

# Oklahoma School Testing Program



Oklahoma Core Curriculum Tests

## 2009–2010 Released Items

End-of-Instruction  
Biology I

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Oklahoma State Department of Education  
Oklahoma City, Oklahoma



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# Section 1

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## Directions

Read each question and choose the best answer.

- 1 Tyrone was studying the populations of a finch on two nearby islands that have similar habitats. His data is in the table below.

**Finch Population Study**

	Island A	Island B
Number of Finches	367	595

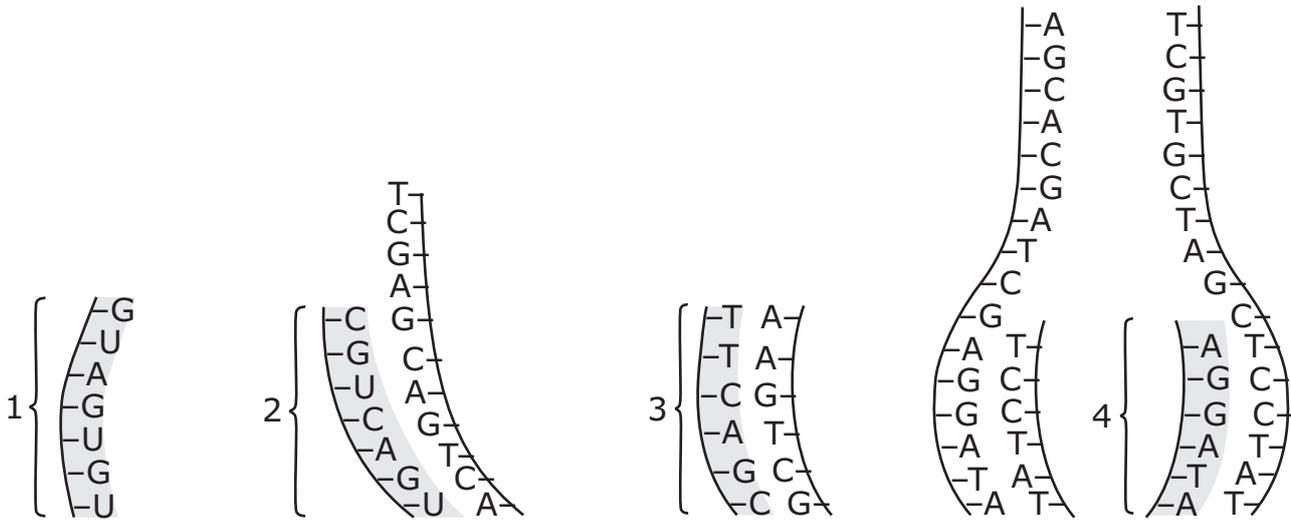
What additional information would he need to make the best comparison between the densities of the finch populations on the two islands?

- A the width of each island
  - B the area of each island
  - C the distance between the two islands
  - D the elevation of each island
- 2 Many different kinds of bacteria have unique adaptations that are useful to humans for producing certain kinds of medicines and foods. Recently, scientists have discovered bacteria that use nitrite for respiration. Scientists are now using these bacteria to consume one of the most common hazardous waste materials, ammonia ( $\text{NH}_3$ ).

Which condition most likely resulted in the adaptation that allows the bacteria to use nitrites for respiration?

- F an environment with little or no nitrogen
- G an environment with little or no oxygen
- H an environment with high levels of hydrogen
- J an environment with high levels of carbon dioxide

