MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

Release of February 2015 MCAS Biology Test Items

March 2015
Massachusetts Department of Elementary and Secondary Education

This document was prepared by the
Massachusetts Department of Elementary and Secondary Education
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Commissioner

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Commissioner's Foreword

Dear Colleagues:

The Massachusetts Department of Elementary and Secondary Education is committed to working in partnership with schools to support a system that will prepare all students to succeed as productive and contributing members of our democratic society and the global economy. To assist in achieving this goal, the Department regularly releases Massachusetts Comprehensive Assessment System (MCAS) test items to provide information about the kinds of knowledge and skills that students are expected to demonstrate. This publication contains all MCAS February Biology items on which student scores are based.

The Department has banked thousands of MCAS items that are currently posted on the Department website. These items, which are available at www.doe.mass.edu/mcas/testitems.html, will continue to be a rich resource for schools.

This publication is available only on the Department website. The test items can be printed from this site. I encourage educators to use the relevant sections of this document together with their test item analysis reports as guides for planning changes in curriculum and instruction that may be needed to support schools and districts in their efforts to improve student performance.

Thank you for your support as we work together to strengthen education for our students in Massachusetts.

Sincerely,

Mitchell D. Chester, Ed.D.
Commissioner of Elementary and Secondary Education

I. Document Purpose and Structure

Document Purpose and Structure

Purpose

The purpose of this document is to share with educators and the public the February 2015 MCAS Biology test items on which student results are based. Local educators will be able to use this information to identify strengths and weaknesses in their curriculum and to plan instruction to more effectively meet their students' individual needs.

This document is also intended to be used by school and district personnel as a companion document to test item analysis reports. The reports list, for the school accessing the report, the names of all enrolled students who took the February 2015 Biology test as well as information about how each student answered each common test item contained in this document. The reports also label each item as multiple-choice or open-response and identify the item's MCAS reporting category. Item numbers in this document correlate directly to the item numbers in the test item analysis reports.

Structure

Chapter II of this document contains information for the February 2015 Biology test and has three main sections. The **first section** introduces the chapter by listing the Massachusetts curriculum framework content strands assessed by the Biology MCAS test. These content strands are identical to the MCAS reporting categories under which test results are reported to schools and districts. The first section also provides the Web address for the *Science and Technology/Engineering Curriculum Framework* and the page numbers on which the learning standards assessed by the test items in the chapter can be found. In addition, there is a brief overview of the test (number of test sessions, types of items, and reference materials allowed).

The **second section** contains the test items used to generate February 2015 MCAS student results for Biology. The test items in this document are shown in the same order and basic format in which they were presented in the test booklet.

The **final section** of the chapter is a table that cross-references each item with its MCAS reporting category and with the *Framework* standard it assesses. Correct answers to multiple-choice questions are also listed in the table.

Materials presented in this document are **not** formatted **exactly** as they appeared in student test booklets. For example, in order to present items most efficiently in this document, the following modifications have been made:

- Some fonts and/or font sizes may have been changed and/or reduced.
- Some graphics may have been reduced in size from their appearance in student test booklets; however, they maintain the same proportions in each case.
- All references to page numbers in answer booklets have been deleted from the directions that accompany test items.

II. February 2015 Biology Test

February 2015 Biology Test

The February 2015 high school MCAS Biology test was based on learning standards in the Biology content strand of the Massachusetts *Science and Technology/Engineering Curriculum Framework* (2006). These learning standards appear on pages 54–58 of the *Framework*, which is available on the Department website at www.doe.mass.edu/frameworks/current.html.

Biology test results are reported under the following five MCAS reporting categories:

- Biochemistry and Cell Biology
- Genetics
- Anatomy and Physiology
- Ecology
- Evolution and Biodiversity

The table at the conclusion of this chapter indicates each item's reporting category and the framework learning standard it assesses. The correct answers for multiple-choice questions are also displayed in the table.

Test Sessions

The MCAS high school Biology test included two separate test sessions, which were administered on consecutive days. Each session included multiple-choice and open-response items.

Reference Materials and Tools

The high school Biology test was designed to be taken without the aid of a calculator. Students were allowed to have calculators with them during testing, but calculators were not needed to answer questions.

During both Biology test sessions, the use of bilingual word-to-word dictionaries was allowed for current and former English language learner students only. No other reference materials were allowed.

Biology
Session 1

DIRECTIONS

This session contains twenty-one multiple-choice questions and two open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet. You may work out solutions to multiple-choice questions in the test booklet.

1 Which of the following statements provides the **best** scientific evidence that chimpanzees and rhesus monkeys come from a common ancestor?

