

THE SCIENTIFIC METHOD

Name _____

Put the following steps of the scientific method in the proper order.

- _____ Organize and analyze data
- _____ State a hypothesis
- _____ Identify the problem
- _____ State conclusion
- _____ Design and carry out an experiment
- _____ Make observations and record data
- _____ Gather information

Match the term in Column I with its definition in Column II.

Column I

- 1. theory _____
- 2. law _____
- 3. hypothesis _____
- 4. experiment _____
- 5. variable _____
- 6. control _____
- 7. data _____
- 8. conclusion _____
- 9. application _____

Column II

- a. suggested explanation to a problem or observation based upon known information
- b. used to test a hypothesis
- c. anything that can affect the results of an experiment
- d. observations and measurements made during an experiment
- e. part within the experiment that is maintained without change in order to provide a comparison for the part of the experiment containing the variable
- f. hypothesis that has been tested and supported by a great amount of evidence over a long period of time
- g. statement describing (but not explaining) a natural event or phenomenon
- h. new use to which results are put or new technique developed
- i. a summary that explains whether or not the data support the hypothesis

SELF QUIZ—SCIENTIFIC METHOD AND THE SI SYSTEM

Name _____

Circle the letter of the correct answer.

1. In an experiment, one ____ is tested at a time to determine how it affects results.
a. control b. variable c. problem d. observation
2. The ____ describes the use of equipment and materials in an experiment.
a. procedure b. conclusion c. control d. problem
3. A ____ is the part of an experiment that provides a reliable standard for comparison.
a. procedure b. theory c. variable d. control
4. The information already recorded about a scientific subject is the scientific ____.
a. record b. method c. technique d. experiment
5. ____ are the recorded facts and measurements from an experiment.
a. Procedures b. Data c. Theories d. Inferences
6. The practical use of scientific knowledge is called ____.
a. research b. inferring c. procedure d. technology
7. A ____ is an explanation of observations that have been tested many times.
a. conclusion b. hypothesis c. theory d. record
8. A(n) ____ is a suggested solution to a scientific problem.
a. observation b. hypothesis c. problem d. procedure
9. Instruments and our senses are used to make ____ during an experiment.
a. observations b. hypotheses c. problems d. controls
10. A(n) ____ is performed under carefully controlled conditions to test a hypothesis.
a. activity b. observation c. inference d. experiment
11. A scientific ____ describes how nature works.
a. record b. law c. hypothesis d. result
12. To be accepted, a scientific discovery must produce ____ each time it is tested.
a. the same results b. the same hypothesis c. new conclusions d. new data
13. If after numerous tests a major hypothesis cannot be shown to be false, it may be accepted as ____.
a. a control b. a theory c. data d. an observation
14. New observations that do not agree with an accepted theory may cause the theory to be ____.
a. explained b. rejected c. proven d. recognized

