



Matter

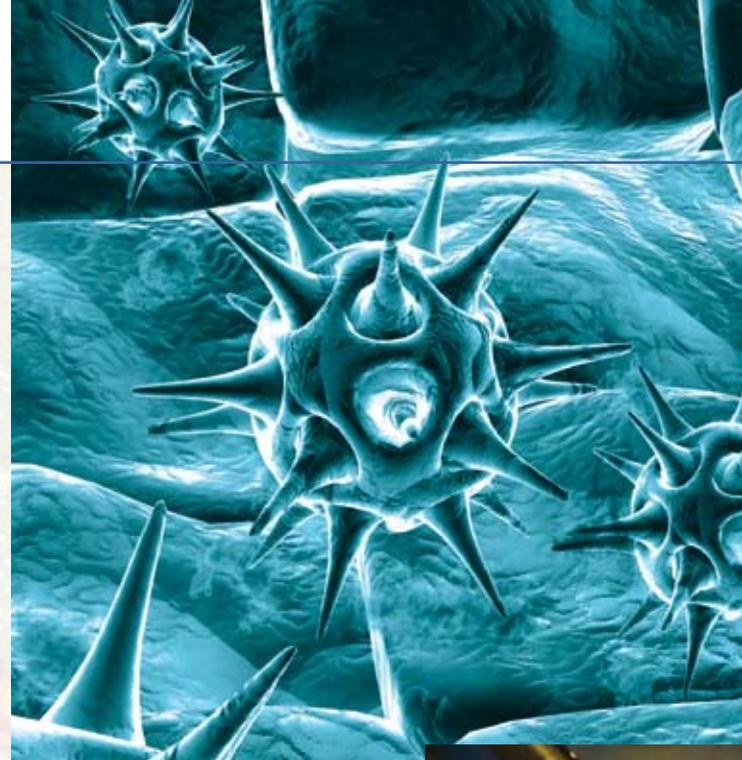
You and this book have something very important in common. You may not think that you are alike at all. After all, one of you is a living thing and one is not. But the truth is, you are both made of exactly the same thing. That thing is called **matter**.

Matter makes up everything in the universe. Big or small, light or heavy, strong or weak—it makes no difference. Because matter is all it is.

Matter is everywhere within and around you. All matter can be detected and measured. The senses help us detect matter. We can see, feel, and smell some matter. For example, we can see a tree, touch its bark, and smell its flowers. However, some matter is too small to see with the eyes. Special tools are needed to see it. The tools are called **microscopes**, and they can see the very small parts that make up matter. Those parts are called **atoms**.

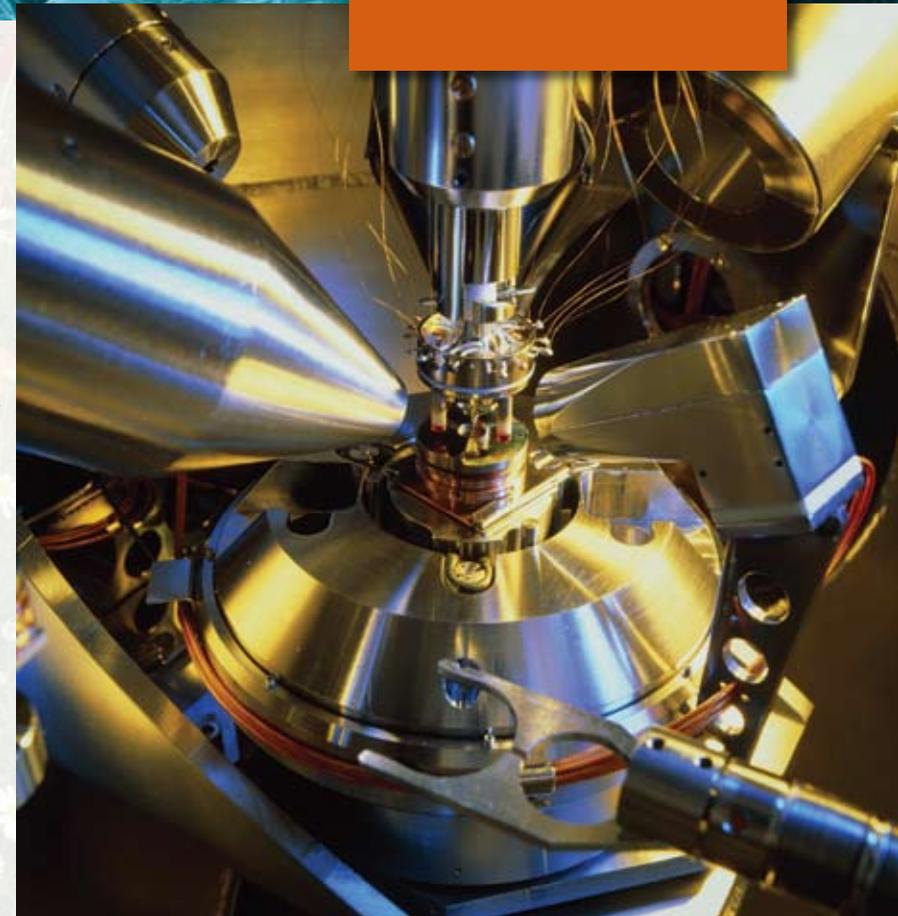


Everything here is made of matter.



