

Pupil Textbook • Unit 7

with oxygen and carbon, is one of the three basic elements that make up most of your body. The elements are given letter symbols to make it easy to refer to them. The symbol for hydrogen is H. Since hydrogen has only one proton in each atom, it is called element number 1.

The second element is helium. It has two protons in its nucleus and therefore two electrons. The symbol for helium is He.

Can you guess how many protons element number 3 has in its nucleus? Of course, it has three, just as you would expect. This element is called lithium with the symbol Li. You maybe never heard of lithium, but helium is sometimes used to inflate toy balloons. There are probably many more of the 109 elements that you never saw or heard of, such as krypton, lanthanum, tellurium, and samarium. But there are many of the elements that you have heard of, such as oxygen, sodium, iodine, iron, lead, and gold.

“But,” you may ask, “what is so orderly and wonderful about all this?” Here is part of the marvel: there is a different, distinct element for every number of protons from 1 to 109. Not one is missing. Every material with which you are familiar is made up of one or more kinds of the 109 elements.

Not all the 109 elements have been discovered in nature. Elements 43, 61, 85, 87, and from 93 to 105 were first discovered as products of atomic changes during man’s experiments with radioactivity and atomic energy. These elements are called the synthetic or “man-made” elements. The unstable nature of the synthetic elements accounts for the fact that most of them do not occur in nature. Element 93, neptunium, has been found in nature since its discovery in 1940 as a synthetic element. It is possible that man will in the future make elements with more than 109 protons. But man

Element number 1
Hydrogen (H) $\left\{ \begin{array}{l} 1 \text{ proton} \\ 0, 1, \text{ or } 2 \text{ neutrons} \\ 1 \text{ electron} \end{array} \right.$

Element number 2
Helium (He) $\left\{ \begin{array}{l} 2 \text{ protons} \\ 1, 2, 3, \text{ or } 4 \text{ neutrons} \\ 2 \text{ electrons} \end{array} \right.$

Element number 3
Lithium (Li) $\left\{ \begin{array}{l} 3 \text{ protons} \\ 2, 3, 4, 5, \text{ or } 6 \text{ neutrons} \\ 3 \text{ electrons} \end{array} \right.$

The basic subatomic particles of the first three elements. The number of neutrons in the most abundant isotope is italicized.