Sustainable energy ACTIVITIES

by Noeline Pullen

Discuss forms of energy with the class and how these are used to make machines work. The children may be familiar with solar energy, wind power, tidal power, geothermal power, hydroelectricity or biofuel. Allow the children to research one or more of these and to think of an experiment or craft activity to represent how that form of renewable energy works. They may also like to show other ways to create energy. Some of the following may prove useful for individuals, groups or class activities. Those requiring adult assistance are indicated.

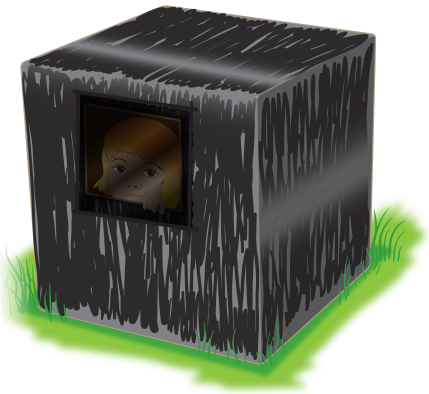
Balloon-powered rocket

You will need: a balloon, a 10-centimetre drinking straw, 4 or 5 metres of fishing line or string, scissors, two chairs, masking tape

Instructions: Thread the fishing line through the straw. Place the chairs about 4 metres apart. Tie the fishing line (with the straw on it) from one chair to the other ensuring that it is pulled as tightly as possible. Slide the straw to one end of the fishing line close to one of the chairs. Blow up the balloon and twist the end tightly to keep the air in (do not tie off!). Use masking tape to secure the balloon to the straw. Quickly stand back and release the end of the balloon. The balloon should shoot to the other end of the fishing line.

Explanation: Gas will move from areas of high pressure to areas of low pressure. The air inside the balloon is a gas which is compressed and under more pressure than the air around it. It will try to escape when the balloon is released. When the air is released, it creates a force, or thrust, which moves the balloon. The motion (or reaction) of the balloon is equal to, and in the opposite direction to, the action (or thrust).

Solar heater (kid-size)



You will need: a large cardboard box such as that from a dryer or washing machine (large enough for a small child to fit inside), electrical tape, flat black paint, 8 cm x 10 cm rectangle of black plastic to cover window

Instructions: Cut a hole in the side of the box large enough for a small window. Cover the hole with the rectangle of black plastic and use the tape to secure it around the sides to the box. On the side opposite the window cut a door large enough for a child to climb through. Paint the entire box black, allow to dry and place in the sun. On a cool day, let the children take turns sitting inside for short periods to feel the warmth.

Vinegar and baking soda rocket*

You will need: a plastic drink bottle, a small funnel, 1/2 cup vinegar in a small jug, balloon, bicarbonate or baking soda, teaspoon

Instructions: Pour the vinegar into the bottle. Stretch the deflated balloon with fingers to loosen the 'neck'. Put the funnel in the neck of the balloon and spoon in enough baking soda to half fill the balloon. Carefully stretch the neck of the balloon over the top of the bottle, trying not to let any baking soda fall into the bottle. Raise the balloon so the baking soda falls down into the bottle and combines with the vinegar.

Explanation: When baking soda combines with vinegar, it creates carbon dioxide gas which expands. The gas fills the bottle then moves into the balloon and inflates it.

** Adult assistance and supervision may be required.*

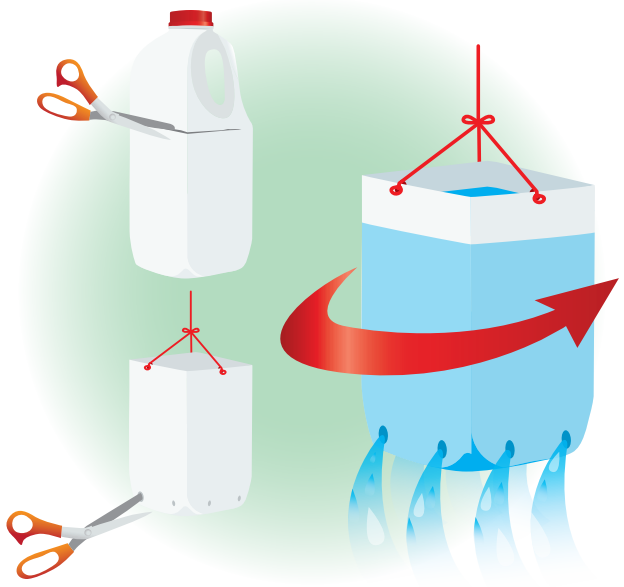
Water turbine*

A water turbine works on the principle that water flows out of jets attached to a wheel. As the water flows out, the wheel turns.

