



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
2016**

**Grade 11
Science**

Science

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

- 1 Highly reactive potassium (K) is placed in a container with an unknown element. The container is heated and no reaction is observed.

Which element is **most likely** the unknown element?

- A. chlorine (Cl)
- B. neon (Ne)
- C. nitrogen (N)
- D. oxygen (O)

- 2 The chemical ammonium nitrate (NH_4NO_3) is used in medical cold packs like the one shown below.

When the cold pack is crushed, the ammonium nitrate begins to dissolve in the water inside the cold pack and the water temperature quickly drops.



Which statement correctly describes the reaction between the ammonium nitrate and the water?

- A. The reaction is endothermic because energy is absorbed.
- B. The reaction is endothermic because energy is released.
- C. The reaction is exothermic because energy is absorbed.
- D. The reaction is exothermic because energy is released.

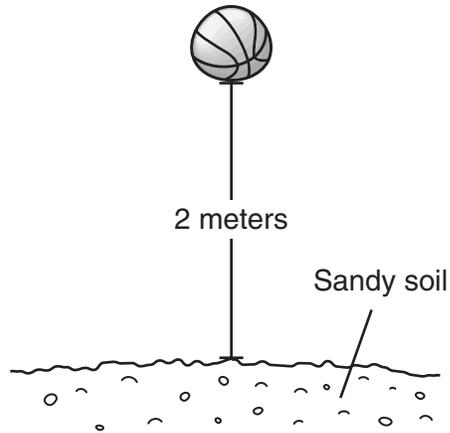
Please use the Formulas on the reference sheet to answer the question.

- 3 A stone rolls off the top of a cliff and free-falls 50 m to the river below. The stone's velocity at the end of 1 s is approximately 10 m/s.

What is the velocity of the stone 3 s after rolling off the top of the cliff?

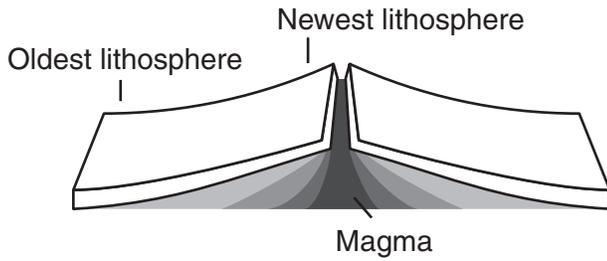
- A. 10 m/s
- B. 30 m/s
- C. 60 m/s
- D. 150 m/s

- 4 An underinflated ball is dropped from a height of two meters onto sandy soil, as shown below.



- a. Predict the height the ball will bounce. Be sure to write your prediction in your Student Answer Booklet. Describe **two** energy transformations that affect the height the ball will bounce.
- b. Describe **two** ways to increase the height the ball will bounce. Explain how these two ways will provide more energy for a higher bounce.

- 5 The Mid-Atlantic Ridge divides the Atlantic Ocean into two nearly equal parts. A deep valley rift runs along the crest of the ridge, as shown in the diagram below.



Scientists drilled into the ocean floor and determined the age of the seafloor on each side of the Mid-Atlantic Ridge.

Which conclusion about the seafloor does the information in the diagram support?

- A. The seafloor is youngest where the lithosphere is thickest.
- B. The seafloor is youngest where Earth's magnetism has reversed.
- C. The seafloor is youngest near the continents.
- D. The seafloor is youngest near the ridge.

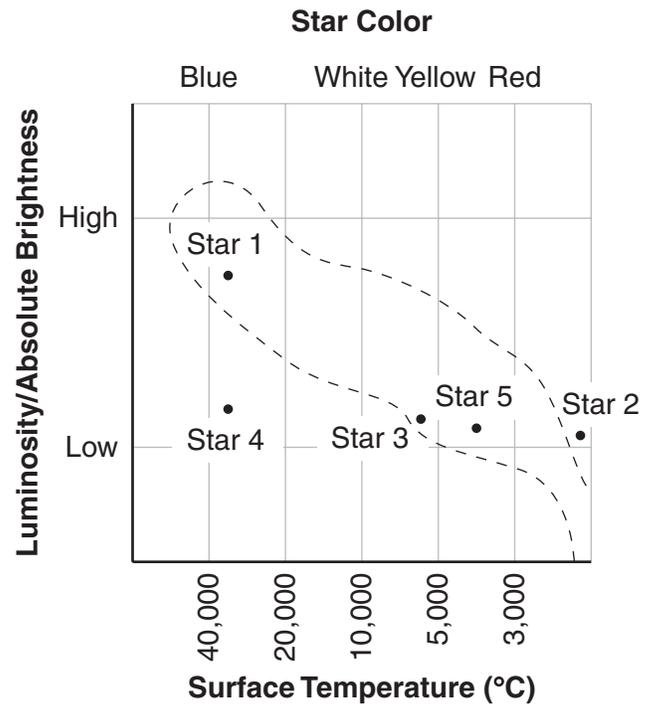
- 6 The half-life of potassium-40 is 1.3 billion years. In a rock sample, 75% of the original amount of potassium-40 has decayed.

Which of the following is the **best** estimate of the age of the rock sample?

- A. about 2.6 billion years old
- B. about 1.3 billion years old
- C. about 0.9 billion years old
- D. about 0.3 billion years old

- 7 The diagram below shows information about five stars.

Star Classification Diagram



Star 1 and Star 4 have similar surface temperatures. What is the **most likely** reason Star 1 is more luminous than Star 4?

- A. Star 1 is larger.
- B. Star 1 is older.
- C. Star 1 is in a different galaxy.
- D. Star 1 is farther from Earth.

Please use the Genetic Code on the reference sheet to answer the question.

- 8 Examine the normal and the mutated DNA codes shown below.

- Normal DNA sequence:
ATG GTG GGT GAT GCT ACC
- Mutation of the same section of DNA sequence:
ATG GTG TCG TAG TGG ACC

What is the immediate result of this mutation?

- A. A smaller lipid forms.
 - B. The same protein is produced.
 - C. A different protein is produced.
 - D. Three incomplete carbohydrates form.
- 9 A news segment presents video clips discussing recent advances in health science.
- Which video clip is **most likely** free of bias?
- A. A panel of doctors share their personal experiences and advice for helping patients quit smoking.
 - B. A professional athlete discusses her increased performance that resulted from taking a nutritional supplement.
 - C. A foreign correspondent interviews elders of a small village to find out about the herb that they have used for centuries to treat cancer.
 - D. A university student summarizes the results of a controlled investigation comparing the effectiveness of two different types of sunscreen.

- 10 Which of the following is an example of one way the human nervous system maintains homeostasis?
- A. Sensory cells in the nose detect fragrance from a flower, causing the person to breathe in more deeply.
 - B. Neurons in the skin detect pressure, causing a feeling of pain to be sent to the person's brain.
 - C. Receptors in the brain detect a decrease in blood pH, causing a signal to be sent to increase the person's breathing rate.
 - D. Cells in the tongue detect a sweet flavor, causing the person to smile.