SELF QUIZ . . . CONTINUED

Name _____

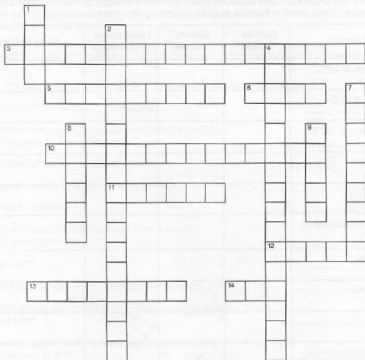
15. A ____ is a logical explanation to a problem based on observation.
a. control b. theory c. conclusion d. procedure
16. The commonly used unit in the measurement of temperature in the Biology laboratory is the ____ .
a. Kelvin b. Celsius c. Fahrenheit d. boiling point
17. The ____ is the unit of time in the SI system.
a. day b. second c. minute d. hour
18. A ____ is a fixed quantity used for comparison.
a. procedure b. variable c. standard d. prefix
19. The unit of mass commonly used in the laboratory is the ____ .
a. meter b. cubic meter c. gram d. kilometer
20. The space occupied by an object is its ____ .
a. volume b. height c. width d. length
21. The amount of matter in an object is its ____ .
a. mass b. volume c. size d. balance
22. A scale commonly used by scientists for measuring temperature is the ____ scale.
a. degree b. Celsius c. boiling point d. Fahrenheit
23. There are ____ in one kilogram.
a. 0.001 grams b. 1000 milligrams c. 0.001 milligrams d. 1000 grams
24. Standards are important for comparing observations and are used ____ .
a. by everyone c. only for counting things
b. only in tropical rainforests d. only in scientific experiments
25. One-hundredth of a meter is written as a ____ .
a. decimeter b. millimeter c. centimeter d. kilometer
26. How many millimeters make a centimeter?
a. 100 b. 10 c. 1000 d. 0.10
27. A prefix meaning one thousand standard units is ____ .
a. milli- b. centi- c. kilo- d. deci-
28. On the Celsius scale, water boils at what temperature?
a. 32 degrees b. 212 degrees c. 0 degrees d. 100 degrees
29. 50 cc of water would equal which quantity?
a. 5000 mL b. 500 mL c. 50 mL d. 0.5 L
30. Which of the following units would we use to measure the distance to Australia?
a. millimeters b. centimeters c. kilometers d. kilograms

Name _____

1. base _____
2. mirror _____
3. stage _____
4. arm _____
5. fine adjustment _____
6. coarse adjustment _____
7. eyepiece _____
8. body tube _____
9. nosepiece _____
10. high power objective _____
11. low power objective _____
12. clip _____
13. diaphragm _____

MICROSCOPE CROSSWORD

Name _____



Across

3. Lens that allows greater magnification
5. Regulates the amount of light
6. The microscope rests on this.
10. Used for final focusing
11. Eyepiece
12. Platform upon which to mount the slide
13. Holds eyepiece lens at top and objective lens at bottom
14. Holds the tube and stage, and attaches them to the base

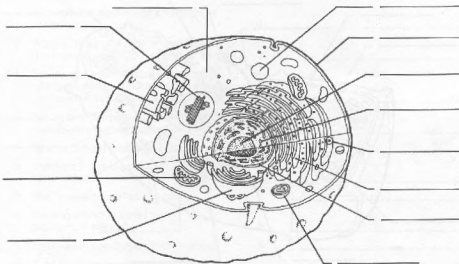
Down

1. Holds the slide in place
2. Lens used to locate the specimen
4. Used for first focusing
7. Rotating piece that holds objective lens
8. Reflects light to the specimen
9. Chemical sometimes used to make the specimen visible

ANIMAL CELLS

Name _____

Label the organelles in the diagram below of a typical animal cell. Describe the function/purpose of each organelle in the cell.

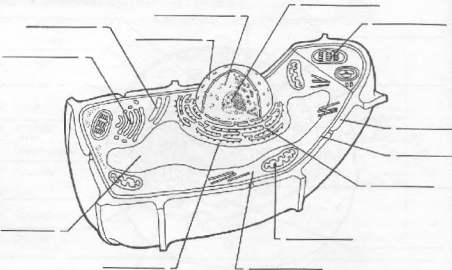


- a. vacuole _____
- b. lysosome _____
- c. ribosomes _____
- d. Golgi complex _____
- e. cytoplasm _____
- f. nucleus _____
- g. nucleolus _____
- h. nuclear membrane _____
- i. cell (plasma) membrane _____
- j. mitochondria _____
- k. smooth endoplasmic reticulum _____
- l. rough endoplasmic reticulum _____
- m. centriole _____

PLANT CELLS

Name _____

Label the organelles in the diagram below of a typical plant cell. Describe the function/purpose of each organelle in the cell.



