

GRADE 8

STUDENT PRACTICE TEST BOOKLET

Student Name: _____



MEA

Maine Educational Assessment

RELEASED 2013 SCIENCE ITEMS

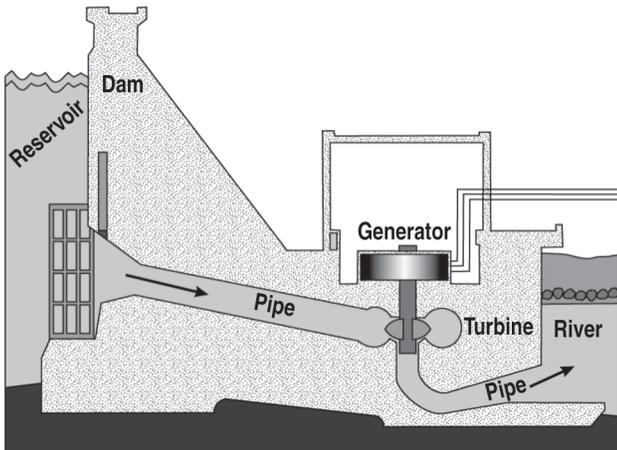
Maine Department of Education

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 The diagram below shows a hydroelectric dam for producing electricity.



What type of energy transformation occurs in this production of electricity?

- A. chemical energy to heat energy
 - B. mechanical energy to electrical energy
 - C. electrical energy to mechanical energy
 - D. heat energy to chemical energy
- 2 During a solar eclipse, what object blocks the Sun?
- A. an asteroid
 - B. a comet
 - C. Earth
 - D. the Moon

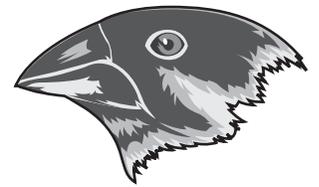
- 3 Which factor at the North and South poles makes the climate at the poles colder than the climate at the equator?

- A. the presence of oceans
- B. the lack of direct sunlight
- C. the presence of ice caps
- D. the lack of vegetation

- 4 The pictures below show four species of birds.

Large ground finch
(*Geospiza magnirostris*)

Medium ground finch
(*Geospiza fortis*)



Small tree finch
(*Camarhynchus parvulus*)

Warbler finch
(*Certhidea olivacea*)

How do the differences in bill shape help these birds survive in the same region?

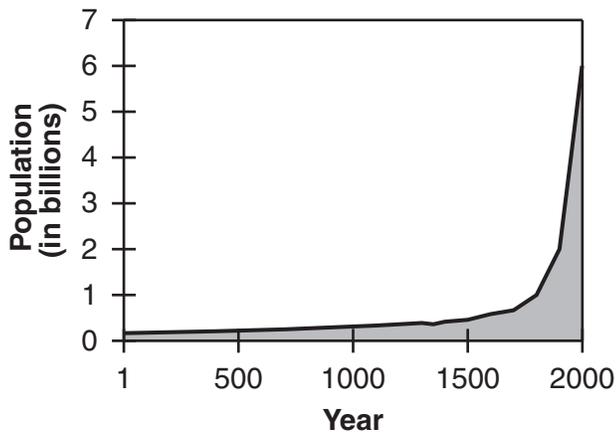
- A. Each bill attracts a different type of predator.
- B. Each bill is best for eating a different kind of food.
- C. The bills are passed on randomly to the bird's offspring.
- D. The bills allow the birds to remove pests from their bodies.

PLEASE GO ON ➡

5 A student has ham, fruit, bread, and juice for breakfast. Which food required the **most** energy per gram to be produced in the ecosystem?

- A. ham
- B. fruit
- C. bread
- D. juice

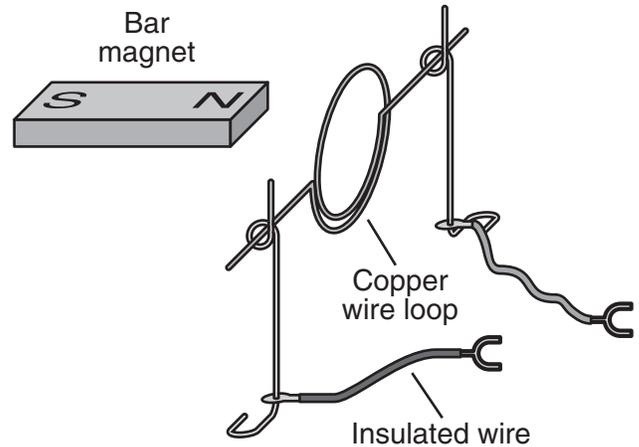
6 The graph below shows the estimated global population from AD 1 to AD 2000.



