

Ocean Layering: Density, Salinity, Temperature, and Circulation

Sylvia Cole, Scripps Institution of Oceanography, San Diego CA

Maureen Quessenberry, University City High School, San Diego CA

Ocean Water Density Lab – Sample Answers

Introduction

Density depends on mass and volume. Salt has a different density than water, so salt in the ocean affects seawater's density. In this activity, you will determine if salt water is denser or lighter than fresh water.

Procedures

- 1) Look at the three objects and PREDICT whether you think each one will sink or float in the fresh water and in the salty water. Circle "SINKS" or "FLOATS" in the left columns of the table.
- 2) Fill two containers each with 400 mL of water.
- 3) Stir 3 spoonfuls of salt into one of the containers.
- 4) Test your predictions by placing the objects in each container and record "SINKS" or "FLOATS" in the right columns of the table.

Data Table

	Prediction		Observations	
	Fresh Water	Salty Water	Fresh Water	Salty Water
Clear Cube	SINKS FLOATS	SINKS FLOATS	Sinks	Sinks
Marble	SINKS FLOATS	SINKS FLOATS	Sinks	Sinks
Two Straws	SINKS FLOATS	SINKS FLOATS	Sinks	Sinks
Group of Straws	SINKS FLOATS	SINKS FLOATS	Sinks	Floats

Questions

Do any of the objects behave differently in fresh water and salt water (sink in one and float in the other)? Which ones?

Yes, the group of straws floated in salt water and sunk in fresh water.

It's possible that the group of straws may float in both, or sink in both. The group should still be able to answer the next question.

If an object floats in salt water and sinks in fresh water, which liquid is denser? Explain.

The object floats in salt water so the object is lighter than the salt water. The object sunk in fresh water so it is heavier than freshwater. This means that salt water is denser than the object and the object is denser than fresh water. So salt water is denser than fresh water.

What conclusions can you make about salinity and density?

Adding salt to water makes the water denser.

Why? Because salt molecules are denser than water molecules.