A. They live in similar habitats.

B. They exhibit similar behaviors.

C. They have similar nutritional needs.

D. They have similar genetic sequences.

2 Pompeii worms, *Alvinella pompejana*, live in tubes along hydrothermal vents on the sea floor. The worms are covered by a layer of bacteria. Scientists have discovered that the bacteria insulate the worms from the extreme heat of the vents, and the worms secrete mucus from glands on their backs to feed the bacteria.

Which of the following terms **best** applies to the relationship between the Pompeii worms and the bacteria?

A. competition

B. mutualism

C. parasitism

D. predation

3 Laboratory tests can be used to evaluate how well a person's liver is working. One test measures how well the liver removes a substance called bilirubin from the blood.

Based on this information, which of the following describes bilirubin?

A. an antibody

B. an energy source

C. a vitamin

D. a waste product

4 Which of the following conditions is **most likely** to lead to an increase in a field mouse population?

A. the arrival of another herbivorous mammal

B. the presence of a greater number of predator snakes

C. the disappearance of a bird species that preys on the mouse

D. the lack of adequate rainfall for plants in the mouse's habitat

5 Fossil evidence shows that ancient aquatic reptiles called ichthyosaurs looked very similar to modern dolphins. However, ichthyosaurs and dolphins are not closely related animals.

Which of the following statements **best** explains the similar appearance of ichthyosaurs and dolphins?

A. Dolphins reproduce using gametes, and so did ichthyosaurs.

B. Dolphins are eukaryotic organisms, and so were ichthyosaurs.

C. Dolphins have the same number of chromosomes that ichthyosaurs had.

D. Dolphins are adapted to the same types of environments that ichthyosaurs lived in.

6 Which of the following substances is used by plants as a reactant in photosynthesis?

A. carbon dioxide

B. glucose

C. oxygen

D. pyruvic acid

7 A small portion of an mRNA sequence is shown below.

AAUGACUGGCUC

Starting with the first base, how many codons does this portion of the sequence contain?

A. 1

B. 4

C. 6

D. 12

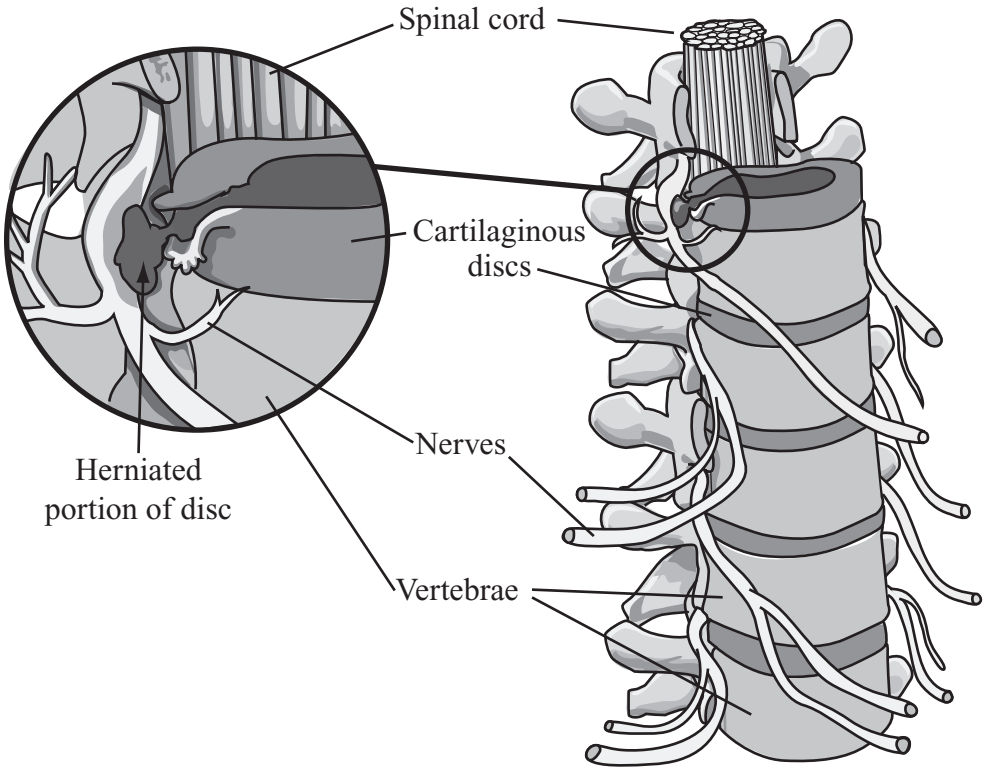
The following section focuses on enzymes called MMPs.