Microorganisms scanned by an electron microscope

The scanning electron microscope (SEM) scans a sample with a beam of electrons. The beam may be scattered off the sample or it may cause electrons to be emitted by it. These electrons are collected and shown as a 3-D image.



Mega Microscope

Did you know that an **electron microscope** can magnify something up to one million times its original size? It uses electrons instead of light to form images of very small things. Electrons are a tiny part of atoms.

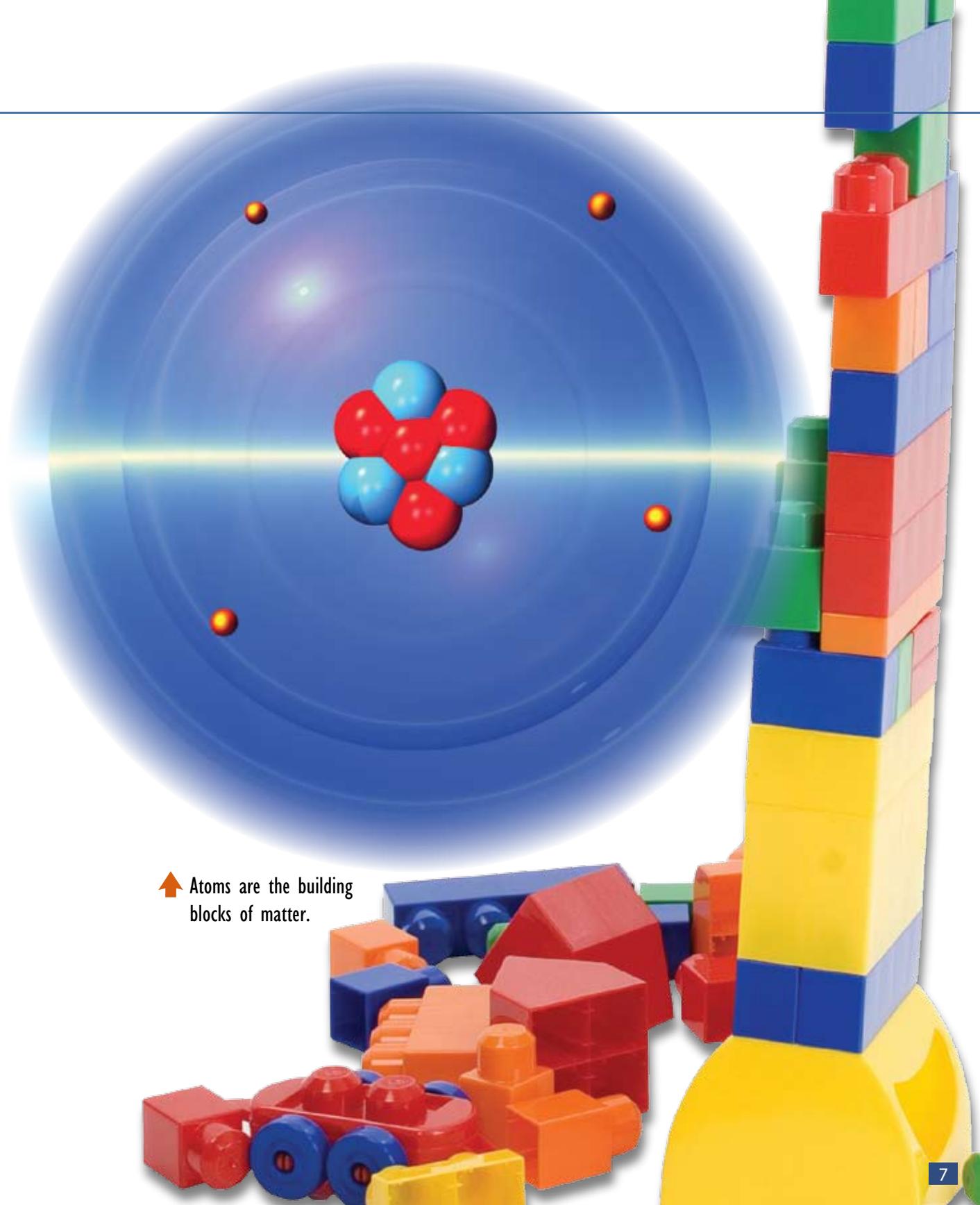
What Are Elements?

An **atom** is the smallest part of matter. Whatever the matter or its form, it is made of atoms. Think of atoms like a child's play blocks. The child can construct anything he or she imagines with the blocks. Atoms are like that. Combined, atoms can make anything in the universe.

If the atoms that make up something are all the same type, they form an **element**. An element is a pure substance because it includes only one type of atom. No matter how hard we try, we cannot split an element into anything simpler. Imagine the child stacked up all the red, square blocks of the same size. The tower of blocks would be like an element. All the pieces would be the same.

There are 90 different elements that occur naturally. That means that they can be found in nature. Others are man-made. Oxygen is an example of a natural element. You know oxygen well because you breathe it.

← The air we breathe is made of many gases, including oxygen. Oxygen is an element.



↑ Atoms are the building blocks of matter.