

Renewable and Nonrenewable Sources of Energy

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Grade Level 4
Duration 4-5 class periods

National Standards	AZ Standards	Arizona Social Science Standards
<p>GEOGRAPHY ELEMENT 6: ENVIRONMENT AND SOCIETY 16. The changes that occur in the meaning, use, distribution, and importance of resources Element 6: The Uses of Geography 18. How to apply geography to interpret the present and plan for the future</p>	<p>ELA Reading Integration of Knowledge and Ideas 4.RI.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears 4.RI.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. Writing Production and Distribution of Writing 4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience Research to Build and Present Knowledge 4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic</p> <p>SCIENCE Physical Science Standards 4.P4U3.4. Engage in argument from evidence on the use and impact of renewable and nonrenewable resources to generate electricity.</p>	<p>GEOGRAPHY Examining human population and movement helps individuals understand past, present, and future conditions on Earth’s surface. 4.G3.1 Explain how the location and use of resources affects human settlement and movement. Human-environment interactions are essential aspects of human life in all societies. 4.G2.1 Compare the diverse ways people or groups of people have impacted, modified, or adapted to the environment of the America</p>

SIOP Elements		
<p>Preparation Adapting content Linking to background Linking to past learning Strategies used</p>	<p>Scaffolding Modeling Guided practice Independent practice Comprehensible input</p>	<p>Grouping Option Whole class Small groups Partners Independent</p>
<p>Integrating Processes Reading Writing Speaking Listening</p>	<p>Application Hands on Meaningful Linked to objectives Promotes engagement</p>	<p>Assessment Individual Group Written Oral</p>

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Arizona English Language Proficiency Standards

Grade 4-5

Basic

Listening and Reading

Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: determine the central idea (in informational text) and theme (in literary text) and explain how they are supported by key details.

B-2: recount specific details and information in a variety of texts.

Standard 2 By the end of each language proficiency level, an English learner can determine the meaning of words and phrases in oral presentations and literary and informational text.

B-1: determine the meaning of frequently occurring academic and content-specific words and phrases.

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-1: deliver short oral presentations that include some details to develop a topic.

B-3: compose informational texts that include details to develop a topic while using appropriate conventions.

Overview

Future generations should be sensitive to the harmful impact of overusage of fossil fuels and its relationship to climate change. Students should understand that today's use of resources determines what people of the future will have to use and in what environment—a healthy one or an unhealthy one they will reside. Therefore, the essential question of this lesson is “What is the impact of over-consumption of nonrenewable energy and how can we avoid it?”

Purpose

In this lesson, students will connect the concepts of renewable resources and alternative resources to possible solutions for climate change and global warming.

Key Vocabulary

pollution - the action or process of making land, water, air, etc., dirty and not safe or suitable to use

fossil fuel - a fuel (such as coal, oil, or natural gas) that is formed in the earth from dead plants or animals

climate change – change in the pattern of climate of a region

sustainable - able to be used without being completely used up or destroyed

renewable resource - a natural resource that the environment continues to supply or replace as it is used

resource - any useful material found in the environment

nonrenewable resource - a resource that cannot be replaced once it is used

Materials

- Renewable and Non-Renewable Energy PowerPoint (must have Teachers Pay Teachers account) (free video by twinkl)
<https://www.teacherspayteachers.com/Product/REE-Renewable-and-Non-Renewable-Resources-PowerPoint-3938170?st=19a87b579587576f9016239e93c83277>
- PowerPoint Notes worksheet and Answer Key
- Projection device
- Vocabulary Cards
- My Group's Energy Source worksheet
- Renewable and Nonrenewable Sources of Energy Presentation Notes graphic organizer
- Smart Science with Bill Nye the Science Guy: Renewable Energy. Bill Nye's YouTube Video. (3.07 min)
<https://www.youtube.com/watch?v=grl3BDSGC4>
- Optional: YouTube Video Renewable vs Non-Renewable by Steve Trash Science (13.20 min)
<https://www.youtube.com/watch?v=osBVRfvmAU>

Renewable and Nonrenewable Sources of Energy

- Scoring Rubric for Poster
- Art supplies and poster paper
- Vocabulary Test and Answer Key

Objectives

The student will be able to:

1. Identify energy as a renewable or nonrenewable resource.
2. Analyze the effects of using fossil fuels on our planet.
3. Explain potential solutions to avoid using fossil fuels.

Procedures

Prerequisite Knowledge: Students should know the meaning and different forms of energy. Students should know how to make keynote presentation
Prior to the Lesson: Determine if Option A or B best fits your students.

