

GROW YOUR PALS PROGRAM GUIDE



THE NATIONAL FFA MENTORING PROGRAM

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LESSON 6

Benefits of Renewable Energy, Why should we use it?

Unit:
RENEWABLE ENERGY

PRECEPTS

- C. Vision
 - C5. Persuade others to commit
- E. Awareness
 - E1. Address issues important to the community



Lesson Type:
Large Group

NATIONAL STANDARDS

- NPH.K-12.5 Responsible Behavior
- NA-T.K-4.2 Acting by Assuming Roles and Interacting in Improvisations

STUDENT LEARNING OBJECTIVES

As a result of this lesson, the student will ...

1. Identify four reasons why *renewable* energy is used.
2. Explain how the use of *renewable* energy benefits humans and the environment.
3. Discuss five challenges with using *renewable* energy.





TIME

Instruction time for this lesson: **60 minutes.**



RESOURCES

Energy Kid's Page – Energy Information Administration, Department of Energy
www.eia.doe.gov/kids/

Alliant Energy Kids
www.alliantenergykids.com
www.powerhousekids.com

RenewableEnergyWorld.com
www.renewableenergyworld.com/rea/tech/why



TOOLS, EQUIPMENT AND SUPPLIES

- ✓ **bag of candies** (M&Ms, Skittles, Reese's Pieces and/or miniature marshmallows)
- ✓ **beads** – (Use a bead of similar size to the candies mentioned above.)
- ✓ **writing surface**
- ✓ **PALS.6.TM.A** – 1 per student
- ✓ **PALS.6.TM.B** – 1 per student
- ✓ **tape or other means to affix paper to writing surface**
- ✓ **8 ½- by 11-inch paper** – 1 per student
- ✓ **markers**



KEY TERMS

The following term is presented in this lesson and appears in bold italics:

renewable (energy source)

INTEREST APPROACH

*The purpose of the Interest Approach is to help students understand the benefits of using ***renewable*** energy sources and how we consume energy. Pass out five candies and one bead to each student. Instruct students not to eat the candies until you tell them to do so. Each candy will represent one of the five nonrenewable energy sources available. Candies such as M&Ms, Skittles, Reese's Pieces or miniature marshmallows will work well for this activity.*



In a moment, we will pass out five candies and one bead to each person. Do not eat the candies until we tell you to do so and don't eat the bead! Eventually, you will get to eat all five candies!

Pass out five candies and one bead to each student.



Each of these candies represents the nonrenewable energy sources we have available to us, including coal, gasoline and natural gas. The first candy represents all of the oil you have available to you for heat. Eat this candy. All the oil you could ever use in your life is gone!

Pick a second candy. This candy represents all of the natural gas you will need to heat your home. Go ahead and eat it. Now, take a third candy. This candy represents the coal needed to provide you with electricity for your lifetime. Eat this candy. Take a fourth candy. This candy represents the nuclear energy you could have used in your life for more electricity. Eat this candy. Now, all you have left is one candy. One last chance for energy, but you'll eat it! Eat your last candy. You have eaten all of your candies ... no more nonrenewable energy sources. You can never use them again. What do you have left? *A bead.*

Right, a bead! This bead represents **renewable** energy sources. You would never eat this bead since it is not a food. This bead will never go away, just like a **renewable** energy source. Nonrenewable sources are used up and take away resources from our planet Earth. However, **renewable** energy sources can never be used up and have less impact on the environment.

Today, we will look at the reasons we should use **renewable** energy sources and the benefits and challenges. Keep your bead to remind you of the **renewable** energy sources that are available to us.

SUMMARY OF CONTENT AND TEACHING STRATEGIES

OBJECTIVE 1. | Identify four reasons why renewable energy is used.



