Tennessee Comprehensive Assessment Program

TCAP

TNReady—Biology
Item Release

TN Department of Education

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Metadata Interpretation Guide – Science

Item Information

Item Code:	TNS10220	Passage Title:	
Standard Code:	0307.1.1	Passage Code:	
Standard Text:	Identify specific parts of a plant and describe their function.		
Reporting Category:	Cells, Flow of Matter & Energy, Heredity		
Correct Answer:	B	DOK Level:	2

Item Code: Unique letter/number code used to identify the item.	**Passage Title:** (if listed): Title of the passage(s) associated with this item.
Standard Code: Primary educational standard assessed.	**Passage Code:** (if listed): Unique letter/number code used to identify the passage(s) that go with this item.
Standard Text: Text of the educational standard assessed.	
Reporting Category: Text of the Reporting Category the standard assesses.	
Correct Answer: Correct answer. This may be blank for constructed response items where students write or type their responses.	**DOK Level** (if listed): Depth of Knowledge (cognitive complexity) is measured on a four-point scale. 1= Recall; 2= Skill/Concepts; 3= Strategic Thinking; 3-4 = Strategic/Extended Thinking

Item Information

Item Code:	GS040040	Passage Title:	
Standard Code:	3210.1.1	Passage Code:	
Standard Text:	Identify the cellular organelles associated with major cell processes.		
Reporting Category:	Cells		
Correct Answer:	B	DOK Level:	1

Which correctly matches the cell process to the organelle in which it occurs?

A protein synthesis – lysosome

B respiration – mitochondrion

C photosynthesis – ribosome

D DNA replication – chloroplast

Item Information

Item Code:	GS050272	Passage Title:	
Standard Code:	3210.1.1	Passage Code:	
Standard Text:	Identify the cellular organelles associated with major cell processes.		
Reporting Category:	Cells		
Correct Answer:	D	DOK Level:	1

Most of the aerobic respiration of a cell takes place in which structure?

A chloroplast

B lysosome

C vacuole

D mitochondrion

Item Information

Item Code:	GS040042	Passage Title:	
Standard Code:	3210.1.2	Passage Code:	
Standard Text:	Distinguish between prokaryotic and eukaryotic cells.		
Reporting Category:	Cells		
Correct Answer:	D	DOK Level:	1

***Staphylococcus* cells are classified as prokaryotes because they**

A lack a cell membrane

B move using flagella

C move using cilia

D lack a nucleus

Item Information

Item Code:	GS040043	Passage Title:	
Standard Code:	3210.1.2	Passage Code:	
Standard Text:	Distinguish between prokaryotic and eukaryotic cells.		
Reporting Category:	Cells		
Correct Answer:	C	DOK Level:	2

A chart listing the characteristics of five cells is shown below.

Cell Characteristics

Cell	Nucleus	Cell Wall	Cell Membrane	Membrane Bound Organelles
1	No	Yes	Yes	No
2	Yes	Yes	Yes	Yes
3	Yes	No	Yes	Yes
4	Yes	Yes	Yes	Yes
5	No	Yes	Yes	No

Based on the chart, which cells would be classified as prokaryotic?

A 1 and 3

B 2 and 4

C 1 and 5

D 3 and 5

Item Information

Item Code:	TEB110080	Passage Title:	
Standard Code:	3210.1.2	Passage Code:	
Standard Text:	Distinguish between prokaryotic and eukaryotic cells.		
Reporting Category:	Cells		
Correct Answer:	C	DOK Level:	2

Which statement best supports the idea that eukaryotic cells evolved after prokaryotic cells?

A Eukaryotic cells are much smaller in size than prokaryotic cells.

B Eukaryotic cells are more common in the environment than prokaryotic cells.

C Eukaryotic cells are more complex than prokaryotic cells.

D Eukaryotic cells require less energy than prokaryotic cells.

Read the passage and answer questions XX and XX.

The hemlock woolly adelgid, *Adelges tsugae*, is a destructive aphid-like insect native to Asia. In North America this pest threatens the health of the eastern hemlock and Carolina hemlock trees. The adelgid was first reported near Richmond, VA, in 1951 and has since spread through the eastern states. The adelgid completes two life cycles within one year. As the adelgid matures, it produces a covering of white wool-like wax filaments. These filaments provide protection from predators and prevent the adelgid from drying out.

Feeding on stored starches that are crucial for the trees' growth, the adelgid can damage a hemlock enough that it can die within 4 years. Chemical control can help reduce the damage but is limited to individual tree treatments. The best control option is biological because there are natural predators that feed on the adelgid. Several beetle predators have been imported from China and Japan and are slowly becoming established in the infested areas.

Item Information

Item Code:	TEB120114	Passage Title:	
Standard Code:	3210.1.3	Passage Code:	
Standard Text:	Distinguish among proteins, carbohydrates, lipids, and nucleic acids.		
Reporting Category:	Cells		
Correct Answer:	A	DOK Level:	1

The white wool-like filamentous substance that the adelgid produces for protection is most likely made up of

A lipids.

B proteins.

C nucleic acids.

D carbohydrates.

Item Information

Item Code:	TEB120116	Passage Title:	
Standard Code:	3210.2.4	Passage Code:	
Standard Text:	Predict how various types of human activities affect the environment.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	3-4

Which is a negative ecological effect of introducing nonnative predators to help eradicate the hemlock woolly adelgid?

A The predators could begin to feed on the hemlock trees.

B The predators could disappear once they have depleted the adelgid population.

C The predators could mutate into an organism that no longer preys on the adelgid.

D The predators could attack other insect species that are beneficial to the ecosystem.

Item Information

Item Code:	GS001022	Passage Title:	
Standard Code:	3210.1.4	Passage Code:	
Standard Text:	Identify positive tests for carbohydrates, lipids, and proteins.		
Reporting Category:	Cells		
Correct Answer:	C	DOK Level:	2

Rick is using iodine to test a food sample for the presence of starch.

What color will the sample turn if starch is present?

A orange or red

B yellow or green

C dark blue or black

D light red or pink

Item Information

Item Code:	GS000092	Passage Title:	
Standard Code:	3210.1.5	Passage Code:	
Standard Text:	Identify how enzymes control chemical reactions in the body.		
Reporting Category:	Cells		
Correct Answer:	B	DOK Level:	1

Cells regulate chemical reactions in order to produce things they need to grow and survive. What type of molecule is <u>most</u> responsible for regulating chemical reactions inside cells?

A lipids

B enzymes

C vitamins

D carbohydrates

Item Information

Item Code:	GS040353	Passage Title:	
Standard Code:	3210.1.5	Passage Code:	
Standard Text:	Identify how enzymes control chemical reactions in the body.		
Reporting Category:	Cells		
Correct Answer:	A	DOK Level:	2

Which best describes how the enzyme carbonic anhydrase helps to form carbonic acid from carbon dioxide and water?

A The enzyme binds the substrates together so they can react.

B The enzyme breaks apart so that the substrates are more likely to react.

C The enzyme strengthens the chemical bonds in both the water and the carbon dioxide.

D The enzyme increases the energy needed for the substrates to react.

Item Information

Item Code:	TEB110046	Passage Title:	
Standard Code:	3210.1.5	Passage Code:	
Standard Text:	Identify how enzymes control chemical reactions in the body.		
Reporting Category:	Cells		
Correct Answer:	A	DOK Level:	2

Which statement best explains the importance of enzymes lowering the activation energy necessary for reactions to take place?

A Reactions that require less energy to begin are able to occur more quickly.

B Reactions requiring less energy are able to produce less product.

C Reactions are able to proceed slowly to maintain the metabolism of the cells.

D Reactions produce heat, causing the chemical bonds to become strong.

Item Information

Item Code:	TEB120091	Passage Title:	
Standard Code:	3210.1.5	Passage Code:	
Standard Text:	Identify how enzymes control chemical reactions in the body.		
Reporting Category:	Cells		
Correct Answer:	D	DOK Level:	2

In the human mouth, saliva contains several enzymes used in digestion, one of which is amylase. When a person chews on a saltine cracker for a short while, a sweet taste is detected. What reaction is taking place in response to the enzyme amylase?

A Amylase is specifically binding with salt to create glucose.