**3** The diagram below shows models of nucleic acids. A segment of each model is highlighted.



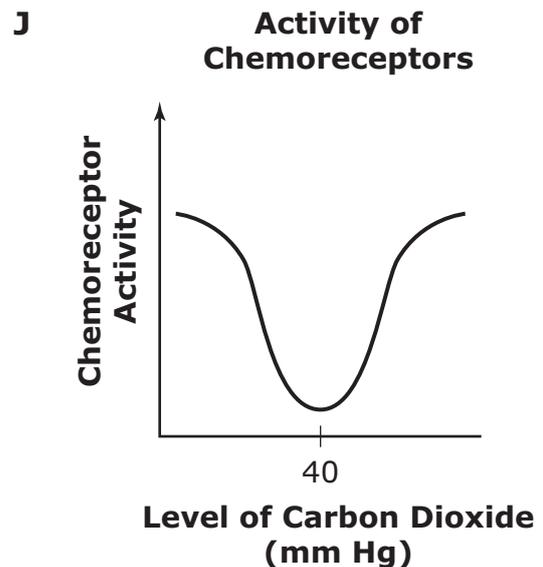
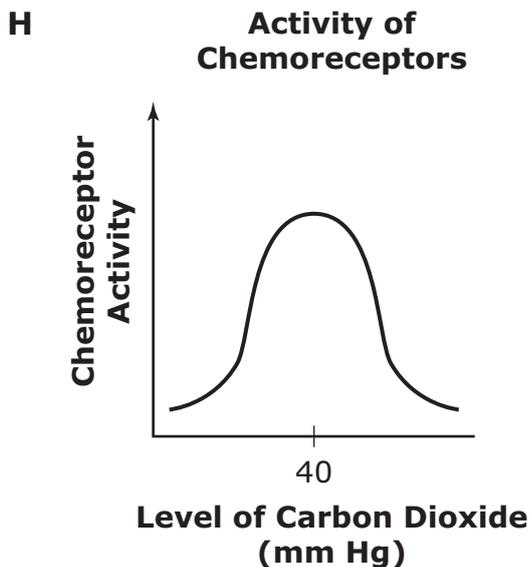
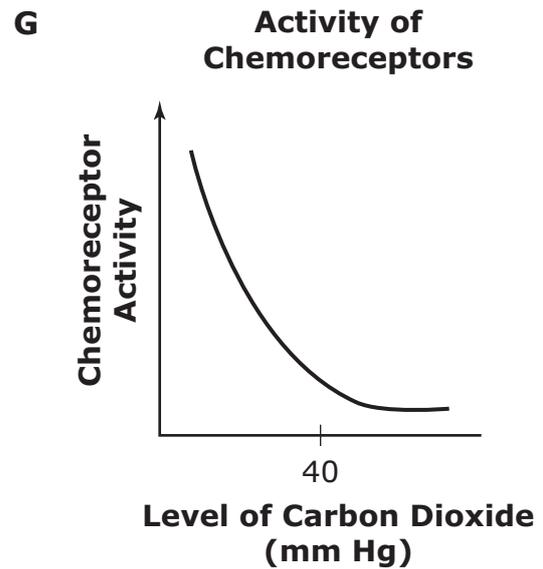
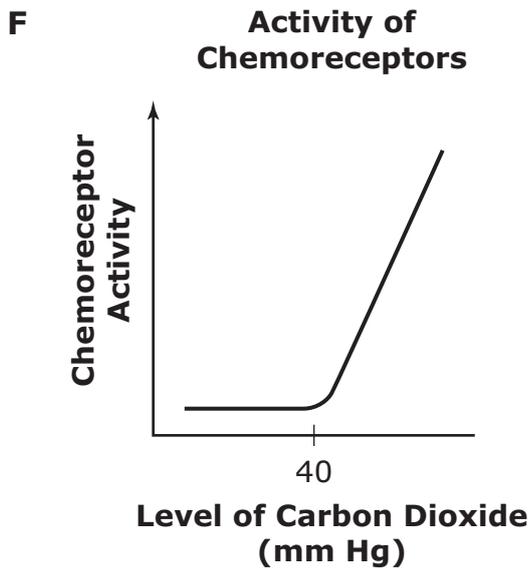
**Which two segments in the models only contain DNA?**

- A** 1 and 2
- B** 2 and 4
- C** 3 and 4
- D** 1 and 3

## Section 1

- 4 Cells known as chemoreceptors respond to changes in the carbon dioxide level of the blood. When these chemoreceptors are stimulated, they send impulses that increase breathing. The increased breathing lowers the blood's carbon dioxide level. The body typically functions best when the level of carbon dioxide is 40 mm Hg. When the chemoreceptors encounter carbon dioxide levels higher than this, they increase their activity.

