

INV. 3 ACTIVITY—DESIGN AND BUILD A CART

Engineering Challenge: Design, build, and test a cart.

Possible Materials:

- Toilet paper roll, or paper towel roll
- Tops of bottles, plastic lids, old CD's, or cardboard
- Pencils, straws, skewer, or chopsticks
- Styrofoam, marshmallows, pieces of a dry sponge, playdough, binder clips or paper clips
- Rubber bands
- Toothpicks
- Nail
- Popsicle sticks
- Glue
- Scissors

Suggested procedure:

In your notebook, jot down ideas, and as you design, draw sketches of your work. Look at or think about cars and other wheeled vehicles and how they move.

- What are some parts of a car?
- List different parts you will include in your cart. List different ways to move your cart.
- How might you get the wheels to rotate at the same time?
- What material can you use for the body, wheels, and axle? The axle is something that runs through the center of the wheel.
- What materials do you have to use to attach wheels to axle?
- What materials do you have to hold the wheels in place and still keep the wheels moving freely? What will you use to move the cart?

The first ideas that inventors and engineers have rarely solve the problem. The inventors and engineers have to try many different ideas and learn from their mistakes and try again. Persistence (not giving up) is part of the design process. Design, build, try and try again. Don't forget to decorate. You don't have to use all the materials.

What parts of your cart are the same as on a real car?

Try this next:

- Make a cart go further.
- Make a cart that will go on the rug.
- Make a cart that will carry a small load.

Can you design a self-propelling power source? If so how does it work and how does it attach to the cart? What do you need to change? Record all your work in your notebook.

INV. 3 ACTIVITY— CONSTRUCT GIANT WHEELS

Engineering Challenge:

Make a really big wheel-and-axle system and roll it around outside.

Materials:

- Hula hoops
- A few cardboard boxes
- Scissors
- Masking tape
- A broomstick

Suggested Procedure:

Use two hula hoops to form wheels and use cardboard to provide supports in each wheel for an axle.

Use a broomstick or other shaft to form the axle.

In your science notebook draw the system, label the parts and describe how it worked and what challenges you had.

Have an adult take a video of you rolling it around. Send to your teacher.