Name ______________________________ Date ______________

BIOLOGY AS A SCIENCE
2-2 Tools of the Biologist

CHAPTER 2

Part I: Vocabulary Review

Identify the term that fits each of the definitions below. Then, to reveal the biological concept below, transfer the letters that have numbers beneath them to the corresponding blank spaces shown below.

1. technique that separates substances based on chemical or physical properties

   ___(2) ___(31) ___(15) ___(38) ___(17) ___(27) ___(6) ___ ___(36) ___(25) ___(34) ___ ___(41) ___

2. device that uses light to produce an enlarged view of an object

   ___ ___(3) ___ ___(43) ___(14)   ___(45) ___(7) ___(10) ___(33) ___ ___(1) ___(24) ___ ___ ___(4)

3. the structural parts of a compound microscope that hold the specimen and lenses and permit focusing of the image

   ___ ___(18) ___ ___ ___ ___(5) ___(9) ___ ___ ___   ___(13) ___ ___(21) ___(20) ___(26) ___

4. the enlargement of an image

   ___ ___ ___ ___(12) ___(11) ___(8) ___(22) ___ ___(46) ___(30) ___ ___ ___(19)

5. process by which materials of different densities suspended in a liquid can be separated

   ___ ___(32) ___(35) ___(40) ___ ___ ___(39) ___ ___ ___ ___ ___ ___ ___

6. technique of maintaining living cells or tissues in a culture medium outside of the body

   ___ ___ ___(48) ___(51) ___(44) ___(42)   ___ ___(16) ___ ___ ___ ___ ___(49)

7. microscope that can magnify images more than 250 000 times

   ___ ___ ___ ___(47) ___ ___ ___ ___ ___(28) ___ ___ ___(50)   ___(52) ___ ___(29) ___ ___ ___ ___ ___(23)

   ___ ___ ___ ___ ___ ___(53) ___ ___ ___ ___

CONCEPT:

___(1) ___(2) ___(3) ___(4) ___(5) ___(6) ___(7) ___(8) ___(9) ___(10)   ___(11) ___(12) ___(13) ___(14) ___(15) ___(16) ___(17) ___(18) ___(19) ___(20) ___(21)

___(22) ___(23) ___(24) ___(25) ___(26) ___(27) ___(28) ___(29)   ___(30) ___(31) ___(32)   ___(33) ___(34) ___(35) ___(36) ___(37)   ___(38) ___(39)

___(40) ___(41) ___(42)   ___(43) ___(44) ___(45) ___(46) ___(47)   ___(48) ___(49) ___(50) ___(51) ___(52) ___(53)

Part II: Content Review

Select the best answer for each question and write the letter in the space provided.

_____ 8. What technique involves tiny instruments to perform operations on living cells under a microscope?
- **a.** spectrophotometry
- **b.** microdissection
- **c.** tissue culture
- **d.** electrophoresis

_____ 9. The magnifying glass is an example of a
- **a.** stereomicroscope
- **b.** phase-contrast microscope
- **c.** compound microscope
- **d.** simple microscope

_____ 10. Which instrument passes a finely focused electron beam over the surface of a specimen?
- **a.** scanning electron microscope
- **b.** transmission electron microscope
- **c.** stereomicroscope
- **d.** phase-contrast microscope

_____ 11. The three systems that make up a compound microscope are
- **a.** magnification, light, and specimen
- **b.** simple, complex, and light
- **c.** optical, mechanical, and light
- **d.** stereo, mechanical, and optical

_____ 12. The ability of a microscope to show two points that are close together as separate images is known as:
- **a.** absorption
- **b.** magnification
- **c.** resolution
- **d.** phase-contrast

_____ 13. What method is used to determine the substances in a sample from the kind of light it absorbs?
- **a.** magnification
- **b.** resolution
- **c.** electrophoresis
- **d.** spectrophotometry

_____ 14. To separate the components in a sample of blood, what laboratory technique would you use?
- **a.** magnification
- **b.** microdissection
- **c.** centrifugation
- **d.** tissue culture

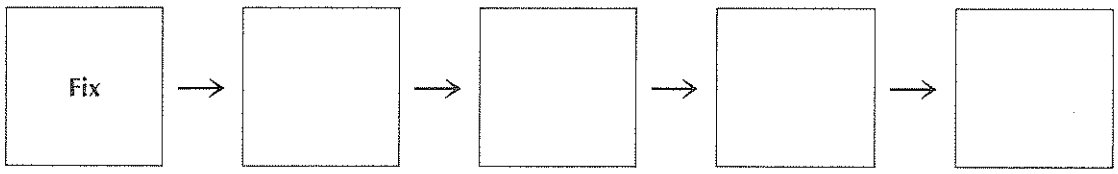
_____ 15. What type of light microscope is used to study the surface structure of specimens?
- **a.** simple microscope
- **b.** stereomicroscope
- **c.** transmission electron microscope
- **d.** phase-contrast microscope

_____ 16. To prepare a specimen to be viewed with an electron microscope, it is
- **a.** placed in a water drop on a slide and stained
- **b.** separated by centrifugation, dried, and stained
- **c.** placed in a vacuum chamber and embedded in plastic
- **d.** dried, embedded in plastic, sliced thin, and stained

Part III: Skills Development

Review the skill entitled "Graphic Organizing: Flow Chart" on pages 34–37. Then complete the flow chart below to show the sequence of steps in preparing a specimen to be observed under a compound microscope.

17.



Name _____ Date _____

CHAPTER REVIEW

CHAPTER 2

Know the Terms

Match the metric prefix with the proper unit.

a. mega
b. kilo
c. centi
d. milli
e. micro
f. deci

1. one-thousandth — 1. _____
2. one-millionth — 2. _____
3. one million — 3. _____
4. one-hundredth — 4. _____
5. one thousand — 5. _____

Match the microscope part with its function.

a. diaphragm
b. coarse adjustment
c. fine adjustment
d. high power objective
e. low power objective
f. stage

6. regulates the amount of light — 6. _____
7. used to locate the specimen — 7. _____
8. used for approximate focusing — 8. _____
9. used for final focusing — 9. _____
10. allows further magnification — 10. _____

Select the most appropriate words from the list to complete the following paragraphs.

problem	scientific law	kilometer
meter	scientific method	milligram
experiment	theory	observation
hypothesis	gram	
liter	variable	

Scientists universally use the (11) _____ to solve problems. The approach begins with defining the (12) _____. Then they formulate a/an (13) _____ that they test using a/an (14) _____ where only one single factor, called a/an (15) _____, is changed. If the process verifies their thoughts on the problem they may propose a/an (16) _____, which may become a/an (17) _____ if it is always true.

In scientific investigations, the SI or metric system is used. (18) _____ is the basic unit of length; (19) _____ is the unit of mass; and (20) _____ is the unit of volume.

11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____