

**Topic 1 – A Hair-Raising Dilemma**

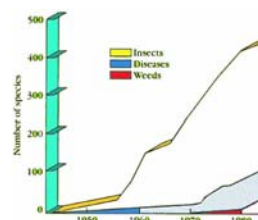
- Hippocrates, known as the 'Father of Medicine', recommended willow bark be used to treat pain and fever. First Nations people used willow bark to make a medicinal tea. Willow bark acts like ...
  - aspirins**
  - proteins
  - vitamins
  - enzymes
- The process of digestion breaks down the chemicals present in food. Chemicals which are organic compounds contain ...
  - hydrogen
  - oxygen
  - carbon**
  - nitrogen
- The organic compounds that are an energy source for metabolism are the ...
  - Lipids
  - Proteins
  - Nucleic Acids
  - Carbohydrates**
- Special protein molecules that regulate chemical reactions in living organisms are ...
  - lipids
  - enzymes**
  - vitamins
  - catalysts
- Maltose + Water → Glucose**  
 $C_{12}H_{22}O_{11} + H_2O \rightarrow 2C_6H_{12}O_6$   
This word equation is an example of a substance that has been broken down in the body by ...
  - photolysis
  - photosynthesis
  - hydrolysis**
  - metabolism
- Iron is a crucial part of red blood cells, which job it is to ...
  - transport oxygen**
  - fight infection
  - stop bleeding
  - store energy
- The amount of a substance that provides an organism with the best health is called the ...
  - maximum output
  - extreme level
  - required amount
  - optimum amount**
- Canada's Food Guide helps you to maintain proper health and take in the right amounts of nutrients on a daily basis. The four groupings included in this guide are ...
  - Fruit and vegetables – milk products – breads and cereals – meat and alternatives**
  - Meat and potatoes – bread and fibre – fruit and salads – milk and cheese
  - Fruit and vegetables – bread and fibre – milk products – Meat and potatoes
  - meat and alternatives – breads and cereals – fruit and salads – milk and cheese
- To make organic compounds, plants take in ...
  - water and trace elements
  - inorganic compounds**
  - glucose and maltose
  - organic molecules

10. When water moves through the walls of the plant's roots from an area where there are more water molecules to an area where there are fewer water molecules this process has occurred ...
- A. osmosis
  - B. diffusion
  - C. dilution
  - D. active transfer
11. Some organisms attach themselves to it or get their nutrients from it. This material, on which an organism moves or lives, is called a ...
- A. niche
  - B. substrate
  - C. ecosystem
  - D. habitat
12. The three numbers on a bag of fertilizer refer to the percentage of chemicals used as plant nutrient supplements. A bag of fertilizer containing **5 - 10 - 5** means there are equal amounts of two chemicals and twice as much of this chemical ...
- A. carbon
  - B. nitrogen
  - C. phosphate
  - D. potassium
13. Crop production has doubled worldwide due to the use of ...
- A. genetic crops
  - B. organic nutrients
  - C. inorganic minerals
  - D. artificial fertilizers
14. The planting of only one crop increases the chance of disease spreading through the entire crop. This type of farming practice is called ...
- A. strip farming
  - B. monoculture
  - C. summer fallow
  - D. irrigation
15. The most common elements present in the Earth's crust are
- A. silicon, iron, oxygen
  - B. sodium potassium, silicon
  - C. calcium, hydrogen, magnesium
  - D. oxygen, carbon, nitrogen

## Topic 2 – A Growing Concern

- Pesticide use is now common practice worldwide. Herbicides are used to control ...
  - insects
  - weeds
  - disease
  - invertebrates
- The invention of DDT by Swiss chemist Paul Müller earned him the ...
  - Pasteur Medical Medal
  - Master Chemist Award
  - Nobel Prize in Medicine
  - Medical Masters Medal
- As you move up the food chain the concentrations of DDT are higher and is called ...
  - Bioactivation
  - Bioacceleration
  - Bioconcentration
  - Bioaccumulation
- The use of DDT was recognized as having potentially harmful effects. What effect would banning the use of DDT have in the control of malaria?
  - The incidence of malaria would rise
  - Malaria would be wiped out entirely
  - The toxins in malaria would disappear
  - Malaria would decline worldwide
- No matter how it is developed, a pesticide (insecticide) is used to control pests. It is now widely recognized that minimizing the effects pesticides occurs ...
  - artificially
  - naturally
  - organically
  - chemically
- Fungicides control ...
  - insects
  - weeds
  - disease
  - invertebrates
- Dichlorodiphenyltrichloroethane is the chemical name that identifies the pesticide ...
  - DPT
  - DCC
  - DDT
  - DTE
- In 1962 a Canadian biologist and writer Rachel Carson described, with scientific evidence, how pesticides had spread throughout the environment in her book ...
  - Silent Killer*
  - Silent Night*
  - Silent Storm*
  - Silent Spring*

