

2. Place a balloon on the water in the small bucket. Force the balloon under the water and then watch what happens when the balloon is released. Back up, water may be splashed when the balloon springs back to the surface!
3. Ask students to explain what happened and accept all plausible answers. Someone might suggest that the buoyant force pushes the balloon to the top.
4. Explain that students will investigate the forces that act on floating and sinking objects in this inquiry.

## Explore



1. Organize students into groups of four. Give each student a copy of Activity One: The Force of Buoyancy.
2. Tell students that they will use equipment to gather data about objects that float and sink in water, and then analyze that data to discover patterns and create rules.



Select Inquiry #6 “The Force of Buoyancy” and view the “Sinkers and Floaters” sequence, which explains how to weigh the objects in air and in the water.

3. Give each group the necessary materials and a Direction Guide for Activity One.
4. Have students follow the directions for the activity and record their observations in the data table.

## Explain

1. Discuss the results of the investigation:
  - Students should observe that the cork stopper, wooden cube, and Styrofoam float, while the rock, plastic cube, steel cube, rubber stopper, and aluminum cube sink.
  - Students should observe that for **floating** objects, the weight of the object in water is **LESS** than the weight of the object in air (the weight in water is zero). The vector diagram should show that the buoyant force (the upward force) is equal to the force of gravity (the downward force). The forces are balanced and the resultant force is zero.
  - Students should observe that for **sinking** objects, the weight of the object in air is **GREATER** than the weight of the object in water. The vector diagram should show that the buoyant force (the upward force) is less than the force of gravity (the downward force).