B Amylase is producing the starch necessary to produce glucose.

C Amylase is increasing the activation energy needed to produce glucose.

D Amylase is catalyzing the digestion of the saltine cracker to produce glucose.

Item Information

Item Code:	TEB120319	Passage Title:	
Standard Code:	3210.1.6	Passage Code:	
Standard Text:	Determine the relationship between cell growth and cell reproduction.		
Reporting Category:	Cells		
Correct Answer:	C	DOK Level:	2

The data table below lists the increase in surface area and volume that occurs as a cell grows.

Cell Growth

Surface Area (m^2)	1	4	9	16	25
Volume (m^3)	1	8	27	64	125
Surface Area: Volume Ratio	1:1	1:2	1:3	1:4	1:5

Based on the data, which of these <u>best</u> describes why cells divide when they reach a certain size?

A The surface area-to-volume ratio of a cell remains constant during growth.

B The surface area of a cell increases more than its volume during growth.

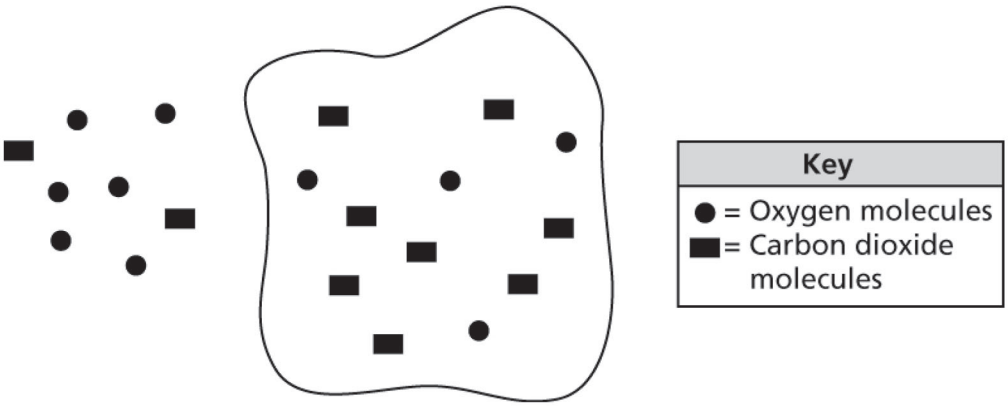
C The volume of a cell increases more than its surface area during growth.

D The volume of a cell increases as the surface area decreases during growth.

Item Information

Item Code:	GS040055	Passage Title:	
Standard Code:	3210.1.7	Passage Code:	
Standard Text:	Predict the movement of water and other molecules across selectively permeable membranes.		
Reporting Category:	Cells		
Correct Answer:	A	DOK Level:	2

A diagram of a cell is shown below. The cell membrane is permeable to both the oxygen and carbon dioxide molecules.



Initially, the oxygen and carbon dioxide molecules will <u>most</u> likely move in which direction?

A Oxygen will enter the cell, and carbon dioxide will exit the cell.

B Oxygen will exit the cell, and carbon dioxide will enter the cell.

C Both oxygen and carbon dioxide will enter the cell.

D Both oxygen and carbon dioxide will exit the cell.

Item Information

Item Code:	TEB120248	Passage Title:	
Standard Code:	3210.1.7	Passage Code:	
Standard Text:	Predict the movement of water and other molecules across selectively permeable membranes.		
Reporting Category:	Cells		
Correct Answer:	A	DOK Level:	2

An animal cell is placed in an isotonic solution. Which best explains why there is no net movement of water across the cell membrane?

A Water flows across the membrane at the same rate in both directions.

B Water flows into the cell at a faster rate, causing the cell to swell.

C Water flows out of the cell at a faster rate, causing the cell to shrink.

D Water flows across the membrane at a slower rate in one direction.

Item Information

Item Code:	GS040156	Passage Title:	
Standard Code:	3210.1.8	Passage Code:	
Standard Text:	Compare and contrast active and passive transport.		
Reporting Category:	Cells		
Correct Answer:	D	DOK Level:	1

Some protein channels in a cell membrane can use energy to change their shape to allow certain molecules to pass through the membrane. This is an example of

A facilitated transport.

B diffusion.

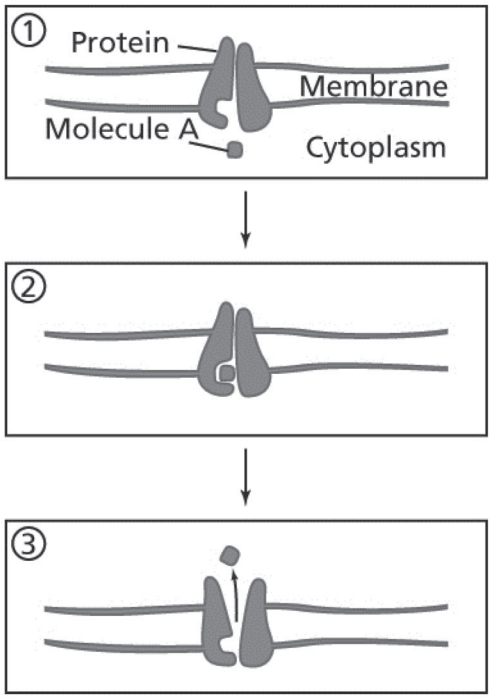
C exocytosis.

D active transport.

Item Information

Item Code:	GS010257	Passage Title:	
Standard Code:	3210.1.8	Passage Code:	
Standard Text:	Compare and contrast active and passive transport.		
Reporting Category:	Cells		
Correct Answer:	D	DOK Level:	2

The diagram below shows a cellular process that requires energy.



What process allowed molecule A to leave the cell?

A osmosis

B diffusion

C passive transport

D active transport

Item Information

Item Code:	TEB110347	Passage Title:	
Standard Code:	3210.1.8	Passage Code:	
Standard Text:	Compare and contrast active and passive transport.		
Reporting Category:	Cells		
Correct Answer:	C	DOK Level:	2

Cells are able to pump ions across their membranes in opposition to a concentration gradient due to

A the destruction of electrons within the cell.

B a drop in temperature outside the cell.

C an expenditure of energy by the cell.

D a vacuole formation within the cell.

Item Information

Item Code:	TEB120144	Passage Title:	
Standard Code:	3210.1.8	Passage Code:	
Standard Text:	Compare and contrast active and passive transport.		
Reporting Category:	Cells		
Correct Answer:	B	DOK Level:	2

The energy necessary to move sodium ions across a cell membrane comes from

A the movement of H_2O.

B the use of ATP.

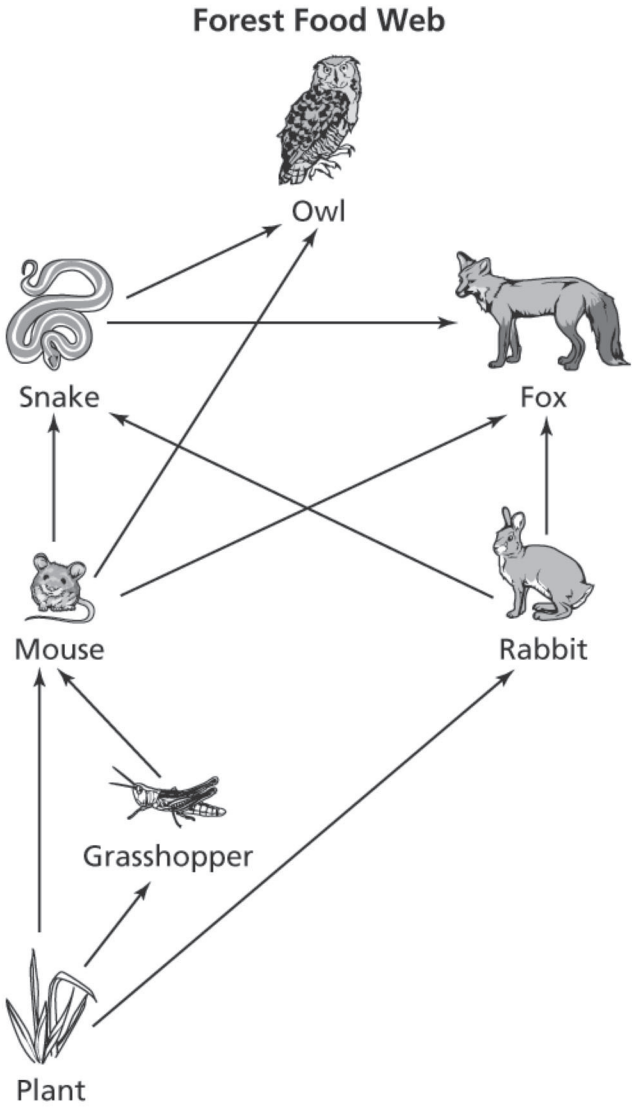
C the manufacturing of RNA.

