

Chapter 1

CHAPTER TEST

● The Nature of Science

I. Testing Concepts

In the blank at the left, write the letter of the term or phrase that best completes each statement.

- d 1. The application of science knowledge to practical problems is _____.
a. pure science b. a hypothesis c. a discovery d. technology ✓
- d 2. Physical science is the study of _____.
a. matter b. living things c. energy d. matter and energy ✓
- a 3. When physical scientists study the makeup of matter, they are studying the matter's _____.
a. composition b. energy c. behavior d. technology
- b 4. The process of gathering information through the senses is called _____.
a. inferring b. observation c. conclusion d. analyzing
- a 5. A testable prediction is _____.
a. a hypothesis b. an experiment c. an exercise d. a variable
- c 6. Sound traveling through air is an example of _____.
a. energy b. matter c. energy transferred through matter
d. matter transferred through matter
- c 7. When designing an experiment, the first step is to _____.
a. state a hypothesis b. list a procedure c. state the problem d. analyze the data
- a 8. A standard for comparison that helps to ensure that the experimental result is caused by the condition being tested is the _____.
a. control b. independent variable c. constant d. dependent variable
- d 9. A factor that changes in an experiment from manipulation of the independent variable is the _____.
a. control b. hypothesis c. constant d. dependent variable
- c 10. A factor that does not change in an experiment is the _____.
a. control b. independent variable c. constant d. dependent variable
- d 11. The reason for wearing safety goggles in a laboratory is to _____.
a. protect clothing from chemical spills b. protect the experimenter from burns c. improve eyesight d. protect the eyes from harmful substances
- b 12. An organized process used to gather observations and test a hypothesis is _____.
a. a problem b. an experiment c. an exercise d. a constant
- a 13. A rule or principle that describes the behavior of something in nature is a _____.
a. scientific law b. hypothesis c. theory d. variable

Chapter 1 Test (continued)

F.P.6

- c 14. An explanation of an event that is based on repeated observations and experiments is a _____.
a. problem b. hypothesis c. theory d. variable
- b 15. A situation in which the steps needed to find a solution are obvious is _____.
a. a problem b. an exercise c. an experiment d. a hypothesis
- a 16. An idea, structure, or system that can be used to represent something you are trying to explain is a _____.
a. model b. constant c. hypothesis d. variable
- b 17. The lightbulb is an example of _____.
a. pure science c. a dependent variable
b. technology d. an exercise
- a 18. A physical scientist who studies heat and light is working with _____.
a. energy c. properties of matter
b. matter d. living organisms
- d 19. In an experiment to determine if the popping of popcorn is affected by the temperature at which it is stored, counting the popped kernels is an example of a(n) _____.
a. conclusion b. control c. hypothesis d. observation
- a 20. A process that uses certain skills to solve a problem is called _____.
a. critical thinking b. a model c. a hypothesis d. an observation

Read the paragraph below and then complete items 21–25.

An experiment was designed to investigate the effect of caffeine on the heartbeat of water fleas. Two populations of water fleas were cultured. Both populations had water with the same mineral content, were supplied with identical amounts of bacteria as food, received the same amount of light, and had their tempera-

ture maintained at 20°C. Every two hours water fleas from both populations were selected and their heartbeats were monitored. The fleas of population one had caffeine administered five minutes before the heartbeat was checked. The fleas of population two were given nothing.

Items 21–25 list factors from this experiment. Match each factor with the correct term from the list below. The terms may be used more than once.

- a. independent variable
b. dependent variable

- c. constant
d. control

- c 21. food
b 22. heartbeat
c 23. water temperature
d 24. population two
a 25. caffeine

F.P.6

Chapter 1 Test (continued)

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Chapter 1 Test (continued)

F.P.6

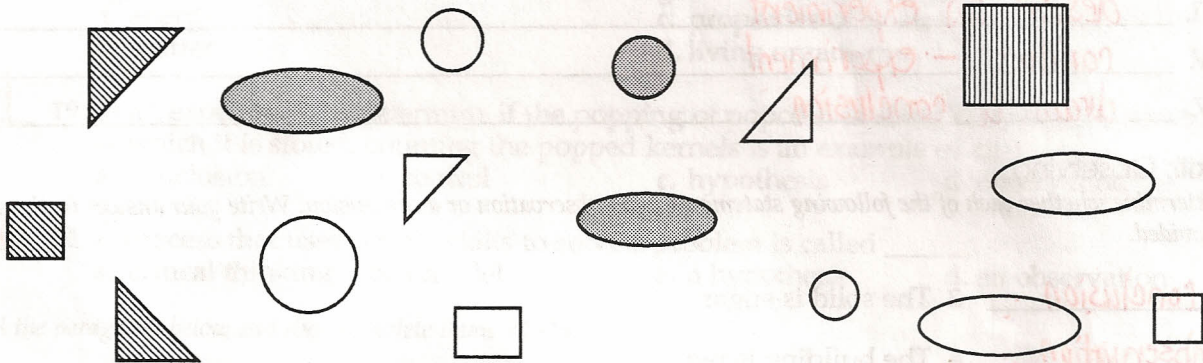
III. Applying Concepts

1. A scientist designed an experiment to see if plants require sunlight to grow. Twenty-four growing plants were placed in a dark closet. Two weeks later all of the plants were dead.

