

## LESSON PLAN

### Floating and Sinking

Students will predict and test whether objects float or sink, gaining an understanding of buoyancy and density. They will then design and build a small raft using straws and tape, testing its ability to float and hold weight, and discussing real-world applications like boats and submarines.

**Recommended  
age for this game**

**6-9  
years old**

**45 - 60  
min**

**Duration**

### Learning Objectives

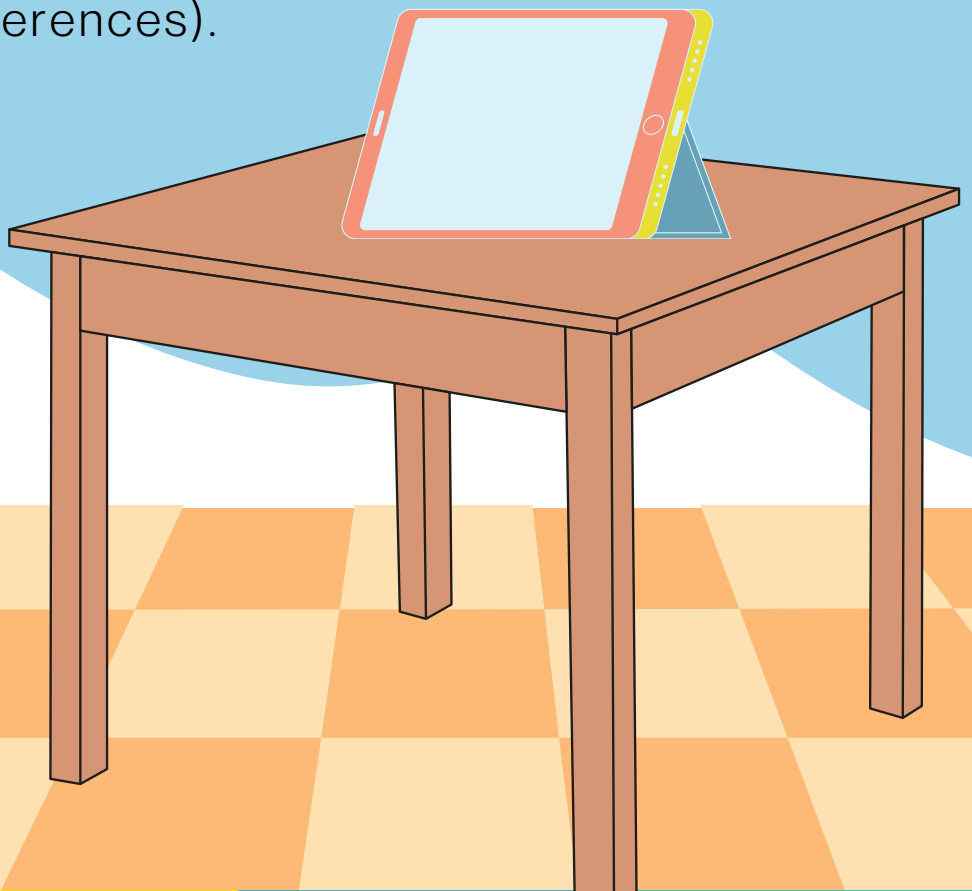


- Understand why some objects float while others sink based on buoyancy and density.
- Explore real-life applications of buoyancy, such as boats and submarines.



## Materials and tools needed

- Large clear container filled with water
- A variety of objects (wood, metal, plastic, rubber, sponge, etc.)
- Straws and tape (for raft-building challenge)
- Coins or marbles (to test how much the raft can hold)
- Printable worksheet for predictions and observations (See references).
- Optional: Digital animations or online simulations on buoyancy (See references).