- This graph represents the numbers of organisms surviving the application of pesticides over time.



A good title for the graph would be ...

- Pesticide Resistance
- Populations of Pests
- Extinction of Pests
- Pesticide Application

**Topic 3 - How Do You Spell Relief?**

- Phosphoric acid is used in fertilizers and detergents. It is identified as an acid because it ...
  - feels slippery, and has a pH of more than 7
  - has a rough texture, and has a pH of 7
  - is insoluble, and has a pH of 7
  - is soluble in water and has a pH of less than 7**
- Sodium hydroxide is used in household cleaners and as a reagent in film processing. The properties that identify it as a base are, it ...
  - feels slippery, and has a pH of more than 7**
  - feels rough with texture, and has a pH of 7
  - is insoluble, and has a pH of 7
  - is soluble in water and has a pH of less than 7
- The pH scale is a way of comparing the ...
  - “power of hydrogen ions”
  - solubility of acids and bases
  - reactivity of acids and bases
  - relative acidity or alkalinity of a substance.**
- Red cabbage juice, grape juice and tea was used by a student in an experiment to act as an indicator because it changed color according to the type of substance it was added to. These types of indicators were used to ...
  - identify the pH of the substance it was added to
  - identify a substance as an acid, a base, or neutral**
  - change the taste of the substance being tested
  - test the substance for the presence of carbon dioxide
- A universal indicator is used to measure pH...
  - as well as acidity
  - flammability level
  - over a wide range**
  - and how basic it is
- In neutralization reactions acids and bases react together when they are mixed. These types of reactions produce ...
  - a salt and water**
  - carbon dioxide gas
  - neutral acids
  - neutral bases
- $\text{SO}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) \longrightarrow \text{H}_2\text{SO}_3(\text{aq})$  - this chemical equation describes the formation of ...
  - acid shock
  - neutralization
  - sulfur dioxide rain
  - acid precipitation**
- In 1996 an agreement between Canada and the US targeted a reduction by the year 2000, in industrial exhaust emissions of
  - 2%
  - 7%
  - 10%**
  - 20%
- A decrease of one unit in the acidity of a substance indicates the acidity has been ...
  - divided by a factor of 10
  - multiplied by a factor of 10**
  - added to how basic it was
  - subtracted from how basic it was

10. One part per million means that one unit of an element or chemical can be found in ...
- A. one very small amount of a litre
  - B. one hundred thousand parts
  - C. one million units of solution
  - D. a trace amount of a particular solution
11.  $\text{Ca}(\text{OH})_2 + \text{H}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{H}_2\text{O}$   
What is the chemical used to neutralize acid rain precipitation?
- A. Hydrogen Sulfide
  - B. Calcium Sulfate
  - C. Sulfuric Acid
  - D. Calcium Hydroxide
12. To reduce the concentration of a pollutant by mixing it with large quantities of air or water is called...
- A. Dispersion
  - B. Dilution
  - C. Biodegradation
  - D. Decomposition
13. A catalytic converter helps the formation of  $\text{CO}_2$  and  $\text{H}_2\text{O}$ , reducing  $\text{CO}$  and  $\text{NO}_2$ . The purpose of the converter is to encourage ...
- A. complete oxidation
  - B. biodegradation
  - C. photoremediation
  - D. corrosive by-products
14. The key to scrubbing exhaust gases is the addition of calcium oxide ( $\text{CaO}$ ), which reacts with the sulfur dioxide gas ( $\text{SO}_{2(\text{g})}$ ) to form calcium sulfite ( $\text{CaSO}_3$ ) – the sorbent, which is soluble in water. The role of the sorbent is to ...
- A. clean and dissolve the sulfur particles
  - B. penetrate and destroy the sulfur particles
  - C. absorb or capture the sulfur oxides
  - D. redirect and neutralize the sulfur oxides
15. An added bonus in the COBRA scrubber is a catalytic reaction that breaks down nitrogen oxides into nitrogen, oxygen gas and water vapour when this is added ...
- A. sulfur
  - B. hydroxide
  - C. ammonia
  - D. calcium