Based on this trend, which statement is the **best** prediction of the competition for and cost of scarce natural resources in the future?

- A. Competition and cost of natural resources will both decrease.
- B. Competition and cost of natural resources will both increase.
- C. Competition for natural resources will increase, and cost of natural resources will decrease.
- D. Competition for natural resources will decrease, and cost of natural resources will increase.

7 The diagram below shows a copper wire loop situated near a bar magnet.



What needs to be connected to the insulated wire to complete the circuit and to make the copper wire loop rotate?

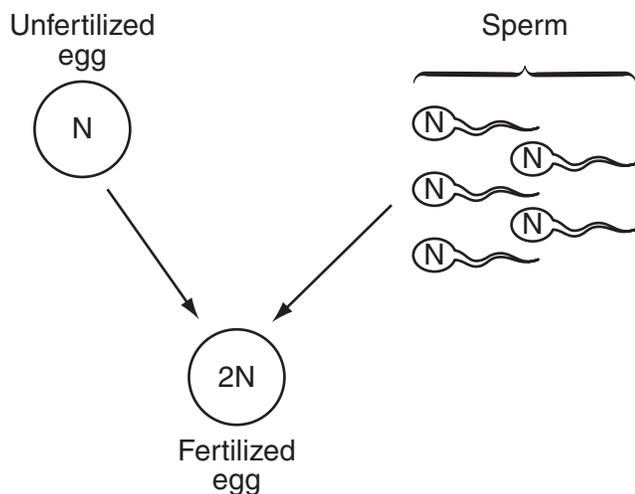
- A. a battery
- B. a lightbulb
- C. a digital meter
- D. an electromagnet

8 Which organisms are **most similar** to pine trees because of how their food is obtained?

- A. algae
- B. honeybees
- C. mushrooms
- D. sea urchins

PLEASE GO ON →

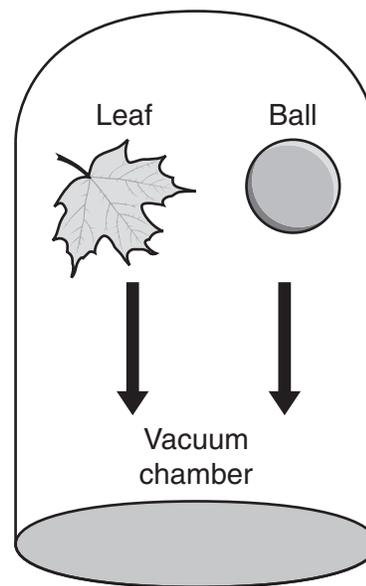
- 9 A student makes the drawing below to help understand fertilization.



What does N **most likely** represent in the student's drawing?

- A. age
 - B. weight
 - C. amount of cytoplasm
 - D. amount of genetic material
- 10 If 100 g of mercury (Hg) melts at -36°C , what is the melting point of 50 g of mercury?
- A. -9°C
 - B. -18°C
 - C. -36°C
 - D. -72°C

- 11 A vacuum chamber has no air in it. The diagram below shows a leaf and a ball released at the same time from the top of a vacuum chamber.



What will a student observe?

- A. The leaf and the ball do not reach the bottom of the chamber.
- B. The leaf reaches the bottom of the chamber first.
- C. The ball reaches the bottom of the chamber first.
- D. The leaf and the ball reach the bottom of the chamber together.

PLEASE GO ON ➔

- 12 The diagrams below represent four different substances.

