

Suitable for primary aged children

Make a Wind Powered Buggy

Climate change is the warming of the Earth due to increased levels of carbon in the atmosphere. The carbon acts like a blanket trapping heat from the sun and warming the planet. The amount of carbon in the atmosphere has increased due to our use of fossil fuels, like coal, oil and gas for electricity, heating and transport. Climate change is affecting many animals and people all around the world, making it harder for them to find food, shelter and even survive.

The whole world needs to work together to reduce the amount of carbon in the atmosphere so we can stop climate change. One of the best ways to do this is to switch to renewable energy sources like wind and solar energy sources to power our homes and devices.

Let's investigate how wind energy can be used to do work!

Definitions:

- **Atmosphere:** The layer of gasses surrounding the Earth (or any planet).
- **Fossil Fuel:** fuel such as coal or gas, formed millions of years ago from the remains of plants and animals.
- **Renewable energy:** energy formed from a source that cannot be used up, such as wind or solar energy
- **Climate Change:** Long-term changes in Earth's temperature and weather patterns, often caused by human activities.

What you will need:

- Lightweight cardboard boxes like cereal boxes or similar
- scissors
- glue
- tape
- paper or lightweight cardstock
- bottle caps (in sets of 4)*
- paper straws (in sets of 2)
- wooden skewers or similar (in sets of 2)
- a fan
- Some small lightweight objects like small pebbles, pom poms, paper clips...

*Prep Work: It is recommended that adults prepare bottle caps with an X shape using a hobby knife before the activity.

Do:

1. Cut out a piece of cardboard to form the body of your car- rectangle approx. 20 x 14 cm is good starting size but you can experiment to find the best size.
2. Tape 2 straws to the bottom of the car to make axels, make sure the straws are parallel to each other.
3. If not prepared, use a craft knife to cut an X into the centre of the bottle caps.
4. Push a wooden skewer through the X shape in one bottle cap.
5. Thread the other end of the skewer through one of the straws.
6. Push a bottle cap onto the end of the skewer opposite the first bottle cap. You just made an axle with two wheels!
7. Repeat steps 4 through 6 to make another axle and complete the base of your buggy.
8. Make sure the axles can spin and the buggy rolls smoothly without getting stuck. If needed, adjust the wheels so they are not too wobbly.
9. Insert a skewer into the middle of the cardboard to form a mast. Secure it at the base with plenty of tape. If needed, reinforce with more cardboard.
10. Cut out a sail shape from a piece of paper.
11. Poke the upright skewer, your mast, though both ends of sail to hold it in place.
12. Place your buggy in front of the fan, turn the fan on and watch your buggy go!
13. Once your buggy is moving well, make it do some work by moving small items from one place to another.
14. Experiment with different wind speeds and different sail shapes to find the fastest buggy and the one that can do the most work (carry the heaviest load).

Discuss What Happened:

The energy of the wind can be used to do work, like moving objects from one location to another. In the same way, wind energy can be converted into electricity as it does work by turning a turbine.

- Was the fastest wind the best for doing work?
- How else could you use the wind to do work?
- What could we do to make our buggies better at doing work?

Follow Up:

Check out these videos to understand more about wind energy and how wind turbines generate electricity.

<https://www.youtube.com/watch?v=-8-9j3mXIYE>

<https://www.youtube.com/watch?v=mU4TBMgemck>