

Elements are the building blocks of matter.



Activity

Elements on Brick World

What if you lived in an alternate reality in which the building blocks of matter are Lego bricks, not atoms? Work in groups. Your teacher will give you a set of bricks. Use your set to do the following:

- Make sketches of each “element” and give them names.
- Make models of two different “compounds” using your brick elements.
- Make a model of a mixture that contains two or more brick compounds.

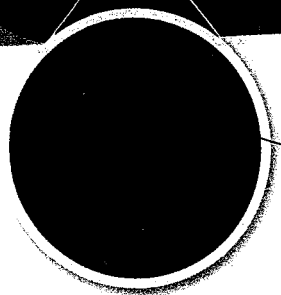
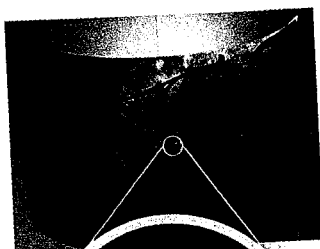
When you are finished, do a gallery walk to see the work of your classmates.

What do you notice about the variety of brick elements, compounds, and mixtures?

Connect to Investigation 2C on page 118

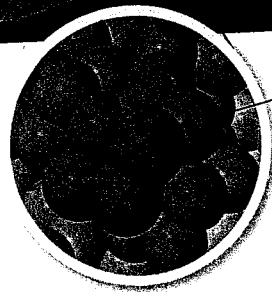
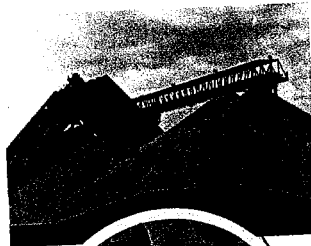
Matter can take many different forms, but all forms of matter can be broken down into a fairly small number of basic building blocks—the elements. On Earth, about 90 elements occur naturally. Carbon, silver, and oxygen are examples of naturally occurring elements. There are also a number of elements that do not exist naturally but have been synthesized in laboratories. Three examples of elements with very different properties are shown in **Figure 2.6**.

Figure 2.6 Like all elements, copper, sulfur, and helium are each made up of one type of atom. They cannot be broken down further into different substances.



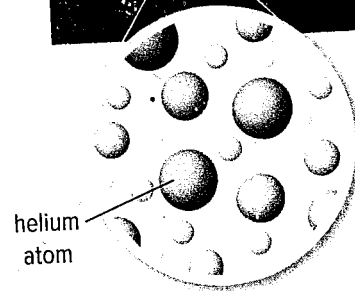
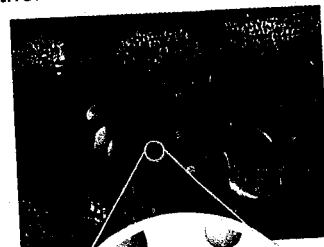
copper atom

Copper (Cu) is shiny and malleable. This means it can be hammered into thin sheets such as the copper leaf used on this car hood by B.C. artist Michael Nicoll Yahgulanaas. This piece is part of a series called *Coppers from the Hood*.



sulfur atom

Sulfur (S) is a powdery, bright yellow solid. The piles shown here in Vancouver harbour are awaiting export overseas. Sulfur is used mainly to make sulfuric acid. Sulfuric acid is used to make many industrial products such as fertilizers, detergents, batteries, and medicines.







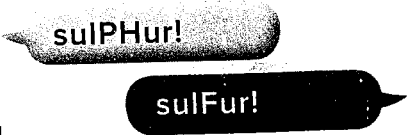
helium atom

This giant floating moose was used in the closing ceremonies of the Vancouver 2010 Winter Olympics. To make it float, it was filled with helium (He), which is a colourless, odourless gas that is less dense than air.

Element Names and Symbols

Each element has a unique chemical name and symbol. The chemical symbol is one or two letters. (Synthetic elements that have not yet been named are given placeholder names and three-letter symbols.) The first letter is always capitalized, and the remaining letter or letters, if any, are always lowercase. The names and symbols of the elements are accepted and used by all scientists worldwide in order to standardize the communication of chemical information. Many element names come from an ancient language called Latin. Others are named for countries or continents (polonium, americium) or to honour scientists of note (bohrium, rutherfordium). The symbols and names of some elements are shown in **Table 2.2**.

Table 2.2 Symbols and Names of Selected Elements

Name of Element	Element Symbol	Origin of Symbol or Name
carbon	C	<i>Carbo</i> = Latin for coal and charcoal. Carbon in the form of soot and charcoal has been known to humans for many thousands of years. 
copper	Cu	<i>Cuprum</i> = Latin for cyprium, meaning metal of Cyprus, an island country near Greece. The ancient Romans obtained much of their copper from mines on Cyprus. 
francium	Fr	<i>France</i> = Marguerite Perey discovered this element in France in 1939. 
lead	Pb	<i>Plumbum</i> = Latin for lead. This element's name has the same root as "plumbing" because the ancient Romans used lead in their plumbing systems. Unfortunately, lead is toxic and their pipes poisoned their water. 
sulfur	S	<i>Sulphurium</i> = Latin for sulfur. In Canada, the United States, and Great Britain, there has been some switching back and forth of the name of this element from sulfur to sulphur. The spelling "sulfur" is now considered standard. 

Before you leave this page . . .

- How many elements occur naturally on Earth?
- What distinguishes one element from another?