Skills Worksheet

Section Review

Tools, Measurement, and Safety

USING KEY TERMS

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

mass	area
volume	temperature

1. The measure of the surface of an object is called ______.

2. Life scientists use kilograms when measuring an object's

3. The ______ of a liquid is usually described in liters.

UNDERSTANDING KEY IDEAS

- _____ **4.** SI units are
 - a. always based on standardized measurements of body parts.
 - **b.** almost always based on the number 10.
 - **c.** used only to measure length.
 - **d.** used only in France.
- **5.** How is temperature related to energy?
- 6. If you were going to measure the mass of a fly, which SI unit would be most appropriate?

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Section Review continued

MATH SKILLS

7. Convert 3.0 L into cubic centimeters. Show your work below.

8. Calculate the volume of a textbook that is 28.5 cm long, 22 cm wide, and 3.5 cm thick. Show your work below.

CRITICAL THINKING

9. Making Inferences The mite shown in your textbook is about 500 µm long in real life. What tool was probably used to produce this?

10. Applying Concepts Give an example of what could happen if you do not follow safety rules.

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TEACHER RESOURCE PAGE

- **5.** Sample answer: Scientists use laws to predict what will happen under specific conditions but not to explain why scientists use theories to make general predictions and explain why they think something happens.
- **6.** 0.21 m or 21 cm
- 7. Sample answer: The model could be used to determine if a certain prehistoric animal was tall enough to reach the leaves of the plant, or to show what the environment of a certain prehistoric area looked like. A limitation is that the model might not smell or taste like the real plant did.

SECTION: TOOLS, MEASUREMENT, AND SAFETY

- 1. area
- 2. mass
- **3.** volume
- **4.** B
- **5.** Temperature is an indication of the amount of energy within matter.
- 6. grams or milligrams
- **7.** 3.0 L = 3000 mL = 3000 cm³
- **8.** (28.5 x 22 x 3.5) = 2194.5 cm³, or about 2,200 cm³
- **9.** An SEM. You can tell by the magnification and the 3-D features visible.
- **10.** Sample answer: You could get hurt by an unknown chemical.

Chapter Review

- **1.** Sample answer: You can use scientific methods to study life science.
- **2.** Sample answer: A variable is a part of a controlled experiment.
- **3.** Sample answer: A theory is an explanation for a broad range of observations and hypotheses. A hypothesis is an explanation of a specific set of observations and can be tested.
- **4.** Sample answer: A compound light microscope uses light to create an image of an object, while an electron microscope uses electrons.
- **5.** Sample answer: Area is a measure of a surface, while volume is a measure of three-dimensional size.
- **6.** C
- **7.** A
- **8.** B

- **9.** B
- **10.** B
- **11.** D
- **12.** Sample answer: Science can be used to find cures for diseases, to understand animal behavior, and to solve environmental problems.
- **13.** Hypotheses need to be testable in order to be useful; if no information can be gathered to either support or disprove a hypothesis, then it is merely an idea that cannot be built upon scientifically.
- 14. Sample answer: A life scientist studying animals might use a radio collar to track the animal's location, a computer database program to record data, and a computer mapping program to draw maps.
- **15.** Sample answer: Physical models include toys and a model of a cell or a human body. Mathematical models include a Punnett square and equations to calculate physical forces. Conceptual models include theories about how the solar system formed or how life evolved on Earth.
- **16.** Sample answer: Advantages of models: they are easier to see and manipulate than the real thing might be, they can simplify concepts. Limitations: models do not behave exactly like the real thing, so they may not accurately predict results.
- 17. The SI units used to describe volume are liters (L), units based on the liter, and units based on the cubic meter (m^3, cm^3, mm^3) . The SI units used to describe the mass of an object are kilograms (kg) and other units based on the gram.
- **18.** The more individuals there are in the groups, the more confident scientists can be that differences between the groups were caused by the variable and not by natural differences between individual organisms.
- **19.** An answer to this exercise can be found at the end of the book.
- **20.** Sample answer: Observations are limited by human senses, or by technology. Things may exist that cannot be observed.

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