- a. ribosomes _____
- b. Golgi complex _____
- c. cytoplasm _____
- d. nucleus _____
- e. nucleolus _____
- f. nuclear membrane _____
- g. cell (plasma) membrane _____
- h. mitochondria _____
- i. rough endoplasmic reticulum _____
- j. vacuole _____
- k. cell wall _____
- l. chloroplast _____
- m. smooth endoplasmic reticulum _____

FUNCTION OF THE ORGANELLES

Name _____

Which organelle performs each of the following functions within the cell?

Function

Organelle

- | | |
|---|-----------|
| 1. Controls the movement into and out of the cell | 1. _____ |
| 2. Watery material which contains many of the materials involved in cell metabolism | 2. _____ |
| 3. Serves as a pathway for the transport of materials throughout the cell; also associated with synthesis and storage | 3. _____ |
| 4. Serves as the control center for cell metabolism and reproduction | 4. _____ |
| 5. Sites of protein synthesis | 5. _____ |
| 6. Involved in the digestion of food within the cell | 6. _____ |
| 7. The "powerhouse" of the cell | 7. _____ |
| 8. Packages and secretes the products of the cell | 8. _____ |
| 9. Involved in cell division in animal cells | 9. _____ |
| 10. Fluid filled organelles enclosed by a membrane; contains stored food or wastes | 10. _____ |
| 11. Site of the production of ribosomes | 11. _____ |
| 12. Controls movement into and out of the nucleus | 12. _____ |
| 13. Gives the cell its shape and provides protection; not found in animal cells | 13. _____ |
| 14. Hairlike structures with the capacity for movement | 14. _____ |
| 15. A long, hairlike structure used for movement | 15. _____ |
| 16. Site of photosynthesis | 16. _____ |
| 17. During cytokinesis, the new cell wall that begins to form in the middle, dividing the two sides | 17. _____ |
| 18. rod-shaped bodies that carry genetic information | 18. _____ |

PARTS OF THE CELL—MATCHING

Name _____

Match the descriptions in Column I with the name in Column II.

