Will it Float?

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Introduction

The heaviest ship ever built weighed over 600,000 tons when fully loaded with cargo. How can something that heavy float? Experiment with household objects to explore the concept of density.

Think About This

Why do some objects float while other objects sink?

Materials

- ☐ Container filled with water (you could also use a sink or bathtub)
- ☐ A towel to clean up any mess
- ☐ Pencil/Pen
- ☐ Piece of paper
- ☐ 4-8 various household items that can fit in the container, such as:
  - Fruits
  - Vegetables
  - Nuts
  - Various Cans
  - Various Bottles
  - Marbles
  - Plastic objects
  - Wooden objects
  - Metal objects

Do Ahead of Time

1. Fill a container with water. Add enough water so that the objects will not initially touch the bottom of the container. You can use your bathtub, a big bucket, or anything else that will be deep enough.
2. Gather the items from around your home that you wish to use.

Directions

Every object has a density, the amount of stuff packed into a certain space. Test various items from around your home to learn if their density lets them float or sink.

1. Divide a piece of paper into 3 columns to make a data sheet. (See example below)
2. Write down the name of each item in the left column.
3. In the middle column, come up with a hypothesis as to whether you think the object will sink or float. A hypothesis is an educated guess on what you think will happen.

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4 One at a time, gently put an object into the water and release.

5 Write down if the object floated or sank in the right column.

ITEM	HYPOTHESIS	OBSERVATION
Example: Ice cube	**Example:** I think it will float.	**Example:** It did float!

Questions to Ponder

1 How many objects did you guess correctly if they would float or sink?

2 What do the objects that floated have in common?

3 What do the objects that sank have in common?

What's Happening?

Density is how much matter something has in it (its mass) in relation to how much space something takes up (its volume). Liquid water has a density of 1 g/cm^3 (gram per cubic centimeter). Objects with a density higher than 1 g/cm^3 will sink and objects with a density less than 1 g/cm^3 will float.

If you have two objects that are the same size (volume) but have different masses, the heavier one will be more dense, while the lighter one will be less dense. For example, a bowling ball and a soccer ball have about the same volume, but a bowling ball is heavier, so it is more dense.

If you have two objects that are the same mass, but different sizes, the larger one will be less dense, while the smaller one will be more dense. For example, a table tennis ball and a glass marble have about the same mass, but the marble takes up less space, so it is more dense.

Now, can you guess the approximate density of the 600,000 ton ship? How is it able to float?

Did more of your objects float or sink? Email us at
AtHome@discoveryworld.org
and let us know some of the objects you tested and what you observed.