

Grade 9 Unit Practice Test

Science

Environmental
Chemistry

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1. Which of the following substances is inorganic?
 - A. Table salt
 - B. Peanut oil
 - C. Orange juice
 - D. Brown sugar

2. Which of the following statements **best** defines the term LD₅₀?
 - A. LD₅₀ is the proportion of the first 50 organisms in a test population that dies when exposed to a particular substance.
 - B. LD₅₀ is the proportion of the first 50 organisms in a test population that becomes sick when exposed to a particular substance.
 - C. LD₅₀ is the concentration of a substance administered to a test population that kills half the organisms in the test population.
 - D. LD₅₀ is the concentration of a substance administered to a test population that makes half the organisms in the test population sick.

Use the following information to answer questions 3 and 4.

The following three brands of fertilizer are administered to three seedlings in a controlled experiment.

Before the administration of the fertilizers, each seedling had similar root growth and three leaves. None of the seedlings had developed flowers.

Composition of Three Brands of Fertilizer

Brand	Major Components		
	Nitrogen (%)	Phosphorous (%)	Potassium (%)
W	7	15	17
X	10	24	5
Y	13	5	10

At the end of a two-month growth period, the following observations are made.

Characteristics of Three Plants Fertilized with Three Brands of Fertilizer

Plant	Brand of Fertilizer	Number of Flowers	Length of Roots (cm)	Number of Leaves
1	W	15	9	6
2	X	5	14	11
3	Y	10	4	16

3. What is the manipulated variable in the experiment above?
- A. The overall growth of each plant
 - B. The length of time that each plant grows
 - C. The amount of water that each plant received
 - D. The brand of fertilizer that is used on each plant
4. Which of the following conclusions is supported by the results of the experiment?
- A. Nitrogen promotes root growth, and phosphorous promotes leaf growth.
 - B. Nitrogen promotes root growth, and phosphorous promotes flower growth.
 - C. Nitrogen promotes leaf growth, and potassium promotes root growth.
 - D. Nitrogen promotes leaf growth, and potassium promotes flower growth.

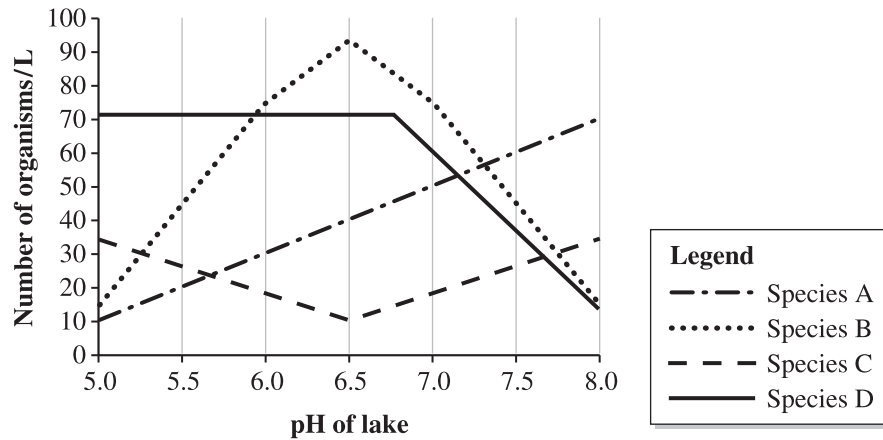
5. Which of the following substances is organic?

- A. Silicon
- B. Sulfur
- C. Sugar
- D. Salt

Use the following information to answer questions 6 to 8.

Scientists conducted a study on a particular lake. The data that were collected are shown below.

Concentration of Organisms of Four Different Species in a Lake as the pH Changed



6. Which of the following rows classifies the type of data that were collected during the study and identifies the type of monitoring that was conducted by the scientists?

Row	Classification	Type of Monitoring
A.	Qualitative	Biological
B.	Qualitative	Chemical
C.	Quantitative	Biological
D.	Quantitative	Chemical

7. Which species has the **greatest** number of organisms present in the lake when the water is at a neutral pH?

- A. Species A
- B. Species B
- C. Species C
- D. Species D

8. If acid rain falls into the lake and changes the pH of the water from 6.3 to 5.0, then the species that is expected to increase in number of organisms is

- A. Species A
- B. Species B
- C. Species C
- D. Species D

9. Which of the following roles is played by carbohydrates in human nutrition?
- A. Provide structural component of cells in the body
 - B. Store unused chemical energy
 - C. Act as an energy source
 - D. Assist enzyme function
-

