

5th Grade - Lesson 2.1

Using Dissolving to Identify Substances

Student Reading

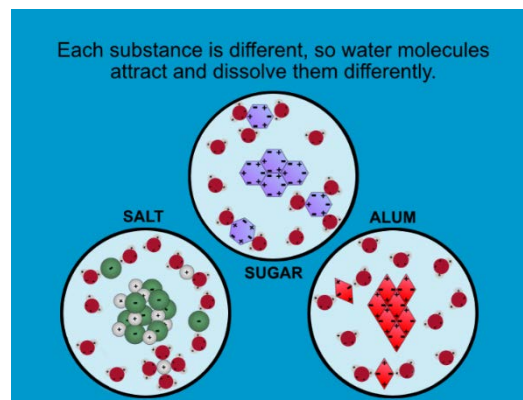
Designing a Dissolving Test

One way to tell one substance from another is to compare how much each substance dissolves in water. To learn something from the test, the same amount of each substance needs to be placed in the same amount of water. Since substances are made from different atoms and molecules, water molecules interact with them differently, and they dissolve by different amounts.

Different Substances Dissolve by Different Amounts

Here are simple models of salt, sugar, and a substance called *alum* being dissolved in water. For the salt, the model shows the sodium and chloride ions. For the sugar and alum, the model uses simple shapes to represent the molecules because they are complicated structures made up of many atoms.

The models show that the substances have different shapes and that their positive and negative charges are in different areas. Because of these differences, each substance interacts with and dissolves in water differently.



Different substances dissolve differently.

Water Dissolves Some Substances but Not Others



Bone does not dissolve.

The fact that substances dissolve by different amounts is very important for various reasons. One good thing is that certain substances barely dissolve at all. The substance that makes up your teeth and bones is made from a compound of calcium and phosphorous and does not dissolve. The substances that makes up the shells of clams, oysters, lobsters, and other underwater animals also don't dissolve.

But certain substances that you might not expect to dissolve can go through a process that makes them dissolve. One example is certain kinds of rock. When rain falls through the sky and moves through the soil, carbon dioxide mixes into the water and reacts to form a weak acid called carbonic acid. This acid reacts with certain minerals in the rock and forms substances that *can* be dissolved. So even though the original rock could not be dissolved, the reaction produces new substances that can be dissolved.



Minerals in rock react with acidic water and the products dissolve.