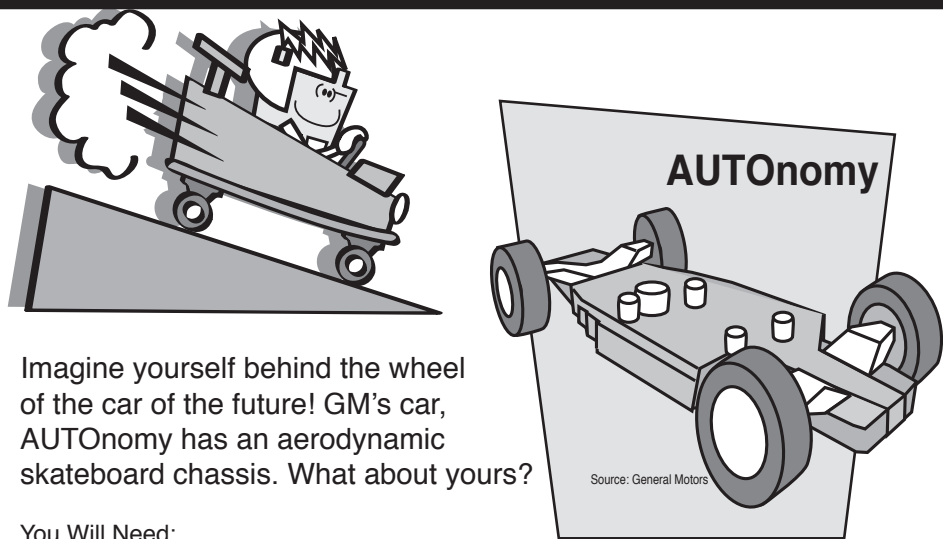


1. Decks, Trucks and Wheels



Imagine yourself behind the wheel of the car of the future! GM's car, AUTOmy has an aerodynamic skateboard chassis. What about yours?

You Will Need:
skateboard and ramp, or mini-skateboard and mini-ramp, cardboard, Styrofoam, scissors, masking tape and watch with a second hand

1. Using the cardboard and other supplies, create a 3-D model of your car, with the skateboard as the chassis or foundation.

2. Mark a starting point on the ramp and a finish line on the floor and release (don't push) your car down the ramp. Time how many seconds it takes to cross the finish line.

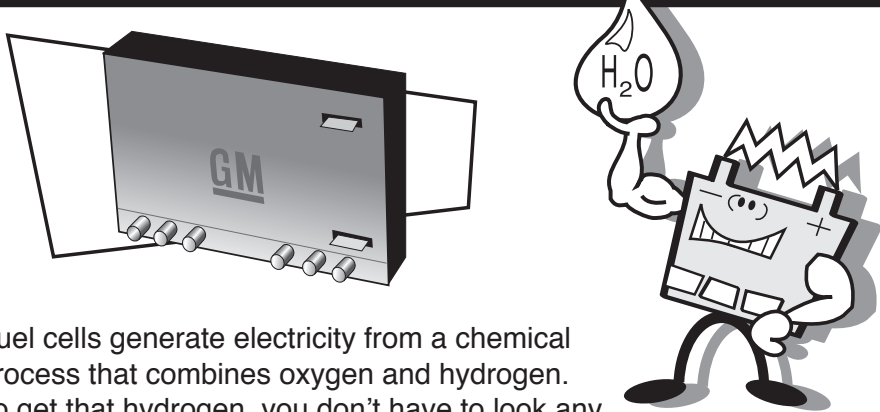
3. Adjust your design to see if you can make the car go faster. Repeat step #2 with your new design and compare the results. How does the shape of the car affect its speed?

4. What kind of energy will your car use?



Try the other activities on this page to give you ideas for energy sources.

2. Say "Hi" to Hydrogen



Fuel cells generate electricity from a chemical process that combines oxygen and hydrogen. To get that hydrogen, you don't have to look any further than your kitchen sink.

