

Didactic Scenario

1. Title

Comparing Weights in Air and Water

2. Keywords

Science experiments, laboratory, chemical elements, chemistry

3. Basic Information

STEAM Subject: Science

Typical interaction time with the instructional scenario in teaching hours for in-school work: 60 minutes

General description of the scenario:

This scenario outlines the basic plan for the experiment titled "Comparing Weights in Air and Water." The experiment is designed to teach students about buoyancy and encourage them to make scientific discoveries by observing the condition of objects in water. It is targeted towards middle school and high school students.

The scenario includes the experiment's durations, required materials, and instructions for dividing students into groups to conduct the experiment. Additionally, it provides guidelines for discussing the experiment results and ensuring students grasp the concept of buoyancy.

The activity fosters STEM (Science, Technology, Engineering, Mathematics) skills by promoting active student participation and observation. It allows students to develop scientific thinking, observation skills, and inference drawing, as well as teamwork and presentation abilities.

Phases

Stage

Time

1	Introduction		5 Minutes	
2	Preparation		10 Minutes	
3	Conduction the Experiment		20/30 Minutes	

Age group: 8 – 11 Years old

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
			X	

Teaching resources

Material:

Dynamometer (preferably one per student)

Beaker or glass (one per student)

Water (approximately half a glass per student)

String or thin rope (about 30 cm in length per student)

Tennis ball (one per student)

School infrastructure: Science Lab

Additional material from external sources/online tools:

https://www.youtube.com/watch?v=khc2wUBsFU4&ab_channel=InfinityLearnNEET

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4. Educational Problem

To help students understand the concept of buoyancy and how it relates to the difference in weights of objects in air and water.

To encourage students to explore and make scientific discoveries through hands-on experimentation.

To foster interest in STEM subjects by engaging students in a fun and interactive experiment.

5. Learning Objective (-s)

1. Students will gain a basic understanding of buoyancy and its role in determining whether objects float or sink in water.
2. Students will learn about the factors that influence buoyancy, such as the weight and volume of objects and the density of the surrounding fluid.
3. Students will be able to explain why some objects float on the surface of water while others sink based on their observations and the concept of buoyancy.
4. Students will develop critical thinking skills by analyzing experiment results and drawing conclusions about the relationship between weights in air and water.
5. Students will practice teamwork and communication skills by working in groups to conduct the experiment and present their findings to the class.
6. Students will make connections between the experiment's findings and real-life examples of buoyancy, such as why boats float or why some objects are easier to lift underwater.

6. Phases of the Scenario

Phase 1

Title: Introduction

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 5 Minutes

Detailed description of the scenario phase:

Explain to students the concept of buoyancy and the reason behind the difference in weights of objects in air and water. Capture their attention with examples and interesting facts.

Activity sheets:

Phase 2

Title: Preparation

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 10 Minutes

Detailed description of the scenario phase:
Encourage students and divide them into appropriate groups. Distribute the necessary materials to each group.

Activity sheets:

Phase 3

Title: Conducting the Experiment

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 20/30 Minutes

Detailed description of the scenario phase:
Instruct each group to fill a beaker or glass with approximately half a glass of water and measure and record the initial weight of the tennis ball using the dynamometer. Then, they will submerge the tennis ball in water and measure its weight again using the dynamometer after it has been immersed in water.

Activity sheets:

7. Evaluation Methodology

15 minutes

Each group will record the experiment results and create a table to present their findings. Then, allow each group to share their experiment results with the class.

As a class, discuss the experiment results and observations:

What was the difference in weights of the tennis balls in air and water?

Why did the weight of the tennis ball decrease when submerged in water?

What causes this phenomenon? (Explain the concept of buoyancy)

What other factors might influence these results?

Conclusion and Applications:

Through this experiment, students will discover that the weight of the tennis ball decreased when submerged in water due to buoyancy. Encourage students to discuss and analyze real-life examples related to buoyancy and its applications.

This scenario enables students to gain knowledge about buoyancy and its effects on the weight of objects in different mediums. Additionally, it fosters teamwork, critical thinking, and presentation skills.