Unit C: Environmental Chemistry (Social and Environmental Emphasis)

Key Concepts

The following concepts are developed in this unit and may also be addressed in other units at other grade levels. The intended level and scope of treatment is defined by the outcomes below.

−chemicals essential to life
−substrates and nutrients
−air and water quality
−organic and inorganic material
−acids and bases
−ingestion and absorption of materials
−concentration and dispersal of pollutants
−evidence of toxicity
−stability and biodegradability
−uncertainties in environmental monitoring and in assessing toxicity and risk

Students should be able to:

- □ identify common organic and inorganic substances that are essential to the health and growth of humans and other living things, and illustrate the roles served by these materials describe, in general terms, the forms of organic matter synthesized by plants and animals
- □ describe processes that introduce chemicals into the environment
- □ describe how biomagnification and bioaccumulation occur
- □ describe how chemicals can be diluted in streams and other surface waters
- □ describe the uptake of materials by living things through ingestion or absorption
- □ describe evidence that some materials are difficult for organisms to break down or eliminate *(persistent pollutants)*
- □ identify substrates and nutrient sources for living things within a variety of environments
- □ identify and describe organisms that can be used to monitor the health of an ecosystem
- □ identify chemical factors in an environment that might affect the health and distribution of living things in that environment *(e.g., available oxygen, pH, dissolved nutrients in soil)*
- □ apply and interpret measures of chemical concentration in parts per million and parts per billion

- □ identify acids, bases and neutral substances, based on measures of their pH *(e.g., use indicator solutions or pH meters to measure the pH of water samples)*
- □ describe the effects of acids and bases on each other and on other substances
- □ describe effects of acids and bases on living things

- □ describe mechanisms for the transfer of materials through air, water and soil
- □ describe how biodegradation occurs.
- □ interpret LD50 data
- □ identify concerns with the disposal of wastes (hazardous and household) such as landfill space, leaching, etc.