SESSION ONE

Engage:

1. Begin the lesson by reviewing 1) what is energy, 2) why do we need energy, and 3) forms of energy. Then explain that today they will be exploring different sources of energy.
2. Distribute the PowerPoint Notes worksheet. Project the Renewable and Non-Renewable Energy PowerPoint. (Must have Teachers Pay Teachers account to access the free PPT.) Use worksheet question #1 to model how to fill in the blanks from the slideshow.
3. Discuss the slides as they are shown. Give students time for them to identify with yellow crayon (non-renewable resources) and with green crayons (renewable resources).
(Preparation: Linking to past learning, Scaffolding: Comprehensible input; Application: Linked to objectives; Grouping Option: Whole class)

SESSION TWO

Explore:

3. Begin the session by projecting the Vocabulary Cards and discussing them building on what was learned yesterday and adding the new terms (fossil fuel, pollution, sustainable, and climate change). Post the cards on the Word Wall.
4. Divide students into nine groups connected with different sources of energy listed in the PowerPoint - solar, wind, geothermal, hydropower, biomass, coal, oil, gas, and

nuclear. Assign each group one of the energy sources.

5. Explain that each group will conduct research to find out more about their topic and to complete the student handout. Distribute the My Group's Energy Source worksheet and explain how to gather information on their specific type of energy. Go through the questions they will be researching to clarify what is wanted. Explain the three websites at the bottom are good for beginning their research but each group needs to list all websites that are used. **(Preparation: Strategies Used; Integrating Processes: Reading, Writing; Application: Hands-on, Promotes engagement; grouping Option: Small groups)**

SESSION THREE

Explain:

6. Distribute the Renewable and Nonrenewable Sources of Energy Presentation Notes graphic organizer.
7. Have student groups present their findings to orally to the class. Students will collect data on the energy sources using the graphic organizer. **(Integrated Processes: Speaking, Listening, Writing)**

Elaborate:

8. Continue the discussion of the renewable energy and climate change by showing Smart Science with Bill Nye the Science Guy: Renewable Energy. YouTube Video. (3.07 min) <https://www.youtube.com/watch?v=gri3BDSGE> **C4 (Scaffolding: Comprehensible Input; Application: Promotes Engagement)**

SESSION FOUR AND FIVE

9. Ask students to make a list of energy resources used by their families and communities (air conditioning, cars, light, computer, etc.). Have them share their responses with a partner and add items from the partner's list to their list. As partners, sort their items as renewable and nonrenewable. **(Integrating Processes: Speaking, Listening, Writing; Grouping Option: Partners)**
10. Instruct students to pick at least 3 nonrenewable resources and think of an alternative to using this energy source. (We use gasoline in our car to come to school - We will walk to school or use a hybrid car.)
11. Explain that students will make poster pledges with their solutions and present it to class. Project and distribute the Scoring Rubric for

Renewable and Nonrenewable Sources of Energy

Poster. Explain what is expected for an exemplary poster. Allow time for students to gather art supplies and work. The posters can be an individual project or a group project.

(Application: Hands on, Linked to Objectives)

12. Student will appreciate the others' posters via a gallery walk. This can be done as a peer evaluation with students making 1) one comment in writing on what they liked about the poster and 2) one comment about what they wished the poster had included. **(Application: Promotes engagement)**

Evaluate: (See Assessment)

Assessment

Social Science, Science and ELA

The PowerPoint Notes worksheet, the My Group's Energy Source worksheet, and the Renewable and Nonrenewable Sources of Energy Presentation Notes graphic organizer can be graded for completeness and accuracy. Mastery will be considered a score of 80% or higher. **(Assessment: Written, Individual or Group)**

The poster can be evaluated using the Scoring Rubric for Poster. Mastery will be considered a score of 120 points or more. **(Assessment: Written, Individual or Group)**

Vocabulary Test can be given to measure language acquisition. Mastery will be considered a score of 80% or higher. **(Assessment: Written, Individual or Group)**

Extensions

The students could create a day in the life of a family that doesn't use any fossil fuels.

The students could create a model for a car that is run by alternative energy like solar or wind energy.

Sources

YouTube Video Renewable vs Non-Renewable by Steve Trash Science (13.20 min)
<https://www.youtube.com/watch?v=osBVRfvkMAU>

Smart Science with Bill Nye the Science Guy: Renewable Energy. YouTube Video. (3.07 min)
<https://www.youtube.com/watch?v=grl3BDSGEC4>

Renewable and Non-Renewable Energy PowerPoint
<https://www.teacherspayteachers.com/Product/FRE-E-Renewable-and-Non-Renewable-Resources-PowerPoint-3938170?st=19a87b579587576f9016239e93c83277>

Suggested Optional Resources- Alternative energy Read-Alouds for student research (Step 4)

Solar energy-Energy from the Sun (4.27 min)
<https://www.youtube.com/watch?v=wBs3GlaAWek>

Wind Energy – How it Works: Windmills (7:02 min)
<https://www.youtube.com/watch?v=REnbwDme0Ho>