

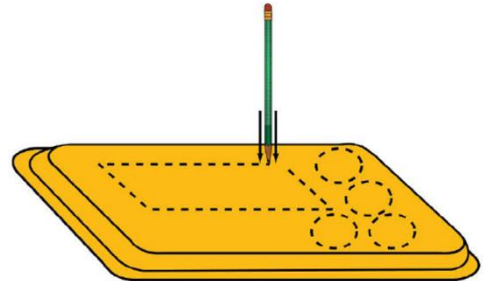
## Newton's Third Law of Motion: Activity #2

1. Look at the instructions and template for building a rocket racer and the materials you have to build your racer.
2. Build your rocket racer using the template. Test your design to make sure it travels straight. Remember, you want to build a racer that can go the farthest distance!
3. When your rocket racer is ready, take it over to the track to perform your trials. You will run three trials with your racer. You can make modifications or improvements to your design between each trial to try to increase the distance it will travel.
4. Fill out the table below for each of the trials.

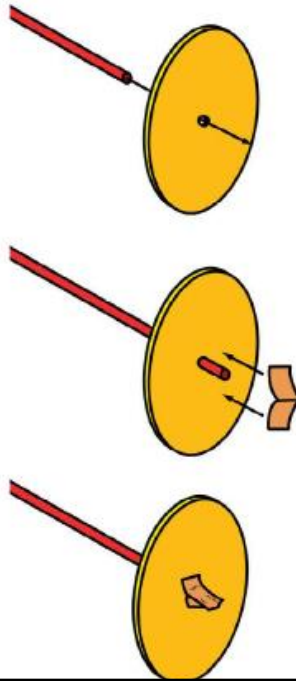
<u>Trial</u>	<u>How far did your racer go? (cm)</u>	<u>How well did your racer run?</u>	<u>What improvements do you plan to make?</u>
<i>Example</i>	<i>412 cm</i>	<i>It went a little crooked.</i>	<i>We want to use smaller wheels.</i>
<b>1</b>			
<b>2</b>			
<b>3</b>			

5. Did your improvements make your racer better? Explain why or why not.

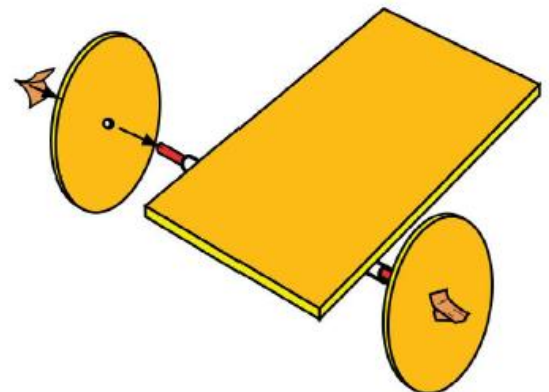
1. Lay out your pattern on the Styrofoam tray. You will need a racer body and wheels. Use a pencil point to score the Styrofoam. Snap out your pieces and smooth them. Make sure your wheels are round! Use sandpaper to round the wheels OR press them on a hard surface and roll them.



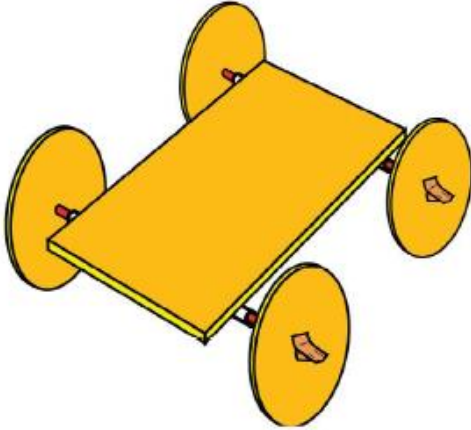
2. Punch a small hole in the center of each wheel with the pencil. Push the axle (stirrer) straw through the hole of one wheel so that it extends 1 cm on the other side. Pinch a piece of masking tape around the end of the straw and smooth it on to the wheel. Do the same for the second axle. Do not add wheels to the other ends yet!



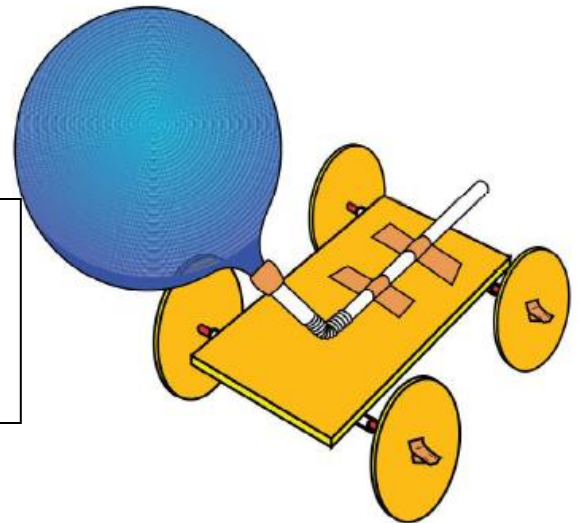
3. Cut two large straws to the size you want. Tape them parallel to each other on the bottom of the racer body at opposite ends. Slide a wheel and axle through one of the straws and mount a second wheel on the other end of the axle.



4. Slide the second wheel and axle through the remaining straw and mount the remaining wheel at its opposite end.



5. Blow up the balloon and then let the air out. Next, slip the straw into the balloon as shown. Use masking tape to seal the balloon nozzle to the straw. Squeeze the tape tightly to seal all holes. Test the seal by blowing up the balloon again through the straw.



*Make sure you are using the balloon pump, and not putting straws in your mouth. Keep track of the number of pumps, and keep that the same, unless that is a variable you change for your trials.*

6. Mount the balloon and straw to the racer with masking tape as shown. Be sure the end of the straw (rocket nozzle) extends off the end of the racer body.