Hydrology Activity Bag

Flinkers: Student Activity Guide

Remember the last time you had water with ice in it. What happened to the ice-cubes in the water? Did they sink, did they float, or did they stay in the middle? In this activity, we are going to explore how things float, sink, or "flink".

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- Tube with Water-Tight Cap
- Sand (If you have not completed the Water Filtration activity, save any leftovers.)
- 2 Tall Plastic Cups (If you have not completed the Water Filtration activity, save the cups.)
- Small Spoon
- Purple Powdered Drink Mix (If you have not completed the other activities, save the remaining powder.)

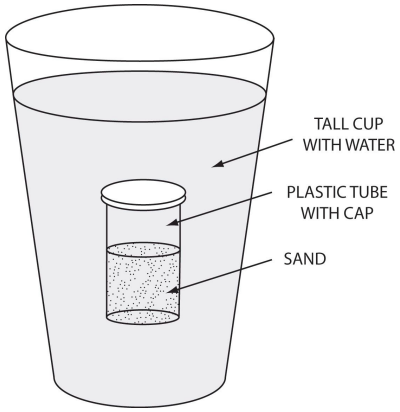
You Will Supply These Materials

- Water
- Salt
- Ice Cubes

Part 1: Flinker

Using only sand and a tube with a water-tight cap, make a "flinker". A "flinker" is a tube that neither floats nor sinks in a cup of water. "Flinkers" stay suspended in the middle of the cup of water.

1. Fill a tall plastic cup almost full of water. Leave a little room at the top.
2. Use the small spoon to place some sand in the tube. Seal the tube with the water-tight cap.
3. Place the tube in the water. Make sure there are no bubbles on or under the tube.
4. If the tube does not "flink", add or subtract sand to adjust your "flinker".
5. Continue to test and modify until you have created a "flinker".



What made it difficult to get the tube to "flink"? What adjustments did you make?

Density is the amount of weight in a given amount of space. When you added sand to the tube, you increased its weight, but the tube took up the same amount of space. You increased its density. When you removed sand from the tube, you decreased its density. Density determines if an object will float, sink, or "flink". Objects that are less dense than the fluid they are in will float. Objects that are more dense than the fluid they are in will sink. If the object has the same density as the fluid, it will neither float nor sink.
Based on this information, compare the density of the "flinker" to the density of the water.

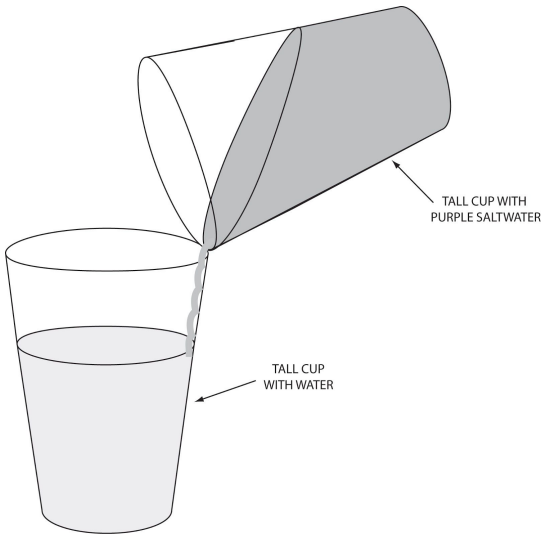
If it "flinks" for a little bit and then settles to the bottom, you may go to part 2.

Part 2: Saltwater and a Flinker

1. Remove the "flinker" from the cup of water.
2. Use the small spoon to add 1 spoonful of salt to the water and stir.
3. Place the "flinker" into the cup of saltwater. What do you notice?
   Based on this information, compare the density of the "flinker" to the density of the saltwater.
4. Adjust your "flinker" to "flink" in the saltwater. *What did you do to adjust your "flinker"? Based on this information. Compare the density of the freshwater to the density of saltwater.*

Part 3: Saltwater and Freshwater

1. Predict what will happen when you mix freshwater and saltwater.
2. Fill up both tall cups ⅔ of the way full with water. Let the cups sit for 30 seconds.
3. Use the small spoon to place three spoonfuls of salt and ½ spoonful of purple powder drink mix into **one** of the cups and stir.
4. Gently pour some of the saltwater down the inside edge of the cup into the water. Observe the cup from the side.
   Draw what you see. What do you notice? Compare your results to your prediction.



Water can dissolve many materials. Saltwater is simply water that has salt dissolved in it. Since there are more things in the same amount of space, saltwater is more dense than freshwater. Other factors change density in fresh and saltwater, such as temperature. These differences in density drive ocean currents.

Part 4: Temperature

1. Predict what will happen when you mix warm and ice-cold saltwater.
2. Turn on the hot water in your tap and let it run until it gets hot. Fill up a tall cup ⅔ of the way full with the hot water. Use the small spoon to place three spoonfuls of salt in the water and stir. Let the cup sit for 30 seconds.
3. Place 2-3 ice cubes into a tall cup and fill up the cup ⅔ of the way full with cold water. Use the small spoon to place three spoonfuls of salt and ½ spoonful of purple powder drink mix into the cup and stir.
4. Gently pour some of the ice-cold saltwater on the edge of the cup into the warm saltwater.
   What do you notice? Compare your results to your prediction.

Adding heat to a liquid adds energy, causing the molecules in the warm liquid to move faster than molecules in the cold liquid. When these molecules move, they get further apart making the liquid less dense. Based on this information compare the density of warm saltwater and ice-cold saltwater.

Rinse, dry, and save the tall plastic cups for the Water Filtration activity.