



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
2009**

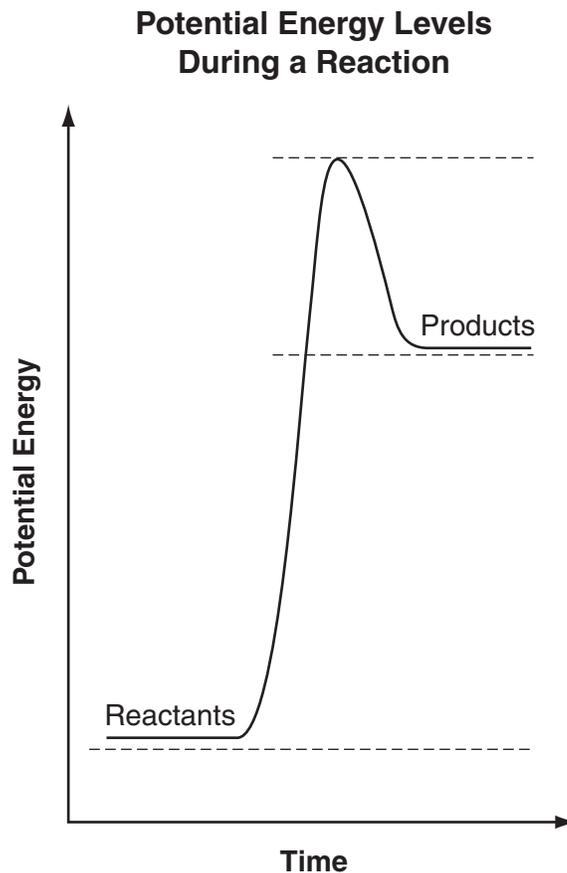
**Grade 11
Science**

Science

Please use the periodic table on the reference sheet to answer the question.

- 1 Which chemical property places neon (Ne) and argon (Ar) in the same group?
- A. Both elements form ionic compounds.
 - B. Both elements have a full outer energy level.
 - C. Both elements have low ionization energy.
 - D. Both elements are liquids at 38°C .

- 2 The graph below shows the potential energy levels of products and reactants during a reaction.

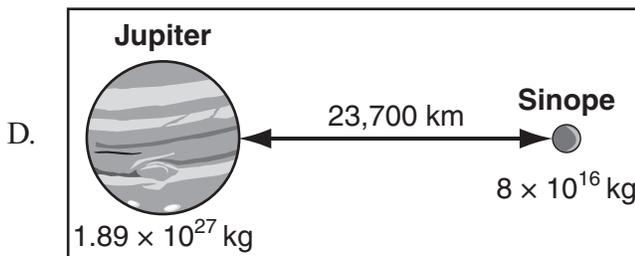
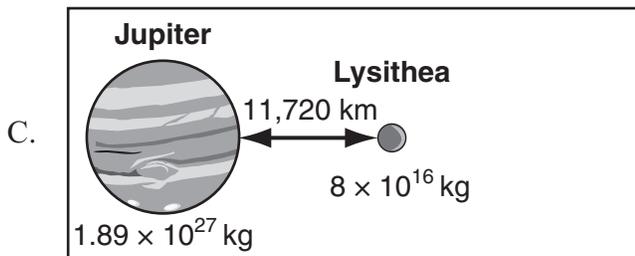
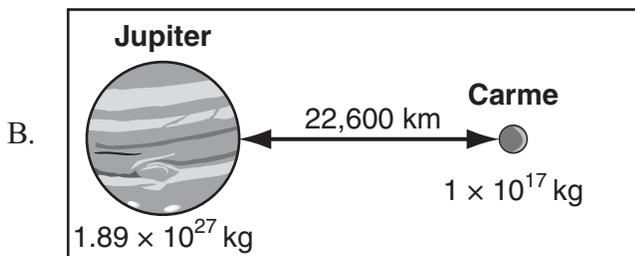
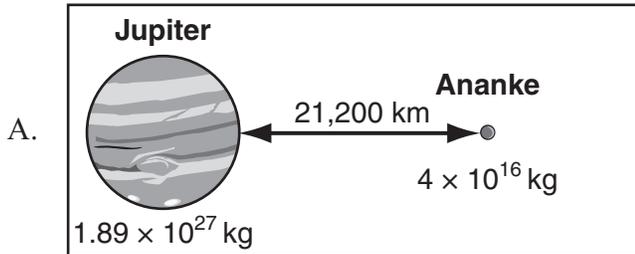


Which statement **best** describes the reaction shown in the graph?

