

Student Name _____

Teacher Name _____

School _____

System _____

BIOLOGY I

PRACTICE TEST

Tennessee End of Course Assessment
Biology I



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Introduction to Biology I

Content of tests

The testing program titled the *Tennessee End of Course Assessment* was established to meet the Tennessee mandate for end of course assessments in Tennessee secondary schools. These tests measure the Tennessee State Performance Indicators. Subject areas covered by the end of course assessments include Mathematics, Language Arts, History, and Science.

Test development

For the *Tennessee End of Course Assessment*, professional item writers experienced in each of the content areas researched and wrote the items. Professional editors and test developers carefully reviewed all items and test directions for content and accuracy. To provide a large pool of items for final test selection, the test developers created approximately 50% more items as were needed in the final editions of the tests.

After items were field tested, student responses were analyzed. Professional content editors and researchers carefully reviewed items, their data, and test directions for content, suitability, and accuracy before including certain items and test directions in operational tests.

Test administration

Tennessee End of Course Assessments are given to students as they are completing courses that are included in the program. Tests may be given midyear for block schedules or at the end of the school year.

Each test contains 65 multiple-choice questions.

You will have ample time to read and answer each of the questions. The Biology I test has been designed to be administered in one session and is not timed. The first 15 minutes are set aside to complete identifying data on the answer sheet.

Tips for Taking the Test

Preparing for the test

- Take this Practice Test several times.
- Review the Tennessee End of Course Item Sampler for Biology I located at http://tennessee.gov/education/assessment/sec_samplers.shtml on the Tennessee Department of Education Web site.
- Become familiar with the correct way to mark answers on the answer sheet. There is a sample answer sheet in this Practice Test.

Before the test

- Get a good night's sleep. To do your best, you need to be rested.

During the test

- Relax. It is normal to be somewhat nervous before the test. Try to relax and not worry.
- Listen. Listen to and read the test directions carefully. Ask for an explanation of the directions if you do not understand them.
- Plan your time. Do not spend too much time on any one question. If a question seems to take too long, skip it and return to it later. First answer all questions that you are sure about.
- Think. If you are not sure how to answer a question, read it again and try your best to answer the question. Rule out answer choices that you know are incorrect and choose from those that remain.

Answer Sheet for the Practice Test

1 (A)(B)(C)(D)	14 (F)(G)(H)(J)	27 (A)(B)(C)(D)	40 (F)(G)(H)(J)	53 (A)(B)(C)(D)
2 (F)(G)(H)(J)	15 (A)(B)(C)(D)	28 (F)(G)(H)(J)	41 (A)(B)(C)(D)	54 (F)(G)(H)(J)
3 (A)(B)(C)(D)	16 (F)(G)(H)(J)	29 (A)(B)(C)(D)	42 (F)(G)(H)(J)	55 (A)(B)(C)(D)
4 (F)(G)(H)(J)	17 (A)(B)(C)(D)	30 (F)(G)(H)(J)	43 (A)(B)(C)(D)	56 (F)(G)(H)(J)
5 (A)(B)(C)(D)	18 (F)(G)(H)(J)	31 (A)(B)(C)(D)	44 (F)(G)(H)(J)	57 (A)(B)(C)(D)
6 (F)(G)(H)(J)	19 (A)(B)(C)(D)	32 (F)(G)(H)(J)	45 (A)(B)(C)(D)	58 (F)(G)(H)(J)
7 (A)(B)(C)(D)	20 (F)(G)(H)(J)	33 (A)(B)(C)(D)	46 (F)(G)(H)(J)	59 (A)(B)(C)(D)
8 (F)(G)(H)(J)	21 (A)(B)(C)(D)	34 (F)(G)(H)(J)	47 (A)(B)(C)(D)	60 (F)(G)(H)(J)
9 (A)(B)(C)(D)	22 (F)(G)(H)(J)	35 (A)(B)(C)(D)	48 (F)(G)(H)(J)	61 (A)(B)(C)(D)
10 (F)(G)(H)(J)	23 (A)(B)(C)(D)	36 (F)(G)(H)(J)	49 (A)(B)(C)(D)	62 (F)(G)(H)(J)
11 (A)(B)(C)(D)	24 (F)(G)(H)(J)	37 (A)(B)(C)(D)	50 (F)(G)(H)(J)	63 (A)(B)(C)(D)
12 (F)(G)(H)(J)	25 (A)(B)(C)(D)	38 (F)(G)(H)(J)	51 (A)(B)(C)(D)	64 (F)(G)(H)(J)
13 (A)(B)(C)(D)	26 (F)(G)(H)(J)	39 (A)(B)(C)(D)	52 (F)(G)(H)(J)	65 (A)(B)(C)(D)

Directions for Taking the Practice Test

In this Practice Test, you will answer various science questions. You may write in the open spaces in this book to work the questions, but remember to fill in the circle on your answer sheet that goes with the answer you choose for each question. Fill in the circle completely and make your mark heavy and dark. If you want to change an answer, erase the mark you made and make a new mark.

You will do the items in this Practice Test by yourself. Remember to read all the directions carefully. When you see the words *Go On* at the bottom of the page, go to the next page. When you come to the word STOP, you have finished this test. When you have finished, you may check your answers.

On your answer sheet, find Number 1. Mark your answers beginning with Number 1.

You may begin. Stop when you have finished the test.

At the end of the Practice Test, make sure that all your marks are heavy and dark and that you have completely erased any marks that you do not want.

Turn to Page 42 and locate the Answer Key. Check your answers and review those items that you marked incorrectly.

