

WIND POWERED CAR

SUMMARY OF ACTIVITY:

Activity Description: Participants will learn how wheels and axles work through creating their own car that can be powered by wind! Their vehicles must include: at least 2 axles and 4 wheels, a base for the vehicle and a sail.

STEAM Skills: Engineering - Simple machines

Ideal Age Group: All ages

Length: 30

MATERIALS AND SUPPLIES:

<ul style="list-style-type: none">• Styrofoam balls (4-8)	<ul style="list-style-type: none">• Skewers (2-4)
<ul style="list-style-type: none">• Cardboard (8 ½ x 11)	<ul style="list-style-type: none">• Straws (3)
<ul style="list-style-type: none">• Paper (8 ½ x 11)	<ul style="list-style-type: none">• Hair dryer or small fan

General supplies needed: markers, scissors, masking tape

TALKING POINTS AND BACKGROUND:

One of the 6 types of simple machines (levers, wheels and axles, screw, inclined planes, pulleys, wedges), wheels and axles work together to let the wheel rotate (moving object) around the axle (fixed object). This allows things like bicycles and cars to move forwards and backwards.

- Examples of wheels and axles; bicycles, cars, steering wheels, merry go-rounds, skateboards, etc.
- What causes our wheels to move?
 - What sort of energy is being used?
 - **Kinetic Energy:** the energy an object possesses due to its motion.
 - **Potential Energy:** the ability that an object has to move/do something later.
- Thinking of these examples, which part is in motion?
 - Traditionally, the axle is fixed while the wheel moves. Why do you think it's built that way? How could we change our design to match this?
- Traditionally, what are cars fueled by? -> fossil fuels
 - **Fossil Fuels:** A natural fuel (coal/gas) that are formed from the remains of organisms ○

Nonrenewable Resources: a natural substance that is not replenished at the speed in which it is used; a finite amount available.

- What is our car powered by?
 - **Wind Energy:** Sustainable & renewable; uses wind turbines to create electricity/energy.
 - **Wind Turbine:** Wind turns the propeller blades around a **rotor** (rotator), which in turn spins a generator, creating electricity.
- Why do we want to use renewable resources rather than nonrenewable resources?

PROCEDURE:

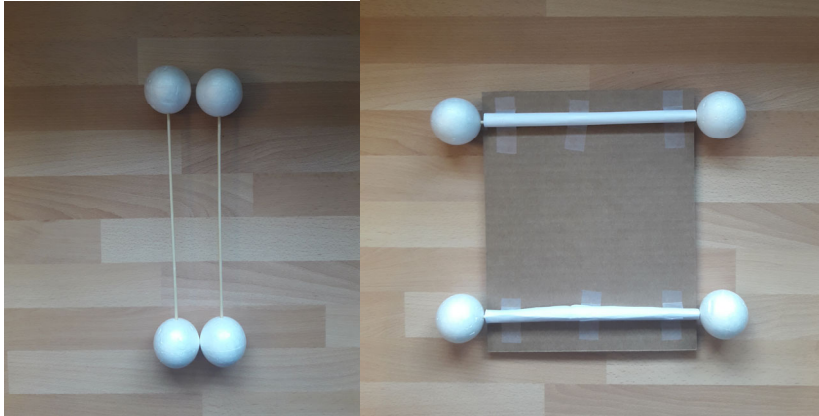
- Participants can build this however they would like, though here is a rough outline for educators to follow:

1. **Base:** Using cardboard, create a base for your vehicle.

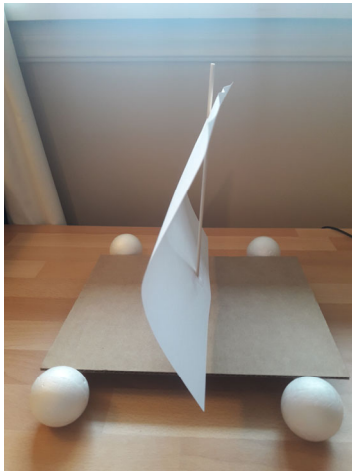


2. Cut straws to the width of your base and tape underneath the vehicle.

3. **Wheels and Axles:** using the skewers, puncture the Styrofoam balls to create 2-3 axles (participants should have at least 2 axles and 4 wheels); thread the skewers through the straws to allow for free movement of the wheels.



4. **Sail:** Using straws/skewers and paper, create a sail for your vehicle; if there is extra time, decorate your sail however you'd like.



5. Create wind to power your car! Use a small fan, hairdryer or fan behind with cardboard/paper to make the car move.

Questions to ask themselves while building:

- Why are/aren't the wheels turning?
- Would changing the size of the sail change how the car moves?
- Would higher or lower winds make it move faster/slower?
- Using materials you can find, make your car heavier. Will this affect the speed of the car?
How much wind does it require to move the car?