D the replication of DNA.

Item Information

Item Code:	GS040059	Passage Title:	
Standard Code:	3210.2.1	Passage Code:	
Standard Text:	Predict how population changes of organisms at different trophic levels affect an ecosystem.		
Reporting Category:	Interdependence		
Correct Answer:	B	DOK Level:	2

A food web of a forest ecosystem is shown in the diagram below.



Which will <u>most</u> likely happen if the number of snakes in the ecosystem decreases?

A increase in owl population

B increase in rabbit population

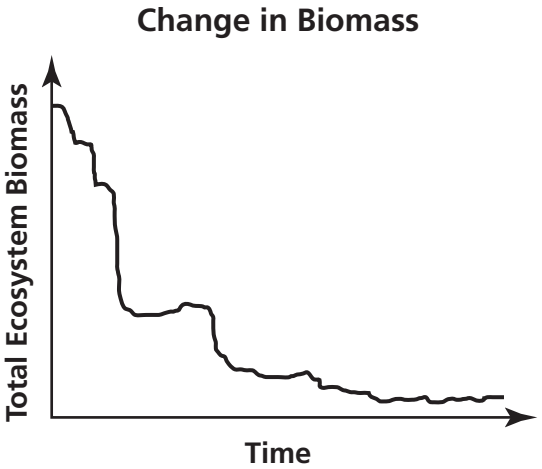
C decrease in mouse population

D decrease in grasshopper population

Item Information

Item Code:	TEB120173	Passage Title:	
Standard Code:	3210.2.1	Passage Code:	
Standard Text:	Predict how population changes of organisms at different trophic levels affect an ecosystem.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	2

The graph below shows the change in the total ecosystem biomass over time.



This overall system change was <u>most</u> likely caused by a rapid decline in the populations at which trophic level?

A decomposer

B primary consumer

C tertiary consumer

D producer

Item Information

Item Code:	GS040170	Passage Title:	
Standard Code:	3210.2.2	Passage Code:	
Standard Text:	Interpret the relationship between environmental factors and fluctuations in population size.		
Reporting Category:	Interdependence		
Correct Answer:	C	DOK Level:	2

Methyl mercury is a toxic chemical that is formed when mercury is combined with water. Methyl mercury accumulates in the tissues of organisms, and the concentration increases at each trophic level. Which population of organisms would be <u>most</u> harmed by an increase in mercury content?

A lake-bottom plants

B photosynthetic microorganisms

C carnivorous fish

D herbivorous crustaceans

Item Information

Item Code:	TEB110216	Passage Title:	
Standard Code:	3210.2.2	Passage Code:	
Standard Text:	Interpret the relationship between environmental factors and fluctuations in population size.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	2

Ecologists have found that dense populations of organisms have lower birth rates, higher death rates, and slower growth rates than less dense populations. Which best explains these findings?

A interactions between predator and prey

B natural environmental disturbances

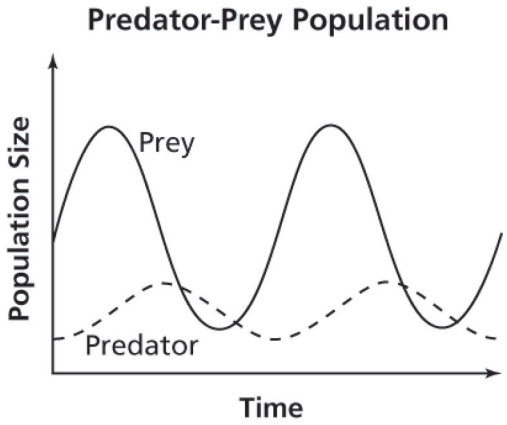
C unusual weather changes

D stressors from competition for resources

Item Information

Item Code:	GS040006	Passage Title:	
Standard Code:	3210.2.3	Passage Code:	
Standard Text:	Determine how the carrying capacity of an ecosystem is affected by interactions among organisms.		
Reporting Category:	Interdependence		
Correct Answer:	B	DOK Level:	2

The graph below represents the fluctuations for a predator and prey population based on the carrying capacity of that particular ecosystem.



Based on the data in the graph, which statement is a valid conclusion?

A The increase in prey population is a result of an increased predator population.

B The increase in predator population is a result of an increased prey population.

C The predator and prey populations increase and decrease at the exact same time.

D The predator and prey populations have no effect on each other's population size.

Item Information

Item Code:	GS040162	Passage Title:	
Standard Code:	3210.2.3	Passage Code:	
Standard Text:	Determine how the carrying capacity of an ecosystem is affected by interactions among organisms.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	2

How would the carrying capacity of an ecosystem be affected if there were a decrease in the number of decomposers?

A It would increase as a result of more available space.

B It would increase due to less competition occurring among organisms.

C It would remain the same regardless of the decomposer population.

D It would decrease due to a low amount of available nutrients for plants.

Item Information

Item Code:	TEB110209	Passage Title:	
Standard Code:	3210.2.5	Passage Code:	
Standard Text:	Make inferences about how a specific environmental change can affect the amount of biodiversity.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	3-4

Plants and animals require particular physical habitats and often have species-specific ranges of temperature and moisture levels in which they can survive and reproduce. This combination of requirements often limits where they exist geographically. Because species interact and rely upon other species in many different ways, which is a likely effect of a warming climate on the interaction of species in an ecosystem?

A The organisms in the ecosystem will become extinct immediately because they cannot adapt.

B The majority of flowering plants will remain dormant until favorable conditions return to their ecosystem.

C The plants will find other means of transporting their seeds to more favorable habitats.

D The life cycle of many insects will be disrupted, and they may not be available to pollinate the plants.

Item Information

Item Code:	GS040103	Passage Title:	
Standard Code:	3210.2.6	Passage Code:	
Standard Text:	Predict how a specific environmental change may lead to the extinction of a particular species.		
Reporting Category:	Interdependence		
Correct Answer:	D	DOK Level:	2

Five hundred acres of timber need to be harvested from a 1000-acre wildlife area. One option is to remove a 500-acre plot, while another option is to remove five 100-acre sections. Why would the first option be more damaging to the ecosystem?

A Displaced species would be able to move to nearby undisturbed sections.

B Replanting efforts would be less disruptive to remaining preserve areas.

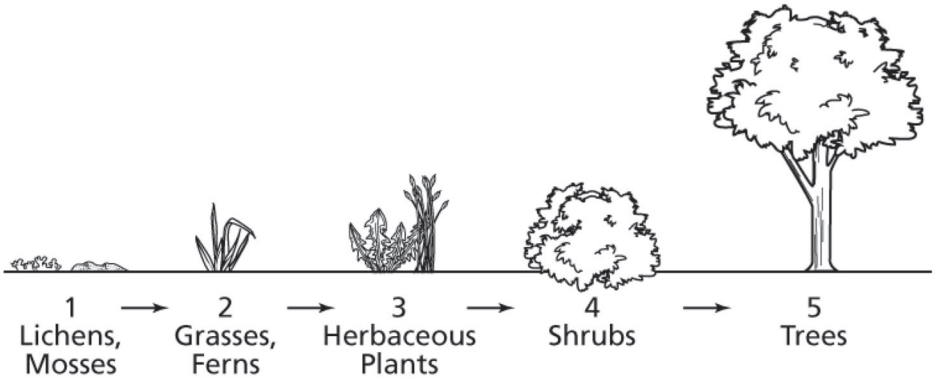
C Fewer roads would have to be made to accommodate forestry.

D A species may become extinct due to elimination of its habitat.