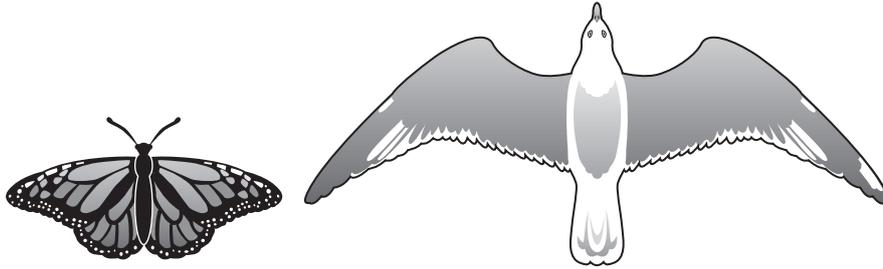
Which of these graphs best shows the relationship between level of carbon dioxide and chemoreceptor activity?





## Section 1

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**Which of these explains why butterflies and birds both have wings?**

- F** Both organisms hatch from eggs.
- G** They follow the same migratory routes.
- H** Butterflies and birds developed from a common ancestor.
- J** Both of their ancestors adapted to occupy similar environments.

- 7** Students are studying respiration in yeast. They pour a solution containing yeast into a flask and cover it with a balloon. The students hypothesize that if sugar is added to the solution, then the yeast will release energy and cause the balloon to expand.



**Which equipment should the students use to test their hypothesis and why?**

- A** a stopwatch for measuring the time it takes the balloon to expand as oxygen is produced
- B** a graduated cylinder for measuring the mass of carbon dioxide in the balloon
- C** a balance for measuring the mass of the balloon as it fills with oxygen
- D** a thermometer for measuring the change in temperature before and after the sugar is added to the yeast
- 8** In pea plants, the allele for round seeds ( $R$ ) is dominant to the allele for wrinkled seeds ( $r$ ). A gardener has two sets of parent plants, Set 1 and Set 2. The parents in Set 1 are heterozygous for this trait. In Set 2, one parent is homozygous dominant and the other is homozygous recessive.
- The gardener wants to produce only round seeds. Which statement describes a correct prediction to identify the parents he should use?**
- F** Set 1 because one out of four offspring will inherit two alleles for round seeds.
- G** Set 2 because none of the offspring will be homozygous for wrinkled seeds.
- H** Set 1 because each seed will have a 25% chance of being wrinkled.
- J** Set 2 because all of the offspring will be homozygous for round seeds.

## Section 1

**9** Which is the best method to study the structures that make up the tissue that transports water through a plant's stem?

- A** Separate the tissue from the plant stem with tweezers.
- B** Examine a cross section of the plant stem with a microscope.
- C** Examine a cross section of the plant stem with a magnifying glass.
- D** Boil the plant stem in a beaker of water to separate the tissue from the stem.

**10** All these practices improve laboratory safety except

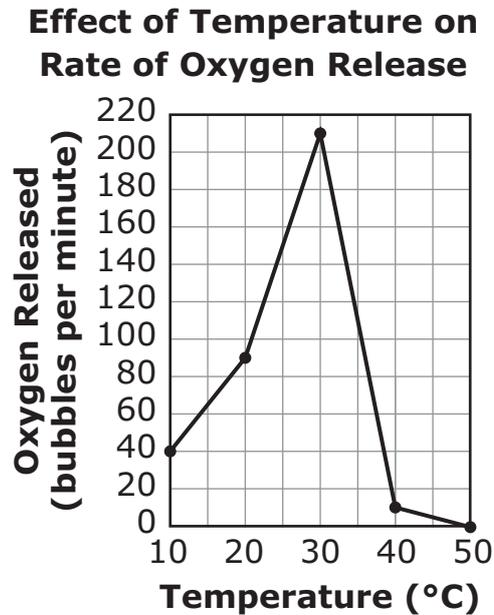
- F** labeling bottles.
- G** tying back long hair.
- H** wearing loose-fitting clothing.
- J** clearing workstation of unneeded materials.

