Balloon Powered Car

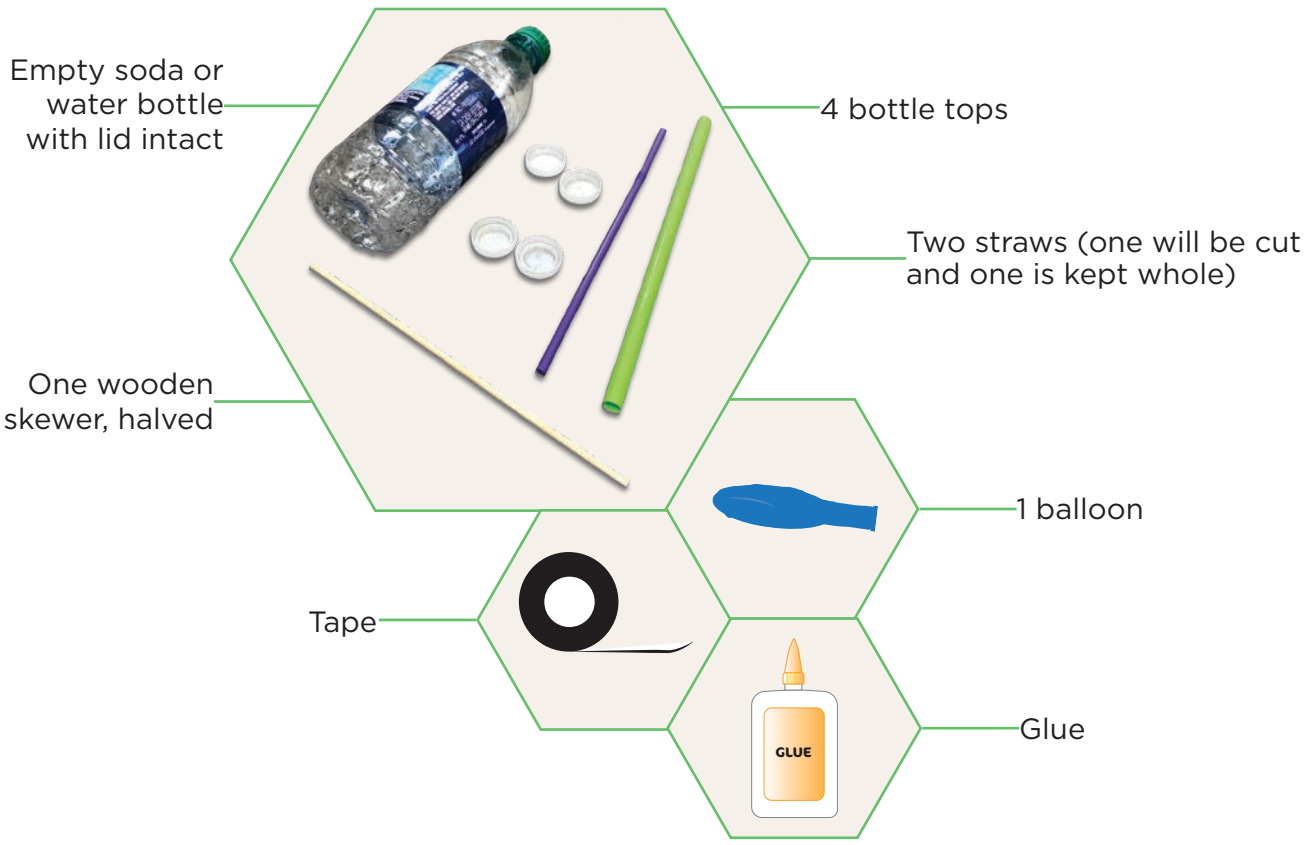
What is wind energy?

Wind is created by the uneven heating of the earth. We have all felt the wind blowing at some point in our lives but have you ever paid attention to how strong it can actually be? Think about standing in front of a fan or drying your hands in a public bathroom. In severe storms such as hurricanes or tornadoes, wind can be strong enough to completely destroy houses, cars, and other large objects. Using the power of wind can also be helpful. Wind power can be harnessed in a number of different ways. For example, windmills create mechanical energy, sails move boats and wind turbines generate electricity. Wind energy is clean and renewable, making it a great resource. Wind or moving air is also created when a balloon is let go. Let's explore this idea.

