Will It Float?

Use measurements to predict what sinks and design a vessel that floats.

P.5.5A "Students will demonstrate an understanding of the physical properties of matter. Obtain and evaluate scientific information to describe basic physical properties of atoms and molecules. Collect, analyze..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle the mass of any solid sample you predict will float in water. Underline the sentence that explains how a heavy object can float because of its shape.

A Vessel for Washers

1 During a class challenge, Nia must move metal washers across a tub of water. She first compares equal-sized samples of water and three solid materials. Each sample takes up 10 cubic centimeters of space. The table shows their masses. For samples with the same volume, greater mass means greater density.

EQUAL-VOLUME SAMPLES

Sample	Mass (g)	Volume (cm^3)
Water	10	10
Wax	8	10
Glass	25	10
Aluminum	27	10

2 A solid piece of material that is denser than water usually sinks when placed in water. A less dense piece usually floats. Density compares mass with volume, not mass alone. Even a heavy object can float if its shape lets it push aside enough water to balance its weight. A hollow vessel also holds air.

3 Nia folds aluminum foil into a shallow tray for the washers. In her first test, the tray carries six washers halfway across the tub, but water spills over its low edge. Nia plans to make the sides taller and test again with six washers over the full distance. She will record whether the tray stays dry and afloat.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which solid sample is less dense than water? Use the masses in the table to explain.

2. Which two solids would you predict will sink as solid pieces? Explain using the table.

3. Why can Nia's aluminum foil tray float even though a solid piece of aluminum sinks?

4. What problem did Nia observe in her first test, and what change will she test?

3 YOUR TURN

Your own words

Design a different vessel to carry eight washers across the tub. In three or four sentences, describe its shape, predict whether it will float using the idea of water pushed aside, and explain one test and one change you would make if it fails.

ANSWER KEY

Will It Float?

GRADE 5 · P.5.5A

PART 1 · READ AND MARK

Circle the mass of any solid sample you predict will float in water. Underline the sentence that explains how a heavy object can float because of its shape. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which solid sample is less dense than water? Use the masses in the table to explain.	**Wax is less dense. The same volume of wax has a mass of 8 g, while water has a mass of 10 g.**
2	Which two solids would you predict will sink as solid pieces? Explain using the table.	**Glass and aluminum. Each has more mass than the same volume of water, so each is denser than water.**
3	Why can Nia's aluminum foil tray float even though a solid piece of aluminum sinks?	**The tray's hollow shape lets it push aside enough water to balance the weight of the tray and its load.**
4	What problem did Nia observe in her first test, and what change will she test?	**Water spilled over the tray's low edge. Nia will test taller sides.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would shape foil into a wide, deep bowl with high sides to carry eight washers. I predict it will float if it pushes aside enough water to balance the weight of the bowl and washers. I would place eight washers inside and test whether it reaches the far side without taking on water. If water spills in, I would raise the sides and test it again.

For the design task, accept other vessel shapes and changes if the prediction correctly connects floating to pushing aside enough water and the test uses eight washers.