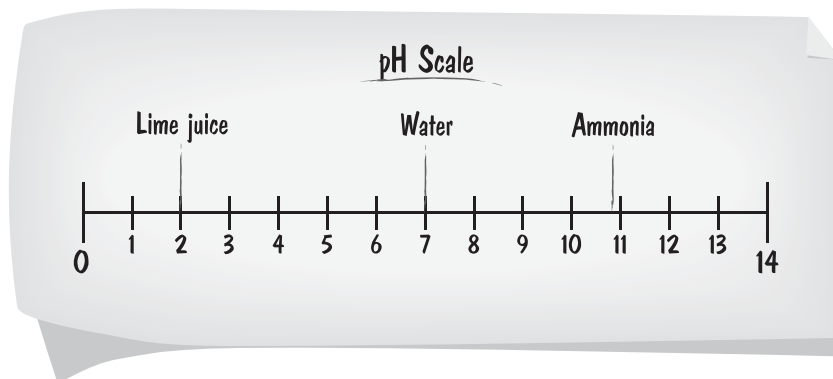
Use the following information to answer question 10.

Bromothymol blue is an indicator that changes colour at different pH levels.

pH	Colour
Above 7.6	Blue
6.0–7.6	Green
Below 6.0	Yellow

10. Bromothymol blue will appear yellow when mixed with
- A. a weak base
 - B. a strong acid
 - C. distilled water
 - D. neutral solutions

Use the following information to answer numerical-response question 1.



Test Results Showing the Effects of Seven Different Liquids on Red and Blue Litmus Paper

Liquid	Test I	Test II
	One Drop of Liquid is Placed on Red Litmus Paper	One Drop of Liquid is Placed on Blue Litmus Paper
Lime juice	No colour change	Turns red
Ammonia	Turns blue	No colour change
Water	No colour change	No colour change
Liquid W	No colour change	Turns red
Liquid X	Turns blue	No colour change
Liquid Y	No colour change	Turns red
Liquid Z	No colour change	No colour change

Numerical Response

1. Use the following code to classify each liquid below. (A number may be used more than once.)

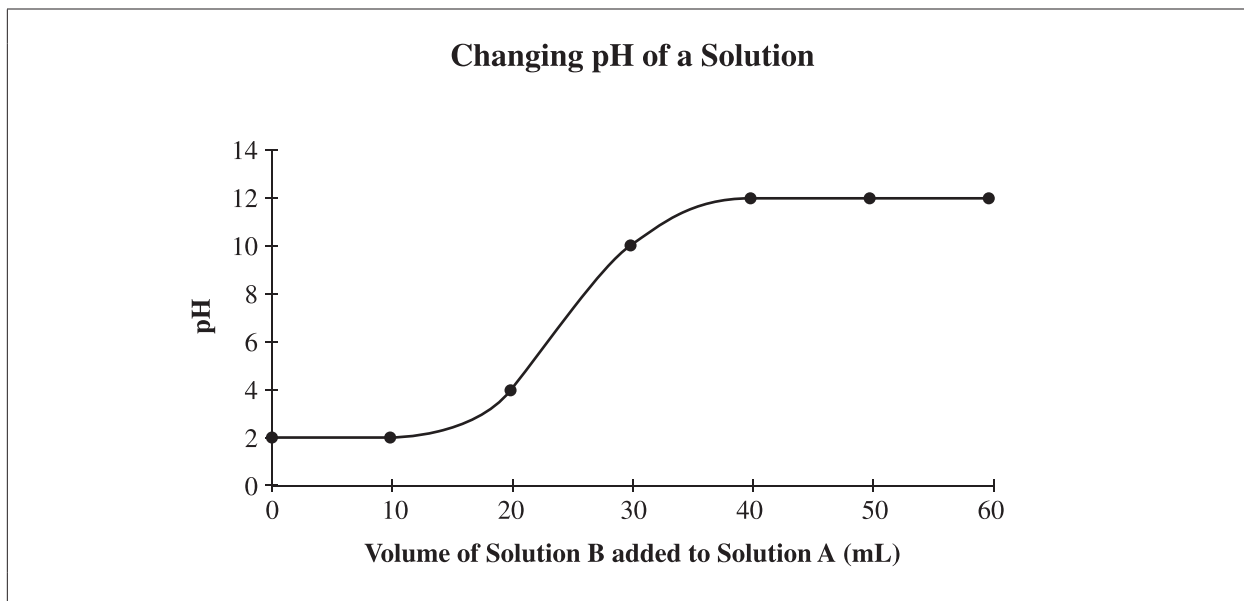
1 = Acid
 2 = Base
 3 = Neutral

Number: _____

Liquid: **Liquid W** **Liquid X** **Liquid Y** **Liquid Z**

(Record all **four digits** of your answer.)