1 Which molecule is paired with its correct role in protein synthesis?

- A** nucleus – forms peptide bonds
- B** ribosome – carries DNA instructions
- C** mRNA – joins amino acids
- D** tRNA – transfers amino acids

2 Which cellular process converts solar energy into chemical energy?

- F** respiration
- G** transpiration
- H** photosynthesis
- J** chemosynthesis

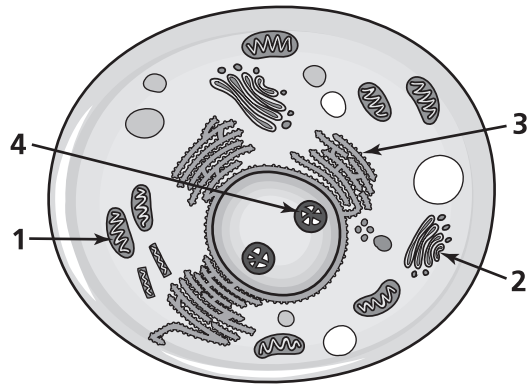
3 Which best explains why a bacterial cell is classified as a prokaryote?

- A** the presence of a nucleus
- B** the absence of a nucleus
- C** the presence of a cell wall
- D** the absence of a cell wall

4 In certain species of roses, white roses and red roses are incompletely dominant to each other. When a red rose and a white rose are crossed, a pink rose is produced. What is the probability of producing a white rose when a red rose is crossed with a pink rose?

- F** 100%
- G** 75%
- H** 25%
- J** 0%

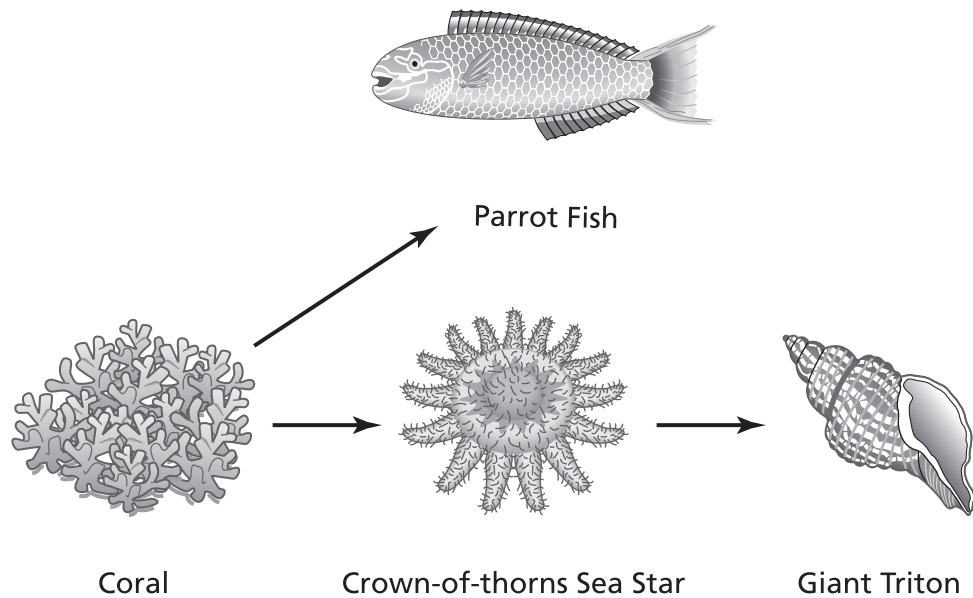
5 A diagram of a cell is shown below.



Proteins are synthesized in which numbered organelle?

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

- 6 The diagram below shows the feeding relationships for four coral reef organisms.



Humans sometimes kill giant tritons in order to collect their attractive spiral shells.

If humans kill most of the giant tritons in a coral reef, the coral population will most likely

- F decrease due to a decrease in the parrot fish population.
- G increase due to an increase in the parrot fish population.
- H increase due to a decrease in the crown-of-thorns sea star population.
- J decrease due to an increase in the crown-of-thorns sea star population.

7 In the late 1800s, Christiaan Eijkman studied a disease called beriberi, which is caused by a vitamin deficiency. A disease similar to beriberi occurred in chickens that were fed polished rice, which is rice that has had the bran layer removed. Chickens that ate unpolished rice did not get the disease.

Eijkman convinced officials of a prison experiencing an outbreak of the disease to start feeding the prisoners unpolished rice. The rate of beriberi decreased dramatically. Which procedure would best convince other scientists who questioned his results?

- A** Feed prisoners chickens that ate only unpolished rice.
- B** Provide the same number of prisoners with polished rice as with unpolished rice.
- C** Study other types of animals that had a disease similar to beriberi.
- D** Compare chickens that ate polished rice to prisoners who ate polished rice.

8 What is the primary function of DNA in organisms?

- F** binds to specific active sites
- G** stores genetic information
- H** transports amino acids to the ribosomes
- J** produces chromosomes for sexual reproduction

- 9 The roots of some plant species have a special coating to help resist rotting in extremely wet weather. In which environment is it most beneficial for plants to have rot-resistant roots?

A



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C



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B



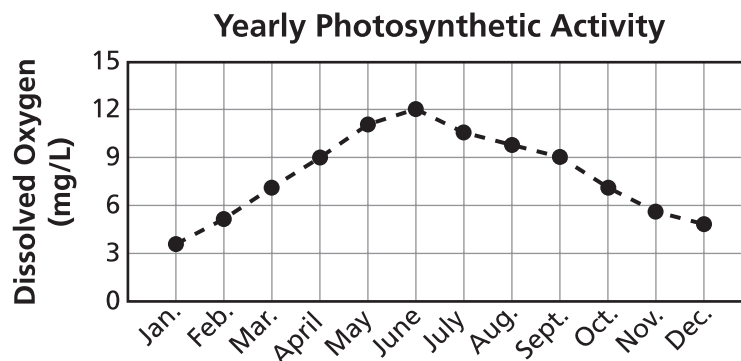
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D



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- 10** An ecologist performed a study to determine how the rate of photosynthetic activity in a lake changed from month to month. The results of the study are shown in the graph below.



Which conclusion is best supported by the evidence?

- F** Photosynthetic organisms were dormant during the months of April through August.
- G** The rate of photosynthesis increased from June through December.
- H** The rate of photosynthesis was greatest during the months of May through July.
- J** Photosynthetic organisms experienced die-off during the months of January through June.