Read the information below and use it to answer the four multiple-choice questions and one open-response question that follow.

Many cells in the human body release enzymes, such as MMPs, into the spaces between cells. MMPs maintain and repair parts of the body by breaking down collagen or other structural compounds.

Several health problems have been linked to MMP activity in humans. One example is a herniated (ruptured) disc. There are cartilaginous discs between each of the vertebrae of the spine. If the concentration of MMPs released into a disc becomes too high, then the MMPs begin to break apart the structural compounds of the disc. As a result, the disc becomes weak and ruptures.

The diagram below shows a herniated disc in the human spine. Material from inside the disc has spread out from between the vertebrae and is applying pressure to the nerves and surrounding tissues.



Mark your answers to multiple-choice questions 8 through 11 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

8 The vertebrae and cartilaginous discs of the spine are parts of which body system?

A. circulatory system
B. excretory system
C. muscular system
D. skeletal system

9 There are many different types of MMP enzymes in the human body. The production of each type of MMP enzyme is determined by which of the following?

A. carbohydrates
B. fatty acids
C. neurotransmitters
D. nucleotide sequences

10 Which of the following statements describes the role of MMPs in the process of breaking down collagen?

A. They increase the rate of the process.
B. They regenerate ATP for the process.
C. They increase the temperature of the process.
D. They transport reactants needed for the process.

11 Which two elements are primary components of an MMP molecule?

A. potassium and iron
B. nitrogen and oxygen
C. aluminum and calcium
D. magnesium and chlorine

Question 12 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 12 in the space provided in your Student Answer Booklet.

12 The diagram of the human spine shows the locations of cartilaginous discs and vertebrae.

a. Identify **one** function of the cartilaginous discs in a healthy human spine.

b. Identify **one** function of the vertebrae besides protecting the spinal cord.

A herniated disc is a serious injury because it often presses on the spinal cord.

c. Describe the main function of the spinal cord.

d. Identify one likely symptom caused by a herniated disc **and** explain why the herniated disc causes the symptom you identified.

Mark your answers to multiple-choice questions 13 through 22 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

13 A population of flat-tailed horned lizards was found in a geographically isolated area. In 2002, the size of the population was about 25,500. In 2004, the size of the population was about 32,800.

Which of the following statements explains the change in the size of the lizard population from 2002 to 2004?

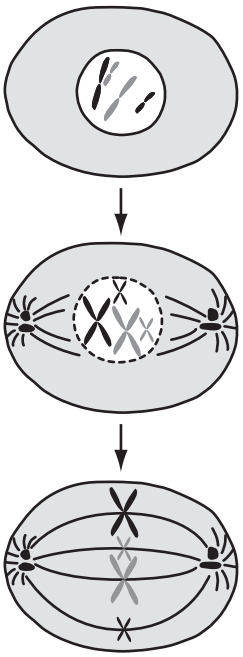
A. The birth rate was greater than the death rate.

B. The emigration rate was greater than the birth rate.

C. The death rate was greater than the immigration rate.

D. The emigration rate was greater than the immigration rate.

14 The diagram below shows part of a cell process.



Which of the following describes the expected end products of this process?

A. two cells that are genetically identical to the parent cell

B. four cells that are genetically identical to the parent cell

C. six cells with twice as many chromosomes as the parent cell

D. eight cells with one-fourth as many chromosomes as the parent cell

15 Millions of years ago, seawater flooded part of the Mississippi River Valley. Scientists have concluded that chorus frogs were affected by the flooding. The flooded areas formed geographic barriers between chorus frog populations for millions of years.

Which of the following **most likely** occurred as a result of the seawater flooding?

A. The frogs lost the tadpole stage of their life cycle.

B. Isolated populations of frogs became separate species.

C. The frogs' eggs were fertilized by sperm of marine species.

D. Frog populations were protected from all the predators in their areas.

16 Which of the following always require the cellular machinery of a host cell in order to reproduce?

A. algae

B. ticks

C. viruses

D. yeasts

17 Which of the following statements **best** describes the genetic makeup of twins that develop when one fertilized egg splits and two embryos form?

A. One twin has chromosomes only from the mother, and the other twin has chromosomes only from the father.

B. The percentage of chromosomes from the mother and the percentage from the father are randomly split between the twins.

C. Both twins receive half their chromosomes from the mother and half from the father, and the chromosomes received by each twin are the same.

D. Both twins receive half their chromosomes from the mother and half from the father, but the chromosomes received by each twin are different.