*You will be helping students understand reasons why **renewable** energy sources are used, as opposed to nonrenewable energy sources. Have the comparisons below recorded on the writing surface before beginning the lesson. First, you will describe why we use **renewable** energy sources and have students recite the comparisons from the writing surface. Then you will lead students through a Motion e-Moment that will help them remember reasons for using each **renewable** energy source.*

Reasons why **renewable** energy is used (*comparisons*)

- A. Biomass energy sources can be used to conserve oil
- B. Water and geothermal energy sources can be used to conserve natural gas
- C. Wind energy can be used to conserve the use of coal
- D. Solar energy can be used to limit the use of nuclear energy



We use **renewable** energy sources such as the sun and water because they can help save the environment. We will talk about five sources of **renewable** energy.

They are: biomass, water, geothermal, wind and solar.

Now you will have students recite the comparisons. Describe the first comparison. You will say the first one, and then have them repeat it along with you. Change the volume and pitch of your voice to emphasize the important points. Words to emphasize are underlined. After practicing the first comparison, continue with the remaining comparisons.

Comparisons:

“We use biomass energy, such as corn, because it’s quick to produce unlike oil.”

“Water and geothermal energy are neater than natural gas.”

“Wind is cleaner than coal.”

“Solar energy is slicker than nuclear power.”



OK, now we are going to compare our **renewable** energy sources to nonrenewable energy sources. Biomass is one type of **renewable** energy source. A great example of biomass energy is using corn to make automobile fuel instead of using gasoline made from oil. So we can say, “We use biomass energy, such as corn, because it’s quick to produce unlike oil.” *Students repeat.*

Water and geothermal energy, which is hot water and steam from below the Earth, are other types of **renewable** energy. They can be used to heat our homes, but they don’t use up resources like natural gas does. Our comparison is “Water and geothermal energy are neater than natural gas.” *Have students repeat the phrase aloud.*

Wind energy can be used to make electricity, just like coal. But wind doesn’t pollute the air like coal does, so we can say, “Wind is cleaner than coal.” *Have students repeat the phrase aloud.*



Finally, energy from the sun--solar energy--can also be used to make electricity and to heat our homes. Nuclear energy is another type of nonrenewable energy that we can compare to solar energy. “Solar energy is slicker than nuclear energy,” because it is **renewable**. So, let’s repeat “Solar energy is slicker than nuclear energy.” *Have students repeat the phrase aloud.*

Now you will add motions to each comparison. Use the Motion e-Moment to help students remember the information by using their hands. The Motion e-Moment can take place while students remain in their seats. It incorporates motions associated with key words and phrases. Students either mimic motions demonstrated by you or create their own. The power of the Motion Moment happens when students make the associations.

This time, as you say the comparisons, make the motion, and then have the students repeat it with you.

Motions:

Biomass: Make “thumbs-up” with both hands. Raise hands up and out away from your body.

Water and geothermal: Snap with both hands when you say “neater” and “natural gas.”

Wind: Make a circular clockwise motion, as if you were washing a window.

Solar: Run one palm across the other when you say, “slick”--as if they were sliding across each other.



Let’s add some motions to our comparisons! This time when we say the comparisons, I will make a motion, and then we will repeat it as a class. Ready? Let’s go!

“We use biomass energy, such as corn, because it’s quick to grow, unlike oil.”

Repeat with students.

“Water and geothermal energy are neater than natural gas.” Repeat with students.

“Wind is cleaner than coal.” Repeat with students.

“Solar energy is slicker than nuclear power.” Repeat with students.



Wow! Awesome work! We have made some great comparisons between **renewable** and nonrenewable energy sources. Now let’s look at how using these sources of **renewable** energy can benefit our lives.

OBJECTIVE 2. | Explain how the use of renewable energy benefits humans and the environment.



*For the next activity you will need to have mentors break students up into groups of three to five. This can be done by having mentors spread out through the room and group the students who are sitting next to or near one another. This activity involves each group making a short commercial on how using **renewable** energy can benefit our lives. Use the sentence strips on PALS.6.TM.A to provide statements for students to say in the commercial. Mentors should help students organize the sentence strips to create a one-minute commercial. Ideas include creating motions with each phrase or coming up with a song using the phrases. Mentors should have the small group practice, then they will present to the entire class. Take about 10 to 15 minutes to create and present the commercials.*

Benefits of **renewable** energy sources to humans and the environment

- A. Help keep the environment clean.
- B. Renewable** energy sources will not run out.
- C. Help make sure there are energy sources for future generations.
- D. Help create jobs and keep money in the United States.
- E. Help to ensure that the United States doesn't have to depend on other countries for energy.



