

# Sink or Float



VIRGINIA  
**AQUARIUM**  
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*Learn about the qualities of water and what factors allow certain things to float, while others cannot. Observe what happens when a material like aluminum changes shape.*

## Duration

Preparation: 15 minutes

Activity: 45 minutes (Will vary depending on which activities are completed)

## Supplies

- Clear plastic tubs of water
- Items to test: paperclip, sponge, wood, toothpick, marble, plastic spoon, metal spoon, penny, plastic straw, crayon, cork, etc.
- Sink or Float baggie (with some possible experiment items)
- Worksheet (attached at end)
- Pencils
- Paper towels
- Large 1-quart measuring cup
- Clear plastic cup
- Cork
- 2 pieces of aluminum foil (3"x3" squares should suffice)
- Plastic straw
- Other suggestions (Students can bring their own items that they think might sink or float and photos/magazine pictures of objects floating in water like boats, insects, plants, etc.)

## Background

Things will float or sink depending on several factors like air trapped in it or the amount of surface area meeting up with surface tension.

## Activity 1: Sink or Float

### Materials:

- Clear plastic tubs
- Items to test (ex: paperclip, sponge, wood, toothpick, marble, plastic spoon, metal spoon, penny, plastic straw, crayon, cork, etc.)
- Worksheet made using the template at the end
- Chart paper or whiteboard
- Pencil and paper

**Pre-lesson:** Discuss what students already know about what objects might sink or float and have the students make predictions regarding the objects they will be testing.

### Activity Preparation:

1. Create a chart on a whiteboard or large chart paper similar to the worksheet the students will use.
2. Have students form groups (3-4 students per group).
3. Each group receives a tub of water, materials to test, paper towel and the worksheet and pencil to record their findings.

### Activity Steps:

1. Students will place items in the tub one at a time, record if it sinks or floats, and place the wet item on the paper towel.
2. After the groups have finished, record the groups' results on the large chart for all to see.

**Follow-up discussion:** Without giving the students any reasons or ideas have them share their ideas on why certain objects might float while others did not. Did any of the results surprise them? Why?

## Activity 2: Demonstrate Sinking and Floating Cork (air pressure & water displacement)

### Materials:

- Large measuring cup (at least 1-quart)
- Clear plastic cup
- Cork

### Activity Preparation:

1. Gather materials.
2. Fill measuring cup  $\frac{3}{4}$  full.

### Steps for Demonstration

1. Show the students the cork and let a few of them hold it.
2. Ask: "Will the cork sink or float? Why?"
3. Place the cork in the water and let the student see that it floats.
4. Ask: "How can we make the cork sink without touching it?"
5. Place inverted cup over cork and press, so that the air pressure trapped in the glass displaces the water and seems to make the cork sink.
6. Ask: "What happened?"
7. Help students describe what they saw in words (\*\*Air trapped in the cup pushed the water below it down, and the cork still floated in the water.\*\*)
8. Take the glass out of the water, and ask the students how much water is in the measuring cup
9. Ask: "What happens to the water level when I push the glass down?"
10. Show students that the water level rises, due to displacement
11. Ask: "Why do items float?"
  - a. Density – less dense than water
  - b. Shape – has air in it (displaces water) ▪ Ex: aircraft carrier, other open boats
  - c. Surface tension – "stickiness" of water keeps light (but denser than water) items floating

### Activity #3: Demonstration – Aluminum Foil Sink or Float

#### Materials:

- Measuring cup from previous activity filled with water
- 2 pieces of flat aluminum foil

**Pre-lesson discussion:** Ask students if they think the foil sheet will sink or float. Roughly tell the kids, based on their predictions that they are on Team Sink or Team Float.

#### Activity Steps:

1. Drop one sheet of paper onto the water flat – it should float.
2. Telling the kids from Team Float to wait and watch, take the second piece of foil and drop it into the water, this time vertically. – it should sink.
3. Point out the both teams were correct.
4. Taking the piece that originally floated flat, fold it very small and tiny. Ask Team Float if they wanted to stay predicting it would float or change teams.
5. Drop the folded foil into the water – it should sink.
6. Take the piece that had originally sunk and lightly crumple it. Ask Team Sink the same question.
7. Drop the lightly crumpled foil into the water – it should float.
8. Ask the students why the foil acted differently? What caused it to sink or float?
  - a. Flat, unfolded – surface tension
  - b. Vertical – no surface tension because surface area too small
  - c. Tightly folded – no air trapped
  - d. Lightly crumpled – trapped air (like a ship traps air and helps it float)

## Activity #4: Demonstration – Does Air Increase Water Level?

### Materials:

- Measuring cup from previous activity filled with water
- Plastic straw

### Steps for demonstration:

1. Ask: “If I blow bubbles in the water, will the water level go up? Why do you think this?”
2. Blow bubbles in the water with the straw.
3. Ask: “What happened?” (\*\*The water level initially went up while I was blowing the bubbles but went down when I stopped.\*\*)

**Follow-up discussion:** Discuss how air blown into the water does *displace* the water temporarily, but that because air is less dense it rises out of the water so the water returns to the previous level.

## Vocabulary

Surface Tension

Cohesion

Density

Molecule

Chemical bond

Displacement

# Sink or Float Worksheet

Will your items sink or float?

1) Write the item name on the left, and then circle “sink” or “float” as your prediction. *What do you think will happen?*

2) Place the item in the water, and then circle “sink” or “float” as the result of the experiment. *What did happen?*

ITEM	PREDICTION		WHAT HAPPENED	
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT
	SINK	FLOAT	SINK	FLOAT