



Society of Women Engineers

ASPIRE • ADVANCE • ACHIEVE

SWENext Engineering Challenge #3

When you complete the activity, please share your finished project with us using pictures and/or videos on facebook, Instagram, or other social media! Use the hashtags #SWEtheFuture #SWENext #BeThatEngineer #DesignSquad when posting. We can't wait to see what you come up with!

To have your design featured by SWE please keep a lookout for an email on how to do this!

4-Wheel Balloon Car

Source: <http://www-tc.pbskids.org/designsquad/media/diy/4wheelcar-english.pdf>

4-Wheel Balloon Car

1

Here's what you need to make your 4-Wheel Balloon Car!

Jet

- Balloon
- Flexible straw
- Rubber band or tape

Body (Select one)

- Water bottle
- Toilet-paper tube
- Juice box
- Disposable cup (paper or plastic)
- Fast-food or deli "clamshell" container (where the top and bottom connect with a seam in the back)
- Ice cream container (pint or quart)
- Milk carton (individual size)
- Cardboard sheet
- Orange-juice can

Axles (Select one)

- Straws
- Barbeque skewers
- Chopsticks



Wheels (Select one)

- Bottle caps
- Candy mints (with a hole in the middle)
- CDs
- Cardboard circles

Connector for attaching wheels to an axle (Select one)

- Dry sponge
- Foam
- Clay
- Marshmallow (cut in half)

2

Make the jet

Put the long end of a flexible straw into a balloon.



3

Make the jet (cont'd)

Attach the straw and balloon so that no air can escape, using either a rubber band or tape.



4

Insert two axles

- 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 barbecue skewer through each straw.



5

Make the wheels

Wedge a square of sponge (or foam or marshmallow) into a bottle cap to make a wheel.



6

Make the wheels (cont'd)

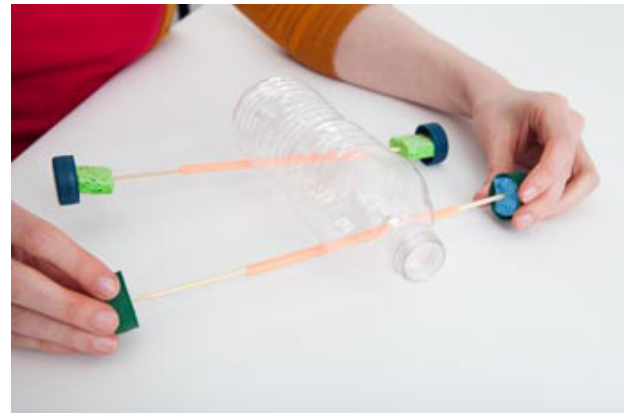
Make four of these wheels.



7

Add 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.



8

Insert the jet

- 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.



9

Power the jet

- 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!



10

Did you know?

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.



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Try this next!

- **Go for the record.** How far can your car go? 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.



PROJECT FUNDING



ADDITIONAL FUNDING

