Floating and Sinking Concept Storyline

Unifying Concept

Substances have characteristic properties, such as density, which are independent of the amount of the sample.

Unit Concept

When an object is placed in a fluid, the difference in the weights of equal volumes of the object and fluid determine the buoyant force that acts on the object.

Grade-Level Concept

Objects that weigh more than an equal volume of a fluid sink; those that weigh less than an equal volume of fluid float.

Subconcept 1

Several factors affect the buoyancy of an object.

Lesson 1: Pre-Unit Assessment: What Do We Know about Floating and Sinking?
Students discuss what they know about floating and sinking.

Lesson 2: Making and Testing Predictions about Familiar Objects
Students test objects and determine which objects float and which ones sink.

Lesson 3: Which Things Float? Which Things Sink?
Students explore how the weight and size of an object affect whether it sinks or floats.

Lesson 6: Making a Sinker Float
Students explore the role of shape in floating and sinking.

Lesson 7: Investigating Boat Designs
Students continue to investigate how the shape of an object affects its ability to stay afloat.

Lesson 8: Does Size Affect Buoyancy?
Students explore the buoyant force on foil boats and relate this to their size.

Subconcept 2

Water pushes up on floating and sinking objects with a buoyant force. Because of this, objects appear to weigh less when submerged.

Lesson 9: Measuring the Buoyant Force
Students measure the upward force on buoyant objects.

Lesson 11: How Much Do Objects Weigh under Water?
Students observe that objects weigh less when submerged.

Subconcept 3

The amount of liquid an object displaces is directly related to its volume.

Lesson 10: What Happens to the Water?
Students investigate the displacement of water by submerged objects.

Subconcept 4

The buoyant force on an object varies with the density of the liquid in which it is submerged.

Lesson 13: Dissolving Salt in Water
Students discover the relative weights of salt and fresh water.

Lesson 14: How Is Salt Water Different from Fresh Water?
Students discover that salt water exerts a greater buoyant force than fresh water does.

Lesson 15: Constructing a Hydrometer
Students build a hydrometer to test the buoyancy of objects in fresh and salt water.

Subconcept 5

Objects that weigh more than an equal volume of water sink; those that weigh less float.

Lesson 4: Measuring Weight with a Spring Scale
Students learn how to calibrate and use a spring scale.

Lesson 5: Weighing Floaters and Sinkers
Students use a spring scale to weigh objects.

Lesson 12: How Much Does Water Weigh?
Students compare the weight of water with that of other materials.

Lesson 16: Working with Mystery Cylinders
Students predict whether objects will sink or float and test their predictions.

Lesson 17: Post-Unit Assessment: Sharing What We Know about Floating and Sinking
Students discuss and reflect on what they have learned.