You will need: sharp scissors, a pencil, two lengths of string – about 20 cm and 30 cm long, a plastic drink bottle (or cardboard milk carton), access to a water tap

Instructions: Cut the top from the plastic bottle to make a cylinder. Use the scissors to carefully poke six or eight holes evenly around the bottom of the cylinder. Push a sharp pencil through each hole and twist the pencil to one side so that each hole is slanted. Make three small holes evenly around the top of the cylinder for hanging. Tie the short length of string to two of the holes of the cylinder top and the longer piece to the third hole. Tie this to the middle of the short string but leave a long end free. Hold the cylinder under a cold water tap and fill with water. As the water flows out, it will be released sideways and turn the cylinder around.

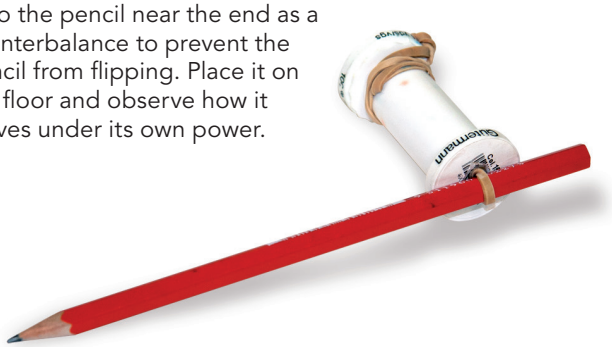
** Adult assistance may be required to cut the top from the plastic bottle and poke the holes.*



Cotton reel racer

You will need: a cotton reel (or 35 mm film case), an elastic band, a pencil, an eraser, a small piece of plasticine or Blu-Tack® (optional)

Instructions: Thread the elastic band through the centre of the cotton reel. Loop one end around the eraser and place a pencil through the loop at the other end. Rotate the pencil to wind up the elastic band. Press the plasticine onto the pencil near the end as a counterbalance to prevent the pencil from flipping. Place it on the floor and observe how it moves under its own power.



Wind-powered car*

You will need: cardboard, scissors, two pipe-cleaners, sticky tape, three 'bendy' drinking straws, sharp pencil or implement to poke a hole in the sail, one large bead, small round lid for tracing wheels, sewing pin, four small beads or a small quantity of Blu-Tack®, toothpicks, straight straw (for blowing on car to make it move – optional)

Instructions: Cut a rectangle (about 5 x 11 cm) from the cardboard. Using two pipe-cleaners, twist the end together then tape the length to the bottom of the rectangular cardboard with the join in the centre of the car base. Cut two small lengths (about 6 cm) from another straw making sure they are long enough to extend slightly past the width of the car base. Tape in place over the pipe-cleaners. These will form the axles of the wheels. Cut a sail the length of the bottom of the 'bendy' straw and use the sharp pencil to poke a hole at the top and bottom. Cut the top from one of the 'bendy' straws to use as a mast. Slide the sail onto the mast and tape together. Curve the sail slightly to enable it to 'catch' the wind. Slide the mast onto one end of the pipe-cleaners. Slide a large bead onto the end and twist or knot the pipe-cleaner to keep the sail in place. Cut a length of straw about 11 cm long and slide onto the other end of the pipe-cleaners. Bend the mast and short straw length over the top of the base. Twist the end of the pipe-cleaner around the middle of the mast to secure it in place. Using the lid, trace four wheels from cardboard then cut them out. Use the pin to poke a hole in the centre of each. Push one wheel a short way onto the end of two different toothpicks, then slide the toothpick through the small lengths of straw attached to the base of the car (the axles). Push a second wheel onto the other end of each toothpick. Secure in place with a small bead on the end of each toothpick.

Blow through the extra straw onto the sail to make the car move.

** Some adult assistance may be required.*