**11** Certain cells have the ability to develop into one of several specialized cell types. Following an injury to the skin, these cells divide and specialize to heal the wound.

**Which structure do the dividing cells repair?**

- A** cell
- B** tissue
- C** organelle
- D** cytoplasm

- 12 Students in a science class are studying the effects of temperature on the aquatic plant *Elodea*. They count the number of oxygen bubbles released by an *Elodea* plant in a beaker of water heated to different temperatures.



Which statement best explains the results of the study?

- F As temperature increases, the rate of photosynthesis constantly increases.
- G As temperature increases, the rate of cellular respiration constantly increases.
- H The rate of photosynthesis increases with temperature up to 30°C and then decreases.
- J The rate of cellular respiration increases with temperature up to 30°C and then decreases.

## Section 1

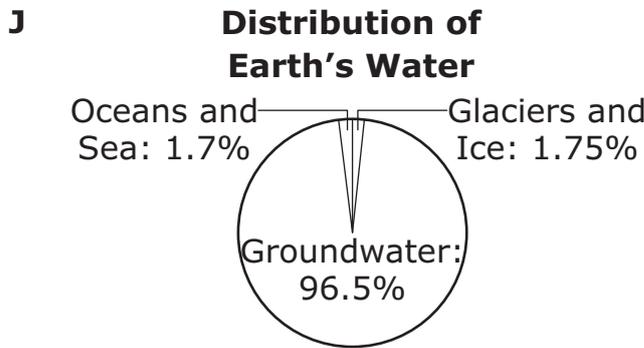
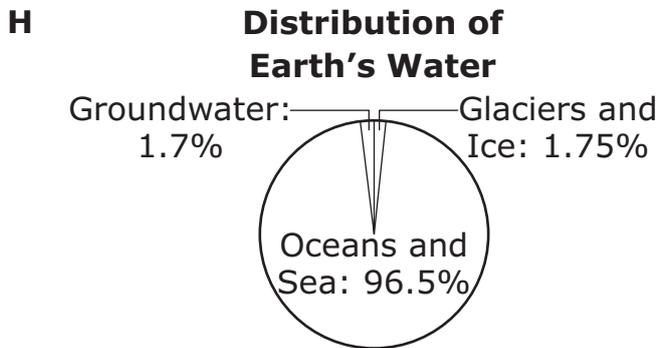
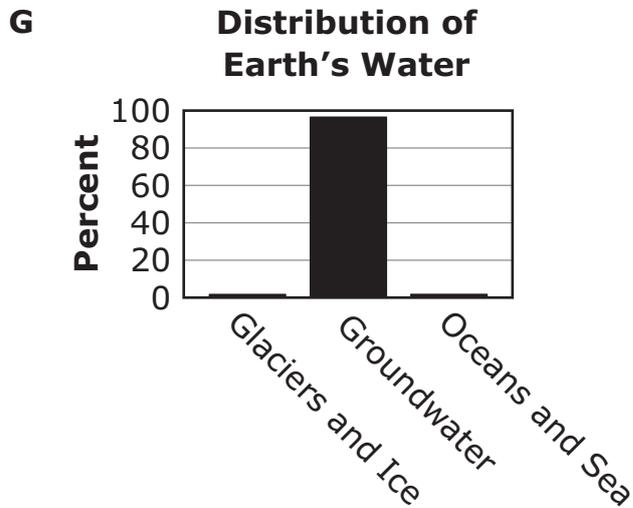
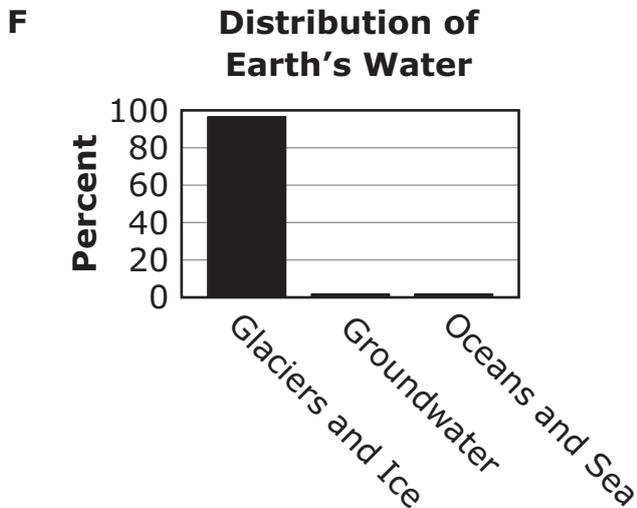
**13** A student hypothesized that algae was the limiting factor for snails in a fish tank. She counted the number of snails in the fish tank and then removed half of the algae. Two months later, she re-counted the number of snails and found no difference in the snail population.

