The Sinking Test

Predict and test how density affects floating

P.5.5A.4 "Make and test predictions about how the density of an object affects whether the object sinks or floats when placed in a liquid."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the rule for predicting whether a tube will sink or float, circle the tube and water densities, and number the steps Nia uses to test a prediction.

Three Tubes, Two Cups

1. In a classroom lab, Nia wants to know whether sealed plastic tubes will sink or float. She uses three tubes of the same size, but puts different amounts of sand inside. She seals them so water cannot get in. A tube's average density depends on its total mass and the space it takes up. An object usually sinks if its density is greater than the liquid's density.

2. Nia measures the tubes' densities. The light tube is 0.80 grams per milliliter, the middle tube is 1.05, and the heavy tube is 1.30. Fresh water has a density of 1.00 grams per milliliter. Nia mixes salt into another cup of water until its density is 1.10. The two cups hold the same amount of liquid. Salt water is denser than fresh water.

3. Before each test, Nia predicts what the tube will do by comparing its density with the liquid's density. She places each tube gently into a cup and watches whether it stays at the surface or sinks to the bottom. The light tube floats in fresh water. The middle tube sinks in fresh water but floats in salt water. Nia repeats these tests and sees the same results.

2 ANSWER WITH EVIDENCE

Use the passage

1. Predict what the light tube will do in salt water. Compare the densities to explain your prediction.

2. Predict what the heavy tube will do in fresh water. Compare the densities to explain your prediction.

3. Predict what the heavy tube will do in salt water. How could Nia test your prediction?

4. A new sealed tube has a density of 1.02 grams per milliliter. Predict what it will do in each cup, and explain why.

3 YOUR TURN

Your own words

Choose a density between 1.00 and 1.10 grams per milliliter for another sealed tube, but do not choose 1.02 or 1.05. Predict what your tube will do in each cup, then describe how you would test and record the results.

ANSWER KEY

The Sinking Test

GRADE 5 · P.5.5A.4

PART 1 · READ AND MARK

Underline the rule for predicting whether a tube will sink or float, circle the tube and water densities, and number the steps Nia uses to test a prediction. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Predict what the light tube will do in salt water. Compare the densities to explain your prediction.	**It will float because its density, 0.80 grams per milliliter, is less than salt water's density of 1.10.**
2	Predict what the heavy tube will do in fresh water. Compare the densities to explain your prediction.	**It will sink because its density, 1.30 grams per milliliter, is greater than fresh water's density of 1.00.**
3	Predict what the heavy tube will do in salt water. How could Nia test your prediction?	**It will sink because 1.30 is greater than 1.10 grams per milliliter. Nia could place it gently in salt water and watch whether it sinks.**
4	A new sealed tube has a density of 1.02 grams per milliliter. Predict what it will do in each cup, and explain why.	**It will sink in fresh water because 1.02 is greater than 1.00 grams per milliliter. It will float in salt water because 1.02 is less than 1.10.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My new tube has a density of 1.08 grams per milliliter. I predict it will sink in fresh water because 1.08 is greater than 1.00. It will float in salt water because 1.08 is less than 1.10. I would place the tube gently in each cup, record whether it sinks or floats, and repeat both tests.

Accept predictions supported by correct density comparisons. For Your Turn, the chosen density must be greater than 1.00 and less than 1.10, excluding 1.02 and 1.05, and the test must check the tube in both liquids.