

RENEWABLE ENERGY

Lesson Plans - Overview

LESSON OVERVIEW

Students will understand the different sources of energy and how it impacts the environment and themselves.

ACTIVITY DESCRIPTION

Build a solar oven and observe sun's energy heat up your food. Make observations and reflect on the process.

LESSON STRUCTURE

- Discussion
 - What is energy?
 - What is renewable energy?
 - What is nonrenewable energy?
 - What is solar energy?
- Solar Oven Activity
- Observation & Reflection Worksheet

POSSIBLE TOPICS

- Energy
- Uses of Energy
- Renewable vs. Nonrenewable Energy Sources
- Sources of Energy

STANDARDS

K.PS.1: Objects and materials can be sorted and described by their properties.

1.ESS.1: The sun is the principal source of energy.

1.PS.1: Properties of objects and materials can change.

2.LS.1: Living things cause changes on Earth.

3.ESS.2: Earth's resources can be used for energy.

3.ESS.3: Some of Earth's resources are limited.

3.PS.3: Heat, electrical energy, light, sound and magnetic energy are forms of energy.

4.PS.2: Energy can be transferred from one location to another or can be transformed from one form to another.

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RENEWABLE ENERGY

Lesson Plans - Discussion

WHAT IS ENERGY?

- What is energy?
 - Energy is what is needed to make things work.
 - Ex: gas, electricity, heat
 - What if the classroom didn't have energy?
- How do people get their energy?
 - We get our energy from the food we eat. It acts as a fuel for our bodies just like a car needs fuel to run.
 - What else do we need energy for every day?
 - Lights, Cars, Heat
- How can we get energy for everyday objects?
 - Just like we can get our energy from different types of food, objects can get energy different ways.
 - Sun, wind, oils and natural gases, digesters, water.
 - What can be used from the sun?
 - Thermal Energy: This can be used for heat (like the solar ovens).
 - Light: This is often turned into electricity using solar panels.

RENEWABLE V.S. NONRENEWABLE ENERGY

- There are two different sources of energy, renewable and nonrenewable.
 - What is nonrenewable energy?
 - This is energy that is being used faster than it can be made and will eventually run out.
 - Ex: coal, gas, oil, diesel
 - What do you think it means for energy to be renewable?
 - This is energy that will never run out because it comes from natural, unlimited sources. This type of energy is environmental friendly and can last thousands of years.
 - Ex: solar, wind, water

CONNECTION TO AGRICULTURE

- Renewable energy sources work towards protecting the environment, which is where everything starts. People will always need to be fed; making a sustainable energy source important.
- Renewable energy sources save money. For a farmer, this will decrease the input cost and make the product more cost effective.
- Biodigesters, a renewable energy source, help reduce waste by turning animal manure into usable energy, creating a holistic cycle.

RENEWABLE ENERGY

Lesson Plans - Solar Oven

MATERIALS NEEDED

- Cardboard Pizza Box
- Box Knife or Scissors
- Aluminum Foil
- Clear Tape
- Plastic Wrap
- Black Construction Paper
- Newspaper
- Ruler
- Metal Back Thermometer
- Food (Ex: nachos, s'mores)



STEP 1

Using the scissors, cut along three sides creating a flap. Leave about an inch from the flap to the edge of the box.

STEP 2

Cover the inside of the flap by tightly wrapping foil around it, taping the excess to the back. This is to reflect the sun's rays.

STEP 3

Using the plastic wrap, open the box and use two layers to cover the window. Create about an inch of plastic wrap overlay and tape down tightly to seal out air.

STEP 4

Take the black construction paper and line the bottom of the pizza box. Black absorbs heat, allowing the food to cook.

STEP 5

For insulation, roll up the newspaper and tape down to create a border around the cooking area.

STEP 6

When cooking, adjust the flap so the sun is reflecting off of the aluminum foil. Use a ruler to set it at the right angle. The best time to cook is 11AM - 3PM when the sun is overhead.

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Observation Worksheet

DRAW YOUR SOLAR OVEN.

ESTIMATE

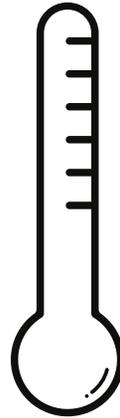


How long do you think it will take to cook your food?

DISCUSS



How long did it take to cook your food?



Color in the thermometer to oven temperature.

Color the stars to rate your dish.



BAD

YUMMY!

REVIEW

How can renewable energy help farmers?

What else can the sun be used for?

How can renewable energy help the planet?

Besides your solar oven, what are other renewable energy sources?

RENEWABLE ENERGY

Solar Energy

FUN FACTS

- The sun produces 10,000 times more energy than earth uses
- Most solar cells are made with silicon, the 2nd most abundant element on earth
- 12 photovoltaic cells are enough to power a cell phone
- Electrons are the only moving part and always go back to where they came from and never get used up
- 30-40 year lifespan
- The sun sends more energy to the earth in **one hour** than the whole planet needs in a year.
- A solar panel is like a leaf - it provides energy to the flower or whatever is being powered.