Does the experiment demonstrate that the plants require sunlight? Explain. Because a control in which an equal number of plants received sunlight was not used, there is no basis for comparison to arrive at the conclusion that plants need sunlight to grow.

Use the diagram to answer question 2.

2. Is there any association between the patterns within the objects and their shapes? What problem solving strategy did you use?



Lines are associated with objects that have corners, dots are associated with cornerless objects. Empty objects include all type shapes. This is a problem solving strategy.

Writing Skills * Do not do questions 3, 4, + 5.

Answer the following questions in complete sentences on the lines provided.

3. What are some ways that scientific controversies arise? _____
4. Why should safety glasses and a laboratory apron always be worn in the laboratory? _____
5. Why do you think it is a good idea to read all instructions before beginning an experiment? _____

Chapter 2

CHAPTER TEST

● Physical Science Methods

I. Testing Concepts

Match each term in Column II with its description in Column I. Write the letter of the correct term in the blank on the left.

Column I

Column II

- m 1. prefix meaning 0.001
f 2. amount of matter in an object
h 3. prefix meaning 1000
a 4. unit of temperature
o 5. prefix meaning 100
K 6. mass per unit of volume
l 7. SI unit of time
b 8. system of measurement used worldwide
g 9. amount of space occupied by an object
c 10. basic SI unit of length
d 11. basic SI unit of mass
n 12. prefix meaning 10
j 13. prefix meaning 0.10
e 14. derived unit of volume
i 15. prefix meaning 0.01

- a. kelvin
b. SI
c. meter
d. kilogram
e. cubic centimeter
f. mass
g. volume
h. kilo-
i. centi-
j. deci-
k. density
l. second
m. milli-
n. deka-
o. hecto-

In the blank at the left, write the letter of the term or phrase that best completes each statement or answers each question.

- c 16. A measurement standard is defined as _____.
a. a system of prefixes
b. the distance between two points
c. an exact quantity people agree to use for comparison
d. the interval between two events
- d 17. A beaker contains 0.32 L of water. What is the volume in milliliters?
a. 3.2 mL b. 0.032 mL c. 32 mL d. 320 mL
- a 18. The correct symbol for the SI unit of temperature is _____.
a. K b. °K c. C d. °C
- d 19. In a graph, the variable on the horizontal axis is the _____.
a. variable with the largest range c. dependent variable
b. variable with the smallest range d. independent variable

Chapter 2 Test (continued)

- a 20. The correct symbol for milliliter is _____.
a. mL b. g c. m d. L
- b 21. The type of graph that would be used to show how some fixed quantity is broken down into parts is a _____.
a. line graph b. circle graph c. bar graph d. table
- b 22. The SI unit that is used in the United States to measure time is the _____.
a. kelvin b. second c. kilogram d. liter
- a 23. In a graph showing how the temperature of a material changes over time, temperature change is the _____.
a. dependent variable c. variable with the smallest range
b. independent variable d. variable with the largest range
- c 24. One benefit of SI is that it is _____.
a. not used in the United States
b. based on units of 100
c. easy to convert from one unit to other related units
d. not used to measure temperature
- d 25. A unit of measurement that is obtained by combining other units is a _____ unit.
a. standard b. metric c. dependent d. derived
- a 26. The prefix kilo- means _____.
a. 1000 b. 100 c. 0.0001 d. 0.001
- d 27. The prefix milli- means _____.
a. 1000 b. 100 c. 0.0001 d. 0.001
- b 28. Of the following, the most correct way to express density is _____.
a. g/m b. g/cm³ c. g/cm d. kg/cm³
- a 29. Of the following, the only unit that cannot be used to express volume is _____.
a. kg b. L c. cm³ d. mL
- a 30. SI is based on units of _____.
a. 10 b. 100 c. 1000 d. 0.01

II. Understanding Concepts**Skill: Sequencing**

1. Arrange the following measurements in order from largest to smallest: kilometer, millimeter, meter, centimeter, micrometer.