Item Information

Item Code:	GS040072	Passage Title:	
Standard Code:	3210.2.7	Passage Code:	
Standard Text:	Analyze factors responsible for the changes associated with biological succession.		
Reporting Category:	Interdependence		
Correct Answer:	A	DOK Level:	2

A diagram representing succession is shown below.



Herbaceous plants become less numerous in the final stages of succession. Which of these factors <u>most</u> likely limits their ability to survive?

A too little sunlight

B too much water

C too many soil minerals

D too few grazing herbivores

Item Information

Item Code:	TEB120324	Passage Title:	
Standard Code:	3210.2.7	Passage Code:	
Standard Text:	Analyze factors responsible for the changes associated with biological succession.		
Reporting Category:	Interdependence		
Correct Answer:	B	DOK Level:	2

Which statement best explains why grasses and shrubs give way to larger and more complex plant species such as hardwood and softwood trees over time due to ecological succession?

A Tree seedlings require fewer nutrients than grass seedlings do in order to mature.

B An increasing amount of soil allows for the establishment of more extensive root systems.

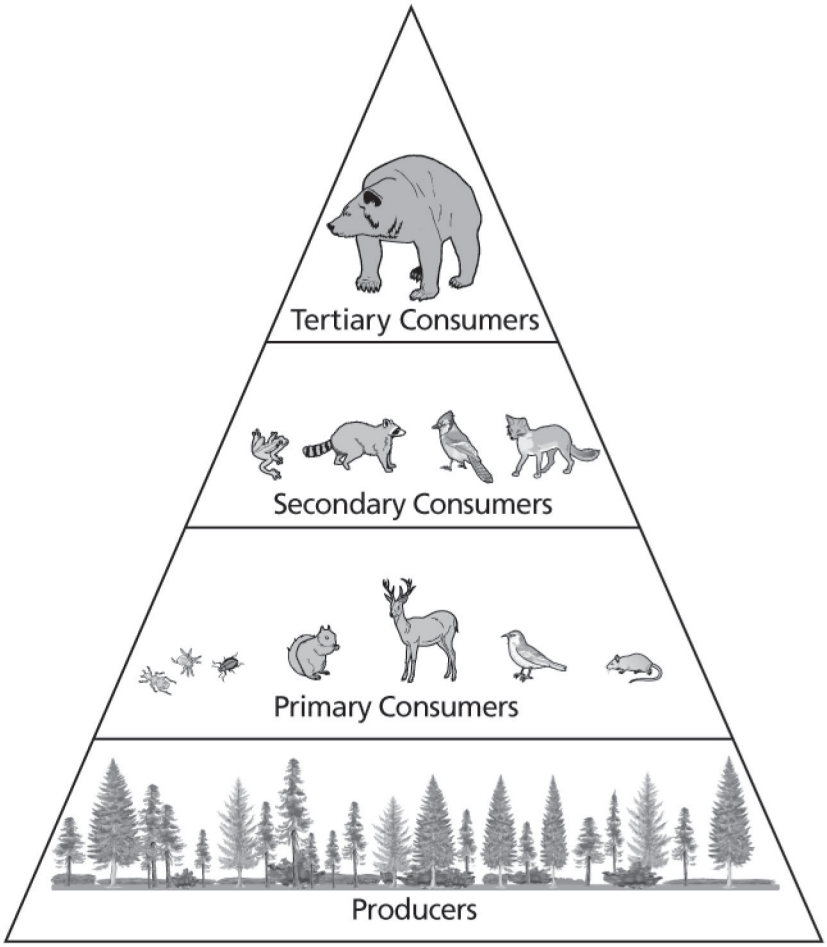
C Tree seeds require a higher soil temperature than grass seeds do in order to germinate.

D An increasing amount of sunlight reaching the forest floor facilitates the germination of tree seeds.

Item Information

Item Code:	GS040105	Passage Title:	
Standard Code:	3210.3.1	Passage Code:	
Standard Text:	Interpret a diagram that illustrates energy flow in an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	D	DOK Level:	2

An energy pyramid representing a woodland ecosystem is shown below.



Which <u>best</u> explains how energy is transferred within the energy pyramid?

A All available energy is transferred to the highest trophic level.

B All available energy remains in the lowest trophic level.

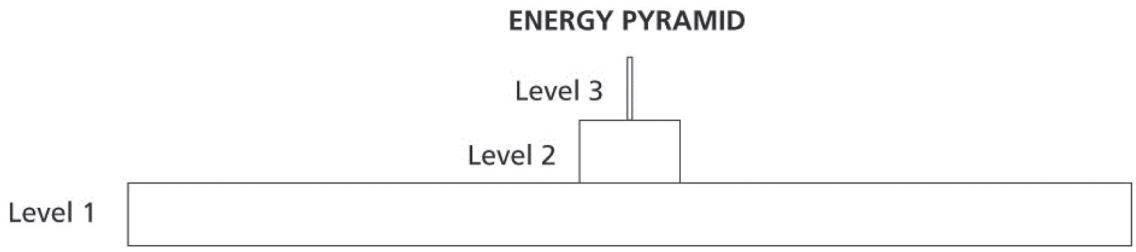
C Each trophic level receives all the energy from the previous level.

D Each trophic level receives a small percentage of energy from the previous level.

Item Information

Item Code:	GS000705	Passage Title:	
Standard Code:	3210.3.1	Passage Code:	
Standard Text:	Interpret a diagram that illustrates energy flow in an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	A	DOK Level:	1

Study the energy pyramid shown below.



Approximately what percent of the energy in Level 1 will be transferred to Level 2?

A 10 percent

B 25 percent

C 50 percent

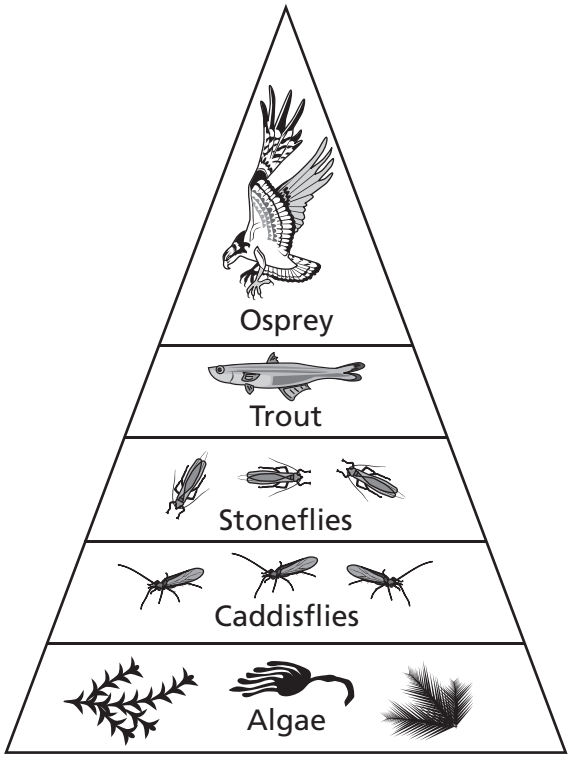
D 90 percent

Item Information

Item Code:	GS040239	Passage Title:	
Standard Code:	3210.3.1	Passage Code:	
Standard Text:	Interpret a diagram that illustrates energy flow in an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	B	DOK Level:	2

An energy pyramid of a lake ecosystem is shown below.

Lake Ecosystem



Stoneflies directly obtain energy from which trophic level?

A Algae

B Caddisflies

C Trout

D Osprey

Item Information

Item Code:	GS040363	Passage Title:	
Standard Code:	3210.3.2	Passage Code:	
Standard Text:	Distinguish between aerobic and anaerobic respiration.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	A	DOK Level:	2

Which description best represents the biological process that produces the greatest number of ATP molecules?

A the use of oxygen to perform aerobic respiration

B the movement of nutrient molecules through diffusion

C the absorption of carbon dioxide to perform photosynthesis

D the division of cells through asexual reproduction

Item Information

Item Code:	GS010376	Passage Title:	
Standard Code:	3210.3.2	Passage Code:	
Standard Text:	Distinguish between aerobic and anaerobic respiration.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	B	DOK Level:	1

What is one way anaerobic respiration differs from aerobic respiration?

