Sink or Float

Summary

Students will predict and test everyday objects as to whether they sink or float. They will test four of the same size cubes of wood, clear plastic, milky plastic and aluminum, and find that two sink and two float. Students will then test the same four types of cubes but in smaller sizes. They will find that the smaller samples sink or float as their larger samples did.

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Materials

- Activity Sheet
  small tub or bowl for every 5 students
  15 different everyday objects that either sink or float. Include objects like cotton balls, sponges, and shells that can sink or float depending on how they are placed in the tub.
  A standard set of two differently sized cubes of aluminum, clear plastic, milky plastic and wood. These objects can be purchased from Delta Scientific.
    cubes, aluminum, large 030-7768-WW 6 @ $4.50
    cubes, aluminum, small 030-7757-WW 6 @ $3.90
    cubes, lucite, large 030-7834-WW 6 @ $2.90
    cubes, lucite, small 030-7779-WW 6 @ $2.00
    cubes, milky plastic, large 030-7867-WW 6 @ $2.80
    cubes, milky plastic, small 030-7856-WW 6 @ $2.40
    cubes, wood, large 030-7955-WW 6 @ $0.90
    cubes, wood, small 030-7977-WW 6 @ $1.00

** Some of these objects, or others substituted in their place, could be cut on your own more inexpensively.

Background for Teachers

Whether an object sinks or floats in a liquid depends mainly on two factors: density and buoyancy. Usually if an object is denser than water it sinks; if it is less dense than water it floats.
Some objects more dense than water can float if they are buoyant. Buoyancy is an upward force in a liquid that causes an object to float. When an object, such as a boat, is placed in the water, it pushes aside enough water that it can float. In this case, the buoyant force pushing up against the object is greater than the force of gravity pushing down. A shell or bottle cap in a boat shape will float on water; however, if it is placed in the water on its edge it will sink.

Intended Learning Outcomes

Framing questions. Designing investigation. Conducting investigations. Collecting data. Drawing conclusions.
Developing social interaction skills with peers. Sharing ideas with peers. Connecting ideas with reasons.
Ideas are supported by reasons. Communication of ideas in science is important for helping to

check the reasons for ideas.

Instructional Procedures

Pre-lab Discussion:

Talk to students about what it means to sink or float. Show them the picture of objects sinking or floating. If you have one, show them a toy with liquids having different densities such as: Liquid Motion Gravity Bubbler, Item #: WLMB-100, $6.99 from stevespanglerscience.com. Have students discuss why some liquids can sink within other liquids. Show them the picture of the wood describing its weight and buoyant force. Discuss boats and why they don't sink in water while a cube of the same material would.

Instructional Procedure:

I. Sink and float everyday objects.

Make sure students know the difference between sinking and floating. Describe to the students what it means to predict. Tell them they are going to predict whether objects will sink or float. Hand out objects to students one at a time. Have students predict whether an object will sink or float. After their prediction, they should test their object. They should sort the items as to sink, float, or something in between.

II. Comparing different materials of the same size and shape.

Give each group a large cube of aluminum, wood, clear plastic and milky plastic. Have them hold the objects in their hands and describe how they are the same and how they are different. They should notice that the aluminum is heavier (denser) than all the rest.

Have them predict whether each item will sink or float. They should test the four cubes and discuss whether their prediction was correct.

Discuss with them how items of the same size and shape can behave differently as to whether they sink or float. The material that an object is made of will dictate whether it will sink or float. Aluminum and clear plastic are denser materials and they sink, while wood and milky plastic are less dense and float.

III. Comparing objects of the same material but different size.

Give each group a small cube of aluminum, wood, clear plastic and milky plastic. Have them compare the smaller cubes to the larger cubes of the same material.

Have students discuss whether or not they think the small tubes will behave the same as the larger tubes. Note: many will predict that they will not behave the same.

Have them predict which of the four small items will sink and which will float.

Have students test the items. They can add the larger objects back into the tub with the small objects in order to see that they are behaving the same way.

Discuss with them why the small cubes behave the same as the large cubes. The property of sinking and floating is a property of a material not the size of a piece of the material you have. Even a very large object of each of the materials tested would behave the same.

Bibliography

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