- 11** Which piece of equipment is best for measuring the change in the mass of potato slices after placing them in different concentrations of salt water?

- A** beaker
- B** metric ruler
- C** graduated cylinder
- D** triple beam balance

- 12 Students conducted an investigation using Biuret reagent to determine the presence of proteins in different foods. The results are shown in the table below.

Test for Proteins

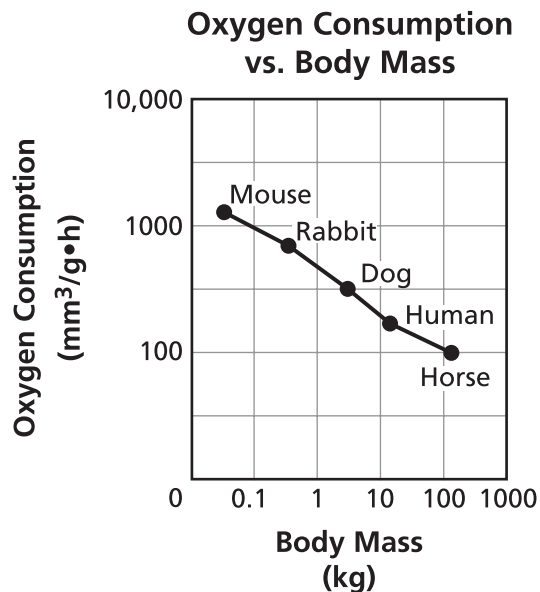
Substance	Color after adding Biuret reagent
Honey	Blue
Cottage cheese	Purple/lavender
Potato	Dark blue
Water	Light blue
Chicken broth	Dark purple
Yogurt, plain	Light purple

According to the data, which foods tested by the students contained proteins?

- F Honey and Potato
 - G Potato and Chicken broth
 - H Cottage cheese and Water
 - J Cottage cheese and Yogurt
- 13 Which best describes how enzymes function in the body?

- A Enzymes are converted into products by the reactions they catalyze.
- B Enzymes lower the activation energy of reactions.
- C One enzyme can catalyze many different reactions.
- D An enzyme is used once and then destroyed by the cell.

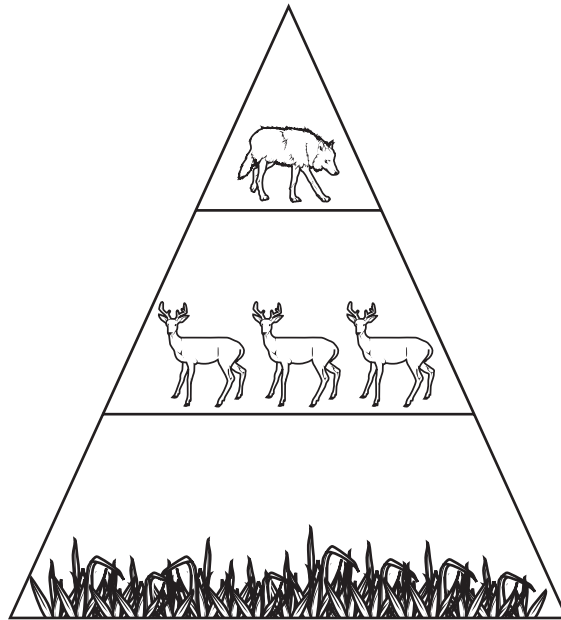
- 14 The graph represents the relationship between an organism's oxygen consumption and body mass.



Which statement is supported by the information shown in the graph?

- F The oxygen consumption of an organism is one-half its body mass.
- G The oxygen consumption of an organism is not related to its body mass.
- H As the body mass of an organism increases, oxygen consumption decreases.
- J As the body mass of an organism decreases, oxygen consumption decreases.

- 15 An energy pyramid is shown below.



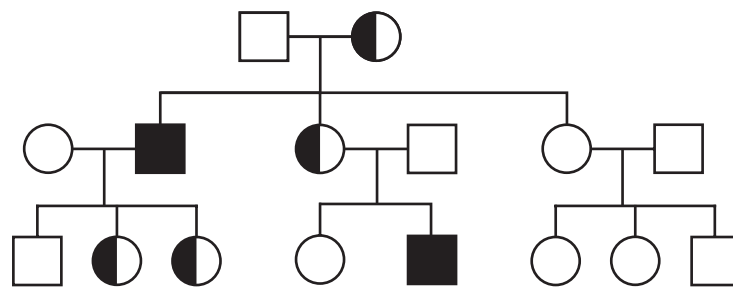
Which best explains why a pyramid is used to represent energy flow within an ecosystem?

- A Available energy increases when moving up an energy pyramid.
 - B Available energy decreases when moving up an energy pyramid.
 - C The size of the organisms decreases when moving up an energy pyramid.
 - D The population size of the organisms increases when moving up an energy pyramid.
- 16 Which molecules store and transmit genetic information?
- F lipids
 - G proteins
 - H nucleic acids
 - J carbohydrates

17 A student notices that the lettuce in a salad wilts soon after salt is added. Wilting most likely occurs because the lettuce cells

- A swell when exposed to salt.
- B absorb the extra salt.
- C release water in the presence of salt.
- D lose oxygen when in contact with salt.