- A. The reaction is exothermic because the products have less energy than the reactants.
- B. The reaction is endothermic because the reactants have more energy than the products.
- C. The reaction is endothermic because the products have more energy than the reactants.
- D. The reaction is exothermic because the reactants have less energy than the products.

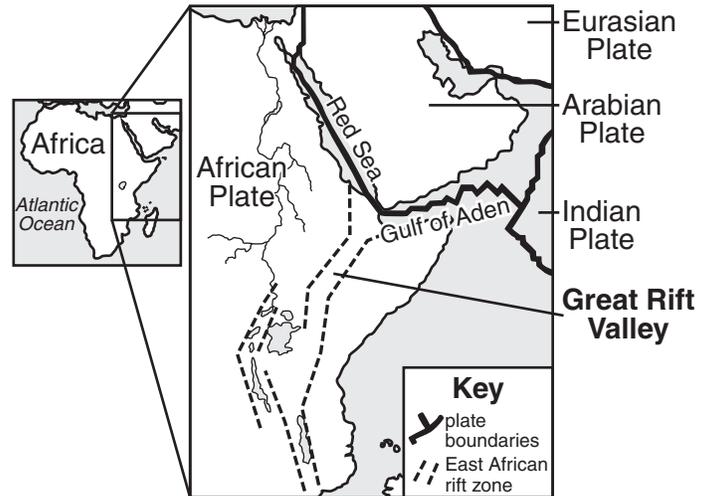
Please use the Formulas on the reference sheet to answer the question.

- 3 Which of Jupiter's moons experiences the **greatest** gravitational force of attraction to Jupiter?



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

- 4 The map below shows the location of the Great Rift Valley in East Africa.



The Great Rift Valley started forming millions of years ago. It slowly continues to deepen and widen, causing many volcanic eruptions and earthquakes in the area.

In a million years, what is the **most likely** geologic feature that will have formed where the Great Rift Valley is now located?

- A. an inland sea
- B. a mountain range
- C. a new continent
- D. a new forest

- 5 A rock sample contains 80 g of a potassium-40 (K_{19}^{40}) isotope with a half-life of 1.25 billion years.

How much of the potassium-40 isotope will remain after 2.5 billion years have passed?

- A. 0 g
- B. 10 g
- C. 20 g
- D. 80 g

- 6 In 1987, a supernova was visible from the Southern Hemisphere. This was the first observation of a supernova in about 400 years.

Which statement does the observation **best** support?

- A. Atmospheric pollution is decreasing.
- B. Stars have a life cycle.
- C. Telescopes are becoming more powerful.
- D. The universe is slowly expanding.

- 7 The table below lists causes of stream changes in the Mud Creek Watershed in North Carolina.

Changes in the Mud Creek Watershed

Cause	Specific Sources
Sedimentation	<ul style="list-style-type: none"> • Runoff from roads, lawns, fields • Solid surfaces: <ul style="list-style-type: none"> - roads - driveways - parking lots - rooftops - sidewalks • Disturbances from construction sites • Livestock access to creek
Nonpoint source pollutants	<ul style="list-style-type: none"> • Road runoff of salt, metals, oil • Nutrients like pet waste, leaky septic systems, fertilizers • Pesticides from lawns and gardens • Agricultural runoff
Bacteria (fecal coliform)	<ul style="list-style-type: none"> • Runoff of pet waste, leaky septic systems • Livestock access to creek

Which action might help improve the condition of the streams?

- A. restricting fishing
- B. clear-cutting the forest
- C. limiting residential development
- D. adding livestock to the region

- 8 Tobacco companies argue that smoking is not directly related to lung cancer. People who smoke cigarettes have only a one-percent chance of getting lung cancer.

Which statement **best** contradicts this claim?

