

# National End-of-Course Practice

## Chapter 1

### Directions

Choose the letter that best answers the question or completes the statement.

For questions 1 and 2, refer to the following paragraph and table.

Valerie designed and conducted an experiment on pothos plants, which are common houseplants. Her hypothesis is that the direction of light will affect the growth pattern of a pothos plant. To test the hypothesis, she sets up two test groups of pothos plants and observes them three weeks later. The table summarizes the test groups and observations.

| Test Group | Growth Conditions                             | Observations                               |
|------------|-----------------------------------------------|--------------------------------------------|
| 1          | Light source is only on the side of the plant | Stems and leaves are bent toward the light |
| 2          | Light source comes from all directions        | Stems and leaves are not bent              |

1. What are the roles of the two test groups in this investigation?
  - (A) Both are experimental groups, and each individually shows the effect of the direction of light.
  - (B) One is the experimental group and one is the control group, and together they show the effect of the direction of light.
  - (C) Both are control groups, but only Test Group 1 shows the effect of the direction of light.
  - (D) Both are experimental groups, but only Test Group 1 shows the effect of the direction of light.
  - (E) Both are experimental groups, but only Test Group 2 shows the effect of the direction of light.
2. After analyzing the results of the experiment, Valerie asks if her hypothesis should be classified as a theory. Which is the **best** response to Valerie's question?
  - (A) Yes, because her data support the hypothesis.
  - (B) Yes, but only if additional experiments show similar results.
  - (C) No, because the experiment did not provide enough data to support the hypothesis.
  - (D) No, because a theory is a highly reliable explanation that incorporates many well-tested hypotheses.
  - (E) No, because a theory and a hypothesis do not relate to one another.

3. Evolutionary theory has become the central organizing principle of biological science. Could this scientific theory ever become a scientific law?
- (A) Yes, if scientists decide that enough evidence supports the theory.
  - (B) Yes, if the theory is shown to predict future events.
  - (C) No, because a theory is a complex explanation that does not become a law.
  - (D) No, because a theory can be proven correct while a law cannot be proven.
  - (E) No, because a theory cannot be proven correct while a law can be proven.
4. A griffin is a mythical creature that appears in many stories. It has the head of an eagle and the body of a lion. What role, if any, could the griffin have in the science of biology?
- (A) The griffin could be the subject of an investigation of animals.
  - (B) The griffin could be cited as evidence to evaluate a hypothesis or theory.
  - (C) The griffin could be used to test new ideas about animal structures or behaviors.
  - (D) The griffin could provide data for an investigation of real animals.
  - (E) The griffin has no role in biology, because it is not real.
5. In her report of an investigation, Shira states that the height of a bush is 0.65 meters. Nathaniel states that the height of the same bush is 65 centimeters. How do the statements of the two students compare?
- (A) Shira stated a greater height.
  - (B) Nathaniel stated a greater height.
  - (C) The students used different metric units to state the same height.
  - (D) The students used different units, only one of which is metric, to state the same height.
  - (E) Shira stated the height more accurately.

6. Write the words or phrases from the bank to complete the sentences. Each word or phrase should be used exactly once.

|             |                        |           |                      |
|-------------|------------------------|-----------|----------------------|
| DNA         | growth and development | cells     | materials and energy |
| homeostasis | stimuli                | reproduce | evolve               |

Living organisms are made up of units called \_\_\_\_\_ and they \_\_\_\_\_ to generate offspring. The genetic code for living things is carried in \_\_\_\_\_, which conveys instructions for \_\_\_\_\_. Living things obtain and use \_\_\_\_\_, and respond to \_\_\_\_\_ in their environment. They \_\_\_\_\_ and maintain \_\_\_\_\_, a stable internal environment.

7. When news of a scientific discovery is reported, readers must assess the credibility of the claim. In general, which statement indicates a valid and credible claim?
- (A) The scientist aimed for pinpoint accuracy by using a small sample size.
  - (B) The scientist followed strict standards of investigation and scientific methodology throughout the research.
  - (C) The scientist assured that the experiment was broad in scope by testing many variables in each trial.
  - (D) No other scientists replicated the experiment to avoid the legal issues of patent infringement.
  - (E) The scientist restated the hypothesis after performing the trial in order to have a more accurate hypothesis.

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

8. In 1999, confusion between the use of the English and metric systems resulted in the loss of the Mars Climate Orbiter, which was intended to study that planet's water history. How could costly mistakes like this be avoided in the future?