Which additional step would be the best improvement for this investigation?

- A** Identify the type of algae she removed.
- B** Calculate the average number of snails.
- C** Repeat the experiment but remove all the snails from the fish tank.
- D** Remove algae throughout the two-month period to maintain the same amount.

**14** Researchers estimate that 96.5% of Earth’s water is in oceans and seas, 1.7% is groundwater, and 1.75% is in glaciers and ice caps.

Which graph correctly displays how water is distributed on Earth?



## Section 1

**15** Purebred sweet peas with red flowers are crossed with purebred sweet peas with white flowers; all of the offspring have pink flowers.

**Predict the phenotypic ratio of the offspring if two sweet peas with pink flowers are crossed.**

- A** 1:2:1
- B** 1:1:1
- C** 3:1
- D** 1:1

**16** A student runs out of time while performing an experiment. There is a beaker of boiling water on a hot plate.

**What should the student do before leaving the work area?**

- F** turn off the hot plate and place ice directly on the hot plate and inside the beaker
- G** turn off the hot plate, pick up the beaker with her hands, and move it to a cooler surface
- H** turn off the hot plate, pick up the beaker with her hands, and move the beaker to an ice bath
- J** turn off the hot plate, pick up the beaker with insulated gloves, and pour the hot water down the sink

**17** An energy pyramid for blue whales is depicted.



**If the phytoplankton produces 50,000,000 calories, how many calories will be available for the whales to receive?**

- A** 500,000
- B** 5,000,000
- C** 50,000,000
- D** 5,000,000,000

**18** An energy pyramid consists of three trophic levels. The carnivores in the top trophic level require 5,000 calories per day.

**How many calories per day do the producers need to provide for the carnivores to reach their requirement?**

- F** 50
- G** 5,000
- H** 50,000
- J** 500,000

## Section 1

- 19 The structures of some large birds are homologous to structures in dinosaurs. Scientists have hypothesized that the densities of the animals would be approximately equal.

Approximate Density of Turkey ( $\text{g}/\text{cm}^3$ )	Estimated Volume of <i>Velociraptor</i> ( $\text{cm}^3$ )
0.99	15,000