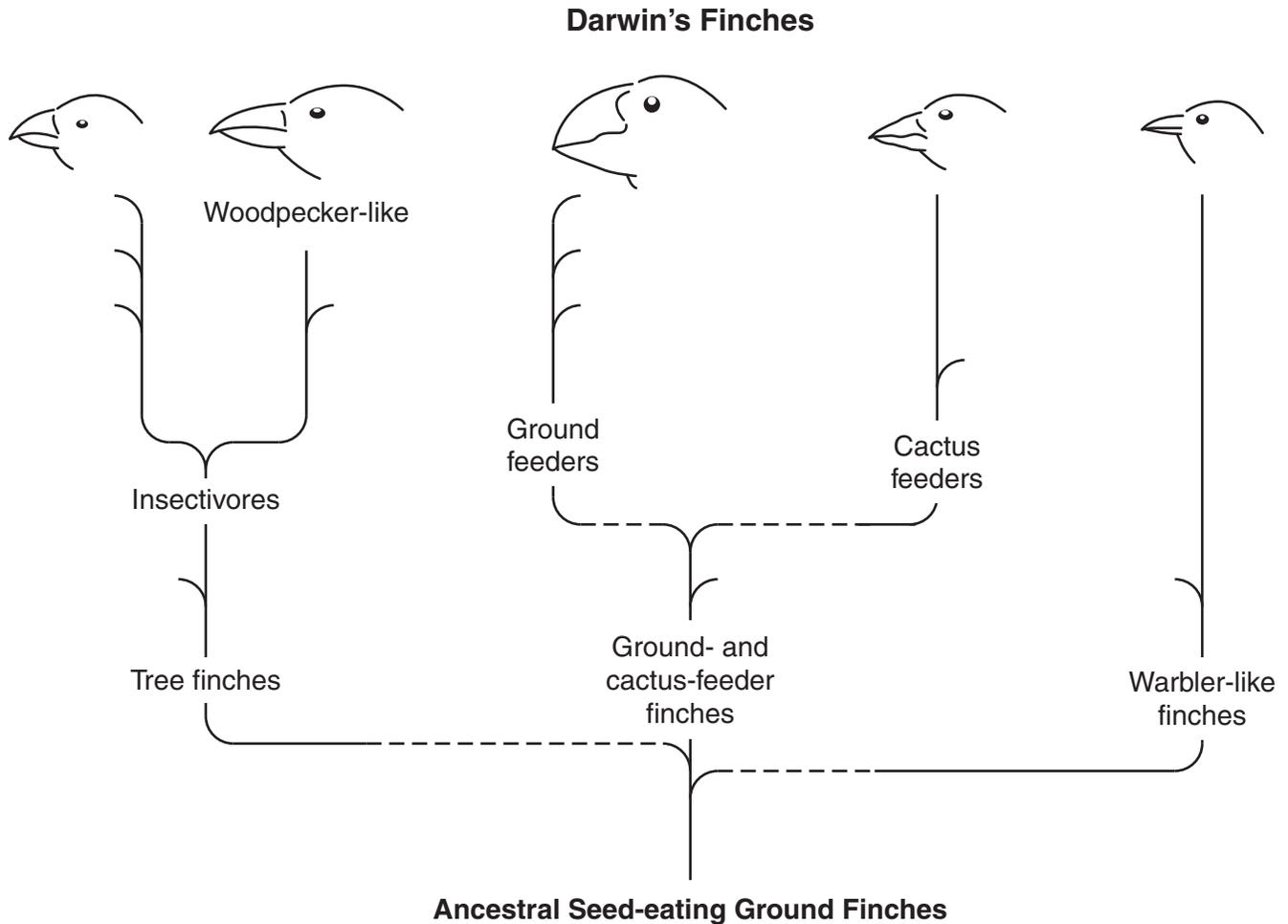
- A. Lung cancer caused by asbestos exposure is the same as lung cancer caused by smoking.
- B. Eighty-seven percent of lung cancer patients smoke cigarettes.
- C. Cigarette smoke contains more than 4000 cancer-causing substances.
- D. Exposure to radon gas is considered the second leading cause of lung cancer.

- 9 Research has led scientists to conclude that fevers help the human body fight infection by elevating body temperatures and causing parts of the immune system to work better.

Which statement does this conclusion **best** support?

- A. Fevers are a disruption of homeostasis.
- B. Fevers should immediately be treated with medication.
- C. Fevers are a necessary part of maintaining homeostasis.
- D. Fevers are rarely caused by bacterial infections.

- 10 The diagram below shows the evolutionary tree of the Galapagos Island finches.



The Galapagos Island finches evolved from seed-eating ground finches into many different species.

- a. Identify **two** factors that might have led to the variations of the ancestral seed-eating ground finches.

North American woodpeckers and Galapagos Island woodpecker finches have similar diets. North American woodpeckers have long tongues that allow them to extract insects that bore into trees. Galapagos Island woodpecker finches, which do not have long tongues, use cactus spines and twigs to extract insects from trees.

- b. Explain how North American woodpeckers and Galapagos Island woodpecker finches are able to occupy the same role.
- c. Explain how North American woodpeckers or Galapagos Island woodpecker finches might change over time if both birds shared the same ecosystem.