## Guidance for Teachers

### Activity description

- Students will explore buoyancy by predicting and testing which objects float or sink. They will design and build a small raft using straws and tape to test how well it floats and supports weight. The activity encourages experimentation, problem-solving, and discussion on real-world applications like boats and submarines.
- Introduction & Demonstration: The teacher introduces buoyancy with a discussion and simple floating and sinking experiment.
- Hands-on Experimentation: Students test a variety of objects in water, record their observations, and analyze the results.
- Raft-Building Challenge: Students design and construct a floating raft using straws and tape, testing its buoyancy with small weights.
- Technology Integration: Students interact with an online buoyancy simulator to explore how shape, material, and mass affect floating and sinking.
- Discussion & Reflection: Students share their findings, discuss real-world applications, and consider how to improve their raft designs.





## Guidance for Teachers

### Preparation

- Gather a variety of materials to test for floating and sinking.
- Fill a large container with water for class demonstrations.
- Prepare a digital animation or simulation explaining buoyancy.
- Provide students with worksheets to record predictions and results.

### Implementation steps

#### 1. Introduction & Prediction

- Discuss the concept of buoyancy and why some objects float while others sink.
- Show examples of floating and sinking objects and ask students to predict outcomes.

#### 2. Experimenting with Objects

- Distribute various objects to small groups.
- Have students test each object in the water and record whether it floats or sinks.
- Discuss results as a class and introduce the concept of density affecting buoyancy.



### 3. Raft-Building Challenge

- Give each student a set of straws and tape and challenge them to design a floating raft.
- Have students test their rafts by placing them in water and adding small weights (coins, marbles, etc.).
- Encourage students to redesign and improve their rafts based on observations.

### 4. Discussion & Reflection

- Discuss which raft designs worked best and why.
- Ask students: How would you improve your raft design?
- Show a real-world example of how engineers design boats and submarines.
- Conduct a short quiz or class discussion to reinforce learning.

## Follow-up and reflection



- Expected Outcome:
  - Students will understand why objects float or sink based on buoyancy and density.
  - Students will apply their knowledge to design and improve floating structures.
- Student Activities:
  - Interactive quiz on floating and sinking concepts (See Annex 1 for the questions).
  - Draw and label their raft designs, explaining why they worked or failed.
  - Discuss real-world applications of buoyancy in transportation and safety.



## Student Activities

Activity description	Expected outcome	Technology integration
<b>Predict Floating &amp; Sinking</b>	Students will use reasoning skills to guess which objects will float or sink.	Use an interactive buoyancy quiz to test predictions.
<b>Testing Objects in Water</b>	Students will observe and classify objects based on buoyancy.	Record observations and compare with an online simulator.
<b>Raft-Building Challenge</b>	Students will experiment with materials and structures to create a floating raft.	Explore an interactive buoyancy simulation.
<b>Discussion &amp; Reflection</b>	Students will explain what they learned and apply it to real-world situations.	Use a virtual whiteboard for brainstorming improvements.