**Topic 4 – How Much Is Too Much?**

- To determine if something is a pollutant or pollution we must determine ...
  - how much of it is present**
  - how long it will take to degrade
  - how much it costs to clean it up
  - why it was released in the first place
- 'Percent' of weight, or volume, means how much there is in a weight or volume sample of 100. Concentrations of chemicals are usually measured in ...
  - percentage of minute parts in one million
  - how many million parts are present
  - millions to one or grams to kilograms
  - parts per million or milligrams per Litre**
- The community of Lynnwood Ridge in Calgary has a toxic substance in the soil that accumulates in the human body, as a result of many exposures over time. This type of toxicity is ...
  - safe
  - acute
  - chronic**
  - invasive
- Scientists measure toxins in LD50 amounts. LD stands for
  - Legal Dose
  - Limited Dose
  - Little Dose
  - Lethal Dose**
- 50 represents 50% of the subject group that will die, if they are given the specified dose, ...
  - In 50 doses
  - all at once**
  - over 50 hours
  - 50 times
- Most of our fatal-dose information for humans comes from ...
  - accidental-exposure case studies**
  - experiments during the World Wars
  - case studies during the 1950's
  - stories that were once urban legends
- Thalidomide was originally developed as a ...
  - pain pill
  - laxative
  - sleeping pill**
  - stimulant
- For every single molecule of human-made pesticide - nature forms this many natural pesticides...
  - 1,000 molecules
  - 10,000 molecules**
  - 100,000 molecules
  - 1 million molecules
- To receive an LD50 dose of a particular substance that was tested for mice – a human would have to drink 70 cups of that substance ...
  - in 50 hours or more
  - in 50 hours or less
  - all at one – in one sitting**
  - a little at a time to avoid vomiting

**Topic 5 - Getting Away From It All?**

1. As the world population grows waste production also grows and the proper handling of this waste is a concern. All wastes entering the environment are potentially harmful and must be treated, or be broken down into ...
  - A. non-combustibles
  - B. anti-pollution devices
  - C. antibacterial waste
  - D. nonpolluting compounds
2. Persistent pollutants accumulate and take a long time to degrade. Non-persistent wastes can be degraded ...
  - A. naturally
  - B. chemically
  - C. artificially
  - D. organically
3. Macro-invertebrates – visible to the human eye – live in aquatic environments depending on the pH level and the amount of dissolved oxygen present. Macro-invertebrates are organisms ...
  - A. with a backbone
  - B. without a backbone
  - C. that only live one day
  - D. that can only be seen with a microscope
4. Microscopic organisms (bacteria) can cause serious health problems if they are present in sufficient numbers. Samples are taken to identify their presence to ...
  - A. avoid contamination of the water supply
  - B. determine their life cycle
  - C. indicate their life expectancy
  - D. determine if pollution is critical
5. Dissolved oxygen, acidity, heavy metals, nitrogen, phosphorus, pesticides, and salts are
  - A. physical factors that determine water quality
  - B. biological indicators of water quality
  - C. chemical indicators of water quality
  - D. chemical compounds that pollute water
6. Pollutants entering the environment from specific locations are point source pollutants. those that enter the environment from locations that cannot be easily monitored or controlled are called ...
  - A. organic pollutants
  - B. biochemical pollutants
  - C. biodegradable pollutants
  - D. non-point source pollutants
7. Excessive amounts of nitrates in the water system are usually a sign of decomposition of organic matter is occurring. This is observed when tiny plants form a dense green growth on the surface of the water, called ...
  - A. algal bloom
  - B. algal patch
  - C. fungal spot
  - D. nitrate zone
8. There are different zones in a water system that help us to identify the level of pollution present or absence of oxygen. The only zone where you will not be able to find fish is the ...
  - A. Clean zone
  - B. Septic zone
  - C. Recovery zone
  - D. Decomposition zone