A It produces sugars from sunlight.

B It produces fewer molecules of ATP.

C It only occurs when oxygen is present.

D It only occurs in the presence of a catalyst.

Item Information

Item Code:	GS040361	Passage Title:	
Standard Code:	3210.3.2	Passage Code:	
Standard Text:	Distinguish between aerobic and anaerobic respiration.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	B	DOK Level:	1

The process of fermentation takes place

A when oxygen is present

B when no oxygen is available

C when water is present

D when no water is available

Item Information

Item Code:	TEB120111	Passage Title:	
Standard Code:	3210.3.2	Passage Code:	
Standard Text:	Distinguish between aerobic and anaerobic respiration.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	2

A sports physiologist was monitoring athletes to determine at which point their muscles began to work under anaerobic conditions. The best way to test for this would be to check for a buildup of

A ADP.

B ATP.

C lactic acid.

D carbon dioxide.

Item Information

Item Code:	TEB120320	Passage Title:	
Standard Code:	3210.3.2	Passage Code:	
Standard Text:	Distinguish between aerobic and anaerobic respiration.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	D	DOK Level:	3-4

Which statement best explains what occurs in skeletal muscle cells during vigorous exercise?

A They produce more than 36 molecules of ATP per molecule of glucose.

B They switch from breaking down glucose to synthesizing glucose.

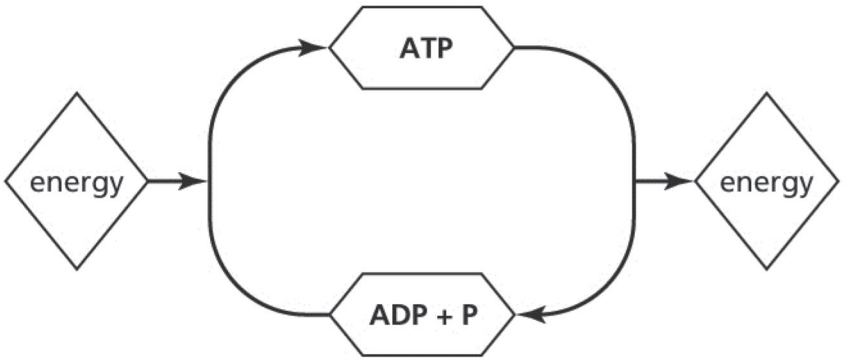
C They switch from anaerobic respiration to aerobic respiration.

D They produce lactic acid instead of carbon dioxide.

Item Information

Item Code:	GS001024	Passage Title:	
Standard Code:	3210.3.3	Passage Code:	
Standard Text:	Compare and contrast photosynthesis and cellular respiration in terms of energy transformation.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	D	DOK Level:	2

Study the diagram below.



Which of these processes provides energy that is used most directly to make ATP?

A the storage of sugars

B the transport of sugars

C the synthesis of sugars

D the breakdown of sugars

Item Information

Item Code:	GS040154	Passage Title:	
Standard Code:	3210.3.3	Passage Code:	
Standard Text:	Compare and contrast photosynthesis and cellular respiration in terms of energy transformation.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	2

The solar energy necessary for photosynthesis is converted to chemical energy and released for the cell's use by which process?

A radiation

B distillation

C respiration

D transpiration

Item Information

Item Code:	TEB120019	Passage Title:	
Standard Code:	3210.3.3	Passage Code:	
Standard Text:	Compare and contrast photosynthesis and cellular respiration in terms of energy transformation.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	3-4

Heterotrophs depend on autotrophs for chemical energy in a food chain. Which statement describes how autotrophs depend on heterotrophs for survival?

A supply oxygen for aerobic respiration

B provide sunlight for photosynthesis

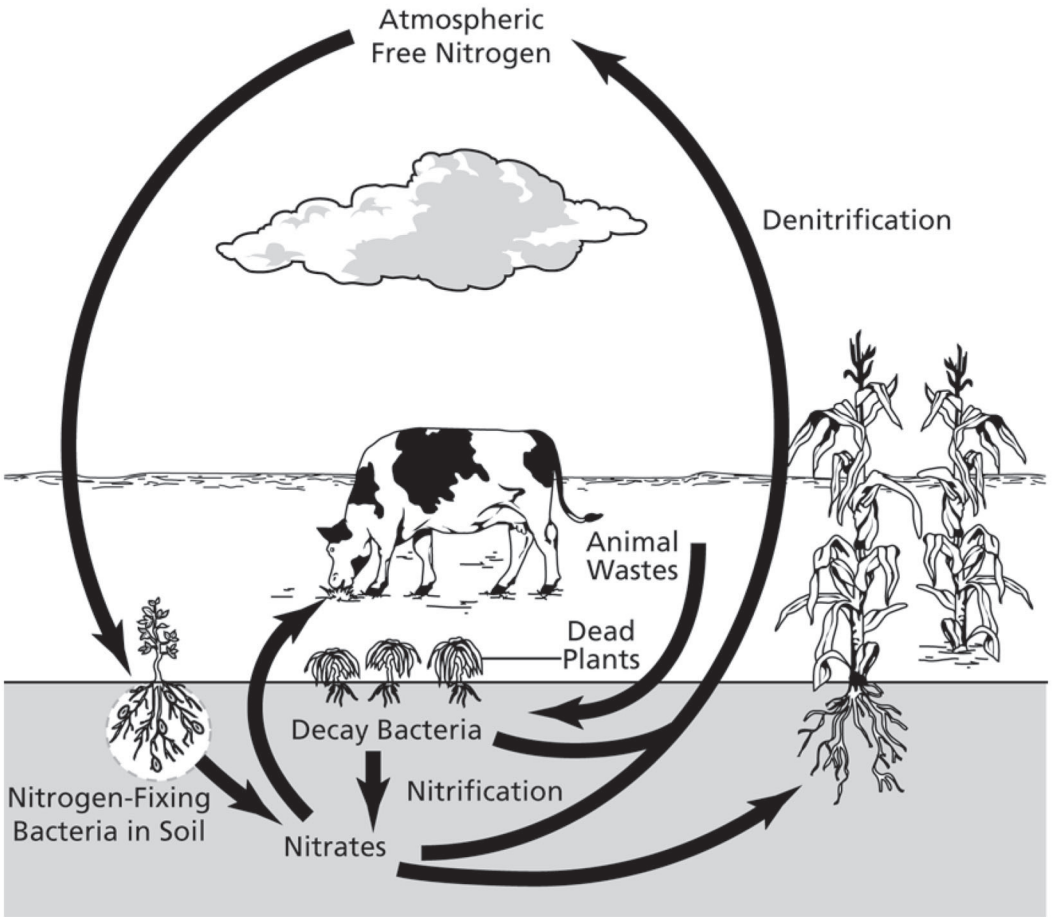
C produce carbon dioxide gas for photosynthesis

D make lactic acid during anaerobic respiration

Item Information

Item Code:	GS040253	Passage Title:	
Standard Code:	3210.3.4	Passage Code:	
Standard Text:	Predict how changes in a biogeochemical cycle can affect an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	B	DOK Level:	2

The diagram below represents the nitrogen cycle.



Which statement <u>best</u> explains what would most likely occur first if the amount of organic matter in an area suddenly decreased?

A The number of decomposers would increase.

B The amount of available nitrogen in the soil would decrease.

C The number of nitrogen-fixing bacteria would increase.

D The amount of atmospheric nitrogen would decrease.

Item Information

Item Code:	GS010190	Passage Title:	
Standard Code:	3210.3.4	Passage Code:	
Standard Text:	Predict how changes in a biogeochemical cycle can affect an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	D	DOK Level:	2

A city of one million people produces approximately 864,000 kilograms of air pollutants a day, including large amounts of sulfur oxides. What is the most likely effect of this pollution on the environment?

A increase of the ozone in the stratosphere

B larger number of plant life in the city

C reduction of the greenhouse effect

D an increase in acid rain

Item Information

Item Code:	GS010433	Passage Title:	
Standard Code:	3210.3.4	Passage Code:	
Standard Text:	Predict how changes in a biogeochemical cycle can affect an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	2

The burning of fossil fuels has increased carbon dioxide emissions dramatically since the 1950s. If the amount of carbon dioxide in the atmosphere continues to rise, it appears to cause a warming trend and affect ecosystems throughout the world by

A increasing the amount of acid rain.
B increasing the amount of ultraviolet radiation.
C changing climates and melting the polar ice caps.
D contaminating water sources with toxic chemicals.

