

# Will It Float?

Estimated Time:

**Prep:** 10 min.

**Activity:** 20 min.

## Introduction

### Overview

**Experiment:** Students test various objects to see whether they **sink** or **float**.

**Key Concepts:** Students will broaden their understanding of **buoyancy**, **density**, and **displacement**.

### Lead-In

Introduce the topic of buoyancy to your class by discussing sinking and floating. Explain that something that is buoyant can float. Ask students to think about why some things sink while others float. Explain that things that float are less dense than water.

Demonstrate density by choosing five or six students to stand in various places around the classroom. Explain that these students represent water molecules. Point to a chair in the center of the classroom and tell the class that you want to see if these students, standing where they are, can hold up that chair. Why can't they hold it up where they are? Guide the class to understand that the students are too far apart to hold up the chair. Now direct your volunteers to move closer together around the chair. Can they hold it up now? Why?

Explain that density is a measure of how close together an object's molecules are. Water can only hold up things that are less dense than itself. Things that are denser than water will sink.

## Teacher Preparation

### Lead-In Materials:

- Chair

### Teacher-Provided Experiment Materials:

- Water

### Try This! Materials:

- Aluminum foil
- Clear plastic container\*

### Prepare:

- Make copies of the Experiment Sheet.

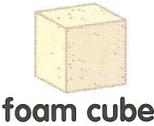
**Note:** This experiment involves water. Have paper towels or hand towels ready, and prepare your work space away from electrical cords and outlets.

\*included in kit

## Vocabulary

- ◆ **buoyancy** the ability of an object to float
- ◆ **density** how close together an object's molecules are
- ◆ **displacement** the amount of water that is moved by an object when it is placed in water
- ◆ **float** to be held up or supported by a liquid
- ◆ **sink** to fall below the surface of something

# You Will Need



Experiment 11: Buoyancy

Name \_\_\_\_\_

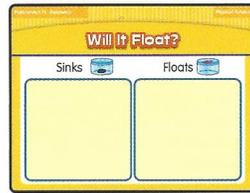
**Will It Float?**

Object	Prediction (Write one)	Was my prediction correct? (Circle one)
mini basketball	sink float	yes no
foam cube	sink float	yes no
rock	sink float	yes no
foam star	sink float	yes no
marble	sink float	yes no
feather	sink float	yes no
sensory ball	sink float	yes no
cork	sink float	yes no
metal ball	sink float	yes no
button	sink float	yes no

## Teacher-Provided Materials



water



sorting mat

Experiment Sheet

# Procedure

1

Look at each object and predict whether it will sink or float.

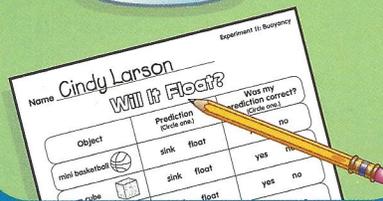
Record your predictions.



2

Fill the container with water.

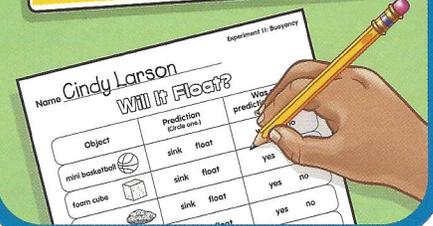
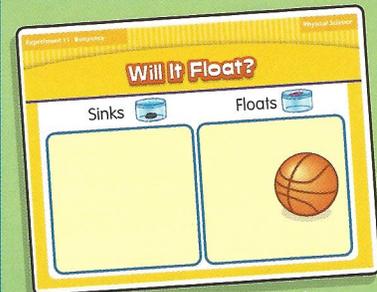
Test each object by placing it in the water.



3

Keep track of your results by placing each object on the sorting mat.

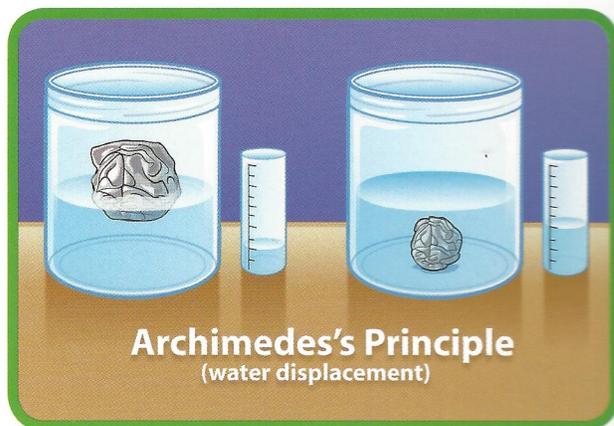
Record your results.





## Why?

In ancient Greece, a scientist named Archimedes discovered that when an object is placed in water, it displaces some of the water. If the object weighs less than the water it displaces (as is the case for objects that are less dense than water), the object floats. Objects that weigh more than water are denser than the water they displace, so they sink. This discovery is known as Archimedes's principle, or the law of buoyancy.



## Discussion Prompts & Questions

- If an object floats, is it more or less dense than water?
- Explain how you can predict whether something will sink or float.
- What did you notice about the objects that sank? What did you notice about the objects that floated?
- Now that you have tested several objects, would you change any of your predictions? Why?



## Sentence Frames

- I predict \_\_\_\_\_ will float because \_\_\_\_\_.
- I predict \_\_\_\_\_ will sink because \_\_\_\_\_.
- When I did the experiment, I discovered \_\_\_\_\_.



## Try This!

Discuss displacement by pointing out that when an object enters the water, it displaces or pushes aside some of the water. Explain that something will float if its weight is spread out over a large enough area. So something can have the same weight or mass as a buoyant object, but still sink because its weight is concentrated in too small an area (it is too dense).

- Shape an aluminum-foil square into a small, watertight boat. Place it gently in the water. What happens? Now take the boat out, dry it off, and squeeze it into a small, very tight ball. Place it in the water. What happens? Why?