N.I.M.B.Y stands for *NOT IN MY BACKYARD*

**Topic 6 – N.I.M.B.Y. – There Is No Away In Throwing**

1. There are three stages of transport of substances in the environment, release, dispersion, and ...
  - A. dilution
  - B. deposition**
  - C. destruction
  - D. degradation
2. Wind speed, prevailing wind patterns and the chemical properties of the airborne chemical pollutant are factors that determine the pollutant's ...
  - A. concentration and pH
  - B. strength and toxicity**
  - C. harmfulness and color
  - D. direction and distance**
3. Atmospheric ozone is the chemical that occurs high in the atmosphere where it maintains a shield around the Earth protecting everyone from harmful UV radiation from the Sun. Ozone at the Earth's surface is.
  - A. non-poisonous
  - B. highly corrosive**
  - C. an irritating toxin**
  - D. a highly toxic substance
4. 1 chlorine atom can destroy 100, 000 ozone molecules. Chlorine is created in the upper atmosphere by our use of ...
  - A. chlorofluorocarbons**
  - B. carbonated soft drinks
  - C. water treatment plants
  - D. sodium chloride - NaCl
5. The biodegradation of pollutants is a multi-step process in which large organic molecules are broken down either inside or outside bacteria through the process of...
  - A. oxygenation
  - B. photolysis**
  - C. hydrolysis**
  - D. photosynthesis
6. A septic tank is a large underground container that traps grease and large solids. The remaining liquid waste is distributed through these, which lead into a drainage area containing gravel.
  - A. perforated pipes**
  - B. wide-mouth tubes
  - C. plastic cylinders
  - D. filtering sieves
7. A waste facility treats sewage in three levels or steps. The biological level is ...
  - A. primary
  - B. secondary**
  - C. tertiary
  - D. not included
8. Water that soaks into the soil is collected in a zone called the groundwater zone. The top of the groundwater zone in the soil is called the ...
  - A. aquifer
  - B. hydrotropic level**
  - C. eutrophic zone
  - D. water table**
9. Permeable ground collects naturally filtered drinking water in underground cavities called ...
  - A. aquifers**
  - B. aquaseas
  - C. water caves
  - D. water bowls



10. Bacteria deep in anaerobic environments remove chlorine from harmful chlorine-containing compounds, such as PCB's, by replacing them with hydrogen atoms – which can then be used as ...
- A. water
  - B. food
  - C. activators
  - D. hydrolizers
11. To protect consumers and reduce the risk of hazardous chemicals having negative environmental effects, government agencies design these ...
- A. regulations
  - B. M.S.D.S.'s
  - C. eco-labels
  - D. crash test dummies
12. A detailed description of a product, the precautions that should be taken when handling, transporting and disposing of the product, as well as health effects, first aid treatment and what to do in case of a spill are included in these product information sheets called ...
- A. Workplace Hazardous Information Sheets
  - B. EcoGuide and Product Label
  - C. Dangerous Goods Data Sheets
  - D. Material Safety Data Sheets
13. Waste can be reduced, recycled, recovered or reused, but most of it is placed in landfill sites. The most preferred option is to ...
- A. reuse
  - B. reduce
  - C. recycle
  - D. recover
14. Hazardous chemicals that need to be disposed of in Alberta are packaged into larger containers and are then transported to Swan Hills treatment ...
- A. liquifiers
  - B. bioreactors
  - C. incinerators
  - D. neutralizers
15. Bioreactors, a new technology in a sanitary landfill site, speed up the rate of organic waste biodegradation by adding
- A. oxygen
  - B. acid
  - C. base
  - D. water
16. Plants able to absorb and accumulate large amounts of harmful chemicals are grown, harvested and processed. This technique – to reduce soil or groundwater contamination – is called ...
- A. Photosynthesis
  - B. Phytoremediation
  - C. Plant Meiosis
  - D. Photolysis
17. The breakdown of compounds by sunlight ( and ozone formation) is known as ...
- A. Photolysis
  - B. Solarization
  - C. Active Transfer
  - D. Phytoremediation