Change is Loud with Pop Rocks®

At-Home

Pop Rocks® is a very special brand of candy — first sold back in 1961! The sugary goodness of the candy coats little pockets of gas that are under pressure. That gas is released when you put the candy in your mouth, and the sugar dissolves, allowing you to "taste the explosion!"

Do a simple experiment with a package of Pop Rocks® candy to look at the ways temperature affects the unique popping. Use your eyes, ears, and nose to study how quickly the gas escapes the candy.

Question to investigate

How does the temperature of the water affect the speed that Pop Rocks® pop?

Chemistry concepts

- Temperature affects the rate of dissolving.
- When sugar dissolves in water, you can no longer see the sugar, but it is there.
- Dissolving is a physical change.
- When the layer of sugar trapping the carbon dioxide gas inside thins, the gas explodes out of the sugar bubble, making a popping sound.
- The frequency of the popping sounds indicates the rate of dissolving.

Activity logistics

- **Ages**: As written, this activity is suited for ages 5-12.
- **Time**: 20-30 minutes

Be Safe

- Safety glasses suggested.
- Caution: hot liquids!
- Do not eat or drink any of the materials used in this activity.
- Thoroughly wash hands after this activity.
- Don't use extremely hot or extremely cold water.

Disposal: All solutions used in this experiment can be disposed of down the drain with running water. Unused Pop Rocks® candy can be disposed of in the trash.

General Safety Guidelines

- Ask an adult for permission to do the activity and for help when necessary.
- Read all directions and safety recommendations before starting the activity.

- Wear appropriate personal protective equipment (safety glasses, at a minimum), including during preparation and clean up.
- Tie back long hair and secure loose clothing, such as long sleeves and drawstrings.
- Do not eat or drink food when conducting this activity.
- Clean up and dispose of materials properly when you are finished with the activity.
- Thoroughly wash hands after conducting the activity.

What you'll need

- 2 packs of Pop Rocks® candy, 0.33 oz (9.4 g) each
- 2 bowls
- 2 small dry cups
- Two ½-cup (about 120 mL) measuring cups
- Cold and hot tap water

Procedure

1. Pour ½ cup (120 mL) of cold water into one bowl, and ½ cup of hot water into the other. Place the bowls at least 12 inches (30 cm) apart.
2. Divide one pack of Pop Rocks® candy equally into two small cups
3. Quickly, and at the same time, pour the Pop Rocks® into the two bowls of water.
4. Record your observations for each bowl.
5. Seeing, smelling, and listening are all ways to observe what is happening. If you haven't already done so, try the experiment again with your eyes closed! Focus on what you hear and smell. Be sure to record your observations.

What did you observe?

Describe what you:
See
Hear
Smell

How does it work?

Pop Rocks® are sugar candies with tiny pressurized bubbles inside them filled with carbon dioxide gas. When you place Pop Rocks® in water, the sugar coating dissolves in water, and the gas and pressure are released. This also makes a popping noise, and leaves behind the sugar molecules.

You might think that a chemical reaction is happening, but this activity investigates a *physical* change, which is when molecules move around, but no new substance is formed. The sugar is dissolved in the water, but it is still sugar. You could find the sugar again if you carefully evaporated the water. Melting, freezing, and boiling are also physical changes.

Sugar crystals are made of many individual sugar molecules. Normally, sugar dissolves in water, because the water molecules interact with the individual sugar molecules and make them dissolve. Over time, the crystals seem to disappear, because they become too small to see. However, they are still there in a different form. Hot water has faster-moving molecules and causes the reaction to happen more quickly than cold water would.

This activity is adapted from an activity that originally appeared in the Celebrating Chemistry *issue for National Chemistry Week 2021, written by Gina Malczewski, Ph.D. and David S. Heroux, Ph.D.*