18 In 1915, a disease killed almost all the oysters in a Canadian bay. The few oysters that survived reestablished the population. By 1940, the disease-causing organism was still present in the bay, but the size of the oyster population was greater than it was before 1915.

Which of the following statements describes what **most likely** occurred in the oyster population between 1915 and 1940?

A. The oysters that survived in 1915 bred with other species, so the offspring could not be infected by the disease anymore.

B. The oysters that survived in 1915 had offspring that learned to fight the disease, so disease rates in the oyster population were lower.

C. The oysters that survived in 1915 had resistance to the disease, so the proportion of resistant oysters in the population increased by natural selection.

D. The oysters that survived in 1915 mutated to reproduce more quickly, so the reproductive rate exceeded the disease rate in the oyster population.

19 In dogs, the allele for curly hair (**H**) is dominant to the allele for straight hair (**h**). A curly-haired male dog is crossed with a curly-haired female dog. Four of their six puppies have curly hair.

Which of the following Punnett squares represents this cross?

A.

	H	**h**
H	HH	Hh
h	Hh	hh

B.

	H	**h**
h	Hh	hh
h	Hh	hh

C.

	H	**H**
H	HH	HH
H	HH	HH

D.

	H	**H**
H	HH	HH
h	Hh	Hh

20 Cytochrome c is a protein needed for aerobic cellular respiration. It is found in nearly all organisms. The amino acid sequence of cytochrome c can be different in different organisms. The table below shows the number of differences observed when the amino acid sequences of cytochrome c in different organisms are compared.

Organisms	Number of Differences between Amino Acid Sequences
horses and whales	5
chickens and snakes	18
silk moths and snakes	29
whales and penguins	10

Which of the following conclusions is **best** supported by this data?

A. Snakes are more closely related to silk moths than to chickens.

B. Chickens and snakes evolved more recently than horses or whales.

C. Whales and penguins evolved more recently than any of the other organisms.

D. Horses and whales are more closely related to each other than the other pairs of organisms are.

21 Plant species such as the sesame plant and the coconut palm have large amounts of lipids in their seeds. Which of the following is the most likely function of these lipids?

A. to store energy for the seedlings

B. to absorb water for the seedlings

C. to encode most of the genetic information in the seedlings

D. to speed up most of the chemical reactions in the seedlings

22 A DNA sequence is shown below.

TAGGAGCAT

What is produced when the sequence is transcribed?

A. a chain of three amino acids

B. a set of three tRNA molecules

C. a section of DNA with the base sequence **ATCCTCGTA**

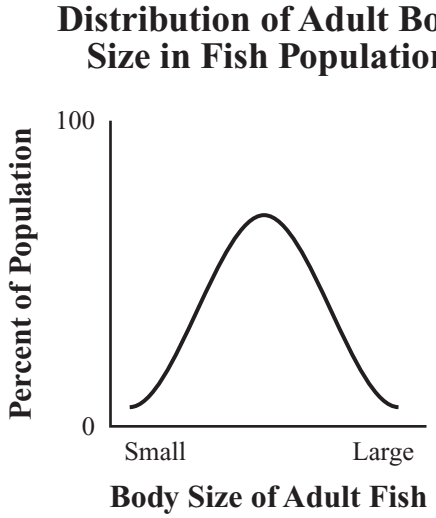
D. a section of mRNA with the base sequence **AUCCUCGUA**

Question 23 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 23 in the space provided in your Student Answer Booklet.

23 The graph below shows a normal distribution for adult body size in a population of a particular species of fish.



Suppose commercial fishers begin using nets that selectively catch larger fish of this species. They continue using these kinds of nets for many years.

a. Describe how the size distribution of adult fish in the population would most likely change over time.

b. Explain, in detail, how natural selection would produce the change you described in part (a).

c. Even if the use of nets that selectively catch larger fish were stopped, some biologists believe that the size distribution in the fish population would not return to normal. Explain why.

Biology
SESSION 2

DIRECTIONS

This session contains nineteen multiple-choice questions and three open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet. You may work out solutions to multiple-choice questions in the test booklet.

24 In some areas, nuts from trees are an important source of food for grizzly bears. Female bears eat the nuts to gain weight before they give birth to their cubs.

Based on this information, which of the following would **most likely** decrease the size of grizzly bear populations?