Use the following information to answer question 11.



11. What volume of Solution B must be used to neutralize Solution A?

- A. 15 mL
 - B. 25 mL
 - C. 35 mL
 - D. 45 mL
-

Use the following information to answer question 12.

The number of mayflies decreases as the habitat quality of a stream declines.

12. The study of the number of mayflies can be useful to scientists for

- A. chemical monitoring
- B. biological monitoring
- C. estimating the concentration of lipids in the tissues of a particular species
- D. estimating the concentration of toxins in the tissues of a particular species

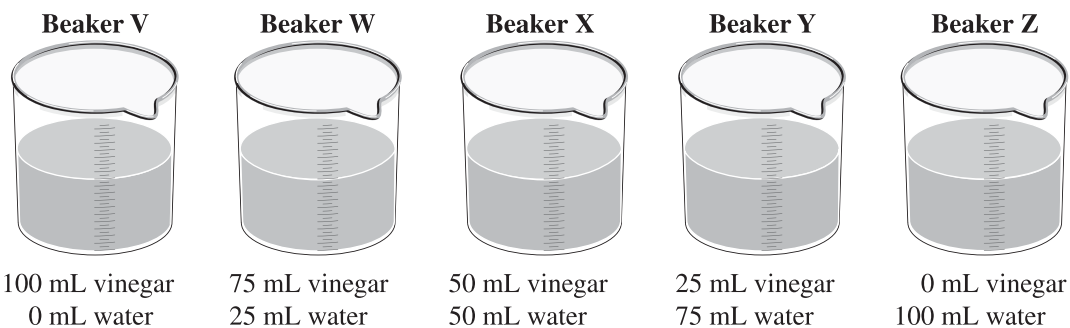
Use the following information to answer question 13.

The dissolved oxygen concentration of a pond is 8 ppm by volume.

13. This level of dissolved oxygen indicates that 8 mL of oxygen is found in
- A. 1 000 000 mL of water
 - B. 10 000 mL of water
 - C. 1 000 mL of water
 - D. 100 mL of water

Use the following information to answer question 14.

Tanisha was curious to see how adding water to vinegar would affect the pH of a particular solution. She set up the following experiment.

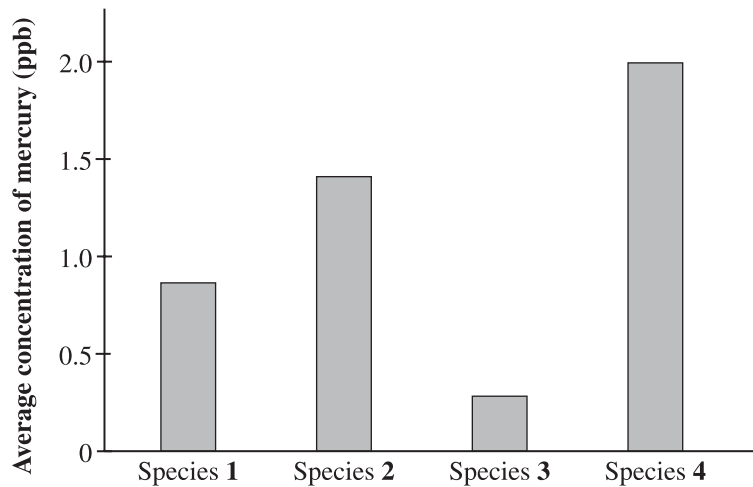


Tanisha used a universal indicator to measure the pH of each beaker's solution.

14. The manipulated variable in Tanisha's experiment is the
- A. initial pH of the vinegar
 - B. resulting pH of each solution
 - C. total volume of solution in the beaker
 - D. ratio of water to vinegar in each beaker

Use the following information to answer numerical-response question 2.

A food chain is a linear representation of the feeding relationship between organisms. Plants are often the first species shown in food chains. Large meat-eating animals tend to be the last species shown in food chains. A biologist studies the concentration of mercury in the livers of four species that are in the same food chain. She records her findings in the graph below.



