

Biology - Middle/High School

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LABORATORY EQUIPMENT

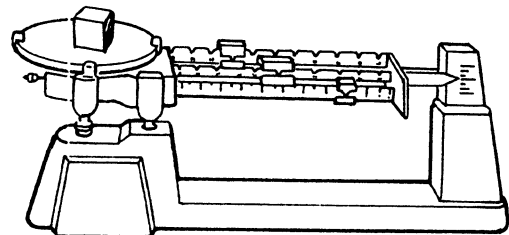
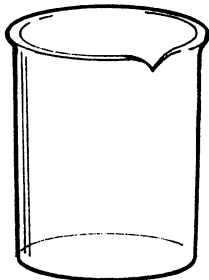
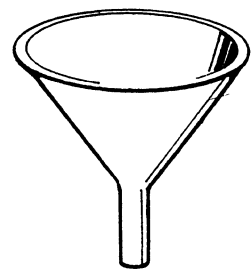
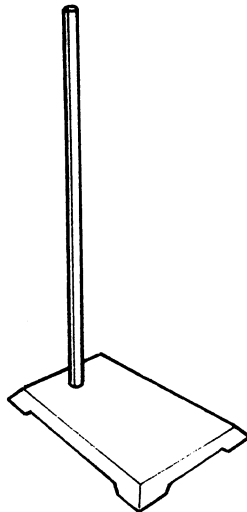
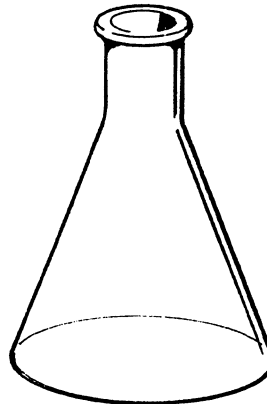
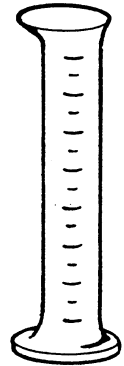
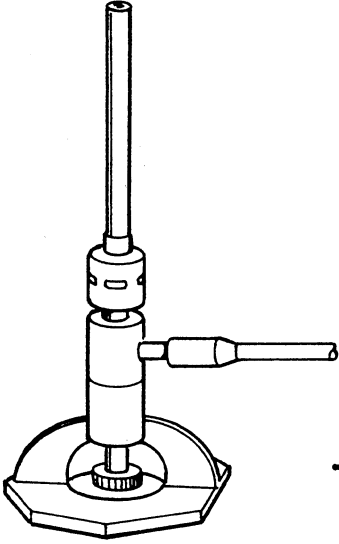
Name _____

Label the following pieces of laboratory equipment.

- a. Bunsen burner
- b. balance
- c. funnel

- d. tongs
- e. ring stand
- f. Erlenmeyer flask

- g. beaker
- h. graduated cylinder
- i. test tube
- j. test tube clamp



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

THE SYSTEME INTERNATIONAL D'UNITES (SI)

Name _____

The measuring system used in science is the SI, which was adopted according to an international agreement reached in 1960. It is based on the metric system. The standard units in SI are:

Property	Unit	Symbol
mass	kilogram	kg
distance	meter	m
time	second	s
electric current	Ampere	A
temperature	Kelvin	K
amount of substance	mole	mol

As with the metric system, the SI utilizes prefixes to change the value of units. The following units are frequently used in science:

Prefix	Symbol	Value
mega-	M	1 000 000
kilo-	k	1 000
deci-	d	0.1
centi-	c	0.01
milli-	m	0.001
micro-	μ	0.000 001
nano-	n	0.000 000 0001

Example:
How many meters are equivalent to 500 mm?

$$500 \cancel{\text{mm}} \times \frac{1\text{m}}{1\,000 \cancel{\text{mm}}} = 0.5 \text{ m}$$

Make the following conversions within the SI.

- | | | |
|-----------------------|------------------------|------------------------|
| 1. 3.0 m = _____ cm | 5. 2.5 L = _____ mL | 8. 0.015 g = _____ mg |
| 2. 1,500 mL = _____ L | 6. 0.25 km = _____ m | 9. 75 cL = _____ L |
| 3. 35 cg = _____ g | 7. 50,000 μm = _____ m | 10. 2,750 mg = _____ g |
| 4. 0.05 m = _____ mm | | |

What would be a reasonable unit to use to measure the following?

11. distance from earth to moon _____
12. length of a bacterium _____
13. mass of a bowling ball _____
14. mass of an aspirin tablet _____
15. dropperful of medicine _____

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