

ANNEDROIDS

EPISODE 110

THE POWER OF LOVE

Watch as Nick and Shania help Anne generate electricity to power up a plasma ball for her summer school project. Will she be able to make the deadline?

EXPERIMENT SUMMARY

Anne plugged her plasma ball into the electrical outlet, but the power went out. She tried several different experiments to try and generate electricity.

EXPERIMENT: Generate electricity to power up Anne's plasma ball.

HYPOTHESIS:

1. By using one big solar panel, the sun's energy will be able to power up the plasma ball.
2. By using a wind turbine, the wind will blow and spin the blades to generate electricity.
3. By having Nick pedal really fast on a stationary bike, Nick's energy through movement will power up the plasma ball.

METHOD:

1. Create a big solar panel using a bunch of smaller solar panels.
2. Create a wind turbine with objects from the junkyard.
3. Have Nick pedal really fast on a stationary bike.

RESULT: Each experiment generated a little bit of electricity, but not enough to power up the plasma ball all the way. Finally, the power came back on and Anne was able to plug in her plasma ball to an electrical outlet which helped generate enough electricity to power it up.

CONCLUSION: There are many different ways to generate electricity but each one needs to have the right conditions to work!

EXTENSION ACTIVITY

Solar energy is using heat from the sun to generate electricity. Human beings have used solar energy for many years.

If you have noticed, most solar panels are black or dark in colour. The reason for this is that the sun's rays are attracted to dark colours. Let's test out the effects different colours have on energy absorption!



Materials:

- A. Two plastic bottles (pop bottle or water bottle)
- B. Black paint
- C. White paint
- D. Paint brush
- E. Two balloons

Directions:

1. Paint the outside of one plastic bottle all white. Then paint the outside of the second plastic bottle all black. Wait for the bottles to dry before continuing to the next step.
2. Remove the lids if they are still on the bottles. Fit the opened end of the balloon around the opening of the bottle. Do this to both bottles. Make sure it is secure and tight, otherwise you may need a smaller balloon.
3. Place both bottles in bright sunlight, either inside or outside.
4. Observe both bottles and what happens to the balloons. You can also touch both bottles and see if one feels warmer than the other.

WHAT'S HAPPENING?

Dark objects absorb light instead of reflecting it. The absorbed light energy is transformed into heat energy. Since darker colours absorb light better, they also release heat better. For example, wearing a white t-shirt rather than wearing a black t-shirt on a hot day will keep you cooler. A white t-shirt reflects more sunlight, so it absorbs less heat.

SYNOPSIS FOR TEACHERS/PARENTS:

In this episode, Anne needs to submit a video of her summer school project, a plasma ball, before the deadline—but the power went out! She needs to find other ways to generate electricity in order to power up her plasma ball. Nick and Shania help her find different ways to generate electricity such as using a solar panel, wind turbine, and energy from Nick's movement.

This episode teaches children about the different ways electricity can be generated. It also teaches them about how solar panels and wind turbines work and how we can even use the energy from our own movement to create electricity.

CURRICULUM EXPECTATIONS:

GRADE 5 SCIENCE: UNDERSTANDING EARTH AND SPACE SYSTEMS – CONSERVATION OF ENERGY AND RESOURCES

- 3.1** Identify a variety of forms of energy and give examples from everyday life of how that energy is used
- 3.2** Identify renewable and non-renewable sources of energy
- 3.3** Describe how energy is stored and transformed in a given device or system

GRADE 6 SCIENCE: UNDERSTANDING MATTER AND ENERGY – ELECTRICITY AND ELECTRICAL DEVICES

- 1.1** Assess the short- and long-term environmental effects of the different ways in which electricity is generated including the effects of each method on natural resources and living things in the environment
- 1.2** Assess opportunities for reducing electricity consumption that could affect the use of non-renewable resources in a positive way or reduce the impact of electricity generation on the environment
- 2.1** Follow established safety procedures for working with electricity
- 3.4** Describe how various forms of energy can be transformed into electrical energy
- 3.5** Identify ways in which electrical energy is transformed into other forms of energy

MULTIPLE CHOICE



QUESTION #1: A WIND TURBINE IS...

