

DATE:

NAME: Key

CLASS:

UNIT 3

ASSESSMENT

BLM 3-10

Unit 3 Test

Goal • Demonstrate your understanding of the concepts presented in Unit 3.

What to Do

Read each question carefully before answering in the space provided. If you work at a steady pace, you should have enough time to finish.

Definitions

Define each term. Use full sentences.

1. trace elements an element needed in less than 100mg of a day.
2. biological magnification the increase in concentration of a chemical substance within the tissues of living organisms.
3. toxicity ability of a chemical substance to cause harm to a living organism
4. biodegradable being able to be decomposed by living organisms.
5. hazardous label used to describe chemicals that are toxic, poisonous, flammable, explosive or corrosive.

True or False

In the space provided, indicate whether each statement is true (T) or false (F).

- T 6. Plants are essential to human nutrition and health because they concentrate elements from soil and synthesize some essential organic molecules.
- F 7. The tendency for DDT and other chlorinated hydrocarbon pesticides is to persist for long periods of time, thus making them safe and effective pesticides.
- F 8. If blue litmus paper turns red in the testing of a substance, then that substance can be considered a base.
- F 9. An acid and a base react to produce a mineral salt and water, which is best described as a combustion reaction.
- T 10. The tendency of a toxic chemical to cause harm to living organisms depends on the dose of the toxin.
- F 11. A point source for excess fertilizer and pesticide pollutants is the run-off from lawns, golf courses, and municipal parks following a rainstorm.

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Unit 3 Test (continued)

Multiple Choice

Circle the best answer for each of the following questions.

12. The inorganic substances that are an essential part of a healthy diet are:
- (a) vitamins
 - (b) minerals
 - (c) carbohydrates
 - (d) proteins
13. Most of the acid precipitation due to human activity is the result of :
- (a) acids in water and soils
 - (b) chemical wastes in landfills
 - (c) the release of CFCs into the atmosphere
 - (d) sulfur and nitrogen oxide gases in the atmosphere.
14. The main purpose of the tertiary treatment step in sewage treatment is to:
- (a) remove nitrates and phosphates
 - (b) decompose any remaining organic matter
 - (c) physically remove solid matter
 - (d) kill disease-causing organisms
15. The use of select micro-organisms and plant species to accumulate or degrade some of the metals and organic pollutants found in contaminated sites is referred to as:
- (a) waste reduction
 - (b) bioremediation
 - (c) ecological succession
 - (d) genetic engineering

Fill in the Blanks

Complete each sentence with the correct term.

16. A macromineral is any inorganic substance that is needed in amounts of 100 mg per day or more to maintain health.
17. The three primary constituents in any fertilizer are in order of how they are listed on the package: nitrogen, phosphate, and potassium. NPK
18. The common method for describing the toxicity of a substance by determining the amount that results in the death of half of the population tested in a given time is referred to as the LD50 of that substance.
19. The three main types of pesticides are insecticide, herbicide, and fungicide.
20. An indicator is a chemical substance that changes colour when exposed to acids or bases.
21. A scrubber is a device that removes oxides from industrial smokestacks.
22. Any substance that is broken down by the action of living organisms is referred to as biodegradable.

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Unit 3 Test (continued)

23. Of the "4Rs" of the environmental movement — recycle, recover, reuse, and reduce — the principal that is the preferred first option is Reduce, because it has the most potential to change the amount of wastes generated.

Short Answers

24. A healthy diet requires certain specific nutrients, both organic and inorganic, to be present in adequate amounts. List these nutrients.

Proteins	Trace elements
Carbohydrates	
Lipids	
Macrominerals	

25. DDT is an example of an effective pesticide that is now banned in most countries. Describe the characteristics that make DDT so effective, and why those same characteristics make it likely to be banned for widespread use.

DDT is effective b/c it is not easily degraded and kills many insects. Because it is not easily degraded it will biomagnify and bioaccumulate up the food chain posing dangers to ecosystems.

26. Acid precipitation is much more of a problem in eastern Canada than it is in western Canada. Give two reasons why this might be so.

1. Western Canada have naturally basic soil, (limestone), that will neutralize the acid ~~precipitation~~ precipitation.
2. Eastern Canada is more heavily populated so has more contributions of pollutants.

27. Most modern sanitary landfills and all modern secure landfills incorporate a clay liner. Some sanitary and all secure landfills also include an impermeable plastic liner. What is the purpose of these liners?

To prevent seepage or leaching of pollutants into the area's ground water.

Unit 3 Test (continued)

Long Answers

28. The use of synthetic fertilizers has greatly increased the amount of food that can be grown worldwide. What are the primary ingredients supplied by a synthetic fertilizer and what role do those ingredients play in plant nutrition?

Nitrogen - growth, leaf development
 Phosphates - Root development
 Potassium (Potash) - Proper flower/fruit formation

29. Describe three methods for reducing the use of pesticides in your yard or garden.

1. Sanitize area, remove breeding sites
2. Use mulch to control weeds etc.
3. Remove pests by hand.

30. Acid precipitation is estimated to cause \$1 billion worth of damage in Canada every year. Describe two methods using the application of chemistry by which the production of acid precipitation or its effects can be reduced?

1. Reduce oxide, (sulfur, nitrogen, carbon), emissions to the atmosphere [cause of acid precipitation] using scrubber technologies.
2. Use "liming": putting calcium carbonate rocks, (basic), into acid lakes, rivers in order to neutralize the acid.

31. Plastics are extremely versatile materials and are used in almost all aspects of your daily life. Most recycling programs accept plastic containers and bottles, but not plastic wrap or Styrofoam™ containers. Explain why these plastics are treated differently.

Each plastic has a different resin base, so they need to be treated differently for recycling and must be separated.

32. Explain why water testing is a focus for many environmental scientists when they are trying to assess the presence of chemical pollutants.

Most pollution testing focuses on water because regardless of the source of the pollutant it is likely that it will spend at least part of the time in the water supply.