You Will Need:
400 – 1000 milliliter clear container, tap water, two 20 cm. or longer wires with double-ended alligator clips, 6-volt lantern battery, strip of cardboard about 3" wide and 2" longer than the top of your container, two electric-conducting tin strips

1. Fill the container 2/3 full with tap water.

2. Cut two small slits in the cardboard to hold and insulate the tin strips as show in the illustration.

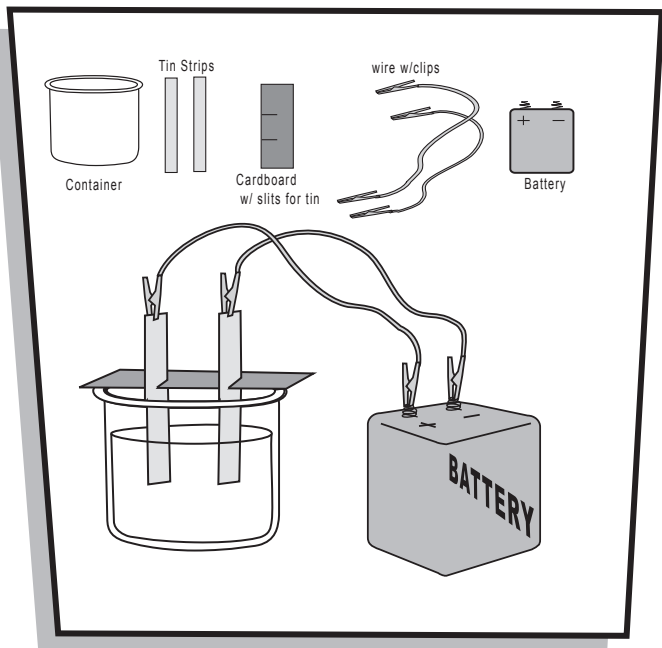
3. Slide the tin strips into the cardboard so the tips of the strips dip into the water.

4. Attach the double-ended alligator clipped wires to the battery.

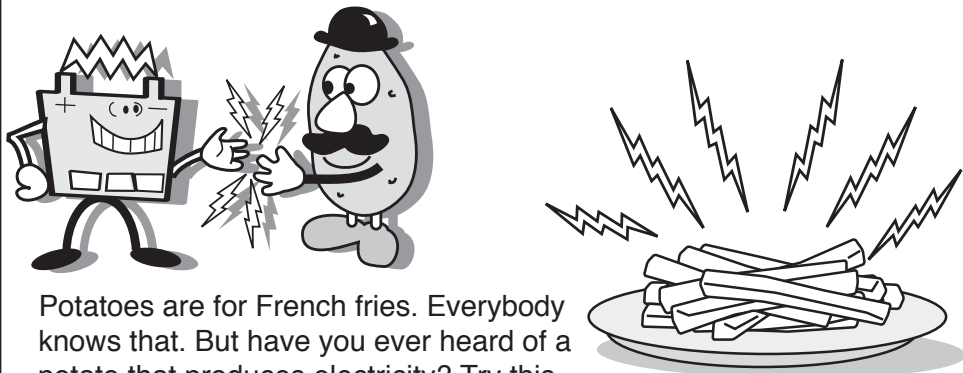
5. Connect the opposite end of the wires to the tin strips. Observe what happens.

6. Oxygen and hydrogen are gases. What evidence do you see in liquid water that gases are present?

7. Why do you think hydrogen would be a good fuel on the Space Shuttle?



3. One Potato, Two Potato



Potatoes are for French fries. Everybody knows that. But have you ever heard of a potato that produces electricity? Try this.

