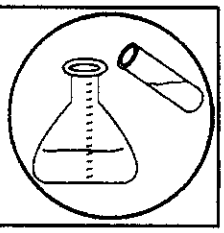
Density



Chemistry
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Viewing Activity #1

* An email link will be sent to you. Please watch video demonstration before Friday!

Hands-On: Floating Crayons

Description

Although paraffin wax floats, crayons generally sink in tap water but will float in salt water. Students investigate how changing the density of the water influences whether an object will float or sink in the water. Students also explore how the pigments used in crayons affect their density.

Materials

for each student:		*source:*
1	Student Activity Sheet	page 7:4
for each group:		*source:*
1	beaker	kit
–	w/ 300 ml water	classroom
1	piece of red crayon	kit
–	other crayon colors	kit
1	stirring stick	kit
1	medicine cup	kit
–	salt, in a plastic cup	kit
–	rags or towels	classroom

Note: Prepare cups of salt and beakers of water for each group in advance so that they can be quickly distributed during the telecast. Fill the beakers with 300 ml water. Remove the paper from the crayons in advance and break pieces for each group.

Leading the Activity

The studio teacher will introduce and describe the activity. Circulate in the classroom and assist the students as they complete the activity and discuss their ideas. Encourage the students to compare their own observations. Encourage the students to discuss their ideas about buoyancy and make note of concepts that need additional exploration.

The studio teacher will direct all the students to begin with one color to explore the initial idea that crayons will sink in fresh water and float in salt water. Different colors of crayons will be investigated following this first experience.

Procedure

1. Fill a beaker with 300 ml of water and add a piece of crayon (or several crayons) to the water.
2. Use the medicine cup to measure and add 5 cc (1 tsp.) of salt to the water and stir it with a spoon or stirring stick. Observe the crayons and record your results.
3 Continue to add salt, 5 cc at a time and record the observations. Be sure to stir the water long enough, each time, to dissolve all of the salt. Continue until all of the crayons are floating or no more salt will dissolve.

Range of Results

Density is a fundamental property of matter but may be a difficult concept for most students in this age range. Additional explorations may be useful to help students construct useful concepts of density and buoyancy.

A common naive concept is that things float and sink based on size. Although students have experienced that very big and heavy things can float, the notion that size or weight determine buoyancy are very persistent. Students may express that a large red crayon will be more likely to sink than a small piece of red crayon—or that more salt will be needed to make a large piece float than a small piece. Encourage the students to explore this concept by having them test large and small pieces ***from the same crayon.***

Different brands of crayons contain differing rations of pigment to wax and some crayons (typically less expensive crayons) will float in clean, fresh water. You may wish to explore this idea by testing several brands. You might try a certain color from several brands and see which floats first as salt is added. Test the crayons for the quality of the color they produce on a sheet of paper and compare this to the float and sink data.

Name _____

Density - Floating Crayons

TYPE of CRAYON		CRAYON COLOR								
		Black	White	Red	Yellow	Blue	Brown	Orange	Purple	Green
Crayola (Regular)	Predicted Rank									
	Number of Scoops of Salt									
	Actual Rank									
Cheap (Jumbo)	Predicted Rank									
	Number of Scoops of Salt									
	Actual Rank									