Scientific Inquiry Regents Practice Questions

Name: _____ **Date:** _____

1. The data shown are based on laboratory studies of male *Drosophila* showing the inherited bar-eye phenotype. Which is the best conclusion to be made from an analysis of these data?

Culture Temperature (°C) During Development	15	20	25	30
Number of Compound Eye Sections	270	161	121	74

A. The optimum temperature for culturing *Drosophila* is 15°C.

B. *Drosophila* cultured at 45°C will show a proportionate increase in the number of compound eye sections.

C. Temperature determines eye shape in *Drosophila*.

D. As temperature increases from 15°C to 30°C, the number of compound eye sections in male *Drosophila* with bar-eyes decreases.

2. A student reported that a wilted stalk of celery became crisp when placed in a container of ice water. The student then suggested that water entered the stalk and made it crisp. This suggestion is considered to be

A. a control B. a hypothesis

C. an observation D. a variable

3. The results of one experiment carried out by a research team would be considered valid if

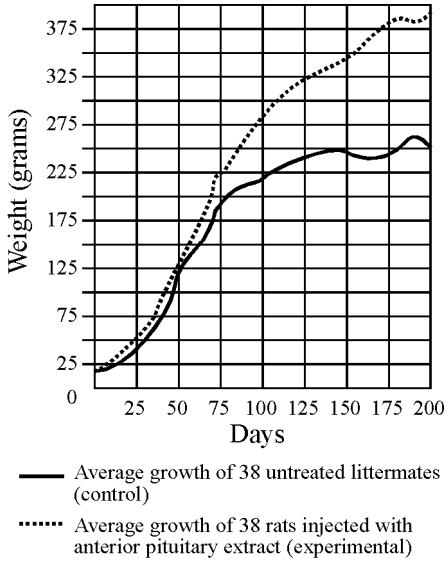
A. the experiment had no control setup

B. all the members of the research team came to the same conclusion

C. the experiment had more than one variable

D. the experiment was repeated and the same results were obtained each time

4. The graph shows the average growth rate for 38 pairs of newborn rats. One of each pair was injected with anterior pituitary extract. The other member of each pair served as a control.



At 75 days, what was the average weight of the rats injected with pituitary extract?

A. 65 grams B. 125 grams

C. 200 grams D. 225 grams

5. An experiment was designed to determine the effect of nitrates on plant growth. Two groups of plants were grown under identical conditions, except one group was watered with a dilute nitrate solution and the other group received water without nitrates. In this investigation, the group of plants grown without added nitrates is known as the

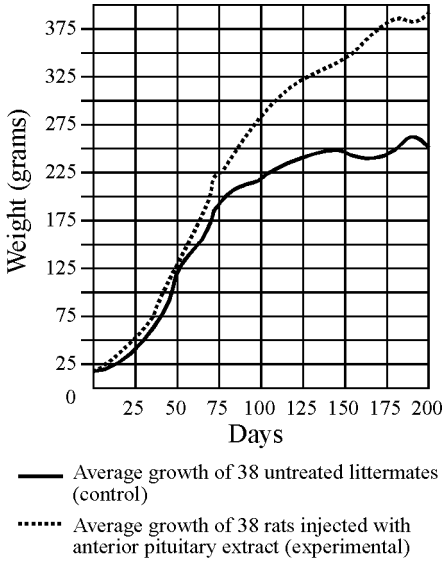
A. abiotic factor

B. control

C. variable

D. environmental stimulus

6. The graph shows the average growth rate for 38 pairs of newborn rats. One of each pair was injected with anterior pituitary extract. The other member of each pair served as a control.



Based on the graph, it can be correctly concluded that the pituitary extract

A. is essential for life

B. determines when a rat will be born

C. affects the growth of rats

D. affects the growth of all animals

7. The graph shows the relationship between the weight of treated and untreated rats and the

A. age of the rats

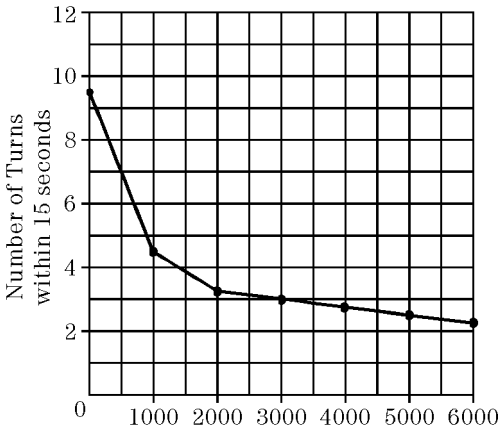
B. sex of the rats

C. size of the rats' pituitary glands

D. type of food fed to the rats

8. The work of Karl von Frisch revealed much information about communication among honeybees. He investigated the ability of scout honeybees to inform the workers in the hive of the direction and distance of a food source from the hive. Part of this communication depended on dances done on the surface of the honeycomb performed by the returning scout bee.

The graph here shows the relationship between the distance from the hive of a food source and the number of turns per unit time that the scout bees make while performing a "wagging dance."