## Reflective questions for students

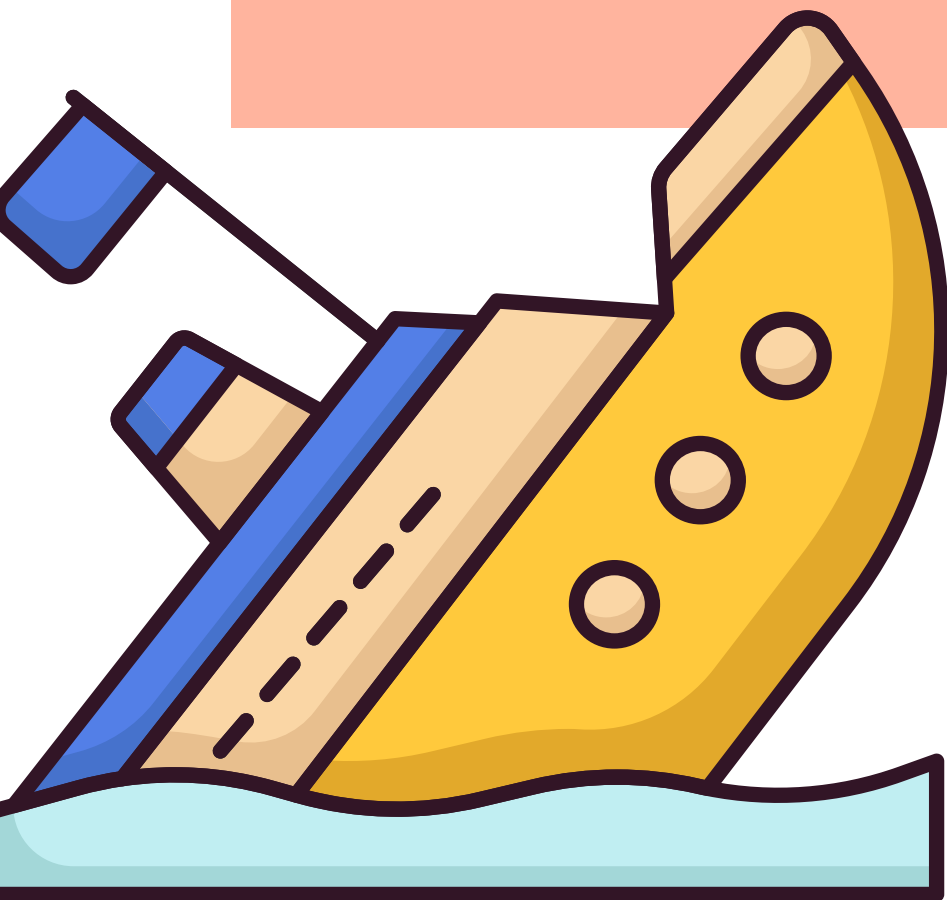
- What surprised you the most about which objects floated or sank?
- How does the shape of an object affect whether it floats or sinks?
- If you redesigned your raft, what changes would you make and why?
- Can you think of any real-life situations where understanding buoyancy is important?





## Differentiation ideas

- **For advanced students:** Challenge them to design a raft using different materials and test variations in weight distribution.
- **For students with special needs:** Provide step-by-step guidance and allow tactile exploration with objects before predictions.



## Tips

- Ask students to explain why they think an object will float or sink before testing.
- Show videos or diagrams of boats, submarines, and life vests to relate the concept to everyday life.
- Assign small groups for testing objects and designing rafts to foster collaboration.
- Let students experiment with different raft shapes and materials to discover what works best.
- Connect the concept to cargo ships, swimmers, and floating toys.
- Provide tactile experiences, visual media, and discussion opportunities for diverse learners.



## Additional materials and references

Floating or Sinking game

<https://www.gynzy.com/en/library/items/floating-or-sinking>.

Video “How Do Boats Float?”

<https://www.youtube.com/watch?v=VnLccU8mihQ>

Example of the Worksheet for “Sink or Float?”

<https://preschool365.com/l3/experiment-float-or-sink/preschool-float-or-sink-science-experiment-06.pdf>

Kahoot <https://create.kahoot.it/auth/register>



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# ANNEX 1

## Questions for the quizzes

- 1. Why do some objects float while others sink?  
A) Because of their color  
B) Because of their weight  
**C) Because of buoyancy and density**  
D) Because of the shape of the container
  
- 2. Which of the following materials is most likely to sink in water?  
A) Wood  
B) Plastic  
**C) Metal**  
D) Sponge
  
- 3. What happens if an object is less dense than water?  
A) It sinks to the bottom  
**B) It floats on the surface**  
C) It disappears in the water  
D) It dissolves in the water
  
- 4. What is an example of a real-world application of buoyancy?  
A) A car driving on the road  
**B) A boat floating on a river**  
C) A bird flying in the sky  
D) A tree growing in a forest
  
- 5. How can you increase the buoyancy of an object?  
A) Make it heavier  
B) Make it smaller  
**C) Increase its surface area and trap air inside**  
D) Push it to the bottom of the water