Item Information

Item Code:	TEB110078	Passage Title:	
Standard Code:	3210.3.4	Passage Code:	
Standard Text:	Predict how changes in a biogeochemical cycle can affect an ecosystem.		
Reporting Category:	Flow of Matter & Energy		
Correct Answer:	C	DOK Level:	1

Decomposers play an important role in the nitrogen cycle to help maintain the health of an ecosystem. Which would most likely occur if there was a decrease in the number of decomposers?

A Waste products would be converted to carbohydrates.

B Energy needed for producers to make food would increase.

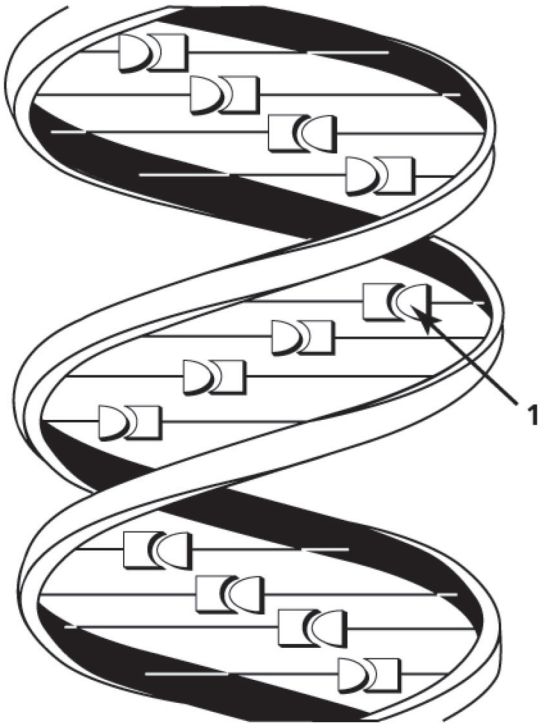
C Necessary nutrients would not be recycled in the environment.

D The amount of carbon dioxide in the atmosphere would decrease.

Item Information

Item Code:	GS040171	Passage Title:	
Standard Code:	3210.4.1	Passage Code:	
Standard Text:	Identify the structure and function of DNA.		
Reporting Category:	Heredity		
Correct Answer:	C	DOK Level:	1

A DNA molecule is shown in the diagram below.



What part of the DNA molecule is represented by the structure labeled 1?

A a nucleotide

B an amino acid

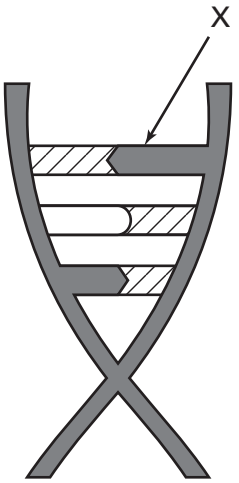
C a nitrogen base

D a phosphate

Item Information

Item Code:	TEB120184	Passage Title:	
Standard Code:	3210.4.1	Passage Code:	
Standard Text:	Identify the structure and function of DNA.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	1

The diagram shown represents part of a DNA molecule.



If X represents adenine, what molecule is its complementary base?

A cytosine

B thymine

C guanine

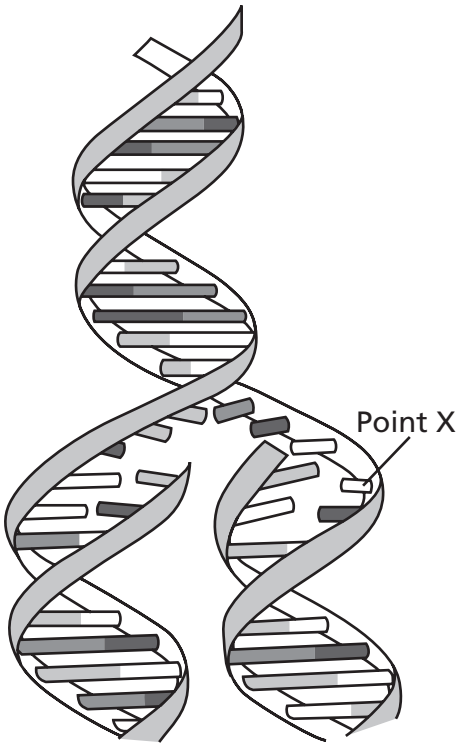
D uracil

Item Information

Item Code:	TEB110060	Passage Title:	
Standard Code:	3210.4.2	Passage Code:	
Standard Text:	Associate the process of DNA replication with its biological significance.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

The diagram below represents DNA replication in which a mutation has occurred at Point X.

DNA Replication



During the cell cycle, this mutation at Point X can result in the production of a mutated protein in which cell?

A the parent cell only

B one resulting cell only

C one resulting cell and the parent cell

D both resulting cells and the parent cell

Item Information

Item Code:	TEB110222	Passage Title:	
Standard Code:	3210.4.2	Passage Code:	
Standard Text:	Associate the process of DNA replication with its biological significance.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

In order to ensure an exact copy of DNA is passed on, replication must occur before

A electron transfer.

B mitosis.

C protein synthesis.

D glycolysis.

Item Information

Item Code:	GS040012	Passage Title:	
Standard Code:	3210.4.3	Passage Code:	
Standard Text:	Recognize the interactions between DNA and RNA during protein synthesis.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

Which best describes the process that occurs when nuclear DNA codes for a protein in the cytoplasm?

A One strand of the DNA temporarily leaves the nucleus to be translated by a ribosome in the cytoplasm.

B mRNA is transcribed from DNA and leaves the nucleus to be translated by tRNA in the cytoplasm.

C A ribosome makes an RNA copy of DNA in the nucleus, then returns to the cytoplasm for protein synthesis.

D The tRNA copies the DNA in the nucleus, then transports the information to the ribosomes in the cytoplasm for protein synthesis.

Item Information

Item Code:	TEB120022	Passage Title:	
Standard Code:	3210.4.3	Passage Code:	
Standard Text:	Recognize the interactions between DNA and RNA during protein synthesis.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

During protein synthesis, an RNA strand is transcribed from one strand of DNA.

GCG TTA CCT

What is the complementary RNA strand to the DNA strand shown?

A CGC UUT CCT

B CGC AAU GGA

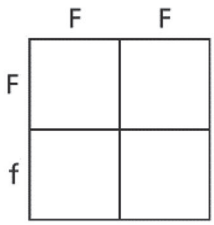
C GCG UUA CCU

D CGC AAT GGA

Item Information

Item Code:	GS000865	Passage Title:	
Standard Code:	3210.4.4	Passage Code:	
Standard Text:	Determine the probability of a particular trait in an offspring based on the genotype of the parents and the particular mode of inheritance.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

In humans, the allele for having freckles (F) is dominant to the allele for not having freckles (f).



What is the probability that a child from this cross will be heterozygous for freckles?

A 25%

B 50%

C 75%

D 100%

Item Information

Item Code:	GS001087	Passage Title:	
Standard Code:	3210.4.4	Passage Code:	
Standard Text:	Determine the probability of a particular trait in an offspring based on the genotype of the parents and the particular mode of inheritance.		
Reporting Category:	Heredity		
Correct Answer:	D	DOK Level:	2

A cross between a white horse and a brown horse produces offspring that are golden in color. The possible results of a cross between two golden-colored horses are shown below.

RESULTS OF A CROSS BETWEEN TWO GOLDEN HORSES

Chance	Coat Color
25%	White
50%	Golden
25%	Brown

Based on these results, what is the <u>most likely</u> mode of inheritance for coat color in these horses?

A polygenic

B sex-linked

C complete dominance

D incomplete dominance

Item Information

Item Code:	TEB120125	Passage Title:	
Standard Code:	3210.4.4	Passage Code:	
Standard Text:	Determine the probability of a particular trait in an offspring based on the genotype of the parents and the particular mode of inheritance.		
Reporting Category:	Heredity		
Correct Answer:	A	DOK Level:	1

A seed company was experimenting with different types of plant stems. Some of the plants they were working with had weak stems and a low survival rate. They crossed plants with weak stems with plants that had strong stems and produced offspring that all had strong stems. Based on these results, the allele for having strong stems is

A dominant.

