**Unit 5: Environmental Chemistry**

**Topic 1: A Hair Raising Dilemma Reading Assignment**

**Take Two Pebbles**

1. What chemicals circulate through the body to the cells? What are these chemicals used for?

The chemicals are called nutrients. The are used for energy, growth, body building, and cell repair.

1. What groups are the chemical divided into?

The two major groups of nutrients are organic and inorganic.

1. What nutrients fall into the carbon containing class? What are the roles in nutrition for each of the nutrients and provide two typical sources.

**Carbohydrates:** They are an energy source and aid in metabolism. They are found in rice and grains.

**Proteins:** They are structural molecules and aids in chemical reactions in the body. They are found in meat and eggs.

**Lipids:** They provide storage of unused chemical energy.

1. What are inorganic substances referred to as? What are these substance requirements distinguished by? Describe the different requirements using appropriate units.

Inorganic substances are called minerals. They are distinguished by the amount needed.

**Macromineral:** 100 mg/day or more

**Trace Element:** (less than 100 mg/day)

**Enzymes**: Protein molecules that regulate chemical reactions

**Vitamins:** Organic molecules that help enzyme functions.

**Become Familiar with Table 3.2 Page 180**

**A Balanced Approach**

Review the attached Canada Food Guide. Be able to answer simple questions by referring to it.

**The Root Source**

1. Where are most of the elements humans need to remain healthy found? What do we eat instead of this source in order to ensure we are getting the correct amount?

Most of the elements we require come from the soil. We eat plants to ensure that we get the correct amount of elements.

1. Describe the process that is required for plants to extract minerals from the ground?

Root hairs take in water from the soil. The water is concentrated with minerals. The minerals that are absorbed move through transpiration to other parts of the plant where they are used to build organic compounds. When we eat the plants we ingest the valuable organic compounds.

**Become Familiar with Table 3.3 Page 182**

**Commercial Fertilizers**

1. What do the numbers 21 – 7 – 7 refer to on a bag of fertilizer?

They are the percentage of mass of the fertilizer that provides nitrogen, phosphorus, and potassium.

1. How is nitrogen, phosphorus and potassium provided in commercial fertilizers?

Nitrogen is provided in three nitrogen compounds nitrates, ammonia and urea to mimic the nitrogen cycle.

Phosphorus is provided as phosphate comounds.

Potassium is provided as the mineral potash.

**Issues Emerging from High Productivity**

1. How much has the use of artificial fertilizers and other human activities increased the amount of nitrogen in the environment per year? What has the increased nitrogen resulted in?

The increase is estimated at 140 000 000 tonnes. The extra nitrogen causes increased plant growth in the form of high yield food crops.

1. Why could this increase in nitrogen be negative?

It requires a lot of fertilizer and water to produce a high yield food crop, this is expensive. In order to maintain the health of one type of crop pesticides are usually introduced. This can impact the environment negatively.