- A. A panel that traps wind in order to create electricity.
 - B. A machine that blows wind.
 - C. A machine that blocks wind.
 - D. A tall tower that has blades on it and can generate electricity.
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QUESTION #2: A SOLAR PANEL CAN...

- A. Generate electricity using the power of water.
 - B. Generate electricity using the power of the wind.
 - C. Generate electricity using the rays from the Sun.
 - D. Trap the Sun's light in order to create shade.
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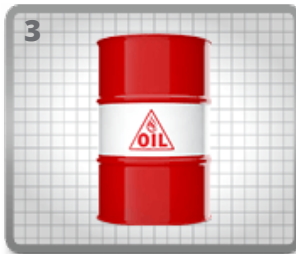


QUESTION #3: WHAT IS RENEWABLE ENERGY?

- A. Energy produced from the sun.
 - B. Energy produced from the wind.
 - C. Energy produced from water.
 - D. All of the above.
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SORTING GAME

Renewable energy comes from natural resources that replenish themselves over time.
Sort these items into the right category!



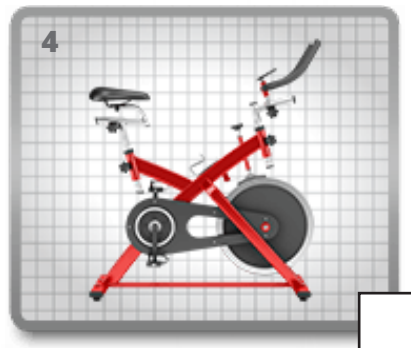
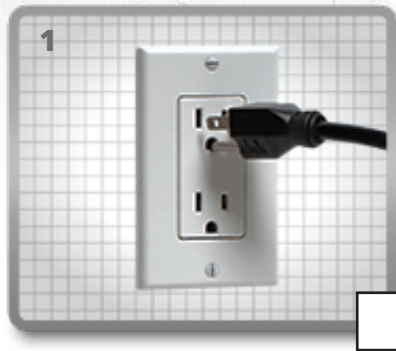
**RENEWABLE
ENERGY**

**NON-RENEWABLE
ENERGY**

1. Sunlight (Renewable). 2. Gas (Non-renewable). 3. Oil (Non-renewable). 4. Wind (Renewable).
5. Water (Renewable). 6. Coal (Non-renewable).

CATEGORY SELECTION

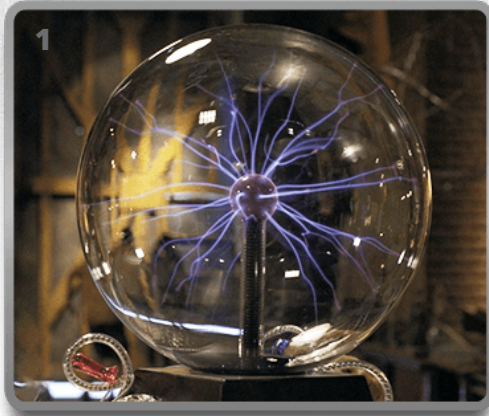
Select all the items that Anne used to generate electricity.



1. Electricity (correct). 2. Solar power (correct). 3. Wind turbine (correct). 4. Exercise Bike (correct). 5. Coal (incorrect).

WORD JUMBLE

Unscramble the letters to find the missing word!



A _____ ball is a globe
that lets you see electricity.

ASMAPL



One _____ line can carry
enough electricity to power 1000 houses.

EROWP



Electricity is generated from different
sources of _____.

EYGRNE

1. PLASMA. Fact: A plasma ball is a globe filled with gases that react to electricity when it is plugged in. 2. POWER. Fact: One power line can carry a large amount of electricity. 3. ENERGY. Fact: Electricity can be generated from different sources of energy, like burning coal, or using wind power.

PUZZLE

Cut along the solid white lines to make a puzzle.

