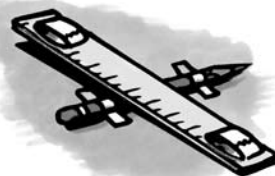


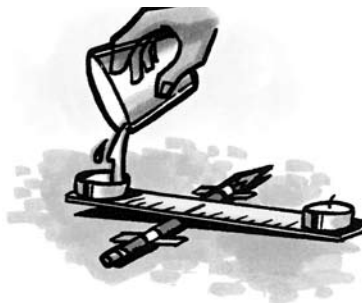
Activity 7.2

Comparing the density of an object to the density of water**How can you predict whether an object will sink or float in water?***Procedure**Build a balance*

1. Tape the pencil down as shown. Roll two small pieces of tape so that the sticky side is out. Stick each piece of tape to the opposite ends of the ruler.
2. Remove both candles from their metal containers. Place an empty metal container on each piece of tape. Be sure that the edge of the metal container lines up with the end of the ruler as shown.
3. Lay the ruler on the pencil so that it is as balanced as possible. (Don't worry if you can't make it balance exactly.) The spot on the ruler directly above the center of the pencil is your *balance point*. Mark the ruler with a pencil or permanent marker at this point.

*Compare the weight of wax and water*

4. Carefully place one of the candles back into its metal container on one end of the ruler. Make sure the same balance point is directly over the center of the pencil.
5. Carefully pour water into the metal container on the other end of the ruler. Be sure to fill the container with water to the same height as the wax fills the other container.



Which is heavier, the wax or the water? _____

Make a prediction. Do you think the wax will float or sink in water? _____

Activity 7.2

Comparing the density of an object to the density of water

(continued)

- Pour water into a plastic cup until it is about $\frac{3}{4}$ filled. Then place the wax in the water to find out whether it sinks or floats.



Write the word “floats” or “sinks” on the line beneath the illustration to describe what happens when you place the wax candle in water.

Compare the weight of clay and water

- Set up the ruler balance with the empty metal containers on each end. Check your balance point.
- Fill one metal container with clay and replace it on the end of the ruler. Make sure the balance point is centered on the ruler.
- Slowly and carefully add water to the empty container until it is filled.



Which is heavier, the clay or the water? _____

Make a prediction. Do you think the wax will float or sink in water? _____

- You had some clay left over after filling the metal container. Place that piece of clay in the water to find out whether clay sinks or floats.



Write the word “floats” or “sinks” on the line beneath the illustration to describe what happens when you place the clay in water.

You made sure that you poured the same amount of water as wax and the same amount of water as clay. Since the amount of space each material took up was the same, you compared *equal volumes* of wax and water and *equal volumes* of clay and water. “Equal volume” is a more accurate way of saying the “same amount”.

Activity 7.2**Comparing the density of an object to the density of water***(continued)*

Density has two parts: the amount of space a substance takes up (volume) and the weight of the substance. If something is more dense than water it will sink, and if it's less dense than water it will float.

1. Fill in the blanks below with “more dense” or “less dense”.
 - If a substance weighs *less* than an equal volume of water, it is _____ than water.
 - If a substance weighs *more* than an equal volume of water, it is _____ than water.

Whether or not an object sinks or floats in water has to do with its density compared to the density of water.

2. Fill in the blank with “float” or “sink” to help predict if an object will float or sink.
 - If a substance is more dense than water, it will _____.
 - If a substance is less dense than water, it will _____.
3. An ice cube will float in a cup of water.

What would you expect if you compared the weight of the ice cube to the weight of an equal volume of liquid water?

Use evidence from your experiment to justify your answer.