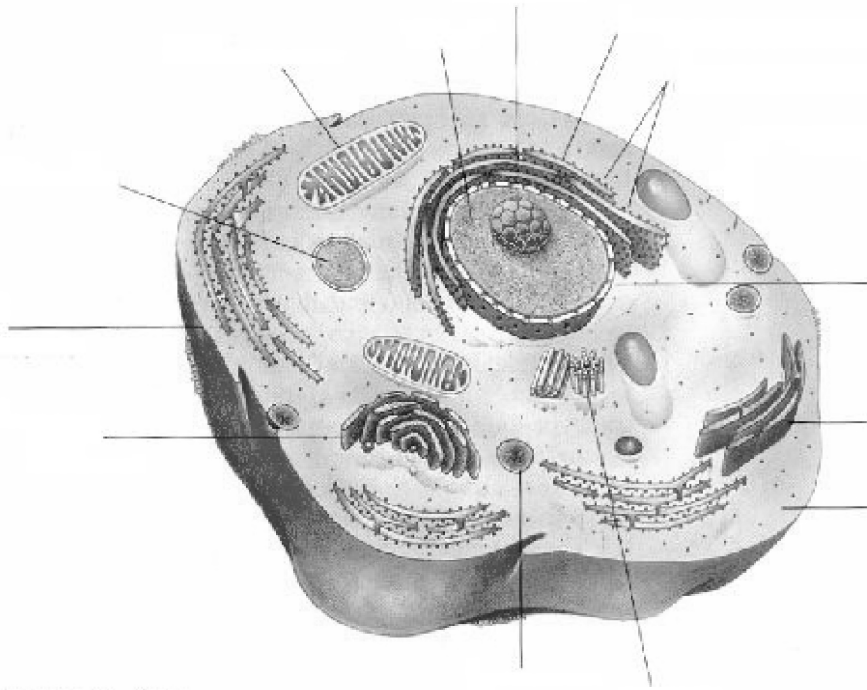
Column I

- _____ 1. holds nucleus together
- _____ 2. surface for chemical activity
- _____ 3. units of heredity
- _____ 4. digestion center
- _____ 5. where proteins are made
- _____ 6. structures involved in mitosis in animal cells only
- _____ 7. microscopic cylinders that support and give the cell shape
- _____ 8. shapes and supports a plant cell
- _____ 9. stores and releases chemicals
- _____ 10. food for plant cells is made here
- _____ 11. spherical body within nucleus
- _____ 12. controls entry into and out of cell
- _____ 13. traps light and is used to produce food for plants
- _____ 14. chromosomes are found here
- _____ 15. jellylike substance within cell
- _____ 16. contains code which guides all cell activities
- _____ 17. minute hole in nuclear membrane
- _____ 18. "powerhouse" of cell
- _____ 19. contains water and dissolved minerals
- _____ 20. stores food or contains pigment

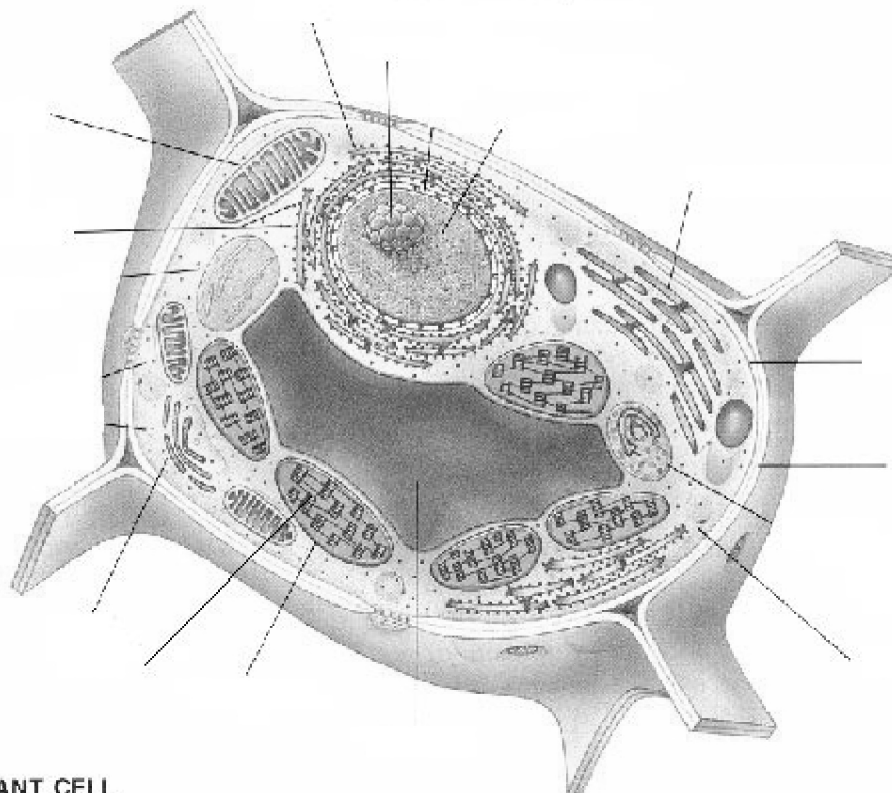
Column II

- a. Golgi bodies
- b. nucleus
- c. chromosomes
- d. vacuole
- e. ribosomes
- f. endoplasmic reticulum
- g. nuclear membrane
- h. centrioles
- i. cytoplasm
- j. chlorophyll
- k. chloroplasts
- l. cell (plasma) membrane
- m. cell wall
- n. mitochondria
- o. lysosome
- p. genes
- q. nuclear pore
- r. nucleolus
- s. plastid
- t. microtubule

Animal Cells and Plant Cells



TYPICAL ANIMAL CELL



TYPICAL PLANT CELL