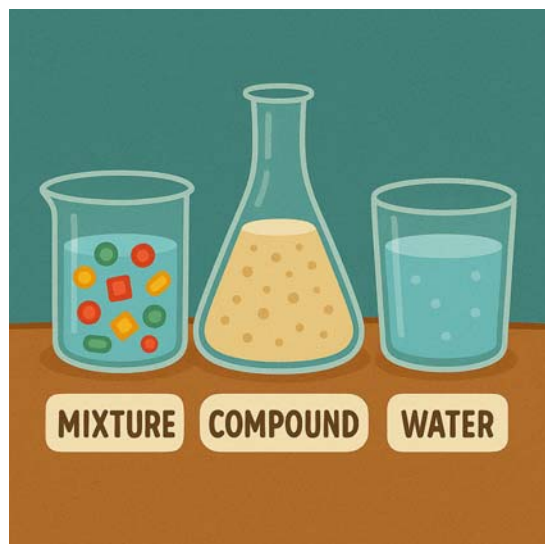


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Mixtures, Compounds, and Clean Water



Water is one of the most important things on Earth. Every living thing needs it to survive. But not all water is clean. Sometimes, water can have dirt, salt, chemicals, or germs in it. Scientists and engineers work hard to clean water so it's safe to drink. But how do they do it? To understand that, we need to learn about mixtures and compounds.

A mixture is made when two or more things are combined, but not changed.

For example, if you mix sand and water, they stay the same. You can still see the sand, and you can separate it by letting it settle or by using a filter. Dirty water is often a mixture—it might contain sand, mud, and even small bits of leaves. These parts can usually be removed with tools or filters.

A compound, on the other hand, is something new made when two or more elements go through a chemical change. For example, water itself is a compound. It's made from two hydrogen atoms and one oxygen atom. Once these atoms join together, they can't be separated easily. You can't pull hydrogen and oxygen apart with a filter.

When people clean water, they remove both mixtures and some compounds. First, they filter out the solids like sand or leaves. Then they might use chemicals, like chlorine, to kill harmful bacteria. Chlorine itself is a chemical that reacts with germs in water—it changes them in a chemical way to make the water safe.

Some water also has salt in it, especially ocean water. Salt is a compound made of sodium and chlorine. To get fresh water, scientists use a process called desalination. This process separates salt from water. It can be tricky and expensive, but it's useful in places where fresh water is hard to find.

So, mixtures and compounds both play a role in water. Mixtures are usually easier to remove. Compounds, like salt or harmful chemicals, take more work. But by using science, we can make sure people have clean, safe water to drink.