

# 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.

- In an experiment, one \_\_\_\_ is tested at a time to determine how it affects results.  
a. control    b. variable    c. problem    d. observation
- The \_\_\_\_ describes the use of equipment and materials in an experiment.  
a. procedure    b. conclusion    c. control    d. problem
- A \_\_\_\_ is the part of an experiment that provides a reliable standard for comparison.  
a. procedure    b. theory    c. variable    d. control
- The information already recorded about a scientific subject is the scientific \_\_\_\_ .  
a. record    b. method    c. technique    d. experiment
- \_\_\_\_ are the recorded facts and measurements from an experiment.  
a. Procedures    b. Data    c. Theories    d. Inferences
- The practical use of scientific knowledge is called \_\_\_\_ .  
a. research    b. inferring    c. procedure    d. technology
- A \_\_\_\_ is an explanation of observations that have been tested many times.  
a. conclusion    b. hypothesis    c. theory    d. record
- A(n) \_\_\_\_ is a suggested solution to a scientific problem.  
a. observation    b. hypothesis    c. problem    d. procedure
- Instruments and our senses are used to make \_\_\_\_ during an experiment.  
a. observations    b. hypotheses    c. problems    d. controls
- A(n) \_\_\_\_ is performed under carefully controlled conditions to test a hypothesis.  
a. activity    b. observation    c. inference    d. experiment
- A scientific \_\_\_\_ describes how nature works.  
a. record    b. law    c. hypothesis    d. result
- 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
- 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
- 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**

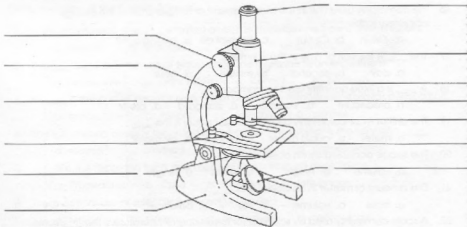
Name \_\_\_\_\_

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

# THE COMPOUND MICROSCOPE

Name \_\_\_\_\_

Label each of the following parts on the diagram of a compound microscope. Describe the purpose/use of each part.



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 \_\_\_\_\_

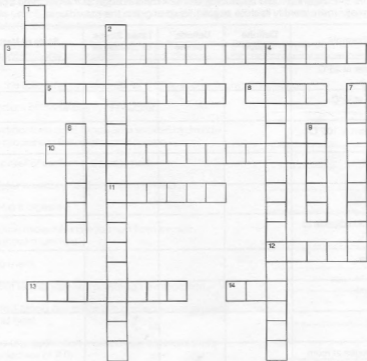
11. low power objective \_\_\_\_\_

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

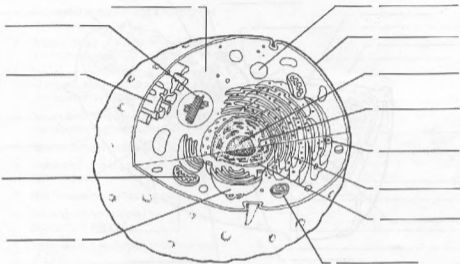
## Down

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.

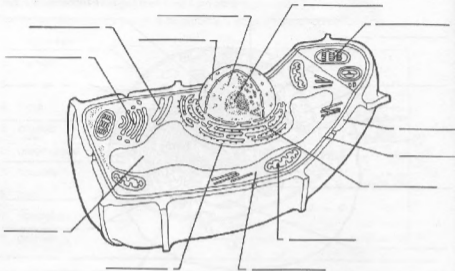


- a. vacuole \_\_\_\_\_
- b. lysosome \_\_\_\_\_
- c. ribosomes \_\_\_\_\_
- d. Golgi complex \_\_\_\_\_
- e. cytoplasm \_\_\_\_\_
- f. nucleus \_\_\_\_\_
- g. nucleolus \_\_\_\_\_
- h. nuclear membrane \_\_\_\_\_
- i. cell (plasma) membrane \_\_\_\_\_
- j. mitochondria \_\_\_\_\_
- k. smooth endoplasmic 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