Numerical Response

2. When listed in order from the species that is first in the food chain to the species that is last in the food chain, the species are _____, _____, _____, and _____.
First **Last**

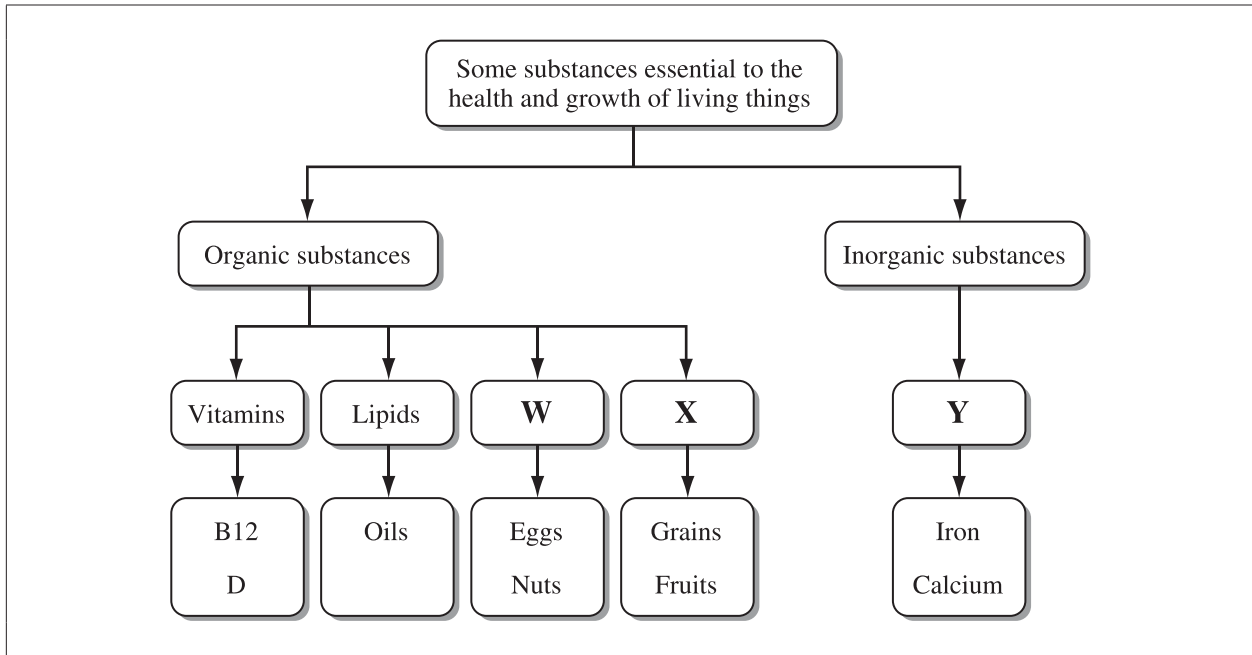
(Record all **four digits** of your answer.)

15. A solution is classified as an acid when its pH is *i* and can neutralize *ii* .

The statement above is completed by the information in row

Row	<i>i</i>	<i>ii</i>
A.	greater than 7	bases
B.	greater than 7	other acids
C.	less than 7	bases
D.	less than 7	other acids

Use the following information to answer question 16.



16. Which of the following rows accurately completes the information above?

Row	W	X	Y
A.	Minerals	Fats	Proteins
B.	Fats	Minerals	Proteins
C.	Carbohydrates	Proteins	Minerals
D.	Proteins	Carbohydrates	Minerals

17. Which of the following actions **most clearly** represents biological monitoring used to determine environmental quality?

- A. The number and diversity of invertebrate species in a pond near a wastewater treatment plant are measured over 10 years.
- B. The pH of a river is measured every two months for five years to track the impacts of a local industry.
- C. The concentration of mercury in groundwater near a waste-disposal site is tracked over two years.
- D. The population of geese in a wetland is measured and is compared to the population size 10 years ago.

Use the following information to answer question 18.

One method to reduce sulfur dioxide emitted into the air is to use smokestack scrubbers in industrial plants and electrical generating plants.

- 18.** Based on the information above, the practice of using smokestack scrubbers would **most directly** result in a reduction of
- A. algal blooms
 - B. acid rain production
 - C. ozone layer depletion
 - D. groundwater contamination

Science 9 – Practice Test 2019 Environmental Chemistry Key

Question # in Document	Key
1	A
2	C
3	D
4	D
5	C
6	C
7	B
8	C
9	C
10	B
NR1	1213
11	B
12	B
13	A
14	D
NR2	3124
15	C
16	D
17	A
18	B