18 The pedigree chart below shows the transmission of genetic traits over several generations.

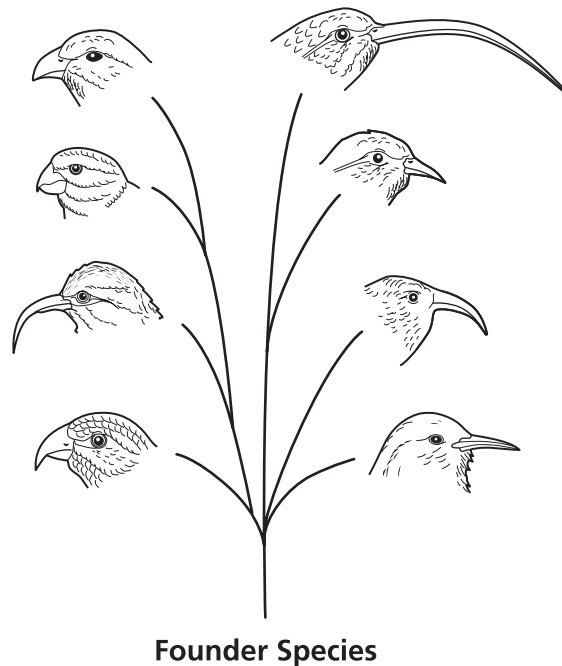


Key	
Female	Male
○ Unaffected	□ Unaffected
◐ Carrier	■ Affected
● Affected	

How is this trait inherited?

- F autosomal recessive
- G autosomal dominant
- H sex-linked recessive
- J sex-linked dominant

- 19 A diagram showing the evolution of eight bird species is shown below.



The differences in the species are most likely a result of

- A length of mating season.
 - B population size.
 - C color of feathers.
 - D available food sources.
- 20 In active transport, carrier proteins
- F move substances across the cell membrane without the use of ATP.
 - G move from low concentration to high concentration by diffusion.
 - H move small molecules through the cell membrane by osmosis.
 - J move substances from a low concentration to high concentration through the use of energy.

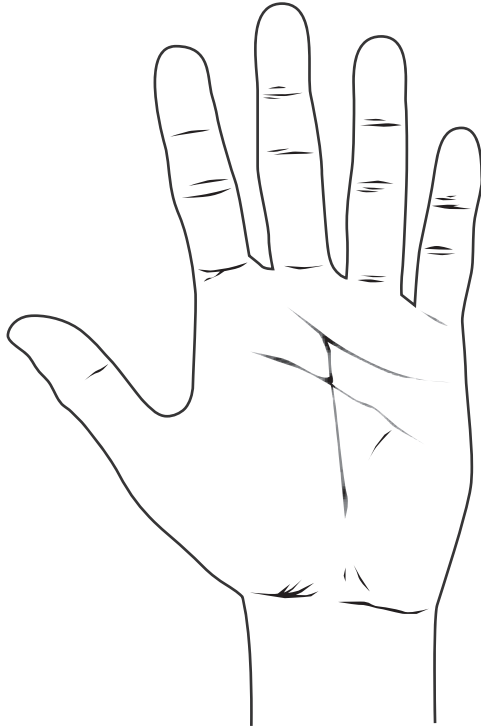
- 21** An isolated population of termites lives in a forest surrounded by mountains. These termites feed on dead wood, grasses, and seeds. This food is broken down by a species of microorganism that lives inside the intestines of the termites. Without the microorganisms, these termites cannot obtain the nutrients they need to survive. One winter, a virus causes most of these microorganisms to die.

As a result of the microorganism's absence, these termites will most likely

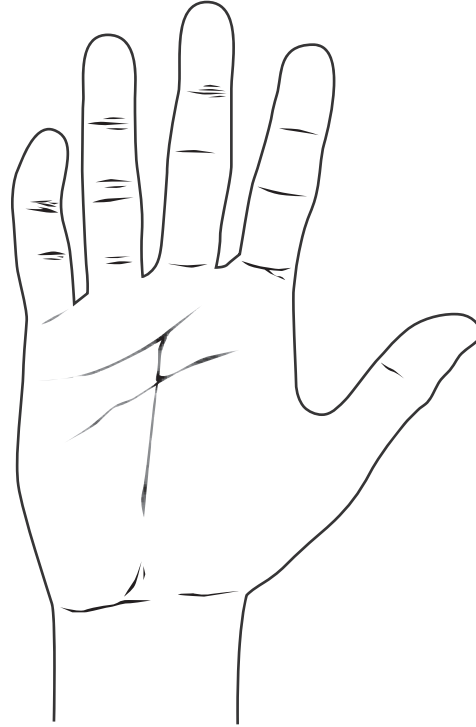
- A** eat different food.
 - B** decrease to a level near extinction.
 - C** evolve immediately into a new species.
 - D** develop a new species of microorganism.
- 22** A researcher is studying the damage that predators cause to the wings of butterflies. Which tools are best to use to determine the percentage of butterflies with damaged wings?
- F** triple beam balance and microscope
 - G** hand lens and triple beam balance
 - H** catch net and hand lens
 - J** microscope and graduated cylinder

- 23** Diagrams of a bent pinky finger and a straight pinky finger are shown below. The allele for having a bent pinky finger is dominant to the allele for having a straight pinky finger.

Straight Pinky Finger



Bent Pinky Finger



If two people who are both heterozygous for the trait of a bent pinky finger have a child, what is the percent probability that the child will have straight pinky fingers?

- A 0%
- B 25%
- C 75%
- D 100%

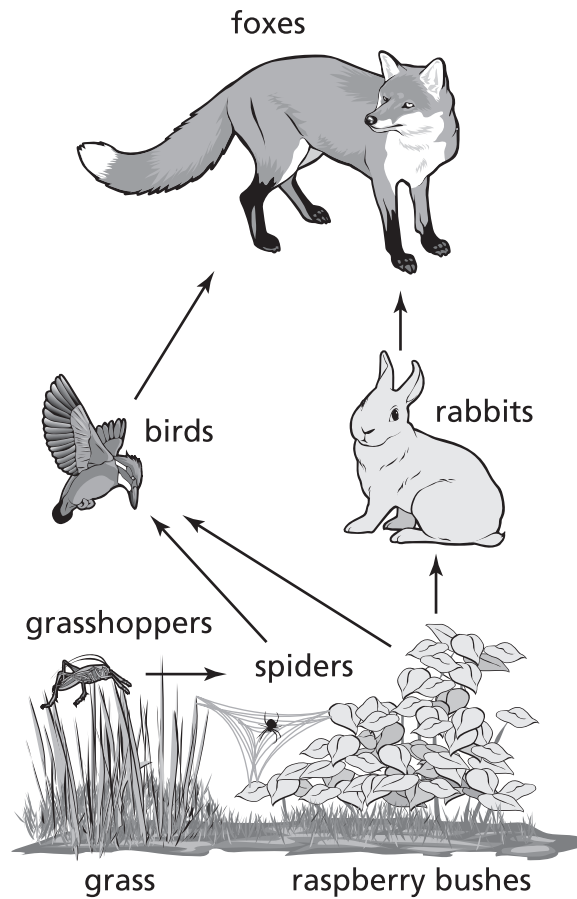
24 Which best describes the role of enzymes in a chemical reaction?

