



# Powering Up!



Name \_\_\_\_\_  
Homeroom Teacher \_\_\_\_\_

Discovery Lab  
Science Notebook

# Powering OpI

## Fun Facts

Date:

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# Powering Up!

*Journal*

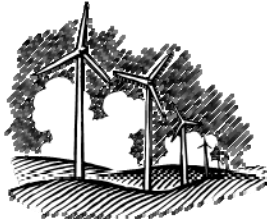
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# Kinds of Energy

<b>KINETIC ENERGY</b>	<b>POTENTIAL ENERGY</b>
<p><b>Kinetic energy</b> is motion—of waves, electrons, atoms, molecules, substances, and objects.</p>	<p><b>Potential energy</b> is stored energy and the energy of position—gravitational energy. There are several forms of potential energy.</p>
<p><b>Electrical Energy</b> is the movement of electrical charges. Everything is made of tiny particles called atoms. Atoms are made of even smaller particles called electrons, protons, and neutrons. Applying a force can make some of the electrons move. Electrical charges moving through a wire is called electricity. Lightning is another example of electrical energy.</p>	<p><b>Nuclear Energy</b> is energy stored in the nucleus of an atom—the energy that holds the nucleus together. The energy can be released when the nuclei are combined or split apart. Nuclear power plants split the nuclei of uranium atoms in a process called <b>fission</b>. The sun combines the nuclei of hydrogen atoms in a process called <b>fusion</b>. Scientists are working on creating fusion energy on earth, so that someday there might be fusion power plants.</p>
<p><b>Radiant Energy</b> is electromagnetic energy that travels in transverse waves. Radiant energy includes visible light, x-rays, gamma rays and radio waves. Light is one type of radiant energy. Solar energy is an example of radiant energy.</p>	<p><b>Stored Mechanical Energy</b> is energy stored in objects by the application of a force. Compressed springs and stretched rubber bands are examples of stored mechanical energy</p>
<p><b>Thermal Energy</b>, or heat, is the internal energy in substances—the vibration and movement of the atoms and molecules within substances. Geothermal energy is an example of thermal energy.</p>	<p><b>Chemical Energy</b> is energy stored in the bonds of atoms and molecules. It is the energy that holds these particles together. Biomass, petroleum, natural gas, and propane are examples of stored chemical energy.</p>
<p><b>Motion Energy</b> is the movement of objects and substances from one place to another. Objects and substances move when a force is applied according to Newton's Laws of Motion. Wind is an example of motion energy.</p>	<p><b>Gravitational Energy</b> is the energy of position or place. A rock resting at the top of a hill contains gravitational potential energy. Hydropower, such as water in a reservoir behind a dam, is an example of gravitational potential energy.</p>
<p><b>Sound</b> is the movement of energy through substances in longitudinal waves. Sound is produced when a force causes an object or substance to vibrate—the energy is transferred through the substance in a wave.</p>	

# Kinds of Energy

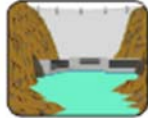
## U.S. ENERGY CONSUMPTION BY SOURCE, 2007



