

NAME: _____

Unit 1 Practice & Study Guide

Scientific Method Questions

1. List the steps of the scientific method:
2. Circle the correct answer in each pair of words: The independent variable is the **(cause/effect)** and is what you **(keep the same/change)**. The dependent variable is the **(cause/effect)** and is what you **(change/measure)**.
3. The **(control/constants)** is/are the group(s) that you do not experiment on. You keep it normal so you have something to compare the experimental groups to. The **(control/constants)** is/are all of the factors you keep the same for every group you experiment on AND do not experiment on.
4. The part of an experiment in which all conditions are kept the same for **all groups** is/are the ____.
 - a. constants
 - b. control
 - c. dependent variable
 - d. independent variable
5. Garfield thinks that lasagna noodles will cook faster if he adds sugar to the recipe. He performs this experiment on twenty noodles. For 10 noodles he adds sugar to the water. The other 10 noodles he boils with just water. Garfield found that 9 out of 10 noodles with sugar boiled in 10 – 12 minutes. He found that 8 out of 10 regular noodles boiled in 6 – 7 minutes.

What is the independent variable in this problem?

- a. The amount of noodles
 - b. The amount of water
 - c. The time it took the noodles to boil
 - d. The type of water (sugar or no sugar)
6. Using the problem above about Garfield and lasagna, what is the dependent variable?
 - a. The amount of noodles
 - b. The amount of water
 - c. The time it took the noodles to boil

- d. The type of water (sugar or no sugar)
7. Tom investigated whether adding salt to water makes the solution boil faster. In a pot, he put 2 gallons of water and 2 cups of salt. He then heated the solution. He measured the temperature when the water reached a rolling boil. Tom repeated the experiment three times and recorded the same result each time. He concluded the salt helped the water to boil faster. What was Tom's mistake in his experimental design?
- He did not boil a pot of water without salt
 - He did not conduct the trials at the same time.
 - He should have repeated the measurement several more times.
 - He waited until the water reached a rolling boil
8. Brian investigated a species of dolphin that are commonly used by the US naval forces to detect sea mines. He attached a different type of mine detector (MK 4, MK 7, or MK 8) to each of 3 groups of dolphins. Each group had 20 minutes to detect the mines. He released each group into a test-course area and recorded the accuracy of each detector system by measuring how close the dolphins placed them to the mines. What question is Brian investigating?
- Are these dolphins the best species to use in detecting sea mines?
 - Does the type of detector used affect the accuracy of locating mines?
 - Does the type of detector used affect the speed of locating mines?
 - Is 20 minutes enough time to complete the test-course?

Characteristics of Living Things Questions

9. List the 6 characteristics that something living must have.
10. The **(individual / species)** can survive by responding to daily changes in its environment. The **(individual / species)** must adapt and reproduce successfully to ensure individuals will live in the future.
11. All living things contain the element _____.
12. Carbon compounds that scientists study are called _____ compounds if they came from living organisms.
- abiotic
 - inorganic
 - organic

13. Which is an example of an organic substance?

- a. gold
- b. paper
- c. rock
- d. silver

14. Identify as abiotic (A) or biotic (B) :

- | | | |
|--------------------|-----------------|---------------|
| a. _____ Bones | e. _____ Paper | i. _____ Tree |
| b. _____ Hamburger | f. _____ Pizza | |
| c. _____ Dead cat | g. _____ Shirt | |
| d. _____ Metal | h. _____ Silver | |

15. An organism (living thing) can change during its life through _____.

- a. adaptation and organization
- b. growth and development
- c. making responses
- d. reproduction

16. Which of these is a true fact AND proves that water non-living?

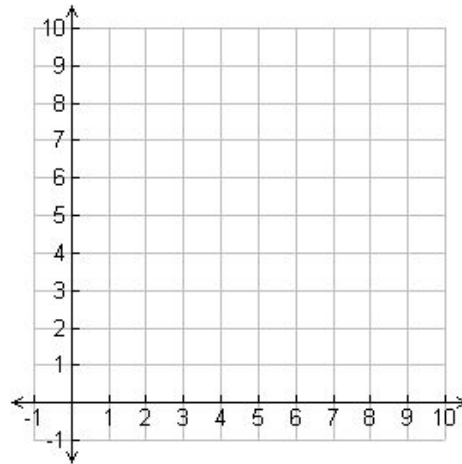
- a. Water can flow from a river to an ocean.
- b. Water can grow and develop.
- c. Water is not made of cells.
- d. Water requires energy to evaporate.

