

Will it SINK or will it FLOAT?

By the time your child is in 5th grade they should know:

- Some objects sink in water while others float.
- Density is the ratio between the mass of an object to its volume.
- Density determines if a material sinks or floats in another substance.
- An object will sink if its density is greater than the density of the fluid it is in.
- An object will float if its density is less than the fluid it is in.

Science Focus Questions

~Younger Children~

What objects float?

What objects sink?

~Older Children~

Why do some objects sink and others float?

Does the type of liquid make a difference?

What is density?

How can we calculate density?

Scientific practices to master:

- **predict** whether objects will sink or float in water
- **classify** objects as sinking or floating in water
- **collect data** of mass and volume
- **explain** why the object sank or floated

Materials Needed:

Younger Child

- Large container of water (large enough to accommodate objects)
- Objects that will float and objects that will sink: stick, rock, clay- depends on shape, cork, cup- depends how placed, paperclip, nail, plastic button, metal button, apple, penny, grape, dime, orange, nickel, quarter, wooden block, ping-pong ball, ink pen, golf ball, plastic spoon, metal spoon, metal button, other any other objects available at home.
- Piece of paper labeled, floats
- Piece of paper labeled, sinks

Older Child

- Large container of water (large enough to accommodate objects)
- Objects that will float and objects that will sink: stick, rock, clay- depends on shape, cork, cup- depends how placed, paperclip, nail, plastic button, metal button, apple, penny, grape, dime, orange, nickel, quarter, wooden block, ping-pong ball, ink pen, golf ball, plastic spoon, metal spoon, metal button, other any other objects available at home.
- Kitchen scale
- Graduated cylinders (100 ml and up to 1 liter)
- Small beakers (100 ml)
- Experiment worksheet

Do the Chillax Science Lesson!

Option 1: Parent Led

- Prepare the materials and invite children to the lesson.
- Invite children to place an object in the water container. Ask children, what do you notice? Once they respond, prompt the children to place the object in the correct category.



- Invite children to place another object in the water container. Ask children, what do you notice?
- Invite them to test the remaining objects and categorize them in the data chart.
- Give space and time for the children to test independently. Ask them to call you when they are done.
- Once all the objects have been tested invite them to report their observations. You may follow-up with questions like:
 - How are the objects that sank similar?
 - How are the objects that floated similar?
 - Do you think we can predict if an object will sink or float?
 - Do you think any of the items that sank could float? What would we need to change?
 - Do you think any of the items that floated could sink? How could we do that?

Option 2: Child Independent

- Offer tray with materials or invite children to collect materials.
- Provide children with experiment guide.
- Child independently investigates using these focus questions:

~Older Children~

Why do some objects sink, and others float?

Does the type of liquid make a difference?

What is density?

How can we calculate density?

- If you are using this option, print pages 5-9.
- Invite children to complete experiment independently.

Physics Laboratory: Sink or Float

WRITE

What we Think we Know!

1. What do you think you know about objects that sink or float in water? Record what you know.

GATHER

In order to test whether an object sinks or floats and explain why that happens, you need to gather some materials. Make a checkmark when you get the material:

- Stick
- Rock
- Clay
- Cork
- Cup
- Paperclip
- Nail
- plastic button
- metal button
- apple
- penny
- grape
- dime
- orange
- quarter
- wooden block
- ping-pong ball
- ink pen
- golf ball
- plastic spoon
- metal spoon

MEASURE, TEST, RECORD

1. Arrange and write down, on the table below, all the objects that you will be testing.



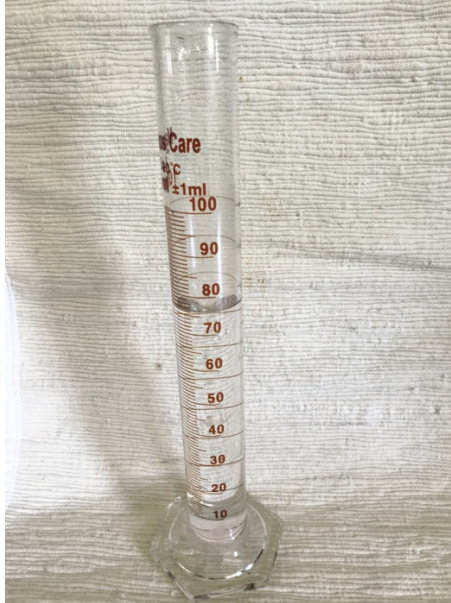
Object	Prediction	Actual	Mass (g)	Volume (ml) (Final-Beg.)	Density (g/cm ³) (mass ÷ volume)



2. Using a kitchen scale weigh each object. Record the grams in the table.
3. Record your prediction. Will the object float or sink?
4. Test and record whether the object sink or floats.

5. Calculate the volume of the object. We can estimate this by calculating how much water the object displaces when placed in a graduated cylinder with water.

a. Find the graduated cylinder and fill it up with water to 75 ml.



b. Pick the first object on your list and place it in the graduated cylinder with water. Here is an example.



- c. Then, record the volume on the table. You calculate the volume using this mathematical equation: $\text{volume} = \text{final volume} - \text{beginning volume}$
Make sure to record the volume on the worksheet.
6. Calculate the object's density. You can calculate the density by using the following mathematical equation: $\text{density} = \text{mass} \div \text{volume}$

ANALYZE

Look at the data worksheet. Answer the following questions:

1. Do objects that have a density higher than $1\text{g}/\text{cm}^3$ sink or float?

2. Do objects that have a density lower than $1\text{g}/\text{cm}^3$ sink or float?

EXPLAIN

Explain how we can predict if an object will sink or float in water. Make sure to use your evidence to support your scientific explanation.