- F** absorb excess energy
- G** release unused energy
- H** increase the reaction rate
- J** regulate product reactivity

25 Which best describes how meiosis contributes to genetic variation?

- A** increases the rate of reproduction with each generation
- B** produces a new individual different from either parent
- C** decreases the risk of lethal mutations being transmitted
- D** forms new DNA that can resist environmental change

- 26 A food web is diagrammed below.



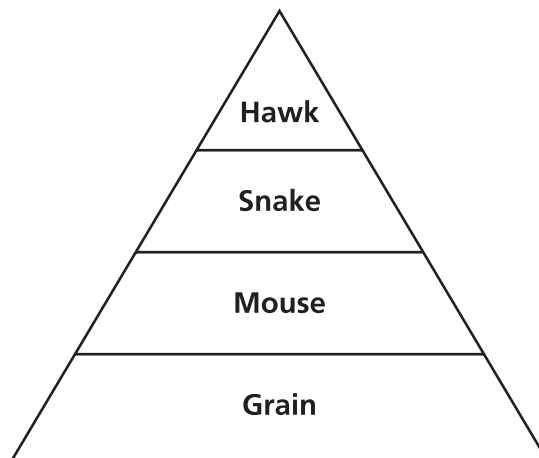
What would most likely happen if the rabbit population decreased as a result of another predator being introduced to the food web?

- F The fox population would decrease.
- G The food web would not be affected.
- H The bird population would increase.
- J The spider population would decrease.

27 Which human activity will have the most positive effect on the global environment?

- A decreasing the amount of trash in landfills through the recycling of glass bottles
- B planting trees in neighborhoods where recent construction has taken place
- C reducing air pollution across countries by enforcing stricter emissions laws
- D establishing a wildlife reserve for the protection of a local endangered species

28 The following diagram represents a food pyramid.



Which trophic level has the greatest total amount of energy to transfer to the next level?

- F Grain
- G Mouse
- H Snake
- J Hawk

29 Some microorganisms, such as yeast, produce energy in oxygen-free environments through the process of

- A mitosis.
- B photosynthesis.
- C aerobic respiration.
- D anaerobic respiration.

30 Which is an organelle that performs cellular respiration and is paired with its correct function?

- F chloroplast – converts light energy into chemical energy
- G chloroplast – converts chemical energy into light energy
- H mitochondrion – converts energy found in glucose into energy for use by the cell
- J mitochondrion – converts cellular energy into glucose chemical energy

31 Which biomolecule contains nitrogenous bases?

- A lipid
- B protein
- C nucleic acid
- D carbohydrate

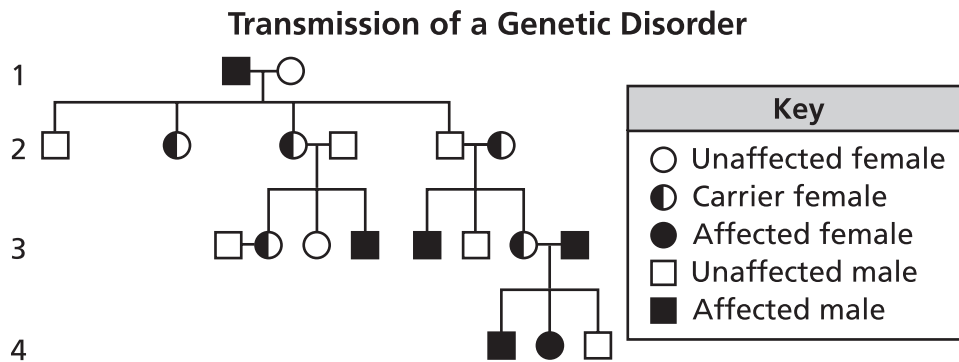
32 Generic drugs are copies that are the same as brand-name drugs in dosage, safety, strength, quality, and performance. Many people prefer generic drugs because they cost much less than their brand-name counterparts. Which best explains why pharmaceutical companies are able to sell generic drugs at a much lower cost than the brand-name drugs?

- F Generic drugs do not have the initial costs of production and advertising.
- G Generic drugs do not have the approval of a government agency.
- H Generic drugs do not have to be tested on humans.
- J Generic drugs do not have to be packaged in childproof containers.

- 33** Which statement best describes the primary function of DNA replication?
- A** to ensure daughter cells have a complete copy of the DNA
 - B** to prevent mutations from occurring in cells
 - C** to provide genetic variation within specific organisms
 - D** to allow prokaryotic cells to undergo meiosis
- 34** Which best describes the interaction between DNA and RNA during protein synthesis?
- F** RNA carries the code to the nucleus where DNA translates the code into a protein.
 - G** DNA travels to the ribosome where RNA translates the code into a protein.
 - H** RNA carries the code from DNA in the nucleus to the ribosome for protein synthesis.
 - J** DNA travels to the cytoplasm while RNA remains in the nucleus.
- 35** An ion must cross the cell membrane through active transport instead of passive transport when the ion is
- A** negatively charged.
 - B** carried across by a protein.
 - C** going against the concentration gradient.
 - D** too small to move independently.