You Will Need:
2 pennies; 2 galvanized nails; potato, cut in half; paper towel; 2 feet of insulated copper wire, cut into 3 pieces with 2 inches stripped at each end; small digital clock or timer; flashlight bulb; adult to cut the potato and strip the wire

1. Set the 2 potato halves, flat side down, next to each other on the paper towel.

2. Wrap one end of the first wire around a nail and stick the nail into the first potato.

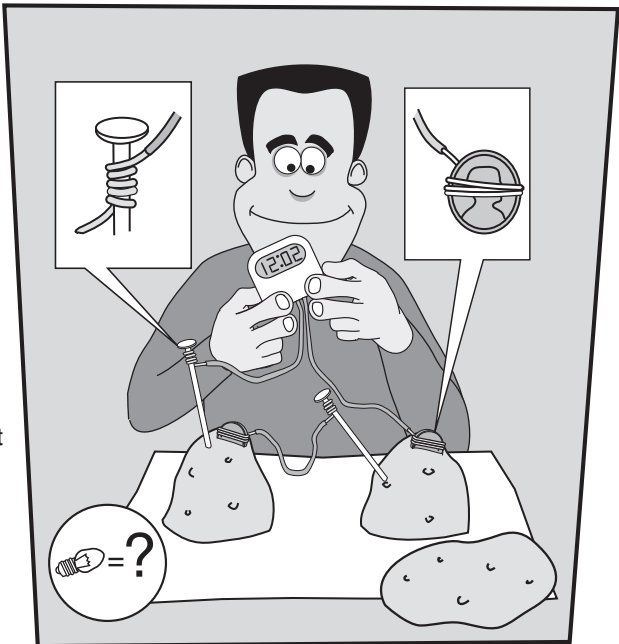
3. Tightly wrap one end of the second wire around a penny and stick the penny into the potato next to the nail, but not touching it.

4. Wrap the third piece of wire around the other penny and stick the penny into the second potato. Put the other nail in this potato, too, without any wire attached.

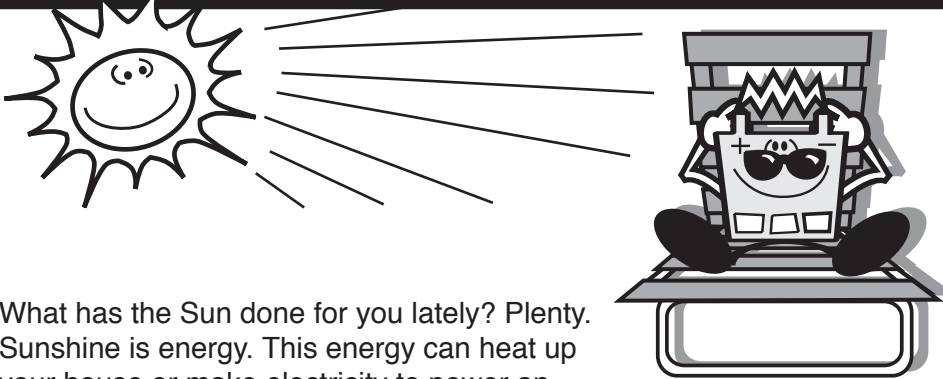
5. Connect the wire from the penny on the first potato to the nail that doesn't have a wire in the second potato.

6. Remove the back of the clock and take out the tiny round battery. Connect the two potato battery wires to the contact points inside the clock. If it doesn't work at first, you may need to switch the wires.

7. How much power does your potato have? Can you use it to light the flashlight bulb? What would happen if you added more potatoes?



4. You Are My Sunshine



What has the Sun done for you lately? Plenty. Sunshine is energy. This energy can heat up your house or make electricity to power an orbiting satellite. Create a solar energy machine that collects heat and see what it can do for you.

You Will Need:
a sunny day, paper cups, black and white construction paper, poster board or cardboard, marble or small ball, scissors, tape, a newspaper, small pieces of apple or other dense fruit or vegetables, pencil

1. Shape the cardboard into a curve that focuses sunlight in one spot. See the illustration for ideas.

2. To find the focal point of your curved cardboard, roll the marble back and forth and mark the spot where it settles.

3. Use the curved cardboard and other supplies to design a solar energy machine.

4. Put the black and the white paper in the sun to see which absorbs the most solar energy. Use the color that feels the warmest to line your machine.

5. Spread out a newspaper in a sunny spot. Put the apple pieces in the focal point of your solar energy machine and place it on the newspaper.

6. Put a second piece of apple on the newspaper next to your machine. Compare what happens.

7. Adjust your solar energy machine to make it more powerful based on your experiments. What changes did you make to your design?

