Lesson Title: Archimedes' Principle in Practice

Grade: 8th
Duration: 45 minutes
Topic: Physics – Buoyancy and Fluids
Objective:
By the end of the lesson, students will:

- Understand **Archimedes' Principle**.
- Be able to explain why objects float or sink.
- Apply the principle through simple experiments.

Materials Needed:

- Water containers (clear plastic tubs or buckets)
- Measuring cups
- Small objects of different materials (metal, plastic, wood, etc.)
- Spring balances or digital scales
- Overflow cans (if available) or graduated cylinders
- Towels (for spills)
- Worksheets for group activity

Lesson Breakdown:

1. Introduction (5 minutes)

- Ask: "Why do some objects float while others sink?"
- Introduce **Archimedes' Principle**:

  > *"Any object submerged in a fluid experiences an upward buoyant force equal to the weight of the fluid displaced."*

- Share the famous **"Eureka!"** story of Archimedes discovering the principle in the bath.

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2. Demonstration (10 minutes)

- Drop different objects (e.g., metal bolt, plastic toy) into water.
- Ask: "Which one displaces more water?" "Which one floats?"
- Use a container and a graduated cylinder to measure displaced water.
- Relate this to **buoyant force** and object **density**.

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3. Group Experiment (15 minutes)

- In small groups, students will:
    1. Weigh an object in air using a spring scale.
    2. Submerge the object and weigh it in water.
    3. Measure displaced water and calculate its weight.
    4. Compare: *Buoyant force ≈ weight of displaced water*.
- Fill out a worksheet with observations and questions.
  (You can simplify calculations or pre-measure to focus on understanding.)

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4. Real-World Connections (5 minutes)

- Discuss where this is used:
    - Ships floating on water
    - Submarines
    - Hot air balloons (gas displacement)
- Optional: Show video clip or image of cargo ships, lifebuoys, etc.

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5. Recap & Quick Quiz (10 minutes)

- Review:
    - What is Archimedes' Principle?
    - Why does a heavy ship float?
    - What happens when you submerge an object in water?
- Give a mini quiz (3–4 questions) and review answers with the class.

Assessment:

- Group participation and accuracy in the experiment
- Worksheet completion
- Quiz results