- 36** What would most likely result if nitrogen-fixing bacteria in an area were destroyed?
- F** Vegetation in the area would grow at a faster rate.
 - G** Vegetation in the area would grow at a slower rate.
 - H** Vegetation in the area would not be affected.
 - J** Vegetation in the area would find other nutrient sources.
- 37** In certain species of guinea pigs, black fur is dominant to white fur. If a white male guinea pig is crossed with a black homozygous dominant female, what is the probability of having offspring with black fur?
- A** 100%
 - B** 75%
 - C** 50%
 - D** 25%
- 38** Which factor is most likely to initiate the process of succession in which a deep freshwater lake becomes a woodland area?
- F** accumulation of sediment
 - G** growth of microorganisms
 - H** change in the pH of the lake water
 - J** increase in invertebrate population

39 The transmission of a genetic disorder is shown in the pedigree below.

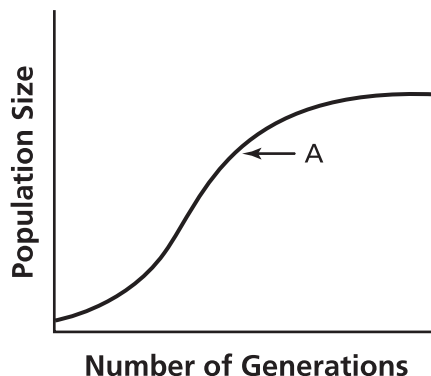


According to the pedigree, what is the mode of inheritance for this disorder?

- A a nonsex-linked dominant trait
- B a nonsex-linked recessive trait
- C a sex-linked trait carried on the Y chromosome
- D a sex-linked trait carried on the X chromosome

- 40 A growth curve for a population of crabs on a coral reef is shown below.

Crab Growth on a Coral Reef



Which statement best explains what is happening at Point A?

- F Population growth decreases as individual crabs get older.
 - G The population is stabilizing as it approaches carrying capacity.
 - H Destruction of habitat is causing a decline in the population of the crabs.
 - J The introduction of a new predator is causing a decline in population growth of the crabs.
- 41 Meiotic cell division results in gametes that produce sperm and egg cells by
- A reducing the daughter chromosome number by 75%.
 - B reducing the daughter chromosome number by 50%.
 - C increasing the daughter chromosome number by 50%.
 - D increasing the daughter chromosome number by 75%.

- 42** An ecosystem has a stable population of white-tailed deer. What is the most likely outcome if a new species of deer that competed for the same resources were introduced?
- F** The white-tailed deer population would increase.
 - G** The producer population would decrease.
 - H** The white-tailed deer population would not be affected.
 - J** The predator population would decrease.
- 43** Which process most contributes to genetic variation in a population?
- A** crossing over during meiosis
 - B** chromosome replication during mitosis
 - C** cytokinesis during cellular division
 - D** duplication of chromosomes in asexual reproduction
- 44** Scientists have developed a way to analyze and compare DNA sequences between humans. Using this genetic information would be most beneficial for
- F** identifying individuals.
 - G** dating the age of fossils.
 - H** creating new gene sequences.
 - J** determining proteins produced in skin cells.

- 45** A student performed an investigation of the relationship between heart rate and blood pressure. The data collected is shown in the table below.

Test Subject	Age	Gender	Resting Heart Rate (beats/min)	Resting Blood Pressure (mmHg)
Q	15	M	70	115/80
R	32	M	70	115/80
S	15	F	76	115/80
T	32	F	76	152/98

The student concluded the resting heart rate affects the resting blood pressure. Which statement supports the student's conclusion?

- A** Subjects Q and S have the same resting blood pressure.
 - B** Subjects Q and R are different ages.
 - C** Subjects R and T have different resting blood pressure.
 - D** Subjects S and T are the same gender.
- 46** The chemical equation below shows the reaction of glucose and oxygen.



Which process does this equation represent?

- F** photosynthesis
- G** aerobic respiration
- H** anaerobic respiration
- J** nitrogen fixation

- 47** A flock of one species of bird arrives on a group of sparsely populated islands. With little or no competition, different species of birds evolve from the original species. Each species is adapted to a different available niche.

This is an example of

- A** divergent evolution.
 - B** convergent evolution.
 - C** dynamic equilibrium.
 - D** graduated equilibrium.
- 48** A student tests an unknown colorless solution for the presence of sugars, starches, lipids, and proteins. The results are shown in the table below.

Unknown Solution Results

Testing Indicator	Observation
Iodine	Unknown solution turned from colorless to brownish-orange
Benedict's Solution	Unknown solution turned from colorless to orange
Biuret Solution	Unknown solution turned from colorless to purple
Brown Paper Bag	No mark left; unknown solution dried completely

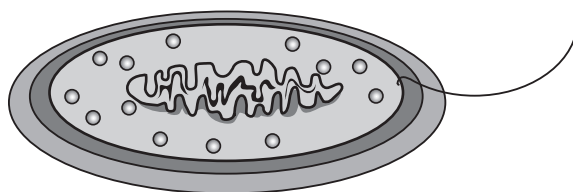
Based on the data collected, which molecules are present in the unknown solution?

- F** starches and lipids
- G** proteins and starches
- H** sugars and proteins
- J** lipids and proteins

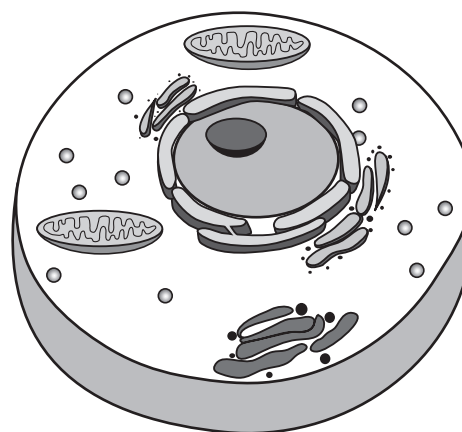
49 A forest area is being harvested for specific types of plants, causing a reduction of resources for organisms. The organism most likely to become extinct as a result of this activity is

- A** one with a specialized diet.
- B** one with a high rate of reproduction.
- C** one that feeds from a variety of sources.
- D** one that has a great amount of genetic variation.

