedures/Activities:

ENGAGEMENT: Teacher will utilize one of two videos to prompt discussion about renewable and nonrenewable resources.

- PBS Learning video – [Energy Sources](#)

Silence is Golden is a strategy explained on the Discovery Education website. First, the teacher will show the video clip once **WITHOUT SOUND**, pausing at different times for students to brainstorm what they are seeing. The students will work independently and utilize [Wordle](#) for their brainstorming platform. This will enable students to sit quietly and simply type words into the document while they are watching the video without sound. When video has finished, allow students to reflect by presenting their [Wordle](#) to the class as a whole. They should practice all classroom norms with their listening and speaking skills.

Teacher will repeat the process again, however, this time by play the video **WITH SOUND**, pausing at different times. Students can again utilize [Wordle](#) to brainstorm. Teacher must urge students to focus on what they saw and now what they are hearing, now really focusing on listening skills. Once again, allow students to present their findings. Teacher must use questioning* to find out if their two brainstorming activities aligned with the same words and thoughts (e.g. water, trees, plants, soil, coal, oil, minerals, air, wind, sunlight). Teacher may want to print a few (or all) of the [Wordle](#) documents to use as a reference in the creation process. *Attached is a sample Wordle brainstorming product.

Questioning:

Build Intrinsic Interest

- Name something that you have enough supply of that you can use when it is needed?
- Name another something that you do not have enough supply of that you can use when it is needed?

Assess Prior Knowledge

- What are the functions of these items?
- How do you have enough of one and not the other?

FocusQuestion Does the fact that some of these items are endless and others are not affect our environment?

EXPLORATION:

Day 1 Explore:

I Do – Using the responses from the video, teacher will give each pair of students one of the resources listed.

First and foremost, teacher will demonstrate use of appropriate search engines and websites to gain information about what type of energy is produced from the resource. For example, teacher can pull up “Google” and type “energy produced from water”. Immediately the students will see a definition about hydroelectric power plants. Teacher will also demonstrate how students should take notes in their science journal, listing any information they can find about their natural resource. Teacher should stress to students to keep all information (URL, website, etc.) to give credit to those whose work they researched.

We Do – Students will work with partners to explore the web to compile information about how their natural resource produces energy. Students will add their information electronically to a classroom wiki page. If a classroom wiki page is not available, this information can easily be compiled on chart paper. Students may also use the following questions to help guide their thoughts and research.

Questioning:

Observe Student Action & Redirect

- What type of energy does your resource provide for you and me?
- Do you use that type of energy? (E.g. dams to harness energy, burning fossil fuel, solar panels)
- Do you think this type of resource is a good thing or bad thing?

Identify Patterns and Relationships

- What do you know personally about this type of resource?
- Have you ever seen this resource being used?

Day 2 Explore:

I Do – Teacher can work whole group with students and utilize classroom Wiki page to view all information shared by each students on Day 1 **or pull chart paper from previous day**. This information should be left up and visible for students to refer.

Questioning:

Inquiry - Is there any harm to our environment through the production of your energy through the renewable or nonrenewable resource you researched? If yes, is there a solution? Explain.

We Do – Students will again work in pairs to research affects caused by using energy from these renewable or nonrenewable resources (e.g. constructing dams while causing a loss of animal habitats; burning fossil fuels while causing air pollution; installing solar panels that require specialized materials necessitating mining). They must utilize the classroom Wiki to record their findings.

EXPLANATION:

Teacher – The teacher will again utilize the classroom Wiki **or charted responses** to view information shared by students from Day 2 research. At this point, teacher should show students the Prezi presentation to clear up any misconceptions that might have been gained from their research and reported on the classroom Wiki.

Renewable and Nonrenewable Prezi presentation. If hyperlink does not connect you directly, the following link may be cut and paste into your address bar: https://prezi.com/cg7rubapmayz/present/?auth_key=i12u6pu&follow=2xxco8boxre

Teacher – The teacher will use questioning to make sure that students recognize the negative effects to our environment through the use of these resources.

Questioning:

Student Theories

- Which resources, renewable or nonrenewable, should we continue to use as energy sources?
- What is the problem with renewable and nonrenewable resources?
- What are the consequences of using these types of resources? Explain your reasoning.

Reflecting on Personal Ideas

- Do you think that these few research findings are something we should really get upset about?
- Do you think these changes will effect where we live?
- Can we do anything to change these things?
- Do you believe we should use all renewable or all nonrenewable resources?

Scientific Knowledge

- What is a renewable resource? Give me one example.
- What is a nonrenewable resource? Give me one example.
- Describe at least one energy gained from a renewable or nonrenewable resource?

- Can you distinguish between a renewable and nonrenewable resource?

Developing New Knowledge - Today you learned that our earth contains natural resources that can be inexhaustible (never be used up), renewable (used over and over), and nonrenewable (cannot be made again in our lifetime). You also learned that some of these natural resources are used to produce energy that we all use. However, with your research, you recognize that there are many negative effects on our environment also.

ELABORATION:

Group: Students will develop a PowerPoint, Discovery Education board, or a Prezi convincing someone to believe what you believe. They must use a logical argument to persuade others about these energy resources. They must prove their argument with information gained from research on the computer as well as cite research source(s). The project must be completed collaboratively with their partner and presented to the class as a speaking grade.

Teacher needs to review grading rubric (see attached) before allowing students to get started with project.

Individual: Students will develop another Wordle, however, it must reflect their understanding of the renewable and nonrenewable resources. Teacher must remind students that the words typed most often in Wordle will show up the largest, which should be the words they feel are most important.

Teacher needs to review grading rubric (see attached) with the students before allowing them to get started.

Attachments:

**Some files will display in a new window. Others will prompt you to download.

[Oral-Presentation-Rubric.pdf](#)

[Wordle-Rubric.pdf](#)

[4-Square-Writing-Template-for-Renewable-and-Nonrenewable-Energy.pdf](#)

Assessment

EVALUATION:

Individual Assessment:

- Students will be assessed individually on their Wordle creation using the attached rubric.
- Students will be assessed using the Kahoot.it application [Formative Assessment](#)

Group Assessment:

- Students will be assessed individually for their participation in the group project using the attached grading rubric.

Acceleration:

Intervention: Differentiation Strategies: Students needing assistance with research can be paired with a higher level student during computer time. Additionally, the teacher will use the 4-Square

Writing process and specific questions to guide their presentation building (writing guide attached).