The Experiment

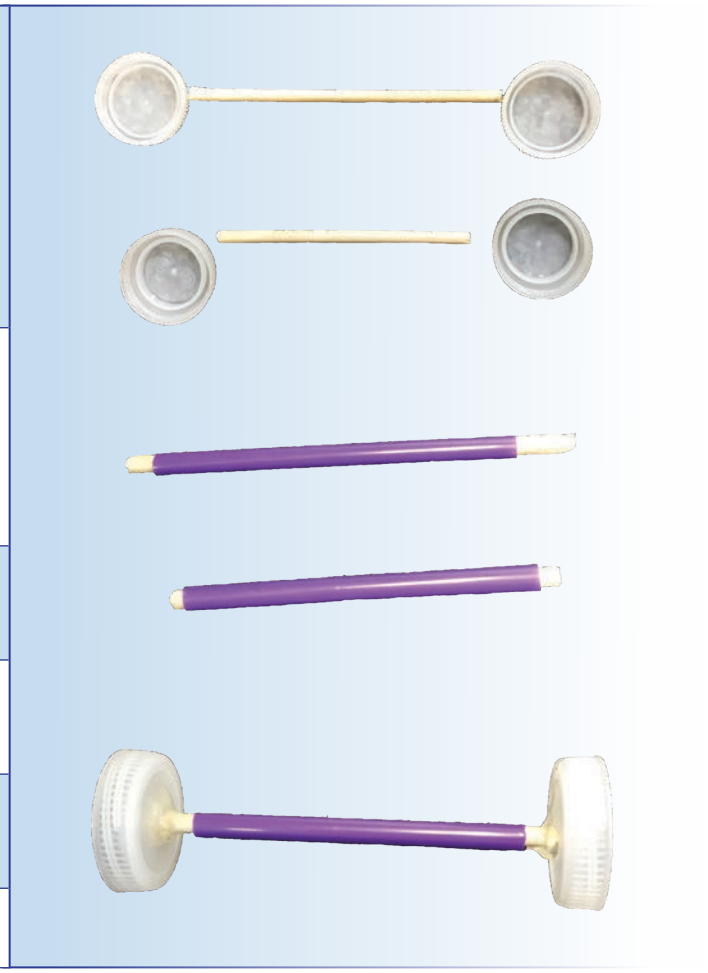
Watch Newton's 3rd Law of Motion at work. When trapped air inside of a balloon is released, the air pushes other air out of the way (wind). For this action, there is an equal and opposite reaction. You guessed it! The car will go in the opposite direction. This is another great way to see wind at work.

Materials



Directions

Step 1	Prepare the two axles. Cut the wooden skewer in half. Cut one straw to be a little shorter than the skewer. Glue one bottle cap to the end of one skewer. Be sure to keep it in the middle and straight. Put the skewer through the cut piece of straw. Glue a bottle cap to the other end of the skewer. Be sure to keep it straight and centered. Repeat to make two axles.
Step 2	Attach the axles to the "car." Glue the straw part of the axle to the bottom of the bottle. Make sure the skewer on the inside of the straw is still able to rotate. Glue the 2nd axle a few inches away from the other one and keep them parallel.
Step 3	Using the whole straw, insert one end of the straw into the balloon and secure it with tape. Do not block the air flow of the balloon.
Step 4	Secure the straw and balloon to the bottle car with tape and/or glue. The balloon should be positioned towards the front of the car.
Step 5	Blow into the straw to blow up the balloon and keep it pinched shut until you are ready to release it.
Step 6	Place your car on a smooth, flat surface. Let the balloon go! Observe.



Dinner Talk

Talk with your family, siblings, friends, etc about this experiment.

- What was the coolest part of the experiment? Why?
- What happened when the air was released from the balloon?
- Which direction did the car travel? Why?
- Where did the energy come from that made the car move?

Extra Enrichment

Modify your car. What happens when you use two straws instead of one? Use buttons as wheels instead of bottle caps. Does this change the speed or distance your car traveled?

Blow the balloon up just a little and then blow the balloon up a lot and compare the results.

What happens if you attach the balloon and straw to the bottle in the other direction? Does the car travel further with the lid of the bottle facing forwards or backwards? Why do you think that is so?

Decorate your bottle car with paint or markers. Write about wind energy or Newton's 3rd Law of Motion and what each one have to do with making this car go.

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