Let's think about how using a **renewable** energy source helps humans and the environment. If we are using corn or other crops to make fuel instead of oil, we don't have to worry about running out of oil. Next we are going to make commercials that tell the story of how using **renewable** energy is good for us and for the environment. We are going to do this in small groups. Mentors will be coming around to create groups of three to five. Mentors go ahead and form your small groups.

Each mentor should have a set of sentence strips from PALS.6.TM.A. Mentor instructions to small groups:



Our group is responsible for creating a commercial to tell the rest of the class how using **renewable** energy is beneficial.

Pass out the sentence strips.



Let's make sure we understand how to say what is on the sentence strip. Go ahead and read it aloud now.



Who has questions about how to say any of the words on your sentence strips?

OK, now let's think about our commercial. We can create a song, a dance, movements or other actions so that we will get our message across to our classmates. It's important to remember that we need to include all of the sentence strips in our commercial.

Continue by guiding students through the process of creating a commercial. The commercial should be less than a minute long. Be sure to have the group practice their commercial a couple of times before presenting to the class.

Once all groups have had the opportunity to practice their commercials, get the attention of all groups to prepare them to share their commercials.



Let's come back together and prepare to listen to each group's commercial. After each group shares their commercial, let's show them some appreciation by saying, "Whoo-rah!" Let's practice that on the count of three. One, two, three, "Whoo-rah!" Great! Let's hear from our first group.

Mentors should have their groups ready to present. The person leading the lesson can tell mentors the order in which they will present, while the mentors are helping small groups prepare commercials.

After all groups have presented their commercial, summarize the objective:



We have done a great job of explaining how **renewable** energy sources benefit humans and the environment. Now let's explore some of the challenges of using **renewable** energy sources.

OBJECTIVE 3. | Discuss five challenges with using renewable energy.



*The activity for this objective will help students understand some of the challenges with using sources of **renewable** energy. This activity is designed for use with an entire class, however if there are many students in the class, mentors can modify it to work in small groups. You'll start with a Go-Get-It e-Moment that will challenge students to go through the room and collect items from PALS.6.TM.B. (You will need to place the cutouts from PALS.6.TM.B around the classroom before the beginning of the lesson. You can make multiple sets of PALS.6.TM.B depending on how many students are in the class.) Mentors will also want to have a copy of PALS.6.TM.B as a key. Use the content below to develop*

*the key. Then, help students understand the components of challenges using **renewable** energy sources by executing the Go-With-the-Flow e-Moment.*

The Go-Get-It e-Moment is a brain-based activity that allows students to seek information by kinesthetic or cognitive means. The teacher provides the information in various ways for students to seek.

The Go-With-The-Flow e-Moment is a teaching strategy that uses symbols and shapes to show a process through the creation of a flowchart.

Challenges of using **renewable** energy sources

- A. Costs
 - 1. For example, coal is cheaper than wind and biomass.
 - 2. New facilities will have to be built to meet demands.
- B. Location
 - 1. Fossil fuel plants can be constructed anywhere, whereas **renewable** energy locations are limited (by their proximity to wind, water, etc.).
- C. Reliability
 - 1. Fossil fuels are easily stored, whereas **renewable** energy sources are difficult to store.
- D. Customer costs
 - 1. People may not be as willing to pay the added costs of **renewable** energy when nonrenewable energy sources are cheaper.



We know what the benefits are of using **renewable** energy sources, but there are some challenges that exist making it difficult for us to use all **renewable** energy sources instead of nonrenewable energy sources. To better understand these challenges, we are going to look for items around the room that have information on them about these challenges. When I say GO GET IT, you will get out of our seats and find the square- and triangle-shaped (insert color) pieces of paper around the room. Once you have found these items, return to your seat and we will organize them so they make sense. What questions are there?