50 Two cells are shown in the diagrams below.



Cell 1

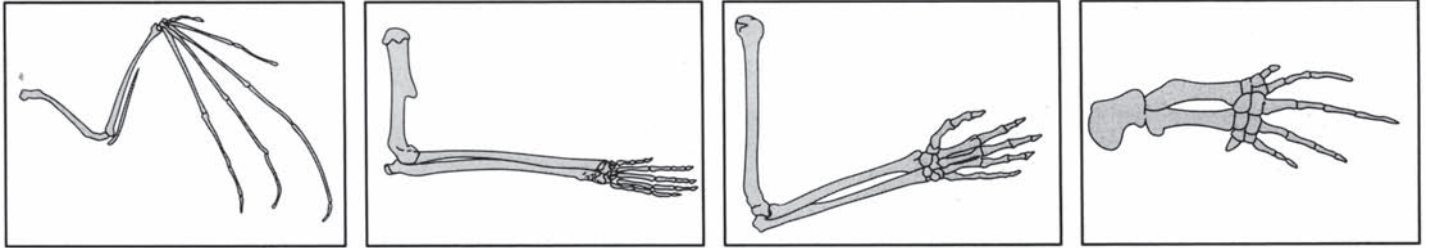


Cell 2

Which statement correctly identifies the cells?

- F** Cell 1 is prokaryotic; cell 2 is eukaryotic.
- G** Cell 1 is eukaryotic; cell 2 is prokaryotic.
- H** Both cells are prokaryotic.
- J** Both cells are eukaryotic.





51 The pictures below show the limbs of four different species.



The four species illustrated most likely have similar limb structures because they all

- A share a common ancestor.
- B use their limbs for the same functions.
- C occupy the same level in a food pyramid.
- D adapted to the same environmental conditions.

52 The classification of four birds is shown below.

				
	Eastern Bluebird	Western Kingbird	Ovenbird	Robin
Class	Aves	Aves	Aves	Aves
Order	Passeriformes	Passeriformes	Passeriformes	Passeriformes
Family	Turdidae	Tyrannidae	Parulidae	Turdidae
Genus	<i>Sialia</i>	<i>Tyrannus</i>	<i>Seiurus</i>	<i>Turdus</i>
Species	<i>sialis</i>	<i>verticalis</i>	<i>aurocapillus</i>	<i>migratorius</i>

Based on the classification, which two birds are most closely related?

- F Western Kingbird and Ovenbird
- G Eastern Bluebird and Robin
- H Western Kingbird and Eastern Bluebird
- J Robin and Ovenbird

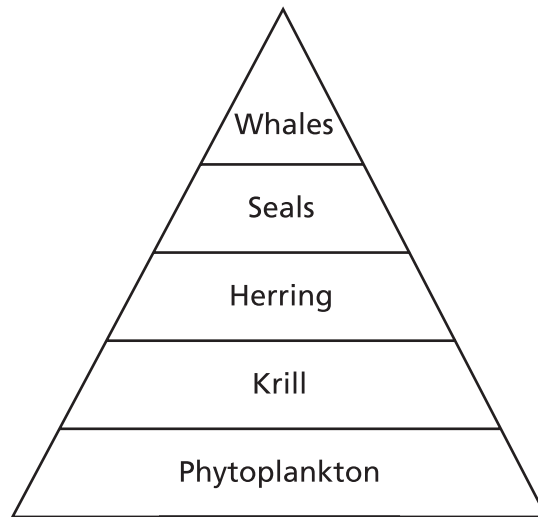
53 A researcher presented the results from an experiment on the effectiveness of a new type of eyedrops. The eyedrops were designed to prevent contact lenses from drying out and irritating the eyes. The researcher tested the eyedrops over a two-year period using subjects who wore various types of contact lenses. The results of the research showed that the eyedrops did prevent contact lenses from drying out. Before manufacturing the new drops, the researcher must verify that his results are free of bias by

- A extending his research for three more years.
- B investigating similar products and their results.
- C testing a larger population of subjects using different brands.
- D having an independent research company perform the same investigation.

54 Antibodies are composed primarily of amino acids. In which class of biomolecules would antibodies belong?

- F** nucleic acids
- G** carbohydrates
- H** proteins
- J** lipids

55 An energy pyramid is shown below.



Which organism receives the least amount of energy from the producer?

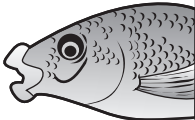
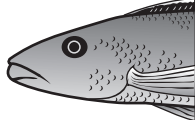
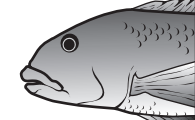
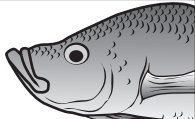
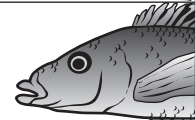
- A** Whales
- B** Seals
- C** Herring
- D** Krill

56 An inventor has an idea for a pest control product for farms. The inventor proceeds to build and market the product. Which step in the engineering design process has the inventor neglected to do?

- F identify a need
- G define the problem
- H narrow the research
- J verify the results

57 A pictorial chart of five cichlid species of fish is shown below.

Cichlid Fish Species

	<i>Cheilochromis euchilus</i>
	<i>Champsochromis caeruleus</i>
	<i>Aristochromis christyi</i>
	<i>Diplotaxodon greenwoodi</i>
	<i>Lichnochromis acuticeps</i>

The physical differences among the fish are most likely

- A a feeding adaptation due to competition for food.
- B a swimming adaptation due to water temperature.
- C an osmotic adaptation due to salinity levels.
- D a respiration adaptation due to different oxygen levels.

