

GRADE 8

STUDENT PRACTICE TEST BOOKLET

Student Name: _____



MEA

Maine Educational Assessment

RELEASED 2017 SCIENCE ITEMS

Maine Department of Education

SCIENCE PRACTICE TEST

This practice session has twenty multiple-choice and two constructed-response questions.

Choose the best answer for each multiple-choice question and mark your answer choices for questions 1 through 20 in the spaces provided on page 2 of your practice test answer booklet.

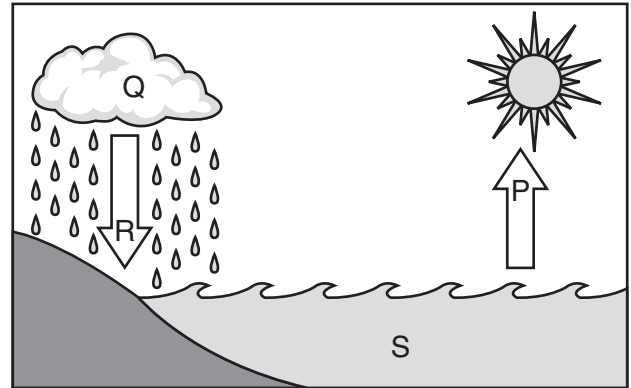
1 What causes the variation of daylight hours at different latitudes?

- A. solar flares
- B. lunar eclipses
- C. Earth's tilted axis
- D. Earth's distance from the Sun

2 A species of rabbit eats only one type of plant. Due to drought conditions, this plant is very hard to find. As a result, the rabbit population decreases. What would **most likely** happen to enable this species of rabbit to survive in this changing environment?

- A. Some of the rabbits would start eating insects.
- B. Some of the rabbits would consume only water.
- C. Some of the rabbits would make food from sunlight.
- D. Some of the rabbits would start eating a different plant.

3 The diagram below shows four parts, P, Q, R, and S, of the water cycle.

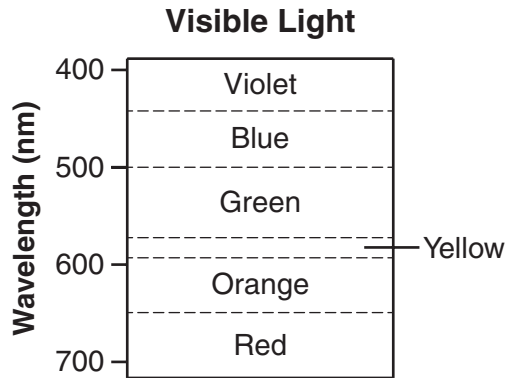


Which letter represents evaporation?

- A. letter P, because water is moving from the hydrosphere to the atmosphere
- B. letter Q, because water is moving from the atmosphere to the atmosphere
- C. letter R, because water is moving from the atmosphere to the lithosphere
- D. letter S, because water is moving from the lithosphere to the hydrosphere

PLEASE GO ON →

- 4 The diagram below shows the electromagnetic spectrum for visible light.



Which statement describes how it is possible for a human to see that a ball is orange in appearance?

- A. The 610 nm wavelength of light radiates from the Sun and reflects off the ball to the human eye.
- B. The 640 nm wavelength of light radiates from the Sun and passes through the ball to the human eye.
- C. The 580 nm and 680 nm portions of the light spectrum radiate from the Sun through the ball to the human eye.
- D. The 400 nm and 700 nm portions of the light spectrum radiate from the Sun and reflect off the ball to the human eye.

- 5 Scientists are developing new varieties of salmon that grow much faster than wild salmon. Some people are concerned about how these new salmon will affect the environment.

Which of the following describes an environmental concern about this fast-growing salmon?

