



## Wind Powered Cars

*A design challenge that utilizes recycled materials.*

**Project Type:** Tinkering, “challenge” project

**Group/Individual:** Individual or Collaborative, let makers choose

**Lesson Plan Audience:** Maker Mentor

**Time:** 1 - 2hrs or multiple days

**Hard Skills:** Using a drill, screw driver, and other basic hand tools

**Soft Skills:** Design concepts, Resilience and patience, Problem Solving

**Ideal # of Participants:** 2 - 15

**Age Group:** 7 - ANY AGE

**Ideas for Taking it Further:** this challenge can be extended over several days if makers get excited about redesigning and tinkering with their cars. Encourage makers to see what designs work for other participants and re-think their own design.

### **Difficulties/Tips:**

Terms to talk about:

Axel - (*n*) the pin or bar on which or by means of which a wheel or pair of wheels rotates.

Sail - (*n*) a piece of material extended on a mast to catch the wind and propel a boat or other vessel.

Propel - (*v*) drive, push, or cause to move in a particular direction, typically forward.

- If the wind cars are too light the power of the box fan wind can knock them over instead of propelling them forward.
- If possible it is helpful to have all the makers begin with the same car body. For example give every maker a 6” piece of 2x2 or 2x4 to begin the challenge.





### Materials needed:

- Box Fan
- Pencils, skewers, or other objects that can be used as axles
- Scrap wood or small boxes to be used as the body of a car
- Different weights of paper or cloth for car's sail
- Circular objects for wheels (Play-Doh lids, jar lids, plastic checker pieces...)
- Hot glue
- Drill
- Eye hooks

### Steps

The important thing about this activity is that car designs don't have to be done in one particular way. Designs will vary greatly depending on the materials available to the makers. The maker mentor can choose to create and show an example car to show one possible design, keeping in mind that this will influence the way the children decide to design their cars. You can begin by giving every maker a piece of 6" scrap 2x2 or 2x4 wood as the body of their vehicle, and let their imagination and design go from there.

Explain that the challenge is to build a car that can go the furthest or fastest using only the wind created by a box fan. Go over the basics of what a "wind car" needs to move forward: **wheels that spin and something to catch the wind (sail)**. If makers are using wood to make their cars you can help them drill holes through the wood to hold the axles and wheels. I have also used eye hooks screwed into the wood to hold axles.

Once makers have created a car that has wheels and a sail begin test runs in front of the fan. Make a starting line on the floor with masking tape and mark how far the cars go with more tape. Encourage makers to make improvements on their cars. Once makers have cars they are pleased with you may choose to have speed or distance races.

