

HW 1.2

Started: Aug 19 at 3:18pm

Quiz Instructions

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Use the following paragraph to answer the next two questions.

In 1928, Sir Alexander Fleming was studying *Staphylococcus* bacteria growing in culture dishes. He noticed that a mold called *Penicillium* was also growing in some of the dishes. His observations of a series of dishes showed that the first dish contained only *Staphylococcus* bacteria. In dishes containing the *Penicillium* mold, Fleming noticed that a clear area existed around the mold because all the bacteria in this area had died. In the culture dishes without the mold, no clear areas were present. Fleming suggested that the mold was producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming grew some *Penicillium* mold in a nutrient broth. After the mold grew in the broth, he removed all the mold from the broth and added the broth to a culture of bacteria. All the bacteria died.

Question 1

1 pts

Which of the following statements is a reasonable expression of Fleming's hypothesis?

- ☐ Mold kills bacteria.
- ☐ There are clear areas around the *Penicillium* mold where *Staphylococcus* doesn't grow.
- ☐ Nutrient broth kills bacteria.
- ☐ *Penicillium* mold produces a substance that kills *Staphylococcus*.
- ☐ Without mold in the culture dish, there were no clear areas in the bacteria.

Question 2

1 pts

Fleming grew *Penicillium* in broth, removed the *Penicillium*, and poured the broth into culture dishes containing bacteria to see if the broth would kill the bacteria. What step in the scientific method does this represent?

- ☐ Testing a hypothesis by experiment
- ☐ Making a hypothesis
- ☐ Rejecting the old hypothesis and making a new one
- ☐ Collecting and organizing data
- ☐ None of these

Question 3

1 pts

Why do scientists sometimes discard theories?

- ☐ Contradictory observations are found.

- ☐ Public opinion disagrees with the theory.
- ☐ Congress voted against it.
- ☐ The steps in the scientific method were not followed in order.
- ☐ The theory is opposed by the church.

Use the following paragraph to answer questions the next five questions.

Gary noticed that two plants of the same type were different in size after three weeks, even though they were initially the same size when his mother planted them on the same day. Since the larger plant was in the full sun all day and the smaller plant was in the shade of a tree for most of the day, Gary believed that the sunshine was responsible for the difference in plant size. In order to test this, Gary bought ten small plants of the same size and type. He also made sure they have the same amount and type of soil. Gary then built a frame to hold a canvas roof over five of the plants, while the other five were nearby but out in the sun. Gary was careful to make sure that each plant received exactly the same amount of water and plant food every day.

Use the following paragraph to answer questions the next five questions.

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Question 4

1 pts

Which of the following is a reasonable statement of Gary's hypothesis?

- ☐ Plants that receive the same amount of water and plant food will grow the same amount.
- ☐ Plants that grow in the shade grow larger.
- ☐ Different plants have different characteristics.
- ☐ Plants that don't receive water will die.
- ☐ Plants that get more sunshine grow larger than plants that get less sunshine.

Question 5

1 pts

What scientific reason might Gary have for insisting that the container size for the all plants be the same?

- ☐ Gary wanted to control how much plant food his plants received.
- ☐ Gary wanted to make sure the size of the container did not affect differential plant growth in his experiment.
- ☐ Gary wanted to determine if the size of the container would affect the plant growth.
- ☐ There is no possible scientific reason for having the same-sized containers.
- ☐ Gary wanted his garden to look organized.

Question 6

1 pts

What scientific reason might Gary have for insisting that all plants receive the same amount of water every day?

- ☐ Gary wanted to test the effect of the amount of water on plant growth.
- ☐ Gary wanted to test the effect of shade on plant growth, and therefore he wanted to have no variables other than the amount of sunshine on the plants.
- ☐ Gary's hypothesis was that water quality was affecting plant growth.
- ☐ There is no possible scientific reason for having the same amount of water for each plant every day.
- ☐ Gary was conserving water.

Question 7

1 pts

What was the variable being tested in Gary's experiment?

- ☐ The amount of soil
- ☐ The amount of sunshine
- ☐ The amount of water
- ☐ The type of soil
- ☐ The amount of plant food

Question 8

1 pts

Which of the following factors did Gary not control in his experiment that may vary?

- ☐ All of these are possible factors that Gary did not control
- ☐ Individual plant variation
- ☐ Soil temperature due to the different colors of the containers
- ☐ The effect of insects, which may attack one set of plants but not the other
- ☐ Water loss due to evaporation from the soil

Question 9

1 pts

A hypothesis is:

- ☐ a theory that has been proven.
- ☐ an observation that remains constant.
- ☐ a tentative explanation for a phenomenon.
- ☐ a description of a consistent pattern in observations.

Question 10

1 pts

A scientific law is:

- ☐ a theory that has been proven.
- ☐ a tentative explanation for a phenomenon.
- ☐ a description of a consistent pattern in observations.
- ☐ an observation that remains constant.

Question 11

1 pts

Which statement best describes the reason for using experimental controls?

- ☐ Experimental controls eliminate the need for large sample sizes.
- ☐ Experimental controls allow comparison between groups differing in one variable.
- ☐ Experimental controls reduce the number of measurements needed.
- ☐ Experimental controls eliminate the need for statistical tests.

Question 12

1 pts

If you have a control group for your experiment, which of the following is true?

- ☐ The control group must be identical to the test group except for one variable.
- ☐ There can be more than one difference between the control group and the test group but no more than three differences, or else the experiment is invalid.
- ☐ The control group and the test group may have many differences between them.
- ☐ None of these are true.

Question 13

1 pts

A well-substantiated explanation of an aspect of the natural world is a:

- ☐ theory.
- ☐ hypothesis.
- ☐ law.
- ☐ none of these.

Quiz saved at 3:24pm

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