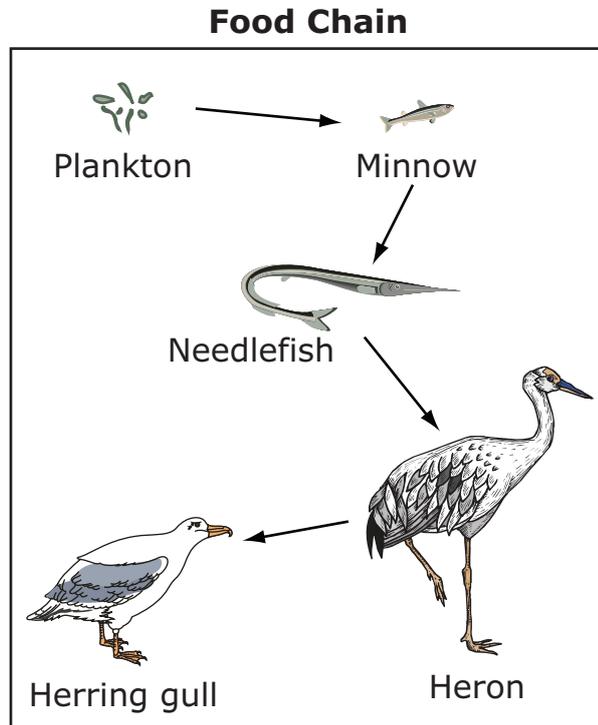
$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Which measurement is the best estimated mass of the *Velociraptor*?

- A 65 kilograms
- B 30 kilograms
- C 15 kilograms
- D 7 kilograms

- 20 Natural and artificial materials cycle through the biosphere. DDT was an artificial material used to control insects such as gnats and mosquitoes. The table shows the amount of DDT in the fat of different animals in a study of a coastal ecosystem.

Organism	Concentration of DDT (parts per million)
Plankton	0.04
Minnow	0.58
Needlefish	2.07
Heron	3.57
Herring gull	6.00

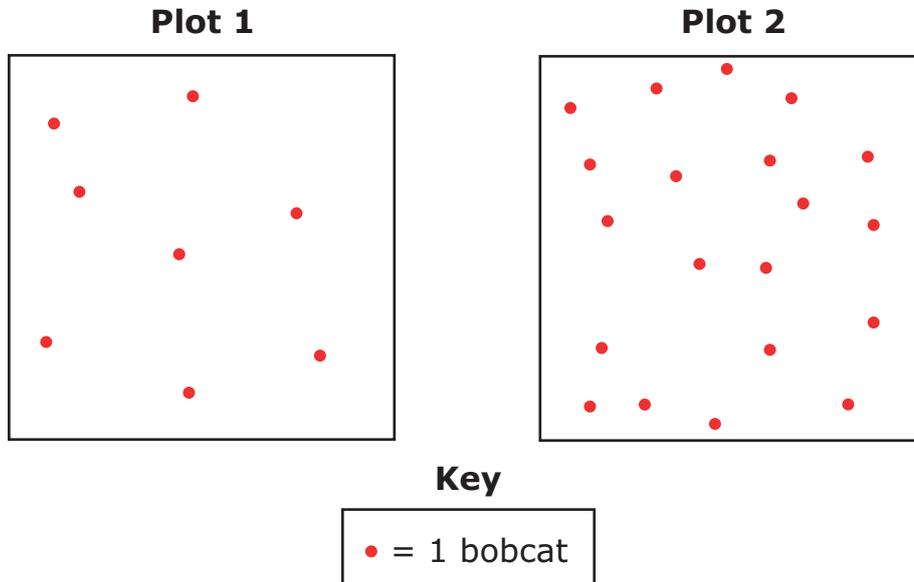


Which percentage is the approximate increase in DDT concentration between the needlefish and the heron?

- F 0.58%
- G 1.7%
- H 72%
- J 170%

## Section 1

- 21** A scientist determined that the carrying capacity of bobcats in a forest is 1 bobcat for every 12 square kilometers. The scientist studied two 100-square-kilometer forests that have bobcats. The bobcat population in Plot 1 is at carrying capacity, while the bobcat population in Plot 2 exceeds carrying capacity.



**By approximately how much does the bobcat population in Plot 2 exceed the carrying capacity?**

- A** 40%
- B** 120%
- C** 140%
- D** 150%

**STOP**

**END OF SECTION 1**





