

What Makes Objects Float and Sink? Engagement Activity

Activity Outline

Question	Why does an object float and sink?				
Learning objectives	All participants will explore floatation by using their creativity and imagination to make a sinking object float; and a floating object sink.				
	Participants will be able to relate this phenomenon to density and have a better understanding of how changes in the volume or mass of an object could lead to changes in the density of the object.				
	Participants will be able to understand that objects sink when they are more dense than water and float when they are less dense.				
Curriculum Links	Density				
Target age	8 to 16	Group Size	6 max.	Time	2 hrs
Resources required	Space/physical requirements				
	Classroom				
	Equipment + materials (Set one)		Quantity		
	Plastic cups		2 per group		
	Sinking object (metal ring)		1 per group		
	Floating object (polystyrene ball)		1 per group		
	Small balloons		3 to 5 per group		
	Big balloons		1 to 3 per group		
	Heavy object (coin)		1 per group		
	Scale				
	Calculator				

Activity Plan

Briefing (50 mins)
<ul style="list-style-type: none"> • What is density? • Playing with mass and volume of objects.
<p>Students are asked to come up with what they think of the following:</p> <ol style="list-style-type: none"> 1. Will two plastic cups containing, to the same volume, sand and salt have the same density? Which of the two will have a larger density? (The weight of the sand and salt are obtained using the scale) 2. Will two plastic cups, filled to different heights, of sand have the same density? 3. What will happen to the density of the resulting object if one of two plastic cups, filled with sand to equal volumes, is transferred into a rectangular box. Will the density of the sand change?

- Comparing densities.
- Why does an object sink and float?
- The idea behind floatation.

A sheet attached to the lesson is useful during the pre-lab sessions and good for getting feedback as students can write their note and conclusion on the sheet as well and tear that portion away for the teacher.

Approach 1 (70 mins)

Activity (50 minutes)

- Students are given the materials and asked to find a way of making the floating object sink and the sinking object float.
- Students are encouraged to work in groups.
- Students are awarded marks after the activity based on certain criteria such as the first group to finish, presentation, creativity and explanation.
- Students are asked to explain the idea or reason behind what they did, and why they did it.

Round Up (20 minutes)

Round up by making comparisons from their outcomes and trying to get students to understand why there were differences. Summarise the purpose of the activity to further put what the students have learnt in perspective.

Approach 2 (70 Minutes)

Activity (50 minutes)

- Students are given the materials and asked to find a way of making the floating object sink and the sinking object float.
- Students are encouraged to work in groups.
- The objects weights and volumes together with the weights and volumes of the water they occupy before and after the activity are determined and recorded in a table attached to the lesson.
- Students are then asked to complete the discussion sheet and calculate the densities.

Round Up (20 minutes)

Students are asked to extend the knowledge they have acquired to try and find out why they think a ship sinks even though it is made up of metals.

