

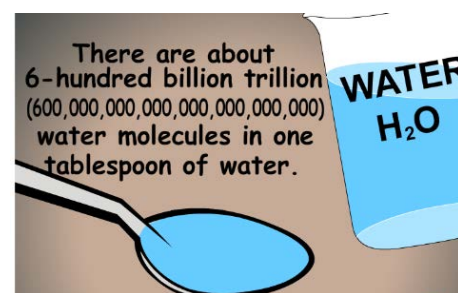
5th Grade - Lesson 1.1

Matter is Made of Tiny Particles

Student Reading

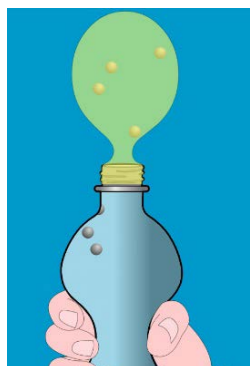
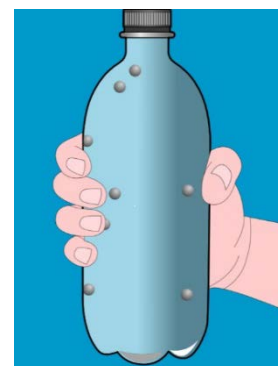
Matter is made of atoms and molecules

All the stuff you see, touch, and use every day, called **matter**, is in the form of either solid, liquid, gas, or a combination of these. By doing many experiments over many years, scientists have learned that matter is made up of incredibly tiny particles called **atoms** and **molecules**. An atom is the smallest building block of matter. A molecule is two or more atoms connected together. These particles are unbelievably small. If you could count the water molecules in one tablespoon of water at the rate of 1 million molecules every second, it would take you 20 billion years to count them all!



An “empty” bottle actually contains different gases

Atoms and molecules are so small that they are invisible. Because you can't see them, it may be hard to believe that an empty bottle actually has something in it. But if you squeeze an empty bottle with the cap on, you will only be able to squeeze it to a certain point, and eventually you will feel that there's something making it hard to squeeze all the way. If there was nothing in the capped bottle, you would be able to squeeze it and easily crush it.



If you put a balloon on the bottle and squeeze the bottle, the balloon fills up. Something you can't see must have moved from the bottle into the balloon, so there must have been something in the bottle to begin with. The bottle contains the invisible particles that make up the gases in air!

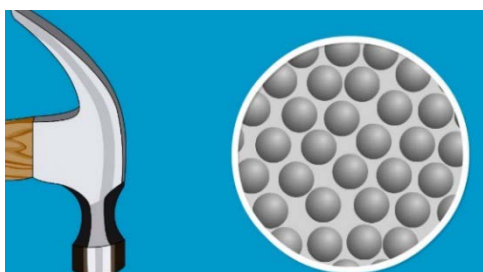
The particles that make up a gas must be far enough apart that you can squeeze them together to some extent in the closed bottle. The particles of a gas have very little attraction for one another and are much farther apart than the particles of a solid or liquid.

Particles of a liquid are much closer together than the particles of a gas

How about a liquid? If you squeeze a liquid, like water, in a sealed bottle, the bottle is very hard to squeeze. If water is also made of particles, the particles of a liquid must be a lot closer together than the particles of a gas. The particles of a liquid have a pretty strong attraction for each other and are much closer together than the particles of a gas.



Particles of a solid are very attracted to each other



How about a solid? You know that if you squeeze a rock or a hammer, you won't be able to make it squeeze together at all. The particles of a solid have a strong attraction for each other and are close together and can't move past each other. We can conclude this because it is extremely difficult to squeeze and move them at all.