Here Today, Gone Tomorrow

Standards of Learning
Science 3.11, 4.9

Objective
Students will:
- Identify sources of energy and their uses
- Describe how fossil fuels are used as an energy source
- Understand renewable and nonrenewable energy resources
- Analyze the advantages and disadvantages of using different naturally occurring energy resources

Materials
- Dictionary
- Concept definition maps (template provided)
- Clue cards (handout provided)
- Renewable or Not? worksheet for each student (handout provided)

Background Knowledge
This lesson focuses on the difference between renewable and nonrenewable resources and examples of each. It includes the use of solar energy as an alternative to nonrenewable fossil fuels for heat and electricity. A renewable resource is one which can be replaced or replenished. Examples are trees. A nonrenewable resource is one which cannot be replaced and once it is used up, it is gone forever. An example is gold. People use fossil fuels, such as coal, oil, and natural gas, for electricity, heat, and transportation. Since fossil fuels are nonrenewable, once they are used up, people must have other sources of energy for heat and electricity. The sun is another energy source we can use for heat and electricity. Corn, soybeans, sugar cane and other agricultural products are being used to produce fuel. These resources are renewable.

Procedure
1. Ask the students what the word "renewable" means. (*Tell them to make guesses using clues from the word even if they do not know its meaning*.)
2. If no one knows its meaning, ask a student to look up the word in a dictionary and read the definition to the class.
3. Discuss this definition as a class and ask a student to define the word in terms which are easier to understand.
4. Once students understand that renewable means it can be replenished or replaced, ask them to think about what a renewable resource may be.
5. Ask if any students know this term and if they can give an example of a renewable resource.
6. Tell the students that a renewable resource is a resource that we use that can be replaced or replenished. These resources may be replaced by nature or by people.
7. Tell the students that one example of a renewable resource is trees. Trees are renewable because even though trees die or are cut down, they naturally continue to grow from seeds or are planted by people.
8. Have students complete the concept-definition map for the term *renewable.*

9. Tell the students to use this information to define what a nonrenewable resource may be.
10. Explain to the students that nonrenewable resources cannot be replaced and once they are used up, they are gone forever.
11. Have students create a concept-definition map for *nonrenewable.*
12. Break the class into groups of four.
13. Hand a clue card to each student. (The students in one group should all have different cards.)
14. Ask the students to read their clue aloud to their group.
15. After they have all read their clues, tell them to use this information to complete the Renewable or Nonrenewable? worksheet with their group members.
16. After all the groups have completed the worksheet, go over the questions as a class.
17. Ask the students if fossil fuels, such as coal, oil, and natural gas, are renewable or nonrenewable resources.
18. Tell the students that fossil fuels are nonrenewable because it takes millions of years for them to form in nature.
19. Ask the students the following questions:
    - What do we use coal, oil, and natural gas for?
    - If these are nonrenewable resources, what does that mean for our electricity, heat, and automobiles?
    - What do we need to do in case these fossil fuels become used up?
20. Tell the students that the sun is the source of almost all energy on Earth and its heat can be used as an energy source for heat and electricity.
21. Ask the students:
    - Do you think the sun's energy is a nonrenewable resource, like fossil fuels?
    - Since solar energy is continually available, would it be a good resource to use to generate electricity?
22. Tell the students that this is continually being studied and many people have already begun to use solar heaters to heat their homes and some businesses use solar energy as an electricity source.
23. Ask the students:
    - Do you think using solar heaters in homes is a good idea? Why or why not?
    - What are the advantages of using renewable resources in place of nonrenewable resources?
    - What are the disadvantages?

What does it mean? _____

_____

_____

_____

_____

_____

What is an example? _____

_____

_____

Term: _____

Draw a picture to represent it.

Cut these clue cards apart and give one to each student. In each group of four, the students should all have different questions.

Some resources on Earth have only limited amounts and cannot be replaced by nature or by people's actions.	**Some resources on Earth are continually available to use if they are properly cared for.**
Once resources such as fossil fuels (oil, coal, and natural gas) and minerals (iron and copper) are used up, they are gone forever.	**Resources such as crops and animals can be continually replaced through nature or by people's actions.**

Name: _____ **Date:** _____

Renewable or Nonrenewable?

Instructions: With your group, answer the following questions using your group's clue cards.

1. Decide if these resources are renewable or nonrenewable and write the answer in the blank.

a) corn grown in fields _____

b) oil found in the ground _____

c) trout living in streams _____

d) trees growing in a forest _____

e) coal found in a mountain _____

f) apples grown in an orchard _____

g) cows living on a dairy farm _____

h) gold found in rocks _____

2. If there is a limited amount of a resource, can it be replenished?

_____

3. Once our limited resources are used up, how long will they be gone?

_____

4. What do we need to do now so that some of our resources will stay available all the time?

_____

_____

5. How do our renewable resources get replenished?

_____

_____