



This boy is diving underwater with an air tank for breathing.

This Is Not an Oxygen Tank

To breathe underwater, divers like this one use oxygen tanks—right? Actually, this is NOT an oxygen tank. Most diving tanks contain compressed air, and air is not the same thing as oxygen. Oxygen is one of the gases that make up the mixture we call air, but there are many other gases in air as well, including nitrogen and carbon dioxide. In fact, air isn't even mostly made up of oxygen—there's much more nitrogen in air than oxygen. Oxygen is a substance, while air is a mixture of different substances.

Every substance is made up of just one type of atom or a specific group of atoms that

repeats over and over, such as a molecule. As a substance, oxygen gas is made up of oxygen molecules—two oxygen atoms stuck together—and nothing else.

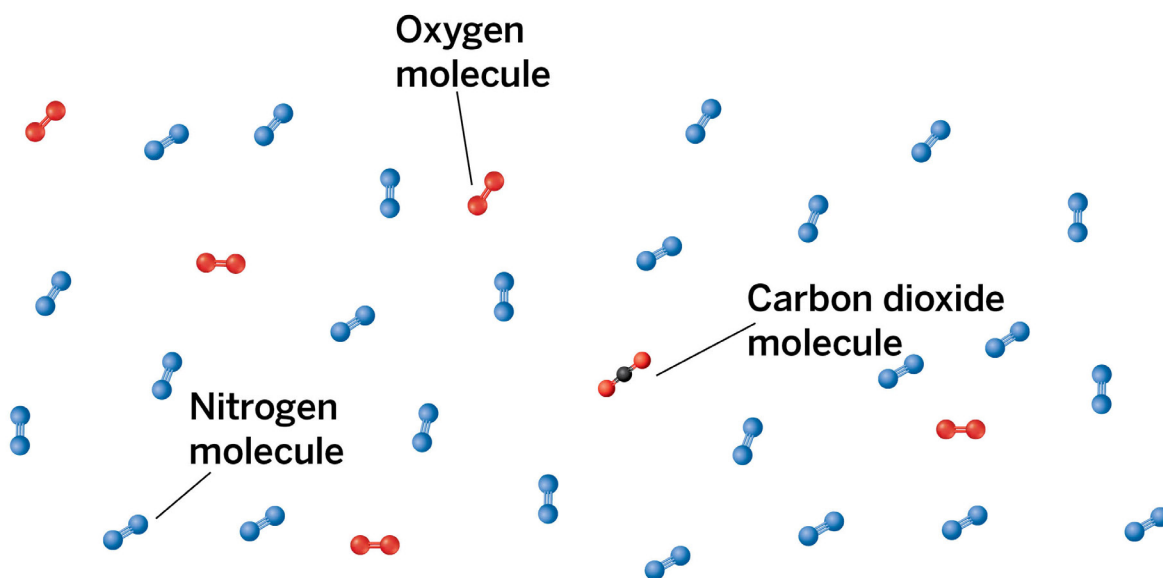
Most matter in the world is made of many different substances mixed together. Milk, soil, steel, and air are examples of mixtures. A mixture contains different kinds of atoms or molecules. It's easy to see that some mixtures (like a piece of granite rock) have different substances in them. For other mixtures, it's not so easy to tell they are mixtures just by looking at them. Apple juice is a mixture, even though it looks completely uniform. You can't see that

it's made up of different substances, but apple juice is a mixture of water, sugar, malic acid, and many other substances. The molecules of these substances mix together so completely that they look like a clear orange liquid.

Why should you care whether your diving tank contains oxygen or a mixture of gases? It makes a big difference. By itself, oxygen can be a dangerous substance. Oxygen gas catches fire easily, so it's difficult to handle, and oxygen can be unhealthy to breathe underwater without other gases mixed in. Divers learn which gas mixtures to use for diving. For some dives, they might use the already-existing mixture of gases found in air. For other dives, people make special blends of oxygen, nitrogen, and helium. Safe diving is all about finding the right mixture!



It may not look like one, but apple juice is a mixture.



Mixtures are made of many different kinds of atoms and molecules. Air is made of many different kinds of molecules, including nitrogen, carbon dioxide, and oxygen.