1. **Nutrients definition:**
2. Organic nutrients (definition):

|  |  |  |
| --- | --- | --- |
| 1. **Organic molecule**
 | **Role in nutrition** | **Dietary source** |
|  |  |  |
|  |  |  |
|  |  |  |

1. **Minerals:** two types-

🡪 Plants convert solar energy into food energy for us by photosynthesis. They take in water and minerals by **root hairs.**



5) Nitrogen helps grow:

Phosphorous helps grow:

Potassium helps grow:

1. **3 types of Pesticides and what they control:**

1. **List some in about the insecticide** DDT

PRO🡪

CON 🡪

1. **Definition of biological magnification (aka biological accumulation).**

|  |  |
| --- | --- |
| 1. **ACID (acidity)**
 | **BASE (alkalinity)** |
| Things about acids:  | Things about bases:  |

1. **During an acid- base neutralization what 2 products are created.**

**10)What is a Catalytic converter?**

**11)What are scrubbers?**

**12) what does ppm stand for, and what does it mean?**

|  |  |
| --- | --- |
| **13) Acute toxicity** | **Chronic toxicity** |
| Definition:  | Def:  |
| Ex)  | Ex)  |

**14) what does LD50 mean?**

15) What is more toxic? Botulinum (LD50 in ppm = 0.0000003) or nicotine (LD50 0.86ppm)

|  |  |
| --- | --- |
| **Non persistent pollutants** | **Persistent pollutants** |
| Def:  | Def: |
| Ex)  | Ex)  |

**16) Biological indicators definition:**

**17) Substrate definition:**

|  |  |
| --- | --- |
| **18) Point source** | **Non-point source** |
| Definition  |  |
| Ex)  | Ex)  |



**Primary** –

**Secondary**-

**Tertiary**-

**Biodegradable –**

 **Leachate-**

**Practice Questions for Environmental Chemistry**

1. Match the term with the appropriate description

|  |  |
| --- | --- |
| Number | Term |
| 1. | Enzyme |
| 2. | Lipid |
| 3. | Carbohydrate |
| 4. | Mineral |

Found in grains and rice \_\_\_\_\_

Found in canola oil and margarine \_\_\_\_\_

May be classified as a trace element \_\_\_\_\_

Not classified as a nutrient, acts as a catalyst \_\_\_\_\_

1. Match the term with the appropriate description

|  |  |
| --- | --- |
| Number | Term |
| 1. | Trace element |
| 2. | Macro mineral |
| 3. | Protein |
| 4. | Lipid |

Used for building and cell repair \_\_\_\_\_

Nutrient found in oils \_\_\_\_\_

Calcium \_\_\_\_\_

Iodine \_\_\_\_\_

1. Match the term with the appropriate description

|  |  |
| --- | --- |
| Number | Term |
| 1. | Biomagnification |
| 2. | Persistence |
| 3. | Pesticide resistance |
| 4. | DDT |

The build up of a chemical in animals at different levels of the food web \_\_\_\_\_

Process that allows a species to adapt to the presence of a pesticide \_\_\_\_\_

Characteristic of DDT that makes it harmful to the environment \_\_\_\_\_

Can severely affect the reproduction of birds of prey \_\_\_\_\_

1. Match the term with the appropriate description

|  |  |
| --- | --- |
| Number | Term |
| 1. | SO2 (sulfur dioxide) |
| 2. | pH scale |
| 3. | Acid |
| 4. | Base |

A chemical with a pH of >7 \_\_\_\_\_

A chemical that turns blue litmus paper red \_\_\_\_\_

Compares the relative acidity or alkalinity of a substance \_\_\_\_\_

Produced by the combustion of fossils fuels and contributes to acid rain \_\_\_\_\_

1. Order the following substances from most acidic to least acidic

|  |  |  |
| --- | --- | --- |
| Number | Substance | pH |
| 1. | Baking soda | 8.2 |
| 2. | Drain cleaner | 14 |
| 3. | Lemon juice | 2.0 |
| 4. | Acidic rainfall | 4.4 |

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,

most acidic least acidic

6. You are a biologist hired by Environment Canada to study the amounts of DDT in a wetland environment. Your field work provides the following data:

|  |  |
| --- | --- |
| Sample | DDT concentration (ppb) |
| Water | 0.0001 |
| Plankton | 0.2 |
| Fish | 40 |
| Osprey | 5200 |

1. How many times greater is the concentration of DDT in the osprey than in the plankton? Show your work. **[2 marks] cg+**
2. What **process** is being represented by the data? **[1 mark] cg**
3. Explain how the DDT from the plankton can accumulate in the osprey. **[2 marks] eg

7.** Place each of the following substances (use their number) on the pH scale provided. **[5 marks]** cg-

|  |  |  |
| --- | --- | --- |
| Number | Substance | pH |
| 1 | Battery acid | 0.5 |
| 2 | Drain cleaner | 14 |
| 3 | Human blood | 7.4 |
| 4 | Natural rainfall | 5.6 |
| 5 | Milk | 6.6 |

 0 7 14

8. List a **function and an example food** for each of the organic compounds below:

**a.** Carbohydrates

**b.** Lipids

**c.** Proteins



**9.** Use the image to the right, explain what the numbers

and letters on the bag of fertilizer means (what do they help grow?).

N

P

K

**10.** State whether each sentence below refers to an acid, a base or a neutral solution:

a. Solution A turns blue litmus paper red. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Solution B has a pH of 10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Pure water has a pH of 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. Solution C neutralizes an acid. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Barnacles are found all over rocks in the intertidal zones of ponds and lakes.

What is the substrate for the barnacle?

12. Humans need to take in nutrients, as they cannot make their own. The process when humans eat food-containing nutrients is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Once the food has been broken down, it then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into the blood stream by the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (which moves it from a high to low concentration).

*Use the following graph to answer question 13.*



13**.** Which of the following conclusions can be made from the graph above?

**A.** Vinegar is more basic than lye.

**B.** Ammonia is more acidic than apple juice.

**C.** Tomato juice is more acidic than lemon juice.

**D.** Baking soda is more basic than human blood.

14. What does biodegradable mean?



15. To find how much more concentrated

a chemical is. Divide bigger/ smaller.

a) How much more concentrated is the

DDT in dolphins than in squid?

16. The nutritional information label on a cereal box states that each **35 g** serving of cereal contains **24 mg** of sodium. What is the concentration of sodium in parts per million (ppm)? **Careful of units.**

Solute = ppm

Solvent 1 000 000

17. A **700 000 mg** water sample from the Flow River contains **120ppm** of barium. Calculate the amount of barium in the water, in milligrams (mg).

18. If the LD50 of salt is 3000mg/kg in rats, and we feed that amount to 682 rats, how many will be alive at the end of the experiment?

19. Graph reading. What are the phosphate levels, in ppm, when there is an oxygen concentration between 4-6ppm?



20. Explain what each of these scientific variables means:

a. Manipulated variable

b. Controlled variable

c. Responding variable