B recessive.

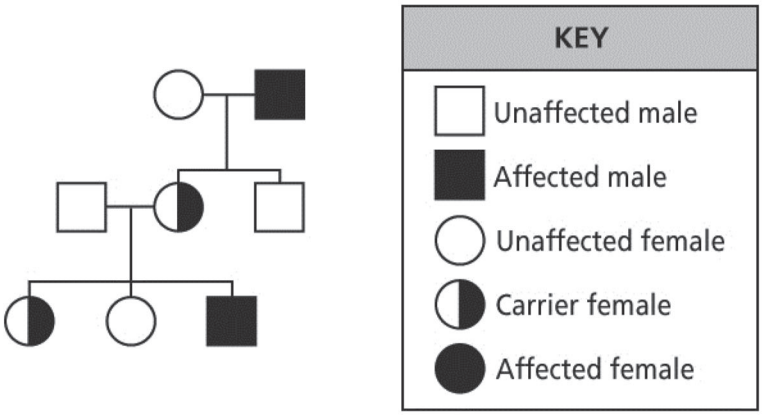
C sex-linked.

D codominant.

Item Information

Item Code:	GS001046	Passage Title:	
Standard Code:	3210.4.5	Passage Code:	
Standard Text:	Apply pedigree data to interpret various modes of genetic inheritance.		
Reporting Category:	Heredity		
Correct Answer:	D	DOK Level:	2

The inheritance pattern of a particular condition is shown below.



This inheritance pattern shows that the condition is

A autosomal dominant

B autosomal recessive

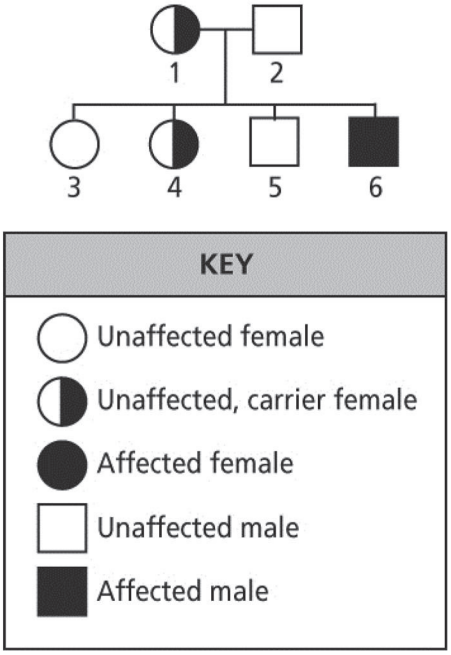
C sex-linked dominant

D sex-linked recessive

Item Information

Item Code:	GS001068	Passage Title:	
Standard Code:	3210.4.5	Passage Code:	
Standard Text:	Apply pedigree data to interpret various modes of genetic inheritance.		
Reporting Category:	Heredity		
Correct Answer:	D	DOK Level:	2

The pedigree below shows the occurrence of a condition in two generations of a human family.



Which of these terms describes the inheritance pattern shown in the pedigree?

A autosomal dominant

B autosomal recessive

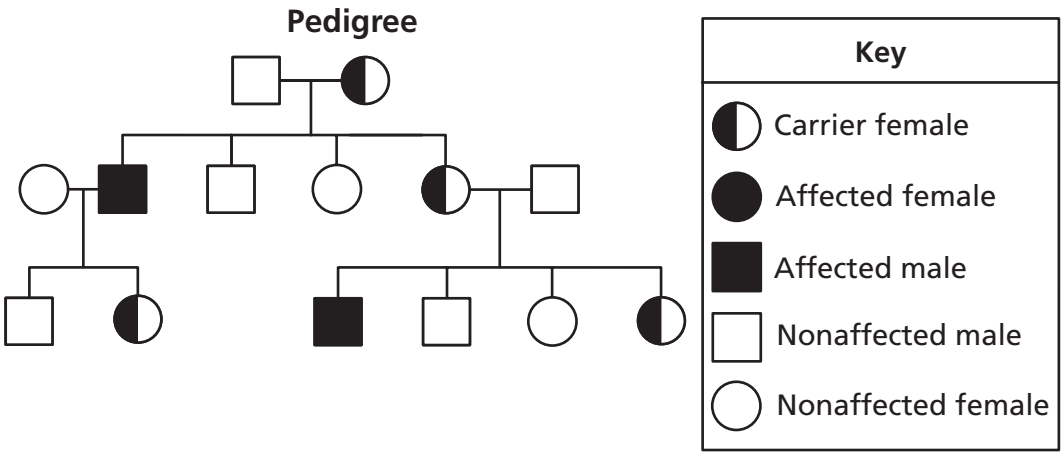
C sex-linked dominant

D sex-linked recessive

Item Information

Item Code:	TEB110064	Passage Title:	
Standard Code:	3210.4.5	Passage Code:	
Standard Text:	Apply pedigree data to interpret various modes of genetic inheritance.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

The pedigree below represents an inherited disorder.



What mode of inheritance is shown?

A autosomal dominant

B X-linked recessive

C autosomal recessive

D X-linked dominant

Item Information

Item Code:	GS000749	Passage Title:	
Standard Code:	3210.4.6	Passage Code:	
Standard Text:	Describe how meiosis is involved in the production of egg and sperm cells.		
Reporting Category:	Heredity		
Correct Answer:	C	DOK Level:	1

The body cells of an adult chimpanzee contain 48 chromosomes.

How many chromosomes does a chimpanzee's fertilized egg have?

A 12

B 24

C 48

D 96

Item Information

Item Code:	GS040207	Passage Title:	
Standard Code:	3210.4.7	Passage Code:	
Standard Text:	Describe how meiosis and sexual reproduction contribute to genetic variation in a population.		
Reporting Category:	Heredity		
Correct Answer:	D	DOK Level:	1

Which event in meiosis increases genetic variation within a population?

A Chromosomes form pairs.

B DNA condenses to form chromosomes.

C Chromosomes duplicate themselves.

D Segments of chromosomes cross over.

Item Information

Item Code:	GS040016	Passage Title:	
Standard Code:	3210.4.7	Passage Code:	
Standard Text:	Describe how meiosis and sexual reproduction contribute to genetic variation in a population.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	1

Which best explains how the process of meiosis contributes to genetic variation?

A by producing diploid cells that contain an exact copy of one diploid cell's DNA

B by producing haploid cells with a random combination of alleles from one diploid cell

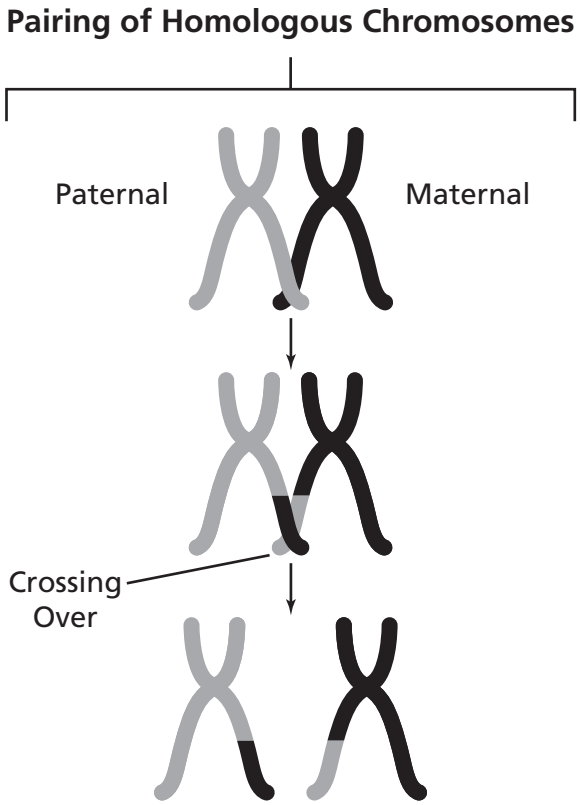
C by producing diploid cells that contain the alleles from only two diploid cells

D by producing haploid cells that contain DNA from two diploid cells

Item Information

Item Code:	TEB120292	Passage Title:	
Standard Code:	3210.4.7	Passage Code:	
Standard Text:	Describe how meiosis and sexual reproduction contribute to genetic variation in a population.		
Reporting Category:	Heredity		
Correct Answer:	B	DOK Level:	2

The diagram shown illustrates a process that occurs during meiosis.