Diagram 1

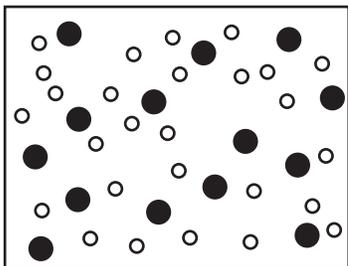


Diagram 2

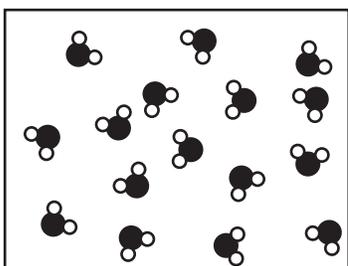


Diagram 3

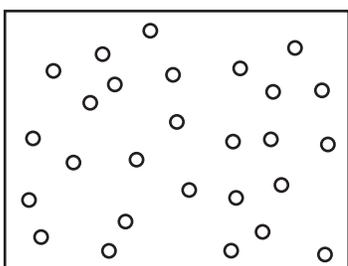
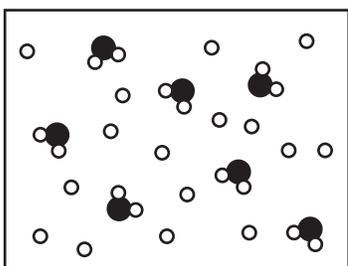


Diagram 4



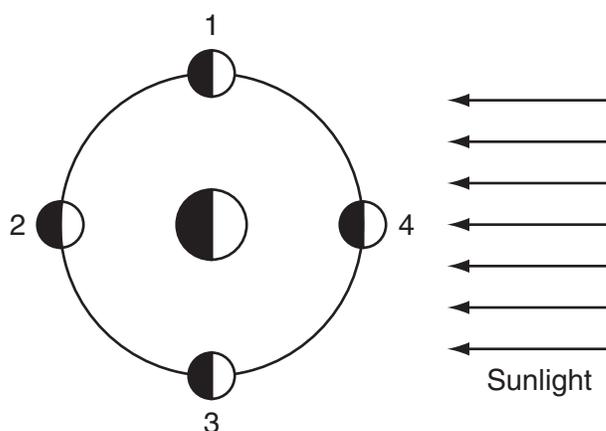
Which diagram **best** represents a mixture of a compound and an element?

- A. Diagram 1
- B. Diagram 2
- C. Diagram 3
- D. Diagram 4

- 13 Scientists who study the universe have observed many different types of energy in outer space. Which type of energy have the scientists been **unable** to detect in outer space?

- A. infrared light
- B. microwave
- C. sound
- D. X-ray

- 14 The diagram below shows the Moon's revolution around Earth.



■ Shaded from sunlight □ Lit by sunlight

Which position will result in a new moon?

- A. position 1
- B. position 2
- C. position 3
- D. position 4

PLEASE GO ON →

- 15 The table below shows some characteristics of four different human organ systems.

System	Organ	Basic Unit	Function
Digestive	Small intestine	Epithelial cell	Digestion
Nervous	Brain	Neuron	Sensing and control
Muscular	Muscle	Muscle cell	Movement
Reproductive	Ovary	?	Reproduction

Which term best completes the table?

- A. Egg
- B. Offspring
- C. Testes
- D. Uterus

- 16 The elements listed below are located in the same vertical column of the Periodic Table of the Elements.

F
Cl
Br
I
At

Why are these elements grouped together in the same chemical family?

- A. They have the same density.
- B. They have similar properties.
- C. They are made of the same type of atom.
- D. They have different properties.

- 17 In the 1850s, wild rabbits from England were released in Australia, where they had no predators. The rabbit population quickly grew to 600 million. There were so many rabbits that they were destroying crops and pastures. In an attempt to control the rabbit population, humans intentionally released a virus that killed 99% of the rabbits.

What is the **most likely** reason the virus did not kill all the rabbits?

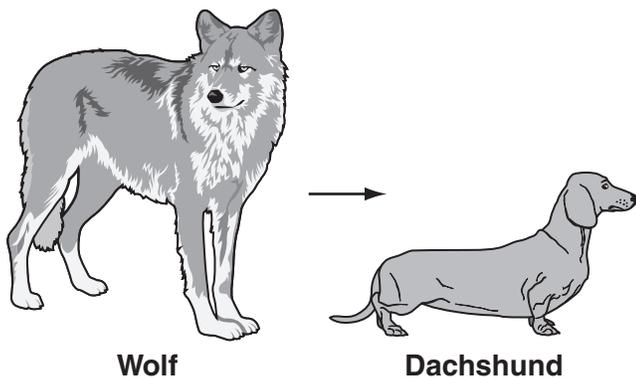
- A. Some rabbits learned to eat a type of plant that cured them.
- B. Some rabbits lived alone and were not exposed to sick rabbits.
- C. Some rabbits safely hid from the virus because Australia is so large.
- D. Some rabbits had an inherited gene that made them resistant to the virus.

