



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
2012**

**Grade 11  
Science**

# Science

- 1 The table below shows the densities of four metals.

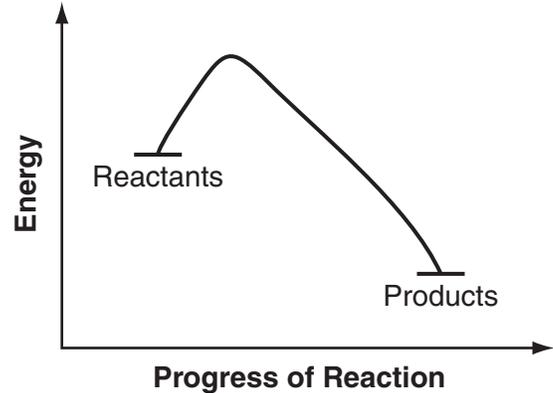
**Metal Densities**

| Metal     | Density (g/cm <sup>3</sup> ) |
|-----------|------------------------------|
| Magnesium | 1.7                          |
| Aluminum  | 2.7                          |
| Iron      | 7.8                          |
| Lead      | 11.3                         |

A student has four rods, each made from one of the metals listed in the table. Which additional set of data will allow the student to identify the rods using the table?

- A. the color and mass of each rod
- B. the mass and volume of each rod
- C. the volume and length of each rod
- D. the length and shape of each rod

- 2 The graph below shows the change in energy that occurs during a chemical reaction.



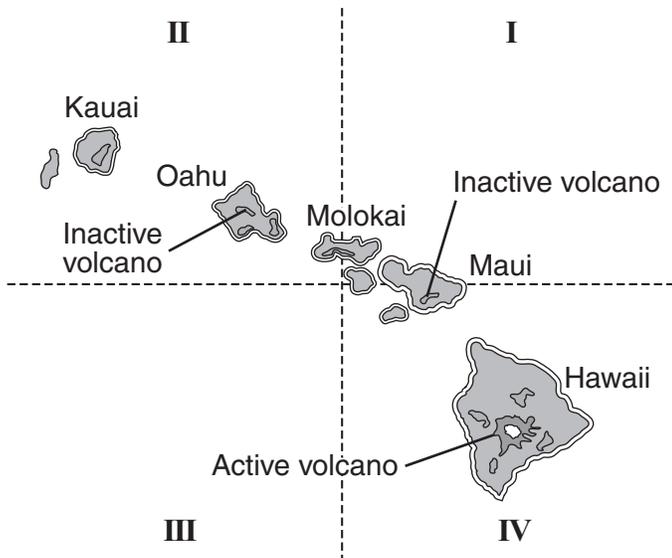
Which of the following is **most likely** to happen as the reaction nears completion?

- A. The energy level of the reactants remains constant.
- B. The energy level of the reactants increases gradually.
- C. The reaction takes in energy from its surroundings.
- D. The reaction releases energy to its surroundings.

- 3 Which statement **best** describes a relationship between electricity and magnetism?

- A. Electric currents weaken magnetic fields.
- B. There can be no magnetic fields without electric currents.
- C. Electric currents can demagnetize permanent magnets.
- D. Changing magnetic fields can create electric currents.

- 4 The Hawaiian Islands formed as the lithosphere moved over a hot spot.



In which region will another island **most likely** form in the future?

- A. region I
- B. region II
- C. region III
- D. region IV

*Please use the Plate Movements diagram on the reference sheet to answer the question.*

- 5 Black smokers vent superheated water and minerals onto the ocean floor. Tall chimneys of solidified minerals develop around these vents.

Black smokers are located **most likely** in which region of Earth's plate boundaries?

- A. the Eurasian and African Plates
- B. the Nazca and South American Plates
- C. the North American and Pacific Plates
- D. the South American and African Plates

- 6 A source of light is moving toward an observer. What can the observer detect?
- A. The speed of the light is increasing.
  - B. The energy of the light is growing less intense.
  - C. The wave crests of the light are spreading apart.
  - D. The wavelength of the light is becoming shorter.

- 7 If a single-celled saltwater organism is placed in freshwater, it will not be able to survive.

Which statement explains why this is true?

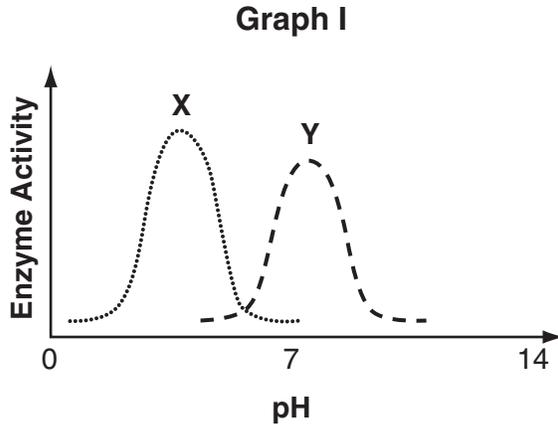
- A. The organism's cell will absorb too much water through osmosis.
  - B. The organism's cell will release too many hydrogen ions through diffusion.
  - C. The organism's cell will release too much water through facilitated diffusion.
  - D. The organism's cell will absorb too many sodium ions through osmosis.
- 8 Which change is the primary effect of a DNA mutation?
- A. coding for a new carbohydrate
  - B. coding for a new lipid
  - C. coding for a different kind of nucleic acid
  - D. coding for a different protein

- 9 Monarch butterflies are poisonous and bad-tasting to birds. Viceroy butterflies have developed a color pattern similar to that of monarch butterflies but are tasty to birds.

How might the similar appearance of the two types of butterflies be a **disadvantage** to monarch butterflies?

- A. Both types of butterflies will be unable to determine mates in their own species because the two types look so much alike.
- B. The increased number of viceroy butterflies will cause a decrease in the food supply available for monarch caterpillars.
- C. Birds might develop resistance to the poison in monarch butterflies and start eating both types of butterflies.
- D. Birds might mistake monarch butterflies for viceroy butterflies and start attacking more monarch butterflies.

- 10 Enzymes are biological catalysts that require specific environmental conditions for proper functioning. The graph below shows the activity of enzymes X and Y.



- Use data from the graph to describe the environmental condition each enzyme needs for proper functioning.
- Identify which enzyme is **most likely** found in a human stomach. Explain your reasoning.