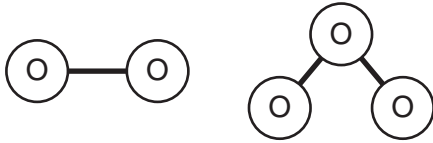
- A. Predators will eat the fast-growing salmon and the wild salmon.
- B. The fast-growing salmon will compete with wild salmon for food.
- C. People will eat more of the fast-growing salmon than other types of fish.
- D. The fast-growing salmon will cause the wild fish it encounters to grow faster.

- 6 Which factors have the **greatest** impact on the health of a human embryo?

- A. the mother's lifestyle and diet
- B. the mother's hair color and due date
- C. the father's age and weight
- D. the father's height and lifestyle

PLEASE GO ON →

- 7 Oxygen gas has the chemical formula O_2 . Ozone has the chemical formula O_3 . The diagram shows the molecular models for O_2 and O_3 .



Which statement best describes a difference between O_2 and O_3 ?

- A. O_2 is a compound and O_3 is a molecule.
- B. O_2 is an atom and O_3 is an element.
- C. O_2 contains two atoms and O_3 contains three atoms.
- D. O_2 consists of two elements and O_3 consists of three elements.

- 8 The table below shows the average monthly temperatures (in degrees Fahrenheit) for two cities.

	City X	City Y
Jan.	54	30
Feb.	59	32
Mar.	64	37
Apr.	72	44
May	80	52
Jun.	90	60
Jul.	96	66
Aug.	95	64
Sept.	87	58
Oct.	75	47
Nov.	62	37
Dec.	54	30

Which statement **best** explains the average monthly temperatures for these two cities?

- A. City X is affected by El Niño and City Y is not.
- B. City X is at a higher altitude and City Y is near sea level.
- C. City X is in a dry climate and City Y is in a humid climate.
- D. City X is located closer to the equator and City Y is at a higher latitude.

- 9 Which process unites the genetic information from both parents to form an offspring?

- A. fertilization
- B. photosynthesis
- C. pollination
- D. respiration

PLEASE GO ON →

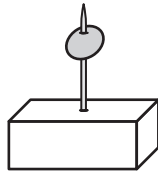
- 10 Students in a science class are modeling eclipses by using the materials below.



Orange



Desk lamp



Grape, toothpick,
foam block

Key

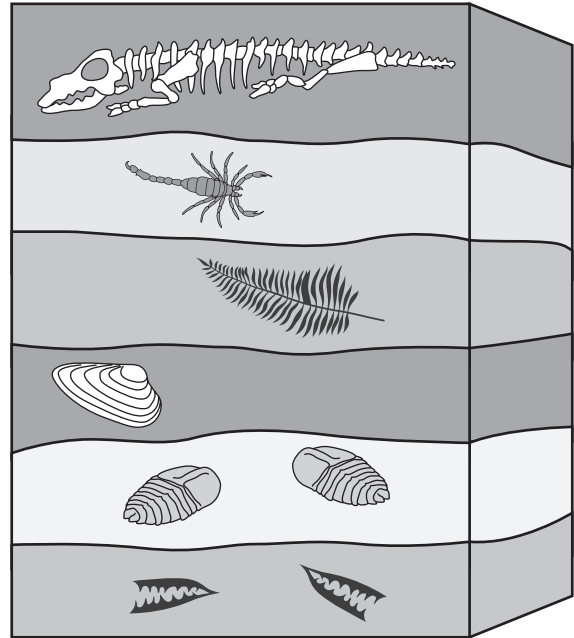
Orange (O) = Earth
Lamp (L) = Sun
Grape (G) = Moon

Once they have the correct arrangement, the students will make a diagram to represent the objects as viewed from above, with arrows to represent light.

Which diagram correctly represents how the students **should** arrange these objects to represent a solar eclipse?

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

- 11 The diagram below shows layers of sedimentary rocks with fossils.



What can scientists determine from the diagram?

