

1) Scientists performed an experiment to determine whether there is a connection between learning ability and food. They took two groups of 20 mice each, all from the same purebred strain. The mice were deprived of food for 3 days and then given a standard learning session in running through a maze. They were trained by giving them a mild electric shock whenever they took a wrong turn. Immediately after each learning session, one group of mice was fed, but the other was not. A week later, all of the mice were tested to see whether they could still run the maze correctly. The group that had been fed had retained this ability, but the other group had not.

The probable reason that the scientists used only mice from the same pure-bred strain is so that

- the mice would all be the same size
- the mice would all be the same color
- the experiment could be repeated with the same mice
- genetic differences would not affect the outcome of the test
- the experiment wouldn't cost as much

Answer :: D

Explanation of Answer:

Neither size nor color was a factor in this experiment, nor was the cost an issue. The same mice could not be reused: the variable in this experiment is learning, and the mice had already been influenced

2

A finding is a proven result obtained as part of an experiment. Which of the following could be considered a valid finding?

- Mice remember better if they are fed immediately after each training session.
- Mice remember better if they are fed and then allowed some time to think about the training.

- Experiments with mice have nothing to do with human learning processes.
- Mice used in experiments have to be from the same purebred strain.
- Mice do not need to be fed in order to learn.

Answer :: A

Explanation of Answer:

This choice is a conclusion that can be drawn from the experiment. All the other choices are irrelevant or erroneous.

3

The use of an electric shock in the teaching process is

- necessary to keep the mice alert
- cruel and should not be allowed
- a way to show the mice that they have taken a wrong turn in the maze
- designed to elicit a predetermined response
- part of the variable

Answer :: C

Explanation of Answer:

This answer is given in the passage.

4

It was noted that the mice could learn to run the maze more readily if it was well illuminated. This information is

- not relevant to their

experiment

- vital to the experiment
- an assumption made by someone who observed the experiment
- a result of the experiment
- an important finding

Answer :: A

Explanation of Answer:

The issue of illumination was not part of the experiment and therefore irrelevant.

5) Acid rain, more properly known as acid precipitation, is a man-made environmental problem that is known to be escalating. The source of acid rain is oxides of sulfur and nitrogen that dissolve in water, lowering the pH to such an extreme that damage to living and nonliving things results. Often the source of acid rain is pollutants from factories or automobiles. The gases produced by fuel combustion react with water vapor in the air and produce acids such as sulfurous acid, sulfuric acid, and nitrous acid. Burning of coal, oil, and natural gas is especially likely to cause an increased amount of acid rain. In addition to man-caused sources of acid rain, volcanic eruptions and some bacterial decay also produce these acidic oxides which lower the pH of water.

Scientists measure the acidity of an object using the pH scale. The scale ranges from 0 to 14, with a pH of 7 being considered neutral. A pH less than 7 is acidic and one more than 7 is basic or alkaline. Normal rain has a pH of about 5.6. It is not neutral because rainwater naturally dissolves a small amount of carbon dioxide from the air and becomes slightly acidic.

Acid rain becomes a serious problem when the pH of the precipitation becomes less than 3.5. There have been reported pH of 1.3 in some areas.

These extremely acidic conditions kill fish and plants, and may render lakes and soil totally uninhabitable. Young fish not only are killed by such acidic waters, but any fish that may survive are usually not able to reproduce. Sometimes, nature provides a means of neutralizing these acidic waters via naturally alkaline ammonia compounds or calcium compounds such as limestone,

The table below gives the pH of some common substances:

pH	Substance
1.1	Battery acid
2.8	Household vinegar
5.5	Normal rainwater
7.0	Distilled water
8.2	Baking soda
11.6	Household ammonia
13.9	Lye

Which of the following mineral formations would be most effective at neutralizing acid rain?

- nitrogen
- oxygen
- calcium carbonate
- magnesium acetate
- baking soda

Answer :: C

Explanation of Answer:

The passage specifically mentions calcium compounds as being natural neutralizers of acid rain.

Which of the following is not a cause of acid precipitation?

- automobile engines
- gasoline-powered lawnmowers
- burning of coal
- hydroelectric plants
- burning of natural gas

Answer :: D

Explanation of Answer:

Hydroelectric plants do not burn fossil fuels to generate electricity. All of the other choices are specifically mentioned as contributing to acid rain.

7

According to the passage, which of the following is the most basic?

- ammonia
- lye
- distilled water
- normal rainwater
- battery acid

Answer :: B

Explanation of Answer:

The chart shows that the highest pH substance listed is lye, the most basic. The information is almost always provided to you. Your job is to take the information given in the passage and use it to answer the questions.

8

Which pair of substances would likely neutralize each other?

- lye and ammonia
- vinegar and battery acid
- vinegar and ammonia
- ammonia and calcium carbonate
- distilled water and rainwater

Answer :: C

Explanation of Answer:

Neutralization requires an acid and a base. The only combination listed among the choices that has an acid and a base is vinegar and ammonia.

9

9) [View Additional Information](#)

Which of the following responses to an acid rain-caused fish kill would have the best chance of preventing the problem from reappearing?

- restocking the lake with heartier fish
- allowing the stronger fish to survive and then reproduce
- seeding clouds so that the rain falls elsewhere
- reducing the amount of air pollution created
- adding large amounts of ammonia to the lake to neutralize the acid

Answer :: D

Explanation of Answer:

The best approach would be to reduce or stop the problem at its source. The

other choices would do nothing to prevent the same problems from reappearing again.

10

Which of the following compounds does not dissolve in water and cause acid rain?

- sulfur dioxide
- sulfur trioxide
- carbon dioxide
- nitrogen dioxide
- nitrogen monoxide

Answer :: C

Explanation of Answer:

The passage specifically mentions that carbon dioxide dissolving in water does not cause acid rain. It also tells you that oxides of nitrogen and sulfur are leading causes of acid rain.