

MEASURING

Measuring Temperature

Temperature is the average amount of kinetic energy that the particles in an object have. We describe temperature in terms of how warm or cold something is. Measuring temperature is important in many scientific investigations. The tool for measuring temperature is the thermometer. Thermometers usually have two temperature scales: the Fahrenheit scale, and the Celsius scale. The Celsius scale is typically used in science. When reading the temperature from a liquid-filled thermometer, remember to keep your eyes level with the liquid in the thermometer.

MATERIALS

- thermometer
- 500 mL beaker
- 250 mL graduated cylinder
- stirring rod
- ice water
- hot tap water

The table below lists proportions of hot water and ice water that you need. Show your teacher your predictions of the mixed temperature before you start step 4. Follow the procedure below.

- Using the graduated cylinder, measure the amount of ice water that you need, and pour the water into the beaker. Measure and record the water temperature.
- Using the graduated cylinder, measure the amount of hot water that you need. Measure and record the water temperature.
- Make a prediction about what the water temperature will be after mixing.
- Pour the hot water into the beaker with the cold water. Wait two minutes and then measure and record the final water temperature.
- Repeat steps 1–4 for mixtures two and three.

Table 1. Temperature of Water Mixtures

Mixture	Hot Water Temperature (°C)	Cold Water Temperature (°C)	Predicted Mixed Temperature (°C)	Actual Mixed Temperature (°C)
100 mL hot; 100 mL cold				
50 mL hot; 150 mL cold				
150 mL hot; 50 mL cold				

Name _____

Period _____

Date _____

Answer the following questions about your temperature data.

1. Why was it necessary to separately measure the hot and cold water temperatures each time before you mixed them?

2. For which mixture did your prediction come closest?

3. For which mixture was your prediction farthest off?

4. What did you learn about using a thermometer from taking these measurements?

5. What did you learn about mixing temperatures from this activity that you could apply the next time you fill a bathtub?

Challenge Explain how your results would have differed if your cold water was at exactly 0°C and your hot water was at exactly 100°C . Describe the significance of these temperatures.
