Name _____ Date _____ Class _____

CHAPTER 2 REVIEW

# *Measurements and Calculations*

## SECTION 1

**SHORT ANSWER** **Answer the following questions in the space provided.**

**1.** Determine whether each of the following is an example of *observation and data,* a *theory,* a *hypothesis,* a *control,* or a *model.*

_____ **a.** A research team records the rainfall in inches per day in a prescribed area of the rain forest. The square footage of vegetation and relative plant density per square foot are also measured.

_____ **b.** The intensity, duration, and time of day of the precipitation are noted for each precipitation episode. The types of vegetation in the area are recorded and classified.

_____ **c.** The information gathered is compared with the data on the average precipitation and the plant population collected over the last 10 years.

_____ **d.** The information gathered by the research team indicates that rainfall has decreased significantly. They propose that deforestation is the primary cause of this phenomenon.

**2.** "When 10.0 g of a white, crystalline sugar are dissolved in 100. mL of water, the solution is observed to freeze at −0.54°C, not 0.0°C. The system is denser than pure water." Which parts of these statements represent quantitative information, and which parts represent qualitative information?

**3.** Compare and contrast a model with a theory.

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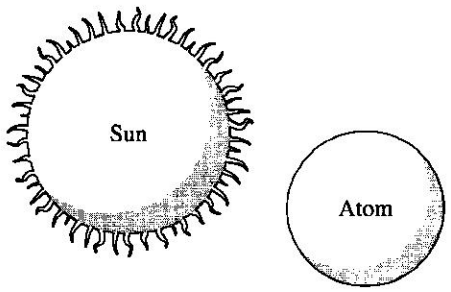
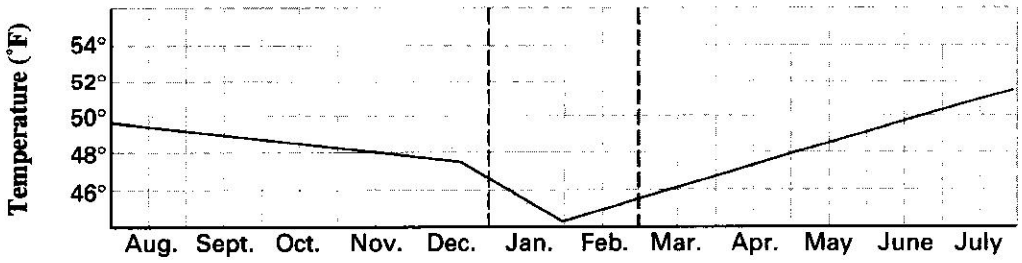
**SECTION 1 continued**

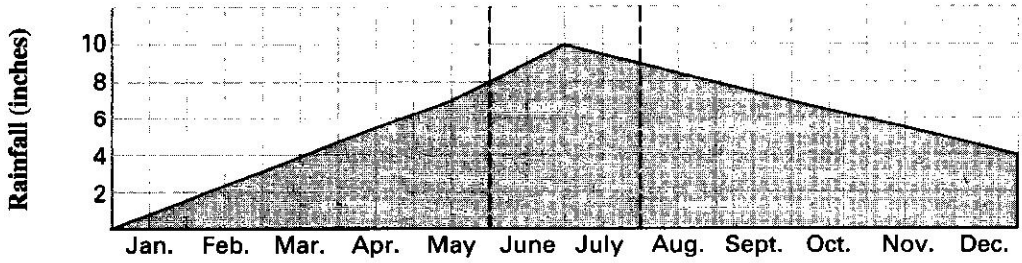
**4.** Evaluate the models shown below. Describe how the models resemble the objects they represent and how they differ from the objects they represent.




**5.** _____ How many different variables are represented in the two graphs shown below?

**a.** one **b.** two **c.** three **d.** four



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Assessment

# Measurements and Calculations

## Section Quiz: Scientific Method

**In the space provided, write the letter of the term or phrase that best completes each sentence or best answers each question.**

_____ **1.** Which of these observations is qualitative rather than quantitative?
- **a.** A chemical reaction is complete in 2.3 s.
- **b.** The solid has a mass of 23.4 g.
- **c.** The density of aluminum is 2.70 g/cm$^3$.
- **d.** Salt deposits form from an evaporated liquid.

_____ **2.** Quantitative observations are recorded in the form of
- **a.** numerical data.
- **b.** detailed descriptions.
- **c.** precise predictions.
- **d.** step-by-step procedures.

_____ **3.** All of the following are steps in the scientific method *except*
- **a.** observing and recording data.
- **b.** forming a hypothesis.
- **c.** discarding data inconsistent with the hypothesis.
- **d.** making predictions based on a theory.

_____ **4.** Which of these statements about the scientific method is *not* true?
- **a.** All experiments must follow the same step-by-step procedure.
- **b.** Experiments may be repeated several times.
- **c.** Some unexpected results can be beneficial.
- **d.** Experimental results may or may not support the hypothesis.

_____ **5.** Ten plants are grown in equal amounts of sunlight with equal amounts of water and varying amounts of fertilizer. Sunlight, water, and fertilizer are
- **a.** controls.
- **b.** experiments.
- **c.** systems.
- **d.** variables.

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## Section Quiz, *continued*

_____ **6.** An experiment was designed to measure the effect of sulfur dioxide emissions from a power plant on the pH of rain falling downwind of the plant. In this experiment, the average pH of rainwater upwind from the plant would be considered
**a.** a model.
**b.** a variable.
**c.** the hypothesis.
**d.** the control.

_____ **7.** Which of these best describes a scientific model?
**a.** a small version of a large object
**b.** the most recent version of a theory
**c.** a way of explaining a complex concept
**d.** a detailed description of a natural event

_____ **8.** A proposed explanation that is based on observations and that can be tested is known as a(n)
**a.** principle.
**b.** experiment.
**c.** law.
**d.** hypothesis.

_____ **9.** For each investigation, the scientific method
**a.** requires that the same set of procedures be followed.
**b.** provides a logical set of procedures.
**c.** is abandoned if there are unexpected results.
**d.** helps to predict the results.

_____ **10.** A theory is accepted as the explanation of an observed phenomenon until
**a.** one study contradicts the theory.
**b.** repeated observations conflict with the theory.
**c.** a new method is used to gather data.
**d.** a leading scientist feels that it is invalid.