17. A plant leaning toward the sunlight indicates that

- a. all living things are made of cells
- b. all living things grow and develop
- c. all living things reproduce
- d. all living things respond to their environment

Questions about interpreting graphs & charts

18. Which axis is the x-axis? Label it on the graph. Then label the y-axis.



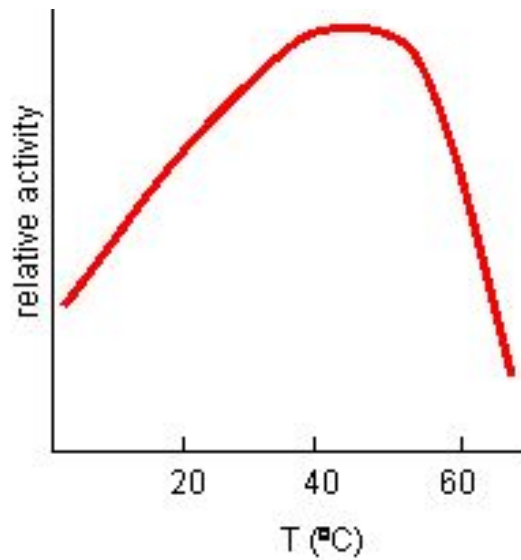
19. When graphing, the **(independent/dependent)** variable goes on the x-axis. The part you measure, the **(independent/dependent)** variable goes on the y-axis.

20. Students in a biology class ran an experiment on a type of flowering plant. Their goal was to find the optimal time in the plant's life for flowering. Using the chart below, what time period will provide the most flowering plants?

Day	Number of Plants Flowering
2	6
4	12
6	18
8	22
10	8

- a. days 4-5
- b. days 6-7
- c. days 7-8
- d. days 9-10

Directions: Enzymes are molecules that our body uses to break down food and turn it into waste. Enzymes like to live in certain temperatures. Use the enzyme graph below to answer the following questions. Use the words "INCREASES" or "DECREASES"



21. As the temperature approaches 20, the enzyme activity level _____.
22. As the temperature approaches 40, the enzyme activity level _____.
23. As the temperature approaches 60, the enzyme activity level _____.

24. The influenza “flu” virus was projected to be more serious this year than normal. Four different vaccines were created and given out to test groups of 100 people whose ages ranged between 30 and 40. Each person received the vaccine on Oct 1, 2014. One test group did not receive a vaccine. The chart below shows the results from each vaccine.

Vaccine	# of people who got sick with the flu
A	33
B	14
C	7
D	28
None	47

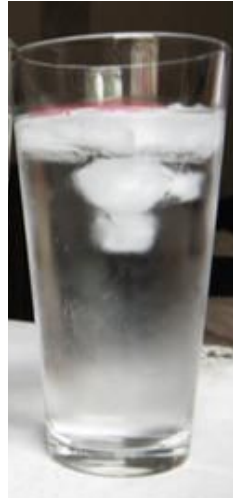
Which represents a constant?

- 14 sick people
- 100 people in a test group
- People receiving vaccine C
- People who didn't get a vaccine

25. Jack noticed that when he puts ice cubes in a glass of water, that the cubes may float at a different depth than the ice cubes did in a previous glass of water. To investigate this observation, Jack used 3 identical glasses, each with 300 mL of water. Each glass contained water of a different temperature: 10⁰C, 20⁰C, and 30⁰C. Jack then measured the height of the floating ice cube and recorded his results.

What is Jack's independent variable?

- a. Height ice cube floats
- b. Height of glass
- c. Water amount
- d. Water temperature



26. Use the question above about Jack and the ice cubes. On a graph, what would Jack label the y-axis?

- a. Height ice cube floats
- b. Height of glass
- c. Water amount
- d. Water temperature

Dichotomous Keys/Cladograms

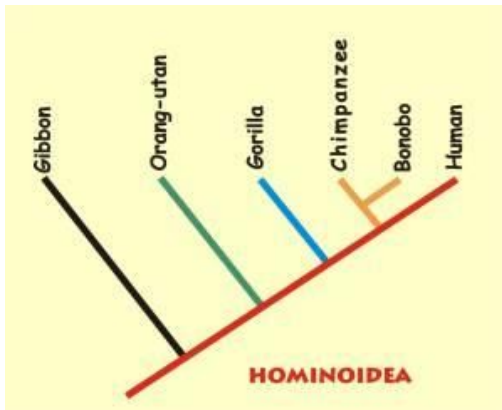
27. What does a dichotomous key do?

- a. organizes living things to show evolutionary relationships
- b. organizes living things to help identify the name of the species

28. What does a cladogram/phylogenic tree do?

- a. organizes living things to show evolutionary relationships
- b. organizes living things to help identify the name of the species

29. Using the following phylogenetic tree, which would be the most primitive (oldest) species?



- a. Bonobo
- b. Gibbon
- c. Gorilla
- d. Human

30. Using the phylogenetic tree above, which group of organisms are Bonobos most closely related to?

- a. Chimpanzee
- b. Gibbon
- c. Gorilla
- d. Human

Use the dichotomous key to answer the following:

- | | |
|--------------------------------------------------|---------|
| 1. a. has distinct toe prints (4 or more toes) | Go to 2 |
| b. no distinct toe prints | Go to 8 |
| 2. a. toe prints attached to sole print | Go to 3 |
| b. toe prints not attached to sole print | Go to 9 |
| 3. a. toes on hind foot are not webbed | Go to 4 |
| b. toes on hind foot are webbed | Beaver |
| 4. a. 4 toes on both front and hind foot | Go to 5 |
| b. more than 4 toes on either front or hind feet | Go to 6 |

31. Which animal has toe prints that are not attached to sole print, distinct toe prints, and claw prints attached to toe prints?

32. This print belongs to which animal?

