



The Nutrient Cycle “Soil is the basis of life”

All living beings on earth are organic. This means that they are **carbon** based. A basic organic structure (molecule) consists of **Carbon (C)**, **Hydrogen (H)**, and **Oxygen (O)**. These three elements (nutrients) make up 95-98% of the mass of all living beings. These three nutrients, however, are not by themselves sufficient for life to exist. **Nitrogen (N)** and **Phosphorus (P)** are also essential to create ribonucleic acid (RNA) molecules. These five elements are sufficient to create viroids (virus-like organisms). But, for these to multiply, more nutrients are needed. Adding **Sulfur (S)** to the above five helps in the formation of protein



molecules that offer protection to the RNA and that control a lot of life activities.

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Using the one-letter symbols representing these six elements, we have created a bicycle design to explain the nutrient cycling process. In our **nutrient cycle** design, **C** is represented by the black tires. The shiny

rims represent **O** and the wheel hub represents **H**. The main frame of the bicycle is green to represent **N** which gives rich green color to plant foliage. The handlebars represent **P** and the shape of the symbol **S** is ideally suited to represent the bicycle's pedals. Many micro-organisms can function very well with these six elements.



However, for advanced life forms, many more nutrients are needed. Magnesium (**Mg**) fits well as the bicycle's sprocket. The chain, representing Iron (**Fe**), serves double purpose here. In the nutrient cycle bicycle, it is the main mechanism for transmitting energy from one set of **C, H, and O** to the next set and it puts the organism in motion. In all living beings, iron (in cytochrome **C** systems) is directly involved in transforming energy molecules from one phase to another and thus releasing energy for body functions. The seat is used to represent **Calcium (Ca)** in our bicycle (an ideal position for to demonstrate **Ca's** vulnerability to easy dislodgement or displacement by acid rain). Potassium (**K**) is included as set of spokes in the front wheel of the nutrient cycle. And then there are all the other elements included as spokes in the front and back wheels.

We have named our bicycle design "the nutrient cycle," and we believe it represents

For more information:

Science Marketing & Client Liaison Team
Canadian Forest Service - Atlantic Forestry Centre
P.O. Box 4000, Fredericton, N.B. E3B 5P7
Tel: (506) 452-3500 / Fax: (506) 452-3525

how these elements combine and interact to create life on earth. It is symbolic of the dynamicity of everything on earth.

In our Nutrient Cycle lapel pin, there are three main colors. The yellow ring represents the sun that supports the basic or primary producers. The green background represents all the chlorophyll-containing life forms that convert the sun's energy into carbohydrates. The brown represents the soil (the mother earth), and the bicycle is the symbol of the mechanism for generating the energy needed to support all the activities of life.

In essence, forests are a physical embodiment of a nutrient cycle fueled by sunlight energy. Disturbing or decoupling the nutrient-cycling processes can only lead to degradation of forest ecosystems.

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— *The Dirtman*
