

### Materials Needed

- Container for water
- Collection of small objects that will sink or float, such as:
  - small wood blocks
  - beads
  - grapes
  - carrots
  - grass
  - paper clips
  - pennies
  - washers
  - small screws/nuts
  - rubber bands
  - pipe cleaners
  - string
  - yarn

### Grade Range

K-2

### Topics/Skills

Science: Scientific Process, Observation, Buoyancy, Density

### Learning Standards

NGSS: [Forces and Motion](#); [Structure and Properties of Matter](#); [Engineering Design](#)

### Duration

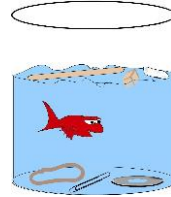
15-30 mins

### Prep Time

10 mins

## Sink or Float?

### Using Water Play to Encourage Scientific Inquiry



Students explore buoyancy by observing objects that sink or float in water.

### Activity Challenge

Students think about which objects will sink or float and place them in water to see the results. Then they design a way to sink a floating object.

### Preparation (Part 1)

1. Gather a collection of 5-10 items that are okay to get wet. Make sure that some of the items will float and others will sink in water.
2. Find a container and fill it about  $\frac{3}{4}$  full of water. The water should be able to fully cover the largest item. If needed, use a sink or tub.
3. Have a container handy to hold the wet objects after they've been removed from the water, and a towel for cleaning up splashes.

### To Do (Part 1)

1. Students take each item, one at a time, and place it in the water.
2. Using the data table (see Table 1 below) have students write the item's name, or draw a picture of the item, in the first column.
3. Ask students if they think the item will float or sink when they drop it into the water.
4. Have students write YES or NO in the 2nd column.
5. Let students put the item in the water and write, or draw, what happens in the 3rd column
6. Repeat this process for each item – **one** at a time.

### Preparation (Part 2)

1. Collect small items that would sink in water, such as paper clips, pennies, small metal washers, and/or screws/nuts.
2. Collect materials that can be used to attach the small items above to the items that floated, like pipe cleaners, string, yarn, or tape.

### To Do (Part 2)

1. Instruct students to pick one of the items that **floated** and challenge them to use some of the small items collected to make the floating item sink.
2. When they have an idea, they should **first** draw their idea in the first box of Table 2 (see below) **then** try their idea and watch what happens. After seeing what happens they can add the results to the table. (Did their idea cause the item to sink?)
3. If they are not successful the first time, encourage them to try again. Having students describe what they are trying to do, and how they think their idea will work, is GREAT for their language development.
4. If they are successful on their first attempt, challenge them to figure out a *different* way to make the item sink. Feel free to repeat this with a different item that floated.

### Observations

- Part 1: After observing all the objects, students share their thinking about why some items floated and others sank.
- Part 2: Students combine more than one material to see how it can affect the total buoyancy of the items in water. This can be used as an example of why wearing a life preserver makes human bodies float in water.

### Extensions

- Have students try to get an object that floated near the top of the water to partly sink, so that it is floating suspended halfway in the container of water.
- Provide different substances like dish soap, vinegar, or salt for students to add to the water and retest previously identified floating materials. They can compare results before and after treating the water.

### The Science Behind the Activity

Asking students to develop their own theories for why objects sink or float helps them develop confidence in their scientific process skills. Incorrect theories are just fine! Developing confidence in creating explanations based on acquired data, even if the explanations are wrong, is an important scientific skill. To explain why objects, sink or float, one needs to understand the concepts of buoyancy, density, Archimedes' principle (see video here (<https://bit.ly/2xl5uKj>)) and sometimes even surface tension. Generally, these concepts are not age appropriate for young learners. This activity creates an early childhood foundation for a curiosity about the concept of buoyancy, which can be revisited at a later stage in a student's education.

**Table 1**

Name, or picture, of item	Prediction: Will the item float? Write YES or NO in the box.	Results: Did the item float or sink? Write or Draw FLOAT or SANK in the box.

This activity was created in collaboration with Santa Clara County Office of Education

**Table 2**

1 <sup>st</sup> try – what happened?	2 <sup>nd</sup> try – what happened?
3 <sup>rd</sup> try – what happened?	4 <sup>th</sup> try – what happened?