Center Stage® SCIENCE

Activity 5

A Tale of Two Marbles

An activity for 2 people

Materials

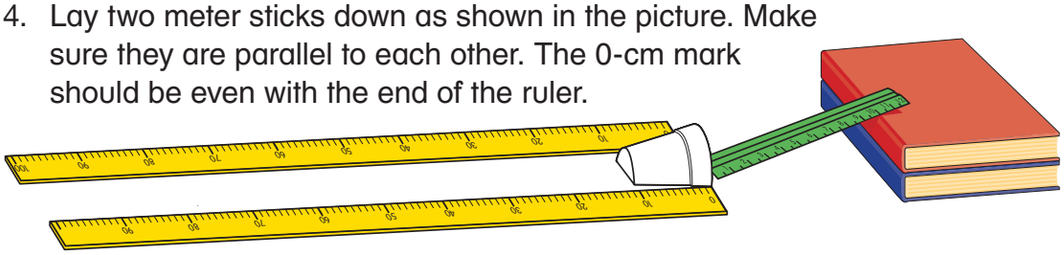
- glass marble
- steel marble
- book (2)
- plastic ruler
- tape
- 8-oz foam cup cut in half
- meter stick (2)

Center Stage Science BLM 3

What To Do

Does the **mass** of a moving object affect its pushing **force**? Try this experiment to find out.

1. Hold the steel marble in one hand and the glass marble in the other hand. Which marble feels heavier? Does your partner agree?
2. Make a ramp using the books and the ruler. The ramp should be about 5 cm high at the top. Tape the ruler in place without blocking the groove.
3. Place the half cup at the bottom of the ramp as shown in the picture. The open end of the cup should be lined up right over the end of the ramp.
4. Lay two meter sticks down as shown in the picture. Make sure they are parallel to each other. The 0-cm mark should be even with the end of the ruler.



5. Hold the glass marble at the top of the ramp. Let go of it, but be careful not to push it. How far does the cup travel? Record the results on the Response Sheet. Do three trials. Find the average distance the cup travels.
6. Predict how far the cup will travel when the steel marble pushes it. Place the steel marble at the top of the ruler and let it go. How far does the cup travel? Record the results. Do three trials. Find the average distance the cup travels.

Learn More!

Repeat the activity, but change the height of the ramp. Describe what you did. Tell what happened.

How was pushing force measured in this experiment? Did the mass of the marble affect the force? If so, in what way?

Purpose: Use motion as a measure of force; observe how mass affects force.