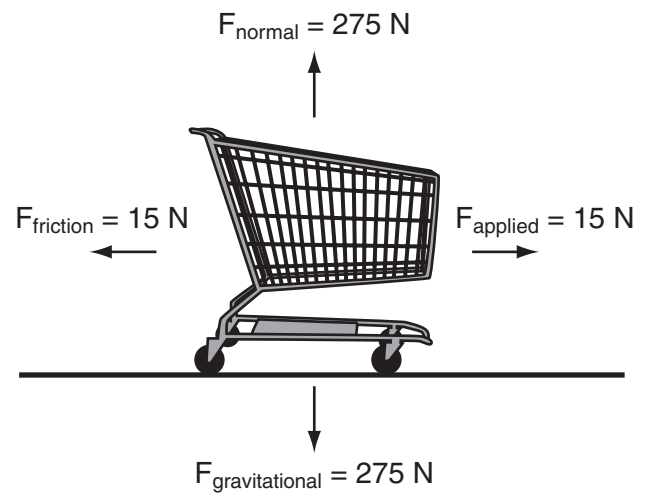
- A. the exact ages of the fossils
- B. the reasons for extinctions of organisms
- C. the relative ages of fossils
- D. the reasons for deaths of the organisms

PLEASE GO ON →

12 According to fossil evidence, different giraffes once had different neck lengths. All giraffes now have long necks. Which statement explains this?

- A. Giraffes with long necks were better able to reach food and produce more offspring.
- B. Giraffes with long necks had behaviors that stretched their necks.
- C. Giraffes with short necks moved to another ecosystem.
- D. Giraffes with short necks became a different species.

13 A student observes a grocery cart on a flat parking lot. The diagram below shows the magnitude of the forces acting on the 28 kg grocery cart.



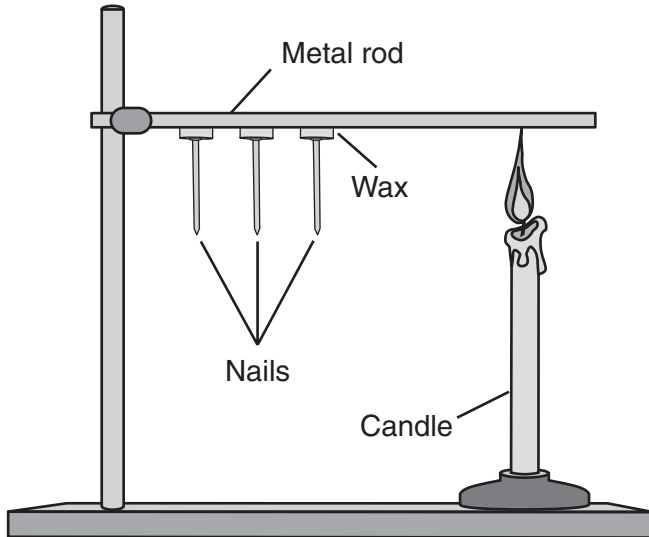
After 30 s, the student observes the unattended grocery cart begin to roll forward.

Which change in force could explain what the student observed?

- A. The normal force decreased by 10 N.
- B. The applied force increased by 5 N.
- C. The frictional force increased by 10 N.
- D. The gravitational force decreased by 5 N.

PLEASE GO ON →

- 14 Three nails are attached by wax to a metal rod, as shown in the drawing below.



When the metal rod is heated at one end by a candle, the nails fall off the rod. How does the rod transfer heat so that it melts the wax holding the nails on the rod?

- A. by conduction
 - B. by convection
 - C. by evaporation
 - D. by radiation
- 15 A bacterium reproduces asexually and makes two daughter cells. Which statement **best** describes the daughter cells?
- A. The daughter cells have twice the mass of the parent cell.
 - B. The daughter cells have half as much genetic material as the parent cell.
 - C. The daughter cells are identical because they came from the same parent cell.
 - D. The daughter cells are unhealthy because they came from the same parent cell.

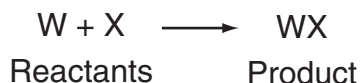
- 16 In 2005, the *Cassini* spacecraft recorded dust particles being expelled from the surface of one of Saturn's moons. The particles then became part of one of Saturn's rings.

