

Unit C: Environmental Chemistry
Science 9 Final Review

1. Nitrogen-fixing bacteria “fix” some of the nitrogen that is in the soil so that it can be used by plants. The nitrogen that is in the soil can not be used by plants or animals in the form that it is in.
2. Using a weak acid. A strong acid can be harmful to the environment . A weak acid can be used the neutralize the base. During a neutralization reaction salt (an ionic compound) and water are formed.
3. a) The organic molecule that contains many units of “x” is a carbohydrate. The molecule above is actually glucose.

b) The organic molecule that contains many units of “y” is a protein. The molecule above is an amino acid.
4. The manipulated variable would be the pH level, and the responding variable would be the rate of hydrolysis of starch.
5. Sulfur dioxide and nitrogen oxides mix with water in the atmosphere to form sulfuric acid and nitric acids. These acids come the earth’s surface in the form of acid precipitation. Examples: snow, sleet and rain.
6. Two effects of global warming:
 - a. Climatic change
 - b. Drought
 - c. Increase in global temperatures
 - d. Extreme weather
 - e. Melting of ice caps → flooding
 - f. Enhanced greenhouse effect → results from the greater concentration of gasses trapping more heat in the atmosphere
7. $0.002 \text{ mL}/1000\text{mL} \times 1,000,000 = 2 \text{ ppm}$
8. 3, 1, 2
9. Many were commercial fishers, and now they could now longer fish. People who relied on wildlife for their food had to purchase more expensive groceries from the store. The tourist trade decreased dramatically as recreational users chose not to come to the contaminated area.
10. Labels alert to the dangers of the product and the safety precautions that should be taken, as well as first aid and disposal instructions. The also provide either WHMIS or SHS (Safety Hazard Symbols).
11. Hazardous household waste includes:

- a. Cleaners
- b. Paint and products
- c. Pesticides and fertilizers
- d. Automotive fluids
- e. Personal hygiene products

These HHW should not be poured down the drain because this waste ends up in our water systems. These wastes pollute the aquatic environment and some of the chemicals end up in the tissues of organisms. These toxins can also affect the development of organisms and their eggs, and harm the environment and organisms around them through biomagnification.

12. The optimum amount of a substance is the amount that provides the best health for an organism.
13. Lichens are often the first organisms to colonize an area. Lichens are a combination of fungi and algae. The algae photosynthesize to produce food and the fungi protect the algae from dehydration. Red snow algae also photosynthesize to produce food and the snow protects the algae from dehydration. These also can both occur in cold conditions.
14. (See chart on p. 197) Magnesium is a macronutrient which means that it is needed in large amounts. If a plant is deficient in magnesium it cannot photosynthesize because magnesium is in the composition of chlorophyll. As a result of not being able to produce its own food the plant will die.
15. $0.45 \text{ mL} / 2000 \text{ mL} \times 1,000,000 = 225 \text{ ppm}$
16. Any animals that eat those plants will ingest the toxins in the environment that the plants were used to clean up.
17. (See p. 251) Floating algae killed. Invertebrates near shore could not survive the decreased oxygen, loss of food and toxic effect of the hydrocarbons. Fish eggs and many young fish are especially sensitive to the toxic chemicals. Pacific herring and pink salmon die or are physically deformed. Seabirds and mammals are covered with oil.
18. Biomagnification is the increase in concentration of a chemical as it moves up the food chain. The mercury comes from emissions from coal-powered plants, waste incinerators, and commercial boilers and furnaces that burn mercury-containing materials.
19. Two ways to control the mosquito population are to use insecticides, or to use natural predators such as fish and bats (some small birds).
20. Site Z will probably have the most biological diversity since there is the least amount of human impact.