

Name: _____ Period: _____ Date: _____ EN _____

WEATHER WATER TANKS

Temperature is one factor that affects the density of a fluid (a liquid or a gas). The same fluid is less dense at a higher temperature than it is at a lower temperature. This means there are fewer atoms or molecules in the same amount of the fluid when it is hotter. Fewer atoms or molecules means less mass. For example, imagine you're in a hot air balloon. All the passengers are in the basket waiting to take off, but nothing happens. At last, the pilot turns on the burner (located above your head, near the mouth of the balloon). There's a loud rushing sound and a huge flame comes from the burner. The balloon starts to rise. Up it goes, higher and higher! Why? The balloon rises because hot air is less dense than cold air. When the air in the balloon was heated by the burner, the hot air inside it became less dense than the cooler air of the atmosphere around it. Hot air (less dense) is lighter and rises up, while heavier cool air (denser air) remains below.

Draw a diagram below of the balloon on the ground, rising and landing. Add notes to explain what is happening in the diagram. Be sure to identify the type of energy transfer used here!!! (Conduction, convection, radiation)

Balloon on the ground.	Balloon rising.	Balloon descending.

Materials Per Group: water tank, red food coloring, blue food coloring. Hot water and cold water, 2 droppers

Procedure:

1. Gather the materials listed above at your table.
2. Add 250 mL cold water to a beaker and add 3 -4 drops of blue food coloring.
3. Add 250 mL hot water to a beaker and add 3 -4 drops of red food coloring.

4. Make sure the divider in the middle of the water tank is pushed firmly to the bottom of the tank. If you have a hard time seeing the water tank then tape a blank piece of paper to the backside of the tank.
 5. Pour 200 mL of the hot red water into one side of the water tank at the same time pour 200 mL of the cold water into the other side of the tank. Draw what you see in Box A
 6. Slowly and carefully remove the divider. Watch the movement of the water in the tank. Diagram and describe what is happening in Box B
 7. Use a clean dropper to carefully put 1-2 drops of hot red water from the beaker into the tank. Diagram and describe what happened. Box C
 8. Use a clean dropper to carefully put 1-2 drops of cold blue water from the beaker into the tank. Diagram and describe what happened. Box C
 9. Disturbing the water as little as possible, have each member of your lab group, one at a time, slide a finger slowly down in the water. Describe how your finger felt when you slid it down to the bottom of the tank.
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10. Carefully put the divider back into the tank and, stir the water on only one side of the tank. Now there is hot and cold water on one side and warm water on the other side. Predict what will happen when the divider separating the layers of hot and cold water from the warm water is removed from the tank. Be detailed in your prediction.
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11. Slowly and carefully remove the divider from the tank .Draw what happened in Box D. Was your prediction correct? If your prediction was not correct, describe what really happened.
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12. Record your conclusion(s) about the interaction of fluids of different densities.

A	B
C	D