**BIOMASS** 3.6%  
*renewable*  
Heating, electricity, transportation



**PETROLEUM** 37.5%  
*nonrenewable*  
Transportation, manufacturing



**HYDROPOWER** 2.4%  
*renewable*  
Electricity



**NATURAL GAS** 23.3%  
*nonrenewable*  
Heating, manufacturing, electricity



**GEOTHERMAL** 0.3%  
*renewable*  
Heating, electricity



**COAL** 22.5%  
*nonrenewable*  
Electricity, manufacturing



**WIND** 0.3%  
*renewable*  
Electricity



**URANIUM** 8.3%  
*nonrenewable*  
Electricity

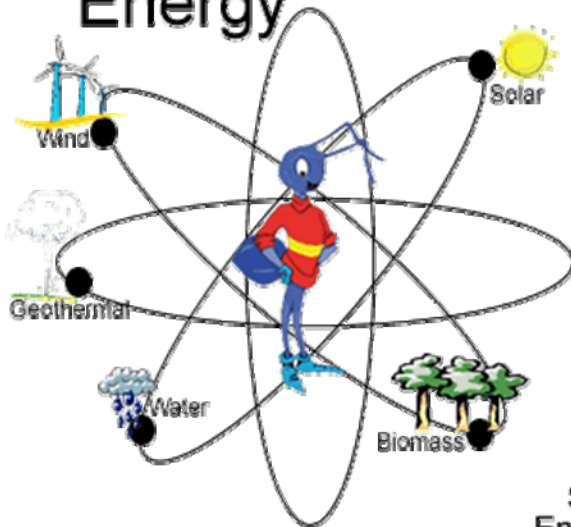


**SOLAR & OTHER** 0.1%  
*renewable*  
Light, heating, electricity

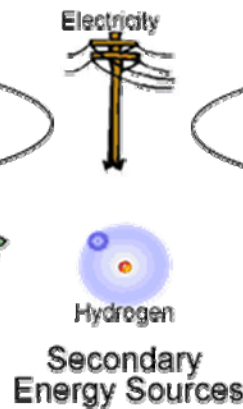
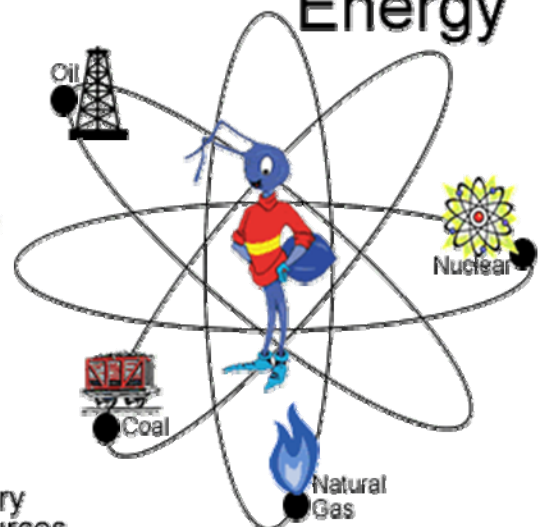


**PROPANE** 1.7%  
*nonrenewable*  
Manufacturing, heating

## Renewable Energy



## Non-Renewable Energy



# **Fuel Fact Sheet**

**Battery Electric**

**Biodiesel**

**Ethanol**

# Pop Can Speedster

1. Does the number of winds of the rubber band affect the toy's speed? Try It.

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2. What is the function of the rubber band on the outside of the can? Take it off and test the speedster. What happens? Were you right?

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3. What do you think will happen if the pipe cleaner is not allowed to touch the ground when the speedster is released? Try it. What happened? Can you explain why this happened?

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4. Predict what will happen if you let the speedster climb a ramp. Explain why you think so. Try it. Describe what happens.

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5. Use energy ideas to explain what happens when the speedster is wound up and let go.

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# **Fuel Fact Sheet**

**Fuel Cell Electric**

**Hybrid Electric**

**Liquefied Petroleum Gas (LPG)**

## Rubber Band Airplane

1. Draw a picture of your rubber band airplane in the space below.  
Label its parts.

2. What happen to the rubber band when you wound the propeller?

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3. When you let go of the propeller, what did the rubber band do?

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4. What kind of energy is created when the rubber band is twisted? \_\_\_\_\_

5. What kind of energy is created after the propeller is let go? \_\_\_\_\_

6. What does the rubber band do besides store energy?

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7. How does the motion of the propeller cause the airplane to move?

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# Fuel Fact Sheet

**Methanol**

**Natural Gas**

**Solar Electric**

# Bounceability

Purpose

Materials

Hypothesis

Procedures

Results

Conclusion