OK, GO GET IT!

*Mentors should help students find the items. Using the content listed above as a guide, have students affix the squares and triangles to the writing surface at the front of the room and draw arrows from the squares to the appropriate triangles. Your task is to help students create a flowchart that shows the challenges of using **renewable** energy. Discuss with students the challenges of **renewable** energy sources after creating the chart (Go with the Flow e-Moment).*



Great! You all did a wonderful job finding the paper squares and triangles. Now please return to your seats so we can make sense of these items. We will be looking at each of these pieces one at a time to make a flowchart that shows us the challenges of using **renewable** energy sources. When your piece is called, bring it up and we will show you where to tape it to the writing surface. What questions are there? Super!

We will use the squares first. If you have a square, bring it up and tape/affix it horizontally across the writing surface. Now, let's take the triangles and see which ones fit under each square.

Who has a triangle that fits under **Costs**?

Have students with appropriate pieces affix them under the Costs square. Draw a line connecting Costs to the triangle. Follow this procedure for the remaining categories.



Who has a triangle that fits under **Location**?

Who has a triangle that fits under **Reliability**?

Who has a triangle that fits under **Customer Costs**?

Great job! Now, as we look at each of these challenges to using **renewable** energy, we can see why it is difficult to completely stop using nonrenewable energy sources. It will cost money to start using **renewable** energy. We have to find the right location for using **renewable** energy sources. We have to be sure **renewable** energy sources are reliable, and we have to help customers understand the benefits of using **renewable** energy sources.



REVIEW / SUMMARY

*Review each of the objectives with the students. Through the review, help students understand how they can help others see the importance of using **renewable** energy sources, leading into the evaluation.*



Today, we have learned why **renewable** energy sources should be used. Let's review the comparisons we made earlier with the motions:



“We use biomass energy, such as corn, because it’s quick to grow, unlike oil.”

“Water and geothermal energy are neater than natural gas.”

“Wind is cleaner than coal.”

“Solar energy is slicker than nuclear power.”

Great job! We also learned the benefits of using **renewable** energy sources by making a one-minute commercial. We know why it’s important to use **renewable** energy, and we just talked about the challenges of using **renewable** energy. Since we know the importance of using **renewable** energy, let’s figure out a way we can share with others the importance of using **renewable** energy sources.

APPLICATION



Small Group Suggestion: *Students in small groups (three to five students) can be guided by mentors in conducting a survey to ask students in the school about their knowledge of the differences between **renewable** and nonrenewable energy sources. Questions should be simple and might include: Is coal power a **renewable** or nonrenewable energy source? Can wind be used to generate electricity?*

Groups can survey around 10 to 20 students outside their own class. Mentors can help groups organize the data into a mini-report that can be given to the rest of the class.



One-on-One Session: *If computer access is available, mentors can log on the Internet with individual students and explore the following website for more information on energy, particularly **renewable** energy: <http://apps1.eere.energy.gov/education/lessonplans/>. If this website is not available, perform a search using a search engine such as Google. Your search might include the words: **renewable** energy for kids or **renewable** energy lesson plans. Mentors can discuss with students what they have learned from the online activities.*



EVALUATION

The evaluation connects to the LifeKnowledge Precept C5. Persuade others to commit. Mentors should break students into small groups of three to five and assign a mentor to each group. Mentors should guide each student in developing a poster that will convince other people (children and adults) to consider using **renewable** energy sources and the reasons why. Refer especially to objectives one and two for information to include on posters. Once each student has created a poster, have students share their poster with the other group members. Encourage the teacher or school to display the posters, or find a community partner who is willing to display the posters at a local business.

PALS.6.TM.A

Renewable energy helps keep the environment clean.
Renewable energy sources will not run out.
By using renewable energy sources, we will help make sure there is energy for our children's children.
Using renewable energy sources helps create jobs and keeps money in the United States.
Using renewable energy sources helps to ensure we do not have to depend on other countries for energy sources.

PALS.6.TM.B

Challenges with using renewable energy sources