This process results in

A the division of the cell.

B an increase in genetic variation.

C the reduction in the number of alleles.

D an increase in the number of chromosomes.

Item Information

Item Code:	GS000529	Passage Title:	
Standard Code:	3210.4.8	Passage Code:	
Standard Text:	Determine the relationship between mutations and human genetic disorders.		
Reporting Category:	Heredity		
Correct Answer:	A	DOK Level:	2

Cystic fibrosis is a hereditary disease that affects the respiratory and digestive systems. Cystic fibrosis occurs when two recessive alleles of a gene (*cc*) are present. A person with one allele for cystic fibrosis is called a carrier (*Cc*) of the disease.

If both parents are carriers, what percentage of their children are expected to have cystic fibrosis?

A 25%

B 50%

C 75%

D 100%

Item Information

Item Code:	GS050086	Passage Title:	
Standard Code:	3210.4.9	Passage Code:	
Standard Text:	Evaluate the scientific and ethical issues associated with gene technologies: genetic engineering, cloning, transgenic organism production, stem cell research, and DNA fingerprinting.		
Reporting Category:	Heredity		
Correct Answer:	A	DOK Level:	2

Which statement best explains a primary argument against developing transgenic organisms, whose genomes carry genes from another species?

A Transgenic organisms may cause unknown consequences in an ecosystem.

B Transgenic organisms may increase food production in many crops.

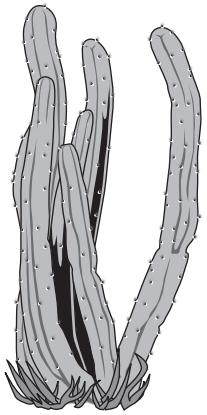
C Transgenic organisms may eliminate harmful diseases in a population.

D Transgenic organisms may prevent harmful mutations in humans.

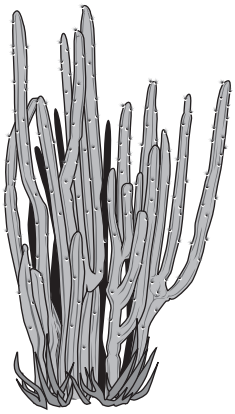
Item Information

Item Code:	TEB110022	Passage Title:	
Standard Code:	3210.5.1	Passage Code:	
Standard Text:	Compare and contrast the structural, functional, and behavioral adaptations of animals or plants found in different environments.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	D	DOK Level:	2

A cactus found in the deserts of North and South America is similar in structure to a plant species found in Africa.



Cacti
(North and South America)



***Euphorbia* sp.**
(Africa)

Which statement <u>best</u> explains how these plants express a similar structure?

A Artificial selection for similar traits occurred.

B Both plant species are pollinated by the same insects.

C Seeds were dispersed from birds across both continents.

D Both plant species are exposed to the same environmental pressures.

Item Information

Item Code:	GS000425	Passage Title:	
Standard Code:	3210.5.2	Passage Code:	
Standard Text:	Recognize the relationship between form and function in living things.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	B	DOK Level:	2

Scientists think that the Hawaiian honeycreepers shown below are closely related. The scientists think the ancestor of the honeycreepers is a finch that migrated to Hawaii.

Which of these <u>most likely</u> led to the different sizes and shapes of the honeycreeper beaks?

A the presence of predators

B the presence of a variety of food types

C the ability of individual birds to change their beak shape

D the desire of individual birds to avoid competition for food

Item Information

Item Code:	GS040284	Passage Title:	
Standard Code:	3210.5.2	Passage Code:	
Standard Text:	Recognize the relationship between form and function in living things.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	C	DOK Level:	2

Which best explains why muscle cells have more mitochondria than skin cells?

A Muscle cells divide more often than skin cells.

B Muscle cells make more protein than skin cells.

C Muscle cells require more energy than skin cells.

D Muscle cells break down more waste than skin cells.

Item Information

Item Code:	TEB110355	Passage Title:	
Standard Code:	3210.5.2	Passage Code:	
Standard Text:	Recognize the relationship between form and function in living things.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	D	DOK Level:	2

Human bones have both strength and a limited amount of flexibility. Their strength helps bones to perform which function?

A circulate oxygen

B absorb calcium

C produce blood cells

D provide support

Item Information

Item Code:	TEB120046	Passage Title:	
Standard Code:	3210.5.2	Passage Code:	
Standard Text:	Recognize the relationship between form and function in living things.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	C	DOK Level:	2

Hawks found in the United States are divided into three groups: short-winged hawks, broad-winged hawks, and harrier hawks.

Scientists have determined that these birds came from a common ancestor. Which best explains why they have developed different physical and behavioral characteristics?

A They chose beneficial mutations to ensure their survival.

B They bred with other species of birds.

C They filled different niches in the environment.

D They imitated other bird species in their habitats.

Item Information

Item Code:	GS040022	Passage Title:	
Standard Code:	3210.5.3	Passage Code:	
Standard Text:	Recognize the relationships among environmental change, genetic variation, natural selection, and the emergence of a new species.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	B	DOK Level:	2

Over a period of time, the average annual temperature of a particular region significantly decreases, resulting in longer winters with increased snowfall. As a result, the majority coat color of a rabbit population has changed from brown to white. Which best explains this change in coat color among the rabbit population?

A White coat color provides more warmth than brown coat color.

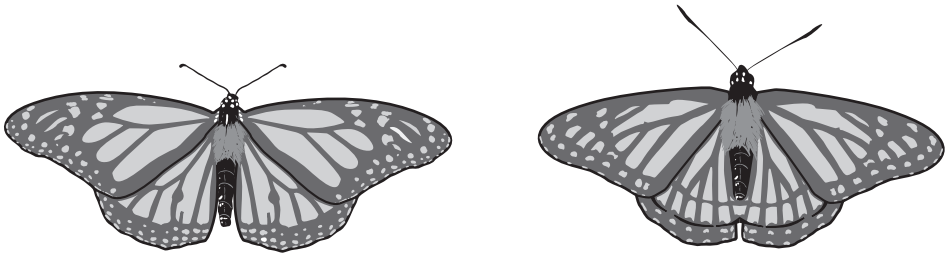
B Rabbits with white coat color are less visible to predators.

C Geographic isolation separated the two populations and resulted in a species with different coat colors.

D Genetic mutation caused a change in the dominant allele, resulting in white as the dominant coat color.

Read the passage and answer questions XX and XX.

The illustrations shown are of the monarch butterfly, *Danaus plexippus*, and the viceroy butterfly, *Basilarchia archippus*. The viceroy butterfly appears very similar to the monarch butterfly; however, the viceroy has a curved black line on both of its hind wings, and the monarch does not.



Monarch
(*Danaus plexippus*)

Viceroy
(*Basilarchia archippus*)

In the natural world, bright orange coloring is often a warning to predators that the creature displaying the color is toxic. Monarch caterpillars eat milkweed plants that contain a class of chemicals called cardenolides which are nontoxic to insects but toxic to vertebrates. The milkweed eaten at the caterpillar stage causes the adult butterfly to taste bitter. The monarch butterfly's bright coloring and unpleasant taste is an effective defense against most butterfly predators.

The viceroy caterpillars eat cottonwood leaves which are nontoxic to vertebrates. However, the viceroy butterfly so closely resembles the monarch that most butterfly predators mistake it for the toxic monarch and leave it alone.

Item Information

Item Code:	TEB120224	Passage Title:	
Standard Code:	3210.5.3	Passage Code:	
Standard Text:	Recognize the relationships among environmental change, genetic variation, natural selection, and the emergence of a new species.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	D	DOK Level:	2

Which process is most likely responsible for the appearance of the viceroy butterfly?

A divergent evolution

B genetic drift

