



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
2010**

**Grade 11  
Science**

# Science

- 1 Element X is added to an airtight container at room temperature and compressed to half its original volume.

Which element is **most likely** element X?

- A. carbon
- B. copper
- C. mercury
- D. nitrogen

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

- 2 Sodium (Na) metal reacts violently with water to form hydrogen gas. Which element has a similar reaction when combined with water?

- A. gold (Au)
- B. lithium (Li)
- C. silicon (Si)
- D. zinc (Zn)

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

- 3 Four colored balls are thrown against a wall. The table below shows the masses and velocities of the balls.

**Data for Four Balls**

Color	Mass (g)	Velocity (m/s)
Red	4	7
Orange	12	2
Yellow	2	11
Green	9	3

Which ball had the **greatest** momentum when it hit the wall?

- A. the red ball
- B. the orange ball
- C. the yellow ball
- D. the green ball

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

- 4 The rotational velocity of Earth is 463 m/s at the equator.
- Calculate the momentum of a 60 kg student standing at the equator. Show your calculations and include units in your answer.
  - Explain why the student lands in the same spot if he jumps straight up, even though Earth is rotating.

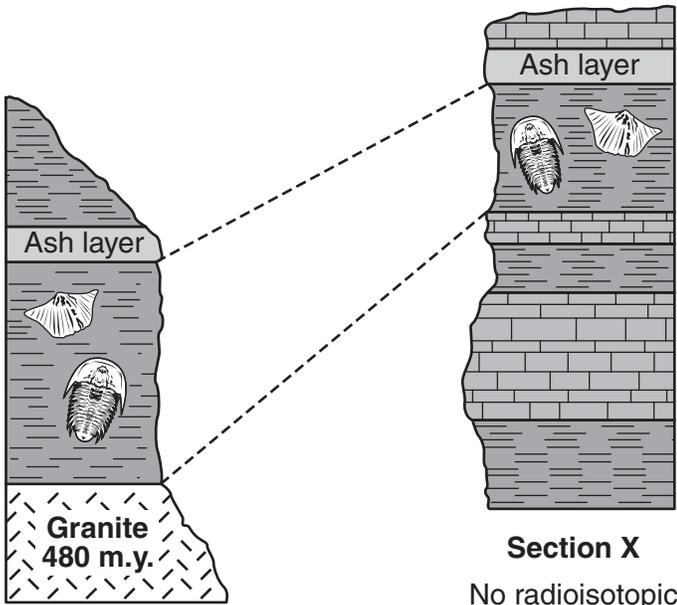
- 5 The map of Turkey below shows the locations of the North Anatolian and East Anatolian Faults.



Both the North Anatolian and East Anatolian Faults are examples of strike-slip faults. Which Earth event occurs along these faults?

- tsunamis
- earthquakes
- formation of volcanoes
- formation of islands

- 6 The diagram below shows two rock sections from different parts of the world.



**Section W**  
Some radioisotopic dates obtained

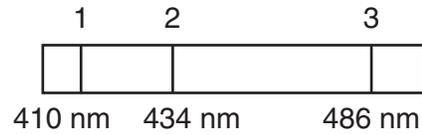
**Section X**  
No radioisotopic dates obtained

The granite layer in Section W is 480 million years old (480 m.y.). How can the **relative** age of the fossils in Section X be determined?

- A. by using the potassium-40 dating method on parts of the fossils
- B. by measuring the thickness of the fossil layer in each section, because fossils in a thick layer are older than fossils in a thin layer
- C. by measuring the height of the fossil layer in each section, because fossils at a high elevation are younger than fossils at a low elevation
- D. by comparing the location of the fossils in Section W to the location of the fossils in Section X

Please use the *Electromagnetic Spectrum* on the reference sheet to answer the question.

- 7 For 10 years, scientists have recorded the emission spectrum of a certain star. The diagram below shows the first spectrum recorded.



Which emission spectrum shows that a redshift of the star has occurred?

- A.
- B.
- C.
- D.

- 8 The table below shows features of four different organisms.

**Comparison of Four Organisms**

<b>Feature</b>	<b>Organism W</b>	<b>Organism X</b>	<b>Organism Y</b>	<b>Organism Z</b>
Number of cells	Many	One	One	Many
Cells have nuclei	Yes	No	Yes	Yes
Cells have walls	Absent	Present	Absent	Present
Does photosynthesis	No	No	No	No
Does respiration	Yes	Yes	Yes	Yes
Type of reproduction	Sexual	Asexual	Asexual	Sexual
Can move about	Yes	Yes	Yes	No

Which organism is **least** related to the others?

- A. Organism W
- B. Organism X
- C. Organism Y
- D. Organism Z

9 Undersea vents called black smokers release superheated, mineral-rich water. Light does not penetrate the water, making photosynthesis impossible. However, diverse communities of organisms exist around black smokers at depths of 2100 m below the ocean surface.

Which is the **most likely** reason these diverse communities can exist so deep in the ocean?

- A. Black smokers are warm like tropical land areas.
- B. Black smokers produce sulfur that blocks light and creates a good hideaway for many organisms.
- C. Producer organisms use minerals in the water to make food through chemosynthesis.
- D. Dead organisms that serve as bacterial food sources drift down from water close to the surface.

10 Queen Victoria of England lived from 1819 to 1901. Which statement supports the idea that she was a carrier of the disease hemophilia?

- A. The word “hemophilia” was first used in 1828.
- B. Hemophilia is called the “royal disease.”
- C. Queen Victoria’s husband died at an early age.
- D. Queen Victoria’s grandsons had hemophilia.