

2nd Grade - Lesson 3.1

Dissolving is a Property

Teacher Background

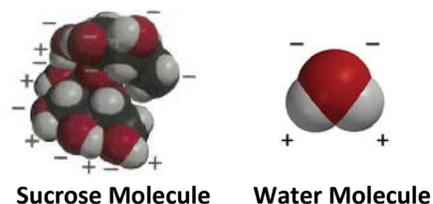
In Lesson 3.1, students help plan and conduct an experiment to investigate the similarities and differences in the dissolving of M&Ms and Skittles. An important part of this lesson is for students to understand that to compare the dissolving of two objects or substances, they need to be tested in the same way, using the same amount of water, at the same temperature, for the same length of time.

Students see that the colored sugar coating of the M&M and Skittle dissolve in a similar way but that the insides dissolve differently. Students know that the inside of an M&M is chocolate and you can tell them that the inside of a Skittle is mostly sugar. Students conclude that a property of sugar is that it dissolves in water and a property of chocolate is that it does not dissolve in water.

Chocolate and Sugar on the Molecular Level

The animation helps you go a bit further to explain why sugar dissolves in water but chocolate does not. The animation shows that water molecules attract sugar molecules and dissolve them. But water molecules do not attract the molecules of fat in the chocolate so water does not dissolve the chocolate.

This explanation is not for second graders but the reason water dissolves sugar is because both water and sugar (sucrose) are polar molecules. The water attracts the oppositely charged areas on the sucrose molecules and pulls them apart, leading to dissolving.



Different Types of Models

Note that in many animations like the one in the lesson, certain compromises are made for simplicity. Water is an easy molecule to model because it is composed of only three atoms, and its structure may even be familiar to some students. But fat molecules and sugar (sucrose) molecules are more complex, so simple shapes, without showing atoms, are used to model these molecules. Since atoms are shown in the water molecules but no atoms are shown in the fat and sugar molecules, a misconception could arise that fat and sugar molecules are not made of atoms. You could explain to students that all molecules are made of atoms but that sometimes different types of models are used to represent the molecules that may or may not show the atoms.

