



# Activity: Propeller Car

## What You'll Need:

### Included in the kit:

- 1 propeller
- 5 popsicle sticks
- 3 straws
- 4 wheels
- 2 marbles
- 4 cubes
- 2 rubber bands
- 2 skewers
- 2 paper clips

### Not included in the kit:

- Tape (to secure the chassis of the car)
- Glue (for cubes and marbles)
- Scissors (to trim straws)

## Procedure:

### PROPELLER CAR

#### Step 1 (see video by The Winkle from [1:39-2:16 minutes](#))

We are going to make the chassis of our car.

- Get four popsicle sticks and your glue. Place a small dab of glue on both ends of two of the popsicle sticks, then affixing the other two, create a perfect square.
- Be careful to make sure your square is as even as possible. Your square should have right angles, like the corner of this page.

#### Step 2 (see video by The Winkle from [2:17-3:25](#))

Now we're going to build our axle and our axle housing.

- You will need to use a pair of scissors to cut a straw. It should be slightly longer than one of the popsicle sticks. Then, use that straw as a guide to cut the other straw the same length.
- Next, glue a straw to one of the popsicle sticks.  
Glue the other straw you just cut to the popsicle stick on the opposite side.
- You have now created your axle housing. The skewers are your axles, which will be placed through the straws once they have dried (and later, taped) to the chassis.

**Step 3** (see video by The Winkle from [3:26-3:59](#))

Move your chassis aside. We're going to build our cubes now.

- Glue the cubes together using a dab of glue in between each, stacking the cubes one on top of another to make a tower that is four cubes high. Make it as neat/straight as you can. This will become our support structure for the propeller-powered 'motor'.
- Gently set it aside next to your chassis to dry.

**Step 4** (see video by The Winkle from [4:00-5:51 minutes](#))

Now we will make the engine/motor part of the propeller car.

We need the propeller, a paperclip, a rubber band, and another popsicle stick.

- Insert the popsicle stick into the propeller.
- Grab the large part of the paperclip with your pincher fingers. Then, with your pincher fingers on your other hand, grab the small part of the paperclip. Pull the two sides apart to make an 'L' shape. Now put your thumb on the big part of the paper clip, press that to an angle. If you need guidance, view the link above (4:00-5:51 minutes).
- Attach the small part of the paper clip to the popsicle stick with some tape. Use about 2-3 inches of tape and wrap it tightly so the paperclip stays attached.
- Hook your rubber band onto the metal hook attached to your propeller, and then hook it to the paperclip. You can experiment with one rubber band and with two rubber bands.

**Step 5** (see video by The Winkle from [5:52-6:06](#))

Now we will connect the engine/motor piece to the stacked cubes we glued earlier.

- Put a dab of glue on the top of the stack of cubes.
- Glue the stack to the popsicle stick, about an inch away from the propeller, on the side opposite of where the rubber band and paperclip are. Place it to the side to dry.

**Step 6** (see video by The Winkle from [6:07-6:47](#))

Now, we will reinforce the chassis.

- You may notice that the straws aren't very secure on the popsicle sticks.
- Use tape to reinforce the axle housing to the chassis. About an inch or so of tape wrapped around near each corner and the middle should do it. Wrap it tightly, but not so tightly that it crushes your straw.

**Step 7** (see video by The Winkle from [6:48-8:00](#))

Let's get rolling and add our wheels now!

- Put a small dab of glue in the small hole in the center of a wheel.
- Take a skewer and push it through. It's okay if it sticks out a little on either side.
- Place another dab of glue on the outside of the wheel, where it meets the tip of the skewer (axle). We want the wheel to be glued to the axle.
- Be careful not to glue the wheel to the straw, as we need it to be able to spin freely within the straw (the axle housing).
- Slide the skewer (axle) through the housing. Follow the same steps above to glue the next wheel to the other side of the axle. Repeat the steps for the other axle and wheels.



<p style="text-align: center;"><b>Step 8</b> Let everything dry for 10 more minutes.</p>
<p style="text-align: center;"><b>Step 9</b> (see video by The Winkle from <a href="#">8:05-9:13</a>)</p> <p>Let's attach the engine/motor (propeller piece) to the chassis of the car.</p> <ul style="list-style-type: none"><li>• Put a small dab of glue on the side you want to be the front of your car, right in the middle of that popsicle stick.</li><li>• Glue the bottom of the stack of cubes to that spot and wait for it to dry.</li><li>• While we wait for it to dry, we can glue the marbles to the back corners of the chassis, to give the car balance or stability.</li></ul>
<p style="text-align: center;"><b>Step 10</b></p> <p>It's our last step of waiting. Finally! Let everything dry for 10 or more minutes. All the parts need to be dry all the way before you try to take your propeller car for a ride.</p>
<p style="text-align: center;"><b>Step 11</b> (see video by The Winkle from <a href="#">9:32-11:24</a>)</p> <ul style="list-style-type: none"><li>• Reconnect your rubber band(s) if they have come disconnected from the paper clip.</li><li>• Twist it up as much as you want to for the first try, then release it and watch the car go!</li></ul>

SOURCE: The Winkle

This STEAM Expo activity was inspired by [DIY Propeller Car activity by The Winkle](#).

### OPTION

Test your new propeller car on different surfaces. Record the results and compare to see which surface your car performs best on. Does it work well to go down a ramp? How about up? What other ideas do you have?

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## The Science Behind It:

The rubber band is the 'motor' on this car. It gives potential energy. As you wind and wind the propeller, this creates tension. Releasing it creates energy, making the propeller spin, which makes the car move.