Kilometer, meter, centimeter, millimeter, micrometer

Skill: Concept Mapping

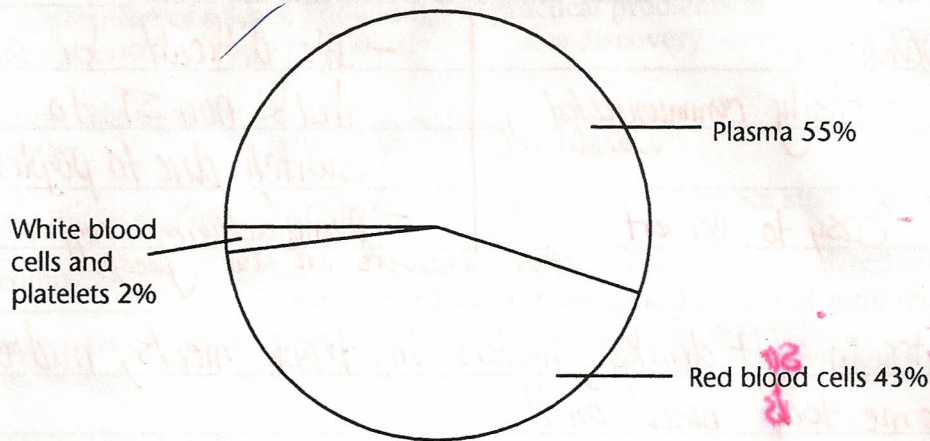
2. In a network tree concept map showing the SI base units used to measure length, mass, time, and temperature, which unit and abbreviation would be under temperature? Kelvin, K

Chapter 2 Test (continued)

Skill: Using Graphs and Making Tables

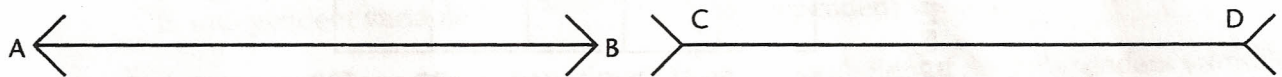
3. A student made a circle graph showing the percentages of the substances that make up human blood. Use the information in the circle graph shown below to complete the table.

Substances Making Up Human Blood



Substance	% of Blood
Plasma	55%
RBC's	43%
WBC's	2%

Use the following illustrations to answer questions 4–5.



4. What is the length of line AB in centimeters? 7.5 cm
5. What is the length of line CD in millimeters? 75 mm

III. Applying Concepts

Writing Skills

Answer the following questions in complete sentences on the lines provided.

1. Why is a cubic centimeter an example of a derived unit? It involves combining 2 or more base units; in this case 3; it is a volume measurement.
- $\text{cm} \times \text{cm} \times \text{cm} = \text{cm}^3$
 length $\times$ width $\times$ height = volume

Chapter 2 Test (continued)

2. Why is it important to make measurements using a standard? _____

Measurements need to be compared with a standard

3. List two advantages and two disadvantages to worldwide use of SI. _____

Advantages:

- Easily communicated worldwide

- Easy to convert

- It's difficult for a country

that's non-SI to make the

switch due to peoples use of another system.

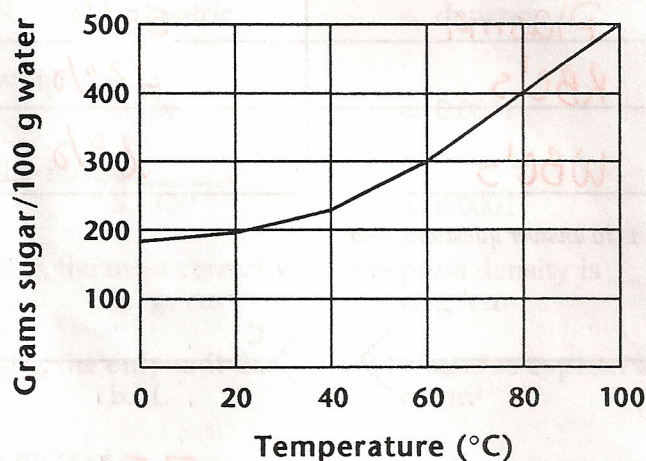
- Manufacturing equip. is based on Non-SI equip.

other answers are also accepted

4. Other than time, how are SI units used in the United States? _____

Liter in soft drinks; meters in track meets, medicine uses it, some tools based on it.

Use the following graph to answer questions 5–10.



5. How many grams of sugar dissolve in water at 80°C? _____

~ 400g

6. At what Celsius temperature will 300 g of sugar dissolve? _____

60°C

7. At what kelvin temperature will 300 g of sugar dissolve in water? _____

60°C + 273 = 333 K

8. How many kilograms of sugar can be dissolved in water at 100°C? _____

500g = 0.5 Kg

9. What is the dependent variable in this graph? _____

grams of sugar/100 g water

10. What is the independent variable? _____

Temp. C°