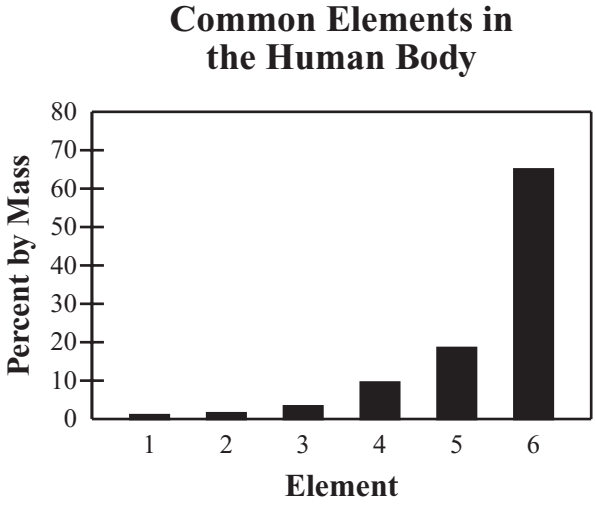
A. insect pests attacking the trees

B. birds building nests in the trees

C. climate conditions spreading tree pollen

D. soil conditions causing rapid tree growth

25 The graph below shows the percent by mass of six common elements in the human body.



What are elements 5 and 6?

A. zinc and sulfur

B. sodium and iron

C. carbon and oxygen

D. chlorine and phosphorus

26 A mouse population lives in an area with tan-colored soil. The number of mice with tan coats and the number of mice with dark gray coats were about equal at one time. Five years later, the number of mice with tan coats was significantly greater than the number of mice with dark gray coats.

Which of the following events **most likely** caused the changes in the coat color distribution in the population?

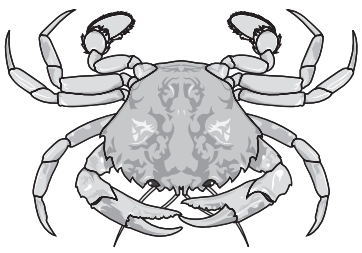
A. the immigration of a new rodent species

B. an increase in the birth rate for the mouse population

C. an increase in the amount of leaf litter decomposed in the soil

D. the introduction of a predatory bird that finds its prey by sight

27 The illustrations below show a crab and a barnacle.



Crab

Barnacle

Which of the following observations would **best** support the conclusion that crabs and barnacles have a common ancestor?

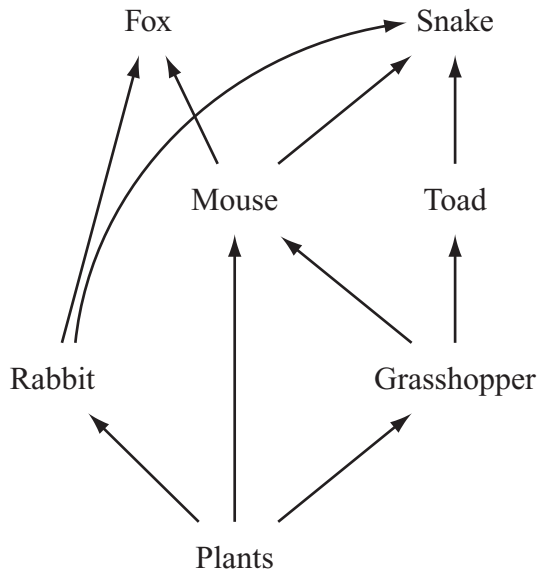
A. Crabs and barnacles are found in the same habitats.

B. Fossils of some crabs and barnacles are found in the same rock layers.

C. Crabs and barnacles look very similar in their early developmental stages.

D. Predators of crabs and barnacles use similar adaptations to break the animals' exoskeletons.

28 The diagram below shows a partial food web.



Based on the food web, which of the organisms acts as both a primary consumer and a secondary consumer?

A. fox
B. mouse
C. rabbit
D. toad

29 Mutations occur in part of a DNA sequence. The DNA sequence before and after the mutations is shown below.

Before mutations: **A T G G C G G A A G C A**

After mutations: **A T G C G G G A A G G A**

A strand of mRNA is made from the mutated DNA sequence. The table below shows the amino acids encoded by some mRNA base sequences (codons).

AUG Met	**GCA** Ala
CCU Pro	**GCC** Ala
CGC Arg	**GCG** Ala
CGG Arg	**GGA** Gly
CGU Arg	**UAC** Tyr
CUU Leu	**UAG** Stop
GAA Glu	

Based on this information, what is the expected effect of the mutations?

A. No polypeptide will be made.
B. The same polypeptide will be made.
C. A polypeptide with fewer amino acids will be made.
D. A polypeptide with different amino acids will be made.

