

## Activity Sheet Answers

### Chapter 3, Lesson 6

### Temperature and Density

#### DEMONSTRATION

1. Why did the hot water stay on top of the cold water?

The hot water stayed on top of the cold water because the hot water is less dense than the cold water.

2. Why do you think the hot and cold water mixed when the cold water was placed on top?

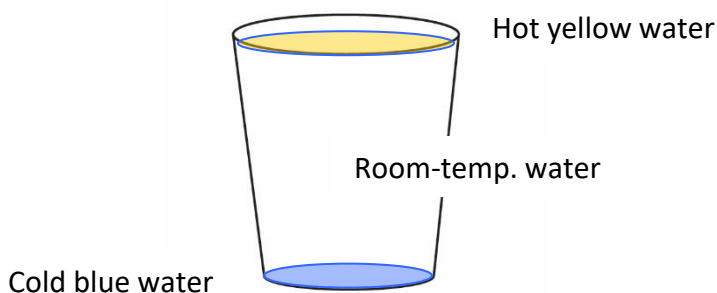
The hot and cold water mixed when the cold water was placed on top because the cold water is more dense than the hot water, so it immediately sank (or mixed) with the water below it.

#### ACTIVITY

3. Draw what you observed in the cup of room temperature water after adding blue cold water and yellow hot water. Be sure to label the areas of cold and hot water.

Is cold water more, less, or the same density as room temperature water?

Is hot water more, less, or the same density as room temperature water?



The hot water floated to the top, while the cold water sank to the bottom. Cold water is more dense than room temperature water. Hot water is less dense than room temperature water.

## EXPLAIN IT WITH ATOMS & MOLECULES

4. Write *more*, *less*, or *same* in the chart to describe the volume, mass, and density of cold and hot water compared to room temperature water.

Comparing cold water and hot water to room-temperature water		
	Cold Water	Hot Water
Volume	Less	More
Mass	Same	Same
Density	More	Less

5. Use what you know about density to answer the following questions.

Why does cold water sink in room temperature water?

Cold water sinks in room temperature water because the molecules in cold water are just a bit closer together, which slightly decreases its volume. This slight decrease in volume leads to an increase in density, so the more dense cold water sinks.

Why does hot water float on room temperature water?

Hot water floats in room temperature water because the molecules in hot water are just a bit further apart, which slightly increases its volume. This slight increase in volume leads to a decrease in density, so the less dense hot water floats.

## TAKE IT FURTHER

6. Your teacher did a demonstration with two cups of water that both had food coloring on the bottom. Ice was placed in one cup of water, but not the other. The food coloring mixed more quickly in the cup that had the ice. Use what you know about the density of water at different temperatures to explain why this happened.

The food coloring mixed more quickly in the cup containing ice because as the ice melted, the cold water sank to the bottom of the cup, agitating the food coloring, and causing it to mix with the rest of the water. The cup containing water, but no ice did not have this extra mixing.