



## Empowerment Activity – 4-Wheel Balloon Car

Topic/Theme: Engineering Careers

Video: Engineering Careers

<https://www.careergirls.org/video/engineering-careers/?back=60>

Supplies:

Jet <ul style="list-style-type: none"><li>• Balloon</li><li>• Flexible straw</li><li>• Rubber band or tape</li></ul>	Body (select one) <ul style="list-style-type: none"><li>• Water bottle</li><li>• Toilet-paper tube</li><li>• Milk carton (individual size)</li></ul>	Axles (select one) <ul style="list-style-type: none"><li>• Straws</li><li>• Barbeque skewers</li><li>• Chopsticks</li></ul>
Wheels (select one) <ul style="list-style-type: none"><li>• Bottle caps</li><li>• Candy mints (with a hole in the middle)</li><li>• CDs</li><li>• Cardboard circles</li></ul>	Connector for attaching wheels to an axle (select one) <ul style="list-style-type: none"><li>• Dry sponge</li><li>• Foam</li><li>• Clay</li><li>• Marshmallow (cut in half)</li></ul>	Optional <ul style="list-style-type: none"><li>• Color tape for racetrack</li><li>• Tape measure to measure distance</li></ul>

Tell students they will be watching the video titled, "Engineering Careers." Invite students to take turns sharing what they know about engineering. Explain that the video presents role models talking about why engineering is a career choice girls should consider.

After watching the video [Engineering Careers](#), ask students the following questions:

- The engineer from General Motors automobile company said that by watching the "crash dummies" she realized her job was important. How might an engineer from a car company work to keep people safe?
- Sometimes a career in engineering can be combined with an interest in other areas. What interests do you have that might be successfully combined with a career in engineering?
- In the video, one role model said that engineering "helps turn scientific principles, ideas, and dreams into reality." In your own words, what do you think she meant by that statement?



### Activity Instructions:

Have your students build a 4-wheel balloon car with the given materials and figure out different ways to make the car go further. They can work in teams of 2 - 4 depending on class size. If time permits have a race to see whose car is the fastest.

#### Make the Jet

1. Put the long end of a flexible straw into a balloon.
2. Attach the straw and balloon so that no air can escape, using either a rubber band or tape.
3. Poke two holes in the bottle's sides, on the part of the bottle that will be the bottom of the car. Make the holes directly across from each other so the axle goes straight across.
  - Slide a straw through the two holes. Adjust so the axle goes straight across.
  - Repeat for the second axle.
  - Slide a barbeque skewer through each straw.

#### Make the Wheels

4. Wedge a square of sponge (or foam or marshmallow) into a bottle cap to make a wheel. Make 4 of these.
5. Add the wheels
  - To make it easy to push a skewer into a sponge, use the skewer's point to poke holes in the sponges.
  - Center the holes so the wheels will spin evenly and not wobble up and down.
  - Push the wheels onto the ends of the skewers.

#### Insert the Jet

6. Poke a hole in the top and back of the bottle.
  - Push the jet into place so that the straw's balloon end pokes out the top and the open end pokes out the back.
  - Make sure the straw at the back is as parallel to the floor or tabletop as possible. If it points up, down, or to the side, your car won't move as fast or far as if the jet points straight back.

#### Power the Jet

7. Blow up the balloon by blowing through the straw.
  - Put your finger over the end of the straw to stop air from escaping.
  - Put the car on a smooth surface. Then let go. ZOOM!

#### How It Works:

Your balloon car uses jet power to move. The stored air in the balloon pushes through the straw, creating thrust—the force that pushes the car forward. So when air from the balloon moves in one direction, it pushes the car in the opposite direction.

## Try This Next:

- Try to double the distance by reducing friction (rubbing), lightening the car, pointing the jet back straighter, and straightening the axles.
- Decorate and have a parade. Give your cars personalities by using different-shaped containers and by decorating them. Have a parade to show off everyone's balloon cars.
- Demolition derby. Whose car is the toughest? See whose car still runs after five head-on collisions.



Thanks to <https://pbskids.org/designsquad/build/4-wheel-balloon-car/> for sharing this activity.