

Energy Transformations

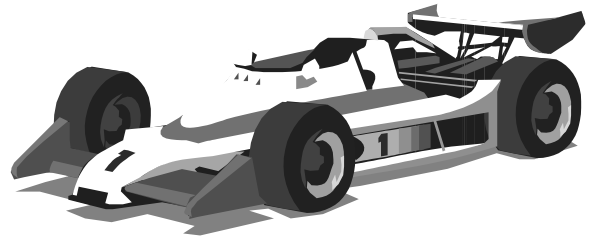
Introduction

Energy is the ability to do work. We even say when we are tired and don't want to work that we have low energy. Energy comes in many different forms including: heat, light, sound, electrical, kinetic (motion), potential (energy of position), and chemical. The law of the conservation of energy states that energy is never created or destroyed. However, energy can be transferred from one object to another and it can be transformed from one form of energy to another.

Energy Transformations in a Car

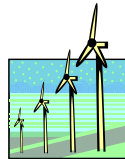
Energy transformations can be understood by looking no farther than a car. In the engine, the fuel (chemical energy) is burned in the cylinder. As the fuel burns, it creates hot gases (heat energy). The gases expand and press against the piston. Through a combination of rods, shafts, and gears, the piston is connected to the wheels of the car. The pressure of the expanding hot gases makes the piston move (kinetic energy). This causes the wheels to rotate and makes the car move (kinetic energy).

Not all the energy released when gasoline burns is transformed to kinetic energy. Most of it becomes heat energy. That is why the car needs a radiator to prevent it from overheating. Once the car is moving, the next important energy transformation comes when the car stops. Friction from the car's brakes stops the car; in other words, it reduces the car's kinetic energy. When the brake pads rub against the brake drums, the brakes get very hot (kinetic energy is being transformed to heat energy). By the time that a car stops, almost all the chemical energy stored in the fuel has been converted to heat energy.



Putting Wind to Work

The kinetic energy of wind starts from light energy. The light energy from the sun warms the earth's atmosphere unevenly, causing air to move and create wind. The blades rotate like a propeller when the wind blows. The blades turn a shaft that runs into a generator, which transforms kinetic energy to electrical energy. Electricity then flows from the generator through the power lines of the local electric company and carries the energy to the user.



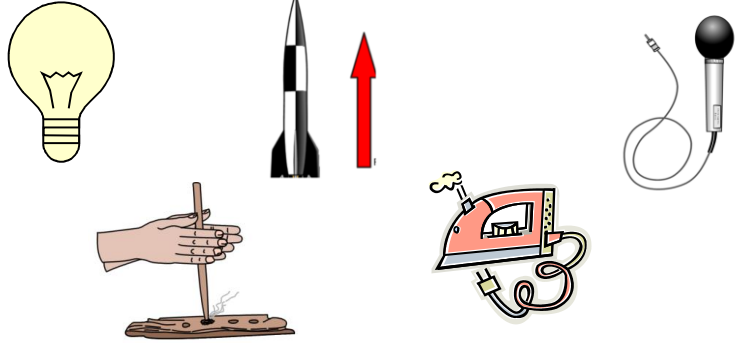
Putting the wind to work is a good idea for several reasons. It is environmental-friendly. No pollution! It is inexpensive. And wind is a renewable resource meaning that nature will never run out.



Name _____

DIRECTIONS: Draw a line to correctly match the energy transformation description with the correct image.

1. Kinetic to Heat
2. Electrical to Light
3. Kinetic to Potential
4. Sound to Electrical
5. Electrical to Heat



DIRECTIONS: Fill in the blanks to complete these sentences

<p>a. Glowstick</p> <p>In the glowstick, _____ energy is transformed to _____ energy.</p>	<p>b. Noisemaker</p> <p>In the noisemaker, _____ energy is transformed to _____ energy.</p>
<p>c. Fan</p> <p>In the battery, _____ energy is transformed to electrical energy and in the moter, electrical energy is transformed to _____</p>	<p>d. Pinwheel</p> <p>In the pinwheel, _____ energy is transformed to _____ energy.</p>

DIRECTIONS: Now in your own words, describe the energy transformations for each of the items below.

<p>1. Clapping Your Hands:</p>	<p>2. Dropping Your Pencil:</p>
<p>3. The Toaster:</p>	<p>4. A Cat Lying in a Sunny Window:</p>
<p>5. Lifting a Book Over Your Head:</p>	<p>6. The Radio:</p>

Directions: Now come up with two of your own examples and describe the energy transformation involved in each.

<p>1.</p>	<p>2.</p>
------------------	------------------