30 The concentration of which gas is higher in exhaled air than in inhaled air?

A. carbon dioxide

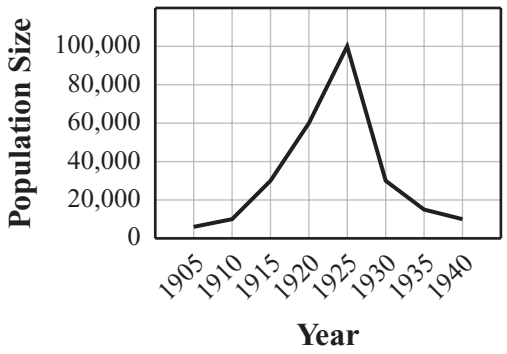
B. helium

C. nitrogen

D. oxygen

31 The graph below shows changes in the size of a mammal population in the early 1900s.

Mammal Population Size, 1905–1940



Which of the following explanations is the **most likely** reason for the dramatic population change between 1915 and 1925?

A. a decrease in the birth rate of the mammal population

B. an increase in the death rate of the mammal population

C. a large decrease in the number of the mammal's predators

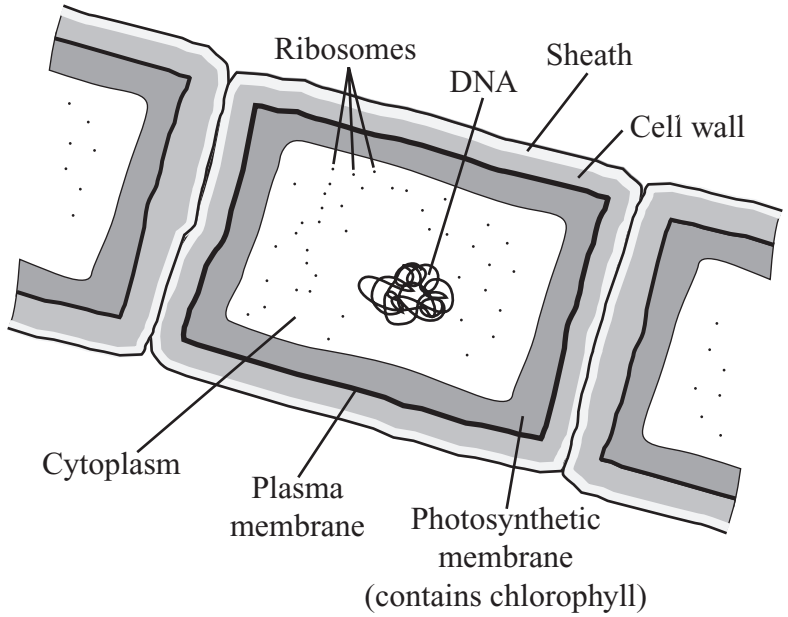
D. a large increase in snowfall for several months in the mammal's habitat

Question 32 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 32 in the space provided in your Student Answer Booklet.

32 Cyanobacteria are prokaryotic organisms commonly found in streams and ponds as chains of cells. A portion of a chain of cyanobacteria cells is shown in the diagram below. The major parts of a cyanobacteria cell are labeled.



a. Identify **one** structural characteristic of a cyanobacteria cell that is similar to a characteristic of a plant cell.

b. Identify **two** structural characteristics of a cyanobacteria cell that are different from the characteristics of a plant cell.

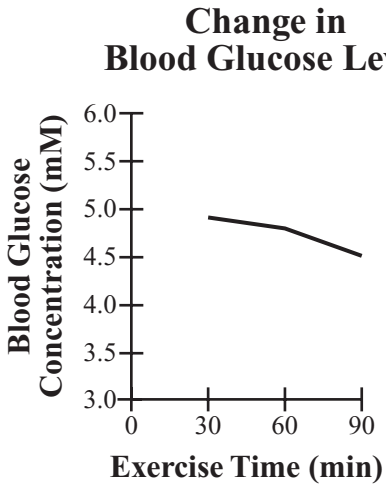
c. Identify **and** describe the most likely process of reproduction in cyanobacteria. In your description, be sure to include what happens to the genetic material and the cell.

Mark your answers to multiple-choice questions 33 through 43 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

33 Which molecule typically has a double helix shape?

A. cellulose
B. DNA
C. glucose
D. tRNA

34 The graph below shows the change in blood glucose level during prolonged exercise.



Which of the following statements explains the change in blood glucose level shown in the graph?

A. Glucose was broken down to produce ATP for energy.
B. Glucose diffused from muscle cells into the bloodstream.
C. Proteins combined with glucose to produce ADP for energy.
D. Polysaccharides were made from glucose in metabolic pathways.

