



Name: _____ Date: _____ Period: _____

"Elements in Living Things"

Of the 92 naturally occurring elements, living things are composed of only about 26, and 6 of those 26 make up practically all of the weight of most living things. The other 20 elements essential for life are present in very small amounts, some in such tiny amounts that they are designated simply as "trace elements". The six most abundant elements are visualized on this diagram.

The element hydrogen is a gas, and it is the most abundant element in the universe. Most of the hydrogen on earth is combined with other elements. Hydrogen gas is so light that it easily escapes the earth's gravity at the upper edges of the atmosphere and is lost into outer space. Plants and animals are about 10% hydrogen by weight.

Oxygen is also a gas, but it is 16 times as heavy as hydrogen, so it remains in the atmosphere, although it also combines with many other elements. Water is a combination of two atoms of hydrogen and one atom of oxygen. Oxygen makes up about 63% of a typical animal and about 77 percent of a typical plant.

The element carbon is familiar to almost everyone in the form of charcoal, which is nearly pure carbon. Carbon can also form crystals such as graphite, which is used in pencil lead and in lubricants, or as diamond, which few people would guess is also pure carbon. In living organisms, carbon is combined with other elements to form carbohydrates, proteins, fats, and many other substances. Carbon makes up about 19% of the weight of a typical animal and about 12% of the weight of a typical plant.

Nitrogen is a gas that makes up about 78% of the earth's atmosphere and is important to living things as a component of genes and proteins. Nitrogen makes up about 4% of an animal and 1% of a plant.

Phosphorus is not found in nature as a pure element. It is so reactive that it will combine with almost anything it contacts, even the air. Phosphorus makes up just under 1% of a plant or an animal.

Calcium is a grayish silver metal in pure form, but it too is rather reactive and is not found in pure form in nature. Very few plants have significant amounts of calcium, so it is not shown on the plant diagram, but it makes up about 2% of the weight of a mammal, such as a rabbit, because it is one of the principal elements of the hard part of bone and is important in the contraction of muscle.

Element	% by weight in...	
	Plant	Animal
Hydrogen (H)		
Oxygen (O)		
Carbon (C)		
Nitrogen (N)		
Phosphorus (P)		
Calcium (Ca)		

Answer the following questions on a separate sheet of notebook paper. Use complete sentences and restate.

1. How many elements are involved in the chemical composition of living things?
2. What are the six most abundant elements in living things?
3. Why is hydrogen, the most abundant element in the universe, not found in earth's atmosphere?
4. What percent of the weight of a typical animal is oxygen?
5. What percent of the weight of a typical plant is oxygen?
6. Besides being part of the composition of bone, why else do mammals need calcium?

Part 3: COLOR by ELEMENT!

KEY

H = Hydrogen

C = Carbon

Ca = Calcium

O = Oxygen

P = Phosphorus

N = Nitrogen

A = Water

B = Carrot

Elements of Living Things

