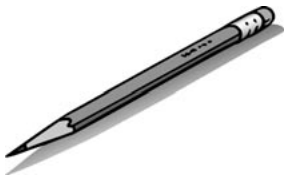
Chapter Science Investigation Name _____

Pushing and Pulling Boats

What You Need

foam food container



sharpened pencil

string

pennies

tub of water

Find Out

Do this activity to see how the size of a load affects how an object moves.

Process Skills

Observing
Communicating
Predicting
Interpreting Data

Time

- 10 minutes to get started
- 1 hour of experimenting and recording

What to Do

1. Carefully poke a small hole in one end of the foam container with the pencil.
   Safety! Be careful with sharp objects.
2. Tie a piece of string to the container. Put the container in the water.
3. **Observe** and **record** what happens.
4. **Observe** what happens if you tap the container with your hand.
5. Put five pennies in the container. **Predict** what will happen when you push and pull it.
6. Add five more pennies. Push and pull the container again.
7. Continue adding pennies and **observe** and **record** what happens.

Mark an *X* to show if you pushed or pulled.
Record the number of pennies you used and **record** what happened each time.

Push	Pull	Number of Pennies	Result

Conclusions

1. What happened when you pushed and pulled the boat?

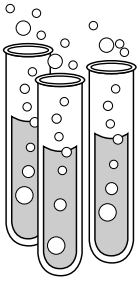
2. When did the boat need more force to start moving?

New Questions

1. Do you think that it would be easier to push or pull your boat in the water or on a table?

2. Why do you think this?

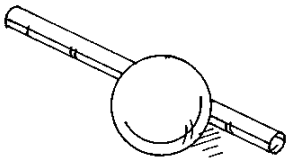
3. Write a new question you have about pushes and pulls.



Name _____

ACTIVITY

Observing Movement



Measure how far the ball moves.

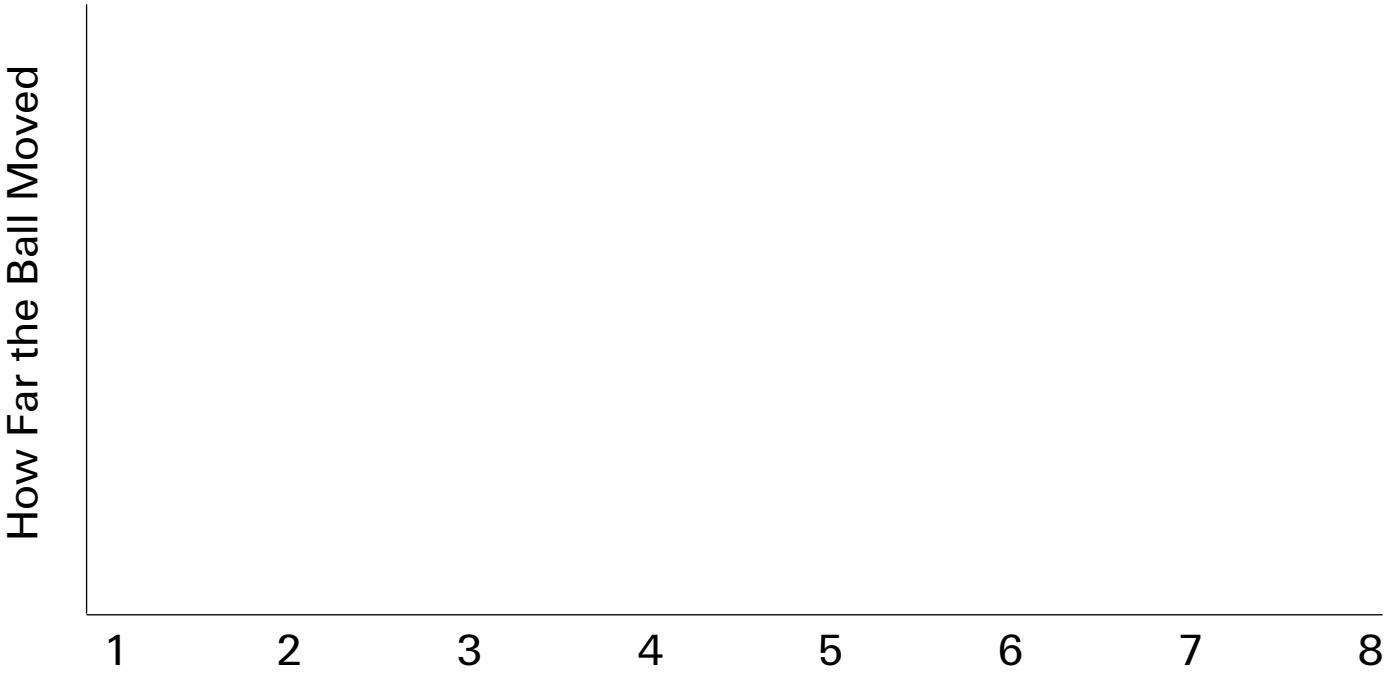
1. _____ **5.** _____

2. _____ **6.** _____

3. _____ **7.** _____

4. _____ **8.** _____

Make a graph of your measurements.



