

Chapter 5, Lesson 6 Activity Sheet Answers

1. Answers will vary by group but should include things like: amount of water, position of M&M in the container, timing, etc. The only variable that should be changed is the temperature of the water.
2. Yes, water temperature affects the amount of coating that dissolves from an M&M. More candy shell dissolves at a higher temperature.
3. Water molecules move faster in hot water than they do in room-temperature or cold water. Molecular motion increases as the temperature of a liquid increases.
4. Sugar dissolves better in hot water than in cold water because of the extra energy of the sugar molecules and water molecules in hot water. When sugar is in hot water, its molecules move faster, and so do the water molecules. This increased movement means that sugar molecules have more energy and when water molecules associate with individual sucrose molecules, they can more easily overcome the attraction that sucrose molecules have for one another.
5. There is a greater difference in the amount of dissolving between hot and room-temperature water than there is between room-temperature and cold water because there is a greater difference in temperature between hot and room-temperature water, and therefore, a greater difference in the energy of the molecules.
6. No, the amount of salt that dissolved in hot and cold water was about the same.
7. The graph shows the amount of sugar and salt that dissolve over a temperature range of 0–100 °C. Over that range, the values for the amount of sugar that dissolves increase, going up along the y-axis. But the values for the amount of salt that dissolves increases only slightly, as shown by the line with a slight increase up the y axis.

About 260 g of sugar will dissolve in 100 mL of water at 50 °C.

About 37 g of salt will dissolve in 100 mL of water at 50 °C.

8. Sodium chloride and potassium chloride have the same solubility near 22°C.

At 0 °C, potassium chloride is the *least* soluble.

At 0 °C, sugar is the *most* soluble.

Solubility of sodium chloride, sucrose, and potassium chloride