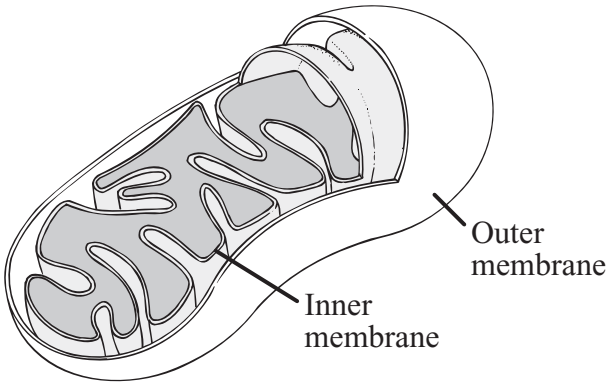
35 A mutation in which of the following types of cells could be passed on from parent to offspring?

A. blood cell
B. bone cell
C. gamete
D. neuron

36 Which of the following statements describes a role of plants in the water cycle?

A. Plants release water from their roots into the soil.
B. Plants transfer water to bacteria during nitrogen fixation.
C. Plants release water vapor into the atmosphere during transpiration.
D. Plants convert water vapor into carbon dioxide during photosynthesis.

37 A mitochondrion has two membranes. The inner membrane is highly folded, as shown in the diagram below.



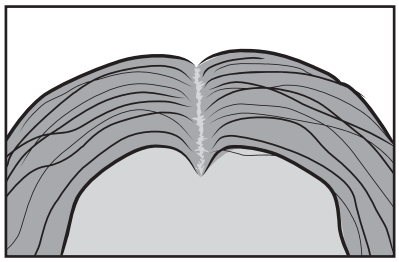
The folds greatly increase the membrane's surface area. This improves the ability of the mitochondrion to do which of the following?

A. move the cell through water
B. digest metabolic wastes in the organelle
C. convert solar energy to chemical energy
D. produce ATP during cellular respiration

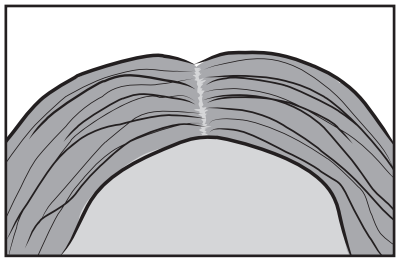
38 Which of the following is one way that energy flows in an ecosystem?

A. from producer to producer
B. from carnivore to producer
C. from herbivore to carnivore
D. from herbivore to herbivore

39 The pictures below show two types of hairlines that children can inherit from their parents.



Widow's peak hairline



Straight hairline

The allele for a widow's peak hairline (**W**) is dominant, and the allele for a straight hairline (**w**) is recessive. If both parents are heterozygous (**Ww**) for this trait, what is the probability that their child will have a straight hairline?

A. 0%

B. 25%

C. 50%

D. 75%

40 Northern water snakes in the Lake Erie region of North America live on the shores of the lake and on islands in the lake. Natural selection favors a banded pattern in mainland populations and an unbanded pattern in island populations. Despite these different selection pressures on the snake populations, the snakes remain a single species.

Which of the following statements describes the **most likely** reason the northern water snakes have remained a single species?

A. The same predators feed on mainland and island snake populations.

B. Gene flow occurs between mainland and island snake populations.

C. Mainland and island snake populations hibernate together in the winter.

D. Young snakes are born at the same time each year in mainland and island snake populations.

41 Sucrase speeds up the breakdown of sucrose into glucose and fructose. Sucrase is an example of which of the following types of molecules?

A. disaccharide
B. enzyme
C. hormone
D. nucleic acid

42 An egg cell in a gorilla contains 24 chromosomes. When the egg cell is fertilized, which of the following occurs?

A. The 24 original chromosomes replicate, resulting in 48 chromosomes in the fertilized egg.
B. The 24 original chromosomes split at the centromere, resulting in 48 chromosomes in the fertilized egg.
C. The nucleus of a sperm cell fuses with the nucleus of the original egg cell, resulting in 48 chromosomes in the fertilized egg.
D. The nucleus of another egg cell pairs with the nucleus of the original egg cell, resulting in 48 chromosomes in the fertilized egg.

43 Damage to neurons **directly** interferes with which of the following processes?

A. delivery of glucose to cells
B. filtering of wastes from blood
C. transmission of nerve impulses
D. exchange of oxygen and carbon dioxide

Questions 44 and 45 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 44 in the space provided in your Student Answer Booklet.