Name _____

What Happened

How far did the ball move each time?

_____

_____

What pushed on the ball to make it move?

_____

What If

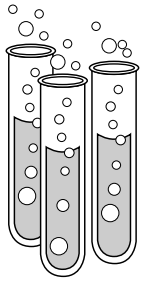
What other forces could move the ball?

_____

_____

_____

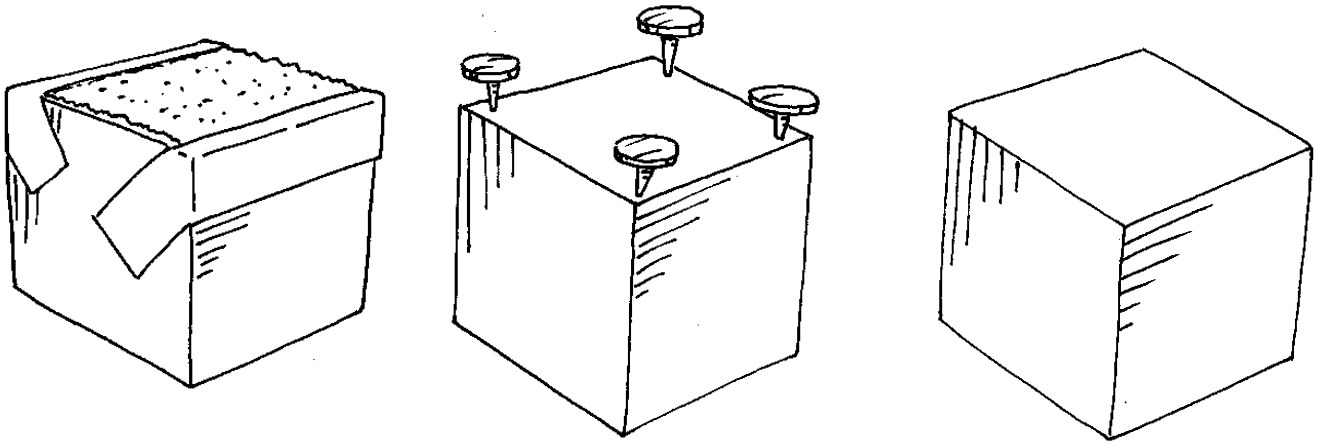
Name _____



ACTIVITY

Investigating Friction

Write an *x* on the block that moved first, after you tilted the board.



Name _____

What Happened

1. Which block moved first? Which block moved last?

_____

_____

_____

2. Why didn't all of the blocks move as soon as you started to raise the board?

_____

_____

_____

What If

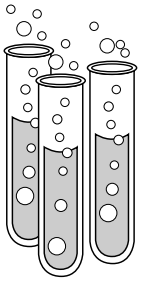
How could you change the blocks or the ramp to create less friction?

_____

_____

_____

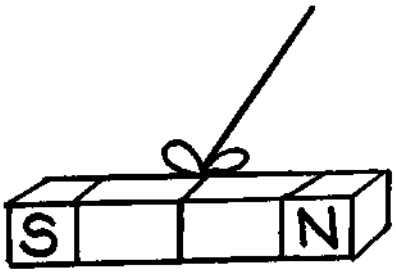
Name _____

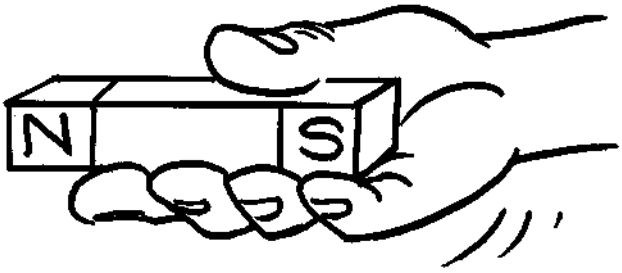


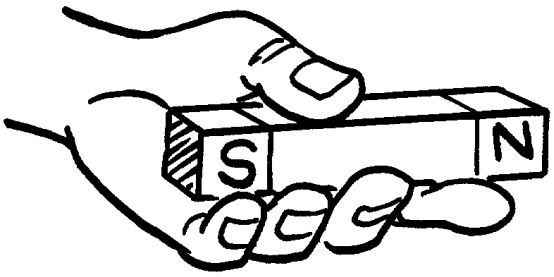
ACTIVITY

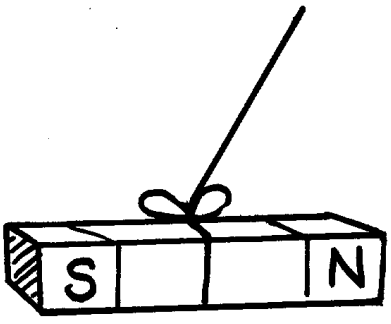
Observing Magnets

Draw arrows to show how the magnets moved.









Name _____

What Happened

1. Which ends of the magnet were attracted? Which ends were not attracted?

_____

_____

_____

2. What happened when the ends were not attracted?

_____

_____

_____

What If

How could you use these magnets to help you do a job?

_____

_____

_____