Skills Worksheet

Vocabulary and Section Summary A

Tools and Models in Science
VOCABULARY

In your own words, write a definition of the following terms in the space provided.

1. mass

_____

_____

2. model

_____

_____

3. volume

_____

_____

4. theory

_____

_____

5. density

_____

_____

6. law

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_____

7. temperature

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❚ Vocabulary and Section Summary A *continued*

SECTION SUMMARY

Read the following section summary.

• Tools are used to make observations, take measurements, and analyze data.

• The International System of Units (SI) is the standard system of measurement.

• Length, mass, volume, density, and temperature are common measurements.

• A model uses familiar things to describe unfamiliar things.

• Physical, conceptual, and mathematical models are commonly used in science.

• A scientific theory is an explanation for many hypotheses and observations.

Name _____ Class _____ Date _____

Skills Worksheet

Vocabulary and Section Summary A

Organizing Your Data

VOCABULARY

In your own words, write a definition of the following terms in the space provided.

1. independent variable

_____

_____

_____

2. dependent variable

_____

_____

_____

3. axis

_____

_____

_____

SECTION SUMMARY

Read the following section summary.

• Scientists use data tables to organize information.

• Labels and units are important parts of data tables and graphs.

• The independent variable is the factor that the investigator changes.

• The dependent variable is the factor that the investigator measures.

• The line of best fit shows the trend of a linear graph.

• Graphs help show patterns, or trends, in data.

• Linear and nonlinear graphs show different relationships between variables.

Skills Worksheet

Vocabulary and Section Summary A

Analyzing Your Data

VOCABULARY

In your own words, write a definition of the following terms in the space provided.

1. mean

_____

_____

_____

2. mode

_____

_____

_____

3. median

_____

_____

_____

4. slope

_____

_____

_____

SECTION SUMMARY

Read the following section summary.

- Mathematics is an important tool for understanding and summarizing data.
- The accuracy and reproducibility of data used in scientific investigations affect the results.
- Mean, median, and mode summarize an entire set of data.
- Slope is the degree of slant of a straight line.
- The slope of a straight line represents a constant that can be used to understand and analyze data.
- Linear and nonlinear graphs result from different relationships in the data.

Skills Worksheet

Chapter Review

USING VOCABULARY

_____ **1. Academic Vocabulary** Choose the appropriate form of the word
accurate for the following sentence: "The degree of _____of the data
used in a scientific investigation affects the results."
a. accurate
b. accuracy
c. accuracies
d. being accurate

Complete each of the following sentences by choosing the correct term from the word bank.

slope	independent variable	axis
dependent variable	density	median

2. The _____ is the factor that the experimenter changes.

3. A reference line that forms one side of a graph is called a(n)

_____.

4. In math, _____ is defined as the degree of slant of a line.

5. The _____ changes in response to the independent
variable.

6. The ratio of the mass of a substance to the volume of the substance is

_____.

UNDERSTANDING CONCEPTS
Multiple Choice

_____ **7.** The slope of all horizontal lines is
a. positive.
b. negative.
c. zero.
d. undefined.

_____ **8.** In an experiment, the mass of each of five apples is measured. The
results are 95 g, 85 g, 90 g, 85 g, and 100 g. Identify the mode.
a. 85 g
b. 90 g
c. 92 g
d. 95 g

_____ **9.** What do scientists often create when they cannot easily study the real thing?

    a. a theory

    b. a model

    c. a trend

    d. a dependent variable

_____ **10.** What is the value of the data point in the middle of a set of data when the data are arranged in order from smallest to largest?

    a. the mode

    b. the median

    c. the mean

    d. the average

Short Answer

11. Applying How would you determine the volume of an object if you were given its mass and density?

_____

_____

_____

12. Identifying A data table shows the height of a person on his birthday each year for 10 years. What is the dependent variable?

_____

_____

_____

13. Demonstrating Several scientists are working together to study the change in the number of whales born each year along the northern coast of California. What is the controlled parameter?

_____

_____

_____

| Chapter Review *continued*

WRITING SKILLS

14. Technical Writing A group of scientists is studying the change in the amount of pesticides found in ocean water over a 20-year period. Outline the steps for constructing an appropriate graph for the data from the investigation. Be sure to clearly identify the sequence of steps to follow and the variables to consider in order to create a graph that would help the scientists analyze their results.

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CRITICAL THINKING

15. Concept Mapping Use the following terms to create a concept map: *slope,*
linear graphs, density, independent variable, axes, and *dependent variable.*

Chapter Review *continued*

16. **Applying Concepts** Describe three kinds of models used in science. Give an example and explain one limitation of each model.

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17. **Identifying Relationships** If you have the masses and volumes of a set of objects, what would a graph of these values represent?

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18. **Applying Concepts** A tailor is someone who makes or alters items of clothing. Why might a standard system of measurement be helpful to a tailor? How would the degree of accuracy of a tailor's measurements affect the quality of the clothes?

_____

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| Chapter Review *continued*

INTERPRETING GRAPHICS

Use the table below to answer the next two questions.

Age (months)	Mass (kg)
0	3.2
1	4.2
2	5.1
4	6.7
5	7.3
6	7.8

19. Applying Concepts A baby's mass was measured when the baby was born and then every month for 6 months. At 3 months of age, the baby was sick, so the baby's mass was not measured. Create a graph by using the data table above. Use the graph to find the likely mass of the baby at 3 months.

20. Evaluating Conclusions Does your graph show a linear or a nonlinear relationship? Explain your answer.

_____

_____

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| **Chapter Review** *continued*

INTERPRETING GRAPHICS

Use the image in the book to answer the next three questions.

21. Making Comparisons How similar is this model to a real object?

_____

_____

_____

22. Evaluating Sources Describe one possible limitation of this model.

_____

_____

_____

23. Applying Concepts How might this model be useful?

_____

_____

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_____

MATH SKILLS

24. Analyzing Data Find the mean, median, and mode of the following data set:
8.9 cm, 7.2 cm, 15.7 cm, 5.2 cm, and 15.7 cm. Show your work below.

25. Using Equations A box of cereal has a mass of 340 g. Its dimensions are
27 cm × 19 cm × 6 cm. What is the volume of the box? What is its density?
Show your work below.

│ Chapter Review *continued*

CHALLENGE

26. Making Inferences You and a friend each decide to build the same model airplane. After the airplanes are built, you decide to conduct an investigation to determine which airplane can glide through the air the longest. Outline a plan to conduct your investigation. Identify the controlled and variable parameters. What are some possible reasons for finding that one airplane glides much farther than the other airplane?

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