

Experiencing Solubility through Food

WHAT STUDENTS WILL LEARN

Through this experiment, students will deepen their understanding of solubility by experiencing it with gum and chocolate in their mouths, and with butter and gum in their hands.

WHAT YOU'LL NEED

- ◆ Gum
- ◆ Chocolate
- ◆ Vegetable oil
- ◆ Coconut Oil
- ◆ Vinegar
- ◆ Butter
- ◆ Sugar
- ◆ Water
- ◆ Beaker

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WHAT YOU'LL DO

First, demonstrate how two polar substances react to one another.

1. Fill a beaker with water.
2. Pour in one tablespoon of sugar.
3. Swirl the beaker in a circular motion so that the sugar dissolves in the water.

Students will watch as the sugar dissolves into the water, demonstrating that like substances dissolve like substances.

Next, demonstrate how two nonpolar substances react to one another.

4. Pour 10 ml of vegetable oil into a beaker.
5. Add 10 ml of coconut oil to the beaker.

Students will see that since both substances are nonpolar, they will combine with one another, much like sugar and water.

Now, demonstrate how insoluble substances react to one another.

6. Pour 10 ml of vegetable oil into a beaker.
7. Add 10 ml of vinegar to the beaker.

Students will see that oil and vinegar will not combine because they are not like substances. The oil separates from the vinegar because vinegar is polar, and oil is nonpolar.

Now, demonstrate the concept of solubility with gum and chocolate.

Have each student:

8. Chew three gumballs until all flavor has disappeared.
9. Add one piece of chocolate to their mouth.
10. Chew both the gum and chocolate, mixing both together in their mouth until both dissolve.

As students chew the gum and chocolate together, they'll notice that the gum begins to disappear. This is because chocolate is made of mostly fat, and the polymer in gum is fat-soluble.

Finally, demonstrate solubility with gum and butter. Have each student:

11. Chew three new gumballs until all flavor has disappeared.
12. Spit the gum into their hand.
13. Take a small amount of butter and mix it into the gum.
14. Stretch the gum in their hands until the gum has dissolved into the butter and lost its stretchiness.

The fat in the butter will dissolve the fat-soluble polymer in the gum. Students will gain a further understanding of solubility by watching one substance dissolve into another.