What force keeps these dust particles in a ring around Saturn?

- A. Saturn's gravity
 - B. solar winds
 - C. the Sun's gravity
 - D. magnetic fields
- 17 Which statement **best** explains how thermal energy is transferred between the Sun and Earth?
- A. Thermal energy from space is reflected by the Moon and travels as radiation toward Earth.
 - B. Thermal energy from the Sun travels through space as radiation and warms Earth's surface.
 - C. Thermal energy from the Sun cycles through space by convection and warms Earth's surface by conduction.
 - D. Thermal energy from space cycles between the Sun and Earth by convection as gases are warmed near the Sun and cooled near Earth.

PLEASE GO ON →

- 18 A scientist carried out a reaction in which two elements reacted completely to form a new, more complex compound, as shown in the equation below.



During the reaction, heat was released. Which statement correctly describes this reaction based on the law of conservation of matter?

- A. The number of atoms in the product is equal to the total number of atoms in the reactants.
- B. The number of molecules in the product is equal to the total number of molecules in the reactants.
- C. There are fewer atoms in the product than the reactants because some were destroyed by heat.
- D. There are fewer molecules in the product than the reactants because some were destroyed by heat.

- 19 All members of the same species have similar appearances. Which other characteristic do members of the same species have in common?

- A. They reproduce within their species.
- B. They are the same color.
- C. They are the same size.
- D. They grow at the same rate.

- 20 A container holds 5 liters of water and another container holds 10 liters of water. Which property is different between the containers of water?

- A. density
- B. mass
- C. melting point
- D. solubility

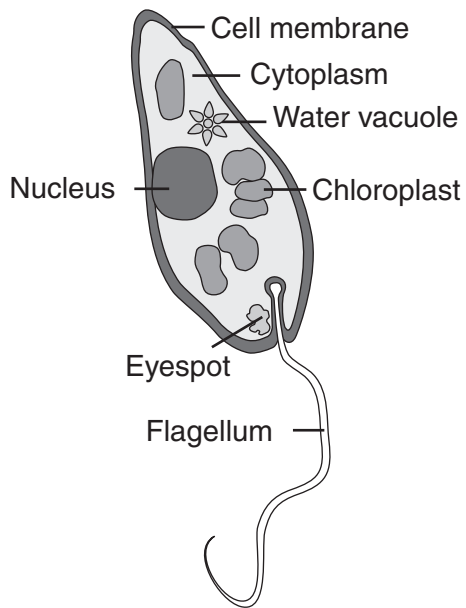
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Write your answers to constructed-response questions 21 and 22 in the boxes provided on pages 2 and 3 of your practice test answer booklet. Be sure to answer and label all parts (a, b, c, etc.) of the questions.

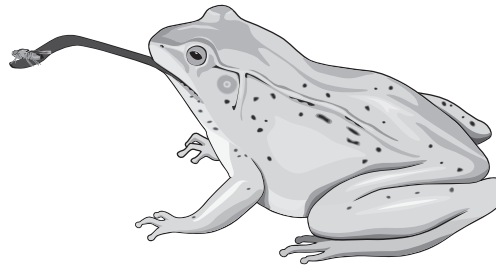
- 21 The Appalachian Mountains in the eastern part of the United States have formed and re-formed during the past 480 million years. At one point in their history, they were the size of the current Rocky Mountains in the western part of the United States, with peaks above 14,000 ft. Today, the tallest mountain in the Appalachian Mountains is Mt. Mitchell at 6,684 ft.
- Describe **two** ways that mountains can form.
 - Explain **two** ways that mountains can change shape and size over time.

PLEASE GO ON ➔

- 22 The pictures below show a single-celled euglena and a multicellular frog.



Euglena



Frog

- Identify **two** structures of the euglena and then name two structures of the frog that have a similar function to the structures you chose for the euglena.
- Describe the function of **each** of the four structures you chose for part a.