PLEASE GO ON ➔

18 What is caused by the rotation of Earth?

- A. the length of a day
- B. the length of a year
- C. the phases of the Moon
- D. the eclipses of the Moon

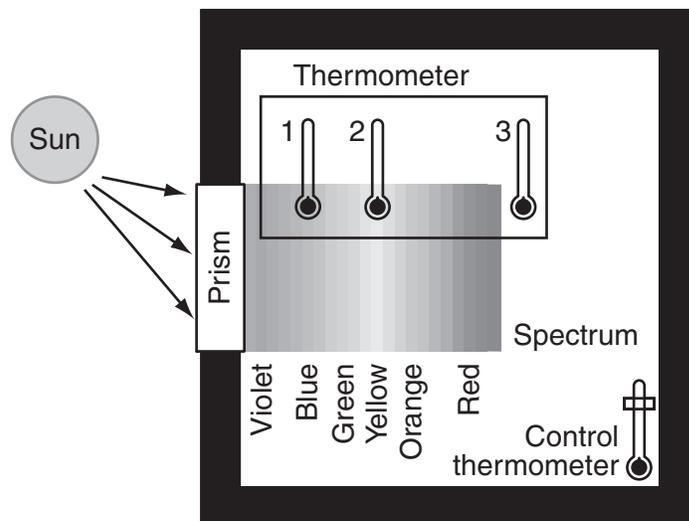
19 The dachshund is a breed of dog that was used in hunting small burrowing animals. Like other breeds of dogs, the dachshund is a descendant of modern-day wolves.



How did the differences between wolves and dachshunds arise?

- A. Starving wolves mated and produced small offspring.
- B. A warm winter caused many wolves to lose their thick, long fur.
- C. People bred wolves that carried traits beneficial for hunting small animals.
- D. An outbreak of disease led to wolves becoming smaller within their lifetime.

20 The diagram below shows the setup at the start of an experiment that uses a prism to split sunlight into different colors.



Students placed four thermometers inside a box with black walls. Blue light strikes Thermometer 1 and yellow light strikes Thermometer 2. The students' data are shown below.

Experimental Results

Thermometer	1	2	3	4 (Control)
Temperature (°C) at 0 min.	24.4	24.3	24.3	24.4
Temperature (°C) at 5 min.	28.3	28.9	29.4	24.5

The students concluded that an invisible form of light exists at the location of Thermometer 3. Which statement is the **best** evaluation of this conclusion?

- A. The conclusion is probably correct since Thermometer 3 receives no light energy.
- B. The conclusion is probably incorrect since the data for Thermometer 3 do not match the control.
- C. The conclusion is probably correct since the data for Thermometer 3 suggest rays that produce heat.
- D. The conclusion is probably incorrect since Thermometer 3 cannot register heat in darkness.

PLEASE GO ON →

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 Carbon dioxide (CO₂) is a colorless, odorless gas. It is used by plants to make sugars, and it is used to make the bubbles in soda. However, scientists and other people are concerned about the long-term effects that increasing carbon dioxide emissions may have on the environment.
- Describe **two** human activities that release carbon dioxide into the atmosphere.
 - Describe **one** direct result of increased carbon dioxide levels in the atmosphere.
 - Describe **one** indirect result of increased carbon dioxide levels in the atmosphere.

- 22 The table below shows similarities and differences among four animals.

	Marsh Hawk	Ladybug	Garter Snake	Snapping Turtle
Internal skeleton	×		×	×
Warm-blooded	×			
Walks on legs	×	×		×
Flies	×	×		
Scales			×	×
Number of legs	2	6	0	4
Cares for offspring	×			

- Based on the information about the animals shown in the table, make a conclusion about two animals that scientists would consider closely related **and** provide evidence from the table to support your conclusion.
- Describe the types of information scientists use for classifying organisms **and** explain how these ideas connect to your answer in part a.