Which statement is an assumption based on this experiment?

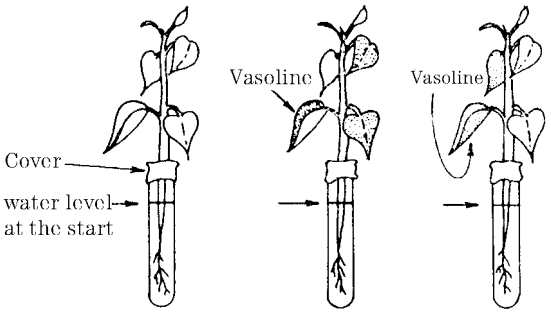
A. Bees respond to visual stimuli.

B. Bees are responsible for cross-pollination of flowers.

C. Bees can communicate by color.

D. Bees possess a nerve net.

9. The diagrams shown represent an investigation concerning the growth of bean plants. The roots of three identical bean plants were each placed through a hole in covered tubes containing water as shown in the diagrams. Nothing was done to plant *A*. Vaseline was used to cover the upper surface of the leaves of plant *B*. Vaseline was used to cover the lower surface of plant *C*. The water level of each tube was marked and the plants were placed together near a window. After 24 hours, the water level in each tube was measured.



A B C

Which tube represents the control for this investigation?

A. *A* B. *B* C. *C*

10. A drug company tested a new medication before putting it on the commercial market. Pills without medication were given to 500 test subjects in group *A* and pills containing medication were given to 500 test subjects in group *B*. In this experiment, the individuals in group *A* served as the

A. host B. variable

C. control D. hypothesis

11. In an experiment, the setup that provides a basis of comparison is known as

A. the conclusion B. a variable

C. a control D. the problem

12. A field study was conducted to observe a deer population in a given region over time. The deer were counted at different intervals over a period of 40 years. During this period of time, both ranching and hunting increased in the study region. A summary of the data is presented in the table.

Data Table

Year	Deer Population (thousands)
1900	3.0
1910	9.5
1920	65.0
1924	100.0
1926	40.0
1930	25.0
1940	10.0

During which 10-year period did the greatest increase in the deer population occur?

A. 1900-1910 B. 1910-1920

C. 1920-1930 D. 1930-1940

13. In an investigation designed to determine the effect of the amount of water on plant growth, two groups of equal-sized bean plants of the same species were grown under identical conditions, except for the amount of water they were given. One group was watered with 200 milliliters of water once a day, while the other group was watered with 400 milliliters of water once a day. After several days, the heights of the plants were measured. It was determined that the plants watered with 400 milliliters of water once a day showed more growth. The variable in this investigation is the

A. type of bean plants used in the experiment

B. amount of water given the plants each day

C. type of soil the bean plants were growing in

D. group of bean plants watered with 200 mL of water

14. What is the first step of a scientific investigation?

A. perform the experiment

B. analyze the experimental data

C. formulate a hypothesis

D. state the problem

15. As part of an investigation, 10 bean seedlings in one setup were grown in the dark, while 10 seedlings in another setup were grown in sunlight. All other growth conditions were kept the same in both setups. The seedlings grown in the dark were white with long, slender stems. These seedlings eventually died. The seedlings grown in the sunlight were green and healthy. Which hypothesis was most likely being tested in this investigation?

A. Plants grown in the dark cannot perform the process of respiration.

B. Sunlight is necessary for the normal growth of bean plants.

C. Light is necessary for the germination of bean seeds.

D. Light is necessary for proper mineral absorption by plants.

16. Which sentence represents a hypothesis?

A. Environmental conditions affect germination.

B. Boil 100 milliliters of water, let it cool, and then add 10 seeds to the water.

C. Is water depth in a lake related to available light in the water?

D. A lamp, two beakers, and elodea plants are selected for the investigation.

17. A large island in the Pacific Ocean supports isolated populations of two groups of frogs. The following observations of these frogs were recorded by scientists.

(A) Are different in color
(B) Excrete different products
(C) Live in different, isolated habitats
(D) Can interbreed and produce fertile offspring

Which observation best supports the inference that these frogs belong to the same species?

A. *A* B. *B* C. *C* D. *D*

18. Which sequence should be followed when conducting a laboratory investigation?

A. gather experimental data, make observations, form a conclusion, form a hypothesis

B. define a problem, form a hypothesis gather experimental data, form a conclusion

C. form a hypothesis, form a conclusion, gather experimental data, define a problem

D. make observations, gather experimental data, form a conclusion, state a problem

19. In one of his experiments with pea plants, Mendel noted that 75% of the offspring of a certain cross had green pea pods. This statement would be considered

A. an observation B. an inference

C. a hypothesis D. a conclusion

20. A student conducted an original, well-designed experiment, carefully following proper scientific procedure. In order for the conclusions to become generally accepted, the experiment must

A. contain several experimental variables

B. be repeated to verify the reliability of the data

C. support the original hypothesis

D. be conducted by a scientist