58 Which tool is best for a student to use to observe mitosis in an onion root tip?

- F** gel electrophoresis chamber
- G** triple beam balance
- H** microscope
- J** flask

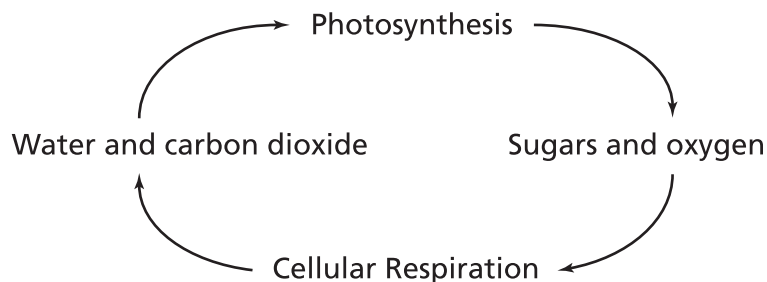
59 An aquatic food chain is shown below.

Algae → Zooplankton → Minnow → Perch → Hawk

What would most likely result if a waterborne bacteria caused the death of most of the minnow population?

- A** decrease in both algae and zooplankton population
- B** increase in both zooplankton and perch population
- C** increase in both perch and hawk population
- D** decrease in both perch and hawk population

- 60** The diagram shows a relationship between photosynthesis and cellular respiration.

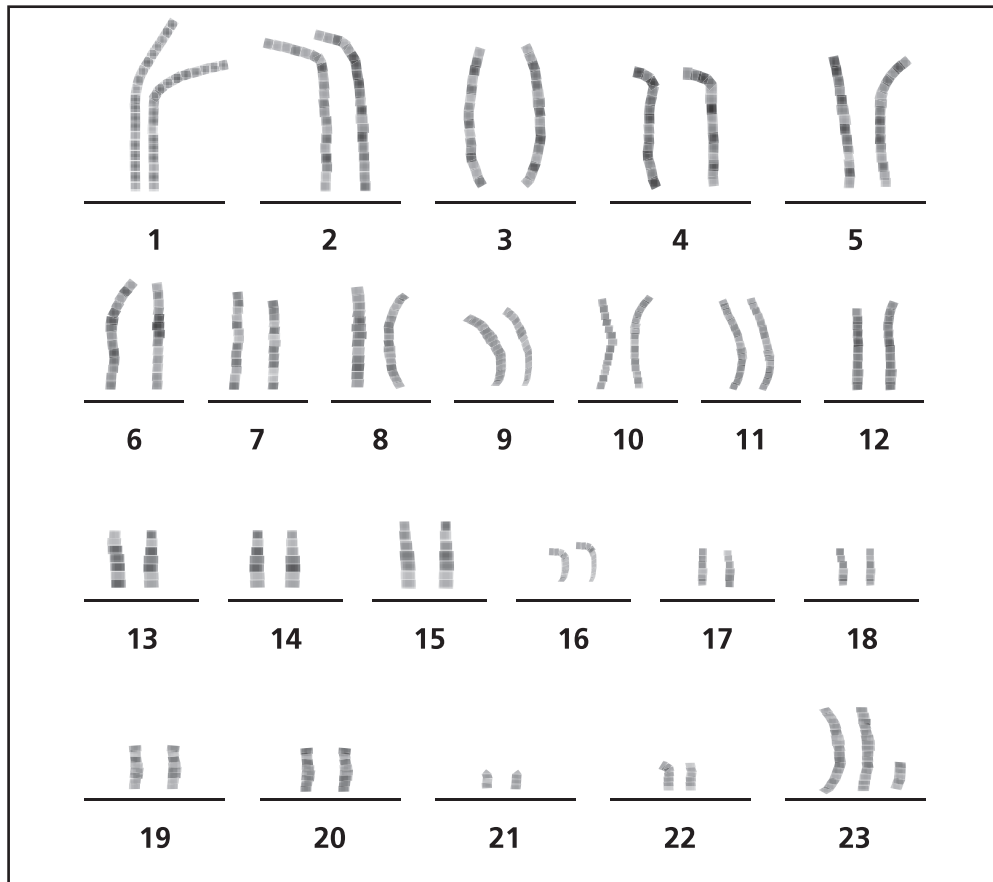


Which statement best describes the interdependence of photosynthesis and cellular respiration?

- F** The products of photosynthesis are carbon dioxide and water to be used in cellular respiration.
- G** The reactants of photosynthesis are the products of cellular respiration.
- H** The reactants of photosynthesis are sugar and oxygen to be used in cellular respiration.
- J** The products of photosynthesis are the same as the products of cellular respiration.

- 61** During the process of protein synthesis, a section of the DNA molecule is copied into which other molecule?
- A** nucleic DNA
 - B** cytoplasmic DNA
 - C** messenger RNA
 - D** transfer RNA
- 62** A single sensory neuron cell extends from a person's large toe to an area adjacent to the spinal canal of the central nervous system. Which process is responsible for the length of this cell?
- F** cell reproduction
 - G** cell division
 - H** cell growth
 - J** cell diffusion

63 A human karyotype is shown in the diagram below.



Which set of chromosomes represents a mutation?

- A 2
- B 11
- C 16
- D 23

64 The enzyme catalase is involved in the breakdown of hydrogen peroxide into water and oxygen. During this reaction, the catalase

- F** is unchanged.
- G** is used up.
- H** is changed into a product.
- J** is formed into a new enzyme.

65 Zebra mussels were first discovered in the Great Lakes thirty years ago and have since spread to lakes throughout the region. Zebra mussels reproduce quickly and have few natural predators.

What will most likely happen to other native mussel species in the Great Lakes region?

- A** Native species will begin to interbreed with zebra mussels.
- B** Native species populations will decrease in areas with large zebra mussel populations.
- C** Individuals of the native species will mutate to become more similar to zebra mussels.
- D** Individuals of the native species will mutate to become less similar to zebra mussels.