44 Honeycreepers are birds found only on the Hawaiian Islands. Mosquitoes are not native to the Hawaiian Islands. When mosquitoes were introduced to the islands, they transmitted deadly diseases to the honeycreepers. As a result, honeycreepers suffered large population declines, and some species became extinct.

Mosquitoes thrive in warm, wet environments. Honeycreepers can live in warmer lowlands or cooler mountain regions on the islands.

a. Compare the expected mosquito birth rates in the lowlands with the rates in the mountain regions. Explain your answer.

b. Compare the expected honeycreeper death rates in the lowlands with the rates in the mountain regions. Explain your answer.

c. Predict how an increase in average temperature would most likely affect honeycreeper populations in the lowlands **and** honeycreeper populations in the mountain regions. Explain your answer.

Write your answer to question 45 in the space provided in your Student Answer Booklet.

45 North American wolves can have gray fur or black fur. A single gene with two alleles codes for fur color. Information about the fur color of parents and offspring in four wolf families is shown below.

Family	Parent Phenotype Cross	Phenotype Ratio in Offspring
1	gray fur × black fur	3 gray fur : 2 black fur
2	gray fur × black fur	0 gray fur : 5 black fur
3	black fur × black fur	1 gray fur : 3 black fur
4	gray fur × gray fur	4 gray fur : 0 black fur

a. Identify the most likely inheritance pattern (dominant-recessive, incomplete dominance, codominance, sex-linked, polygenic, multiple alleles) for fur color in wolves.

b. Explain how the information about family 3 supports the inheritance pattern you identified in part (a).

In both family 1 and family 2, one parent wolf has gray fur and one parent wolf has black fur. The phenotype ratio in the offspring is very different in the two families, however.

c. Using the allele symbols **N** and **n**, identify the most likely genotypes of the parent wolves in family 1 **and** the most likely genotypes of the parent wolves in family 2. Be sure to identify which genotype is for the parent with gray fur and which genotype is for the parent with black fur in **each** family.

d. Draw **two** Punnett squares to support your answer to part (c).

Biology
February 2015 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC)
1	5	*Evolution and Biodiversity*	5.1	D
2	5	*Ecology*	6.3	B
3	5	*Anatomy and Physiology*	4.2	D
4	5	*Ecology*	6.1	C
5	6	*Evolution and Biodiversity*	5.1	D
6	6	*Biochemistry and Cell Biology*	2.4	A
7	6	*Genetics*	3.2	B
8	8	*Anatomy and Physiology*	4.5	D
9	8	*Genetics*	3.2	D
10	8	*Biochemistry and Cell Biology*	1.3	A
11	8	*Biochemistry and Cell Biology*	1.1	B
12	9	*Anatomy and Physiology*	4.5	
13	10	*Ecology*	6.1	A
14	10	*Biochemistry and Cell Biology*	2.6	A
15	11	*Evolution and Biodiversity*	5.2	B
16	11	*Biochemistry and Cell Biology*	2.8	C
17	11	*Anatomy and Physiology*	4.6	C
18	12	*Evolution and Biodiversity*	5.3	C
19	12	*Genetics*	3.6	A
20	13	*Evolution and Biodiversity*	5.1	D
21	13	*Biochemistry and Cell Biology*	1.2	A
22	13	*Genetics*	3.2	D
23	14	*Evolution and Biodiversity*	5.3	
24	15	*Ecology*	6.2	A
25	15	*Biochemistry and Cell Biology*	1.1	C
26	16	*Evolution and Biodiversity*	5.3	D
27	16	*Evolution and Biodiversity*	5.1	C
28	17	*Ecology*	6.3	B
29	17	*Genetics*	3.3	D
30	18	*Anatomy and Physiology*	4.3	A
31	18	*Ecology*	6.2	C
32	19	*Biochemistry and Cell Biology*	2.2	
33	20	*Genetics*	3.1	B
34	20	*Biochemistry and Cell Biology*	2.5	A
35	21	*Genetics*	3.3	C
36	21	*Ecology*	6.4	C
37	21	*Biochemistry and Cell Biology*	2.1	D
38	21	*Ecology*	6.3	C
39	22	*Genetics*	3.6	B
40	22	*Evolution and Biodiversity*	5.2	B
41	23	*Biochemistry and Cell Biology*	1.3	B
42	23	*Biochemistry and Cell Biology*	2.7	C
43	23	*Anatomy and Physiology*	4.4	C
44	24	*Ecology*	6.2	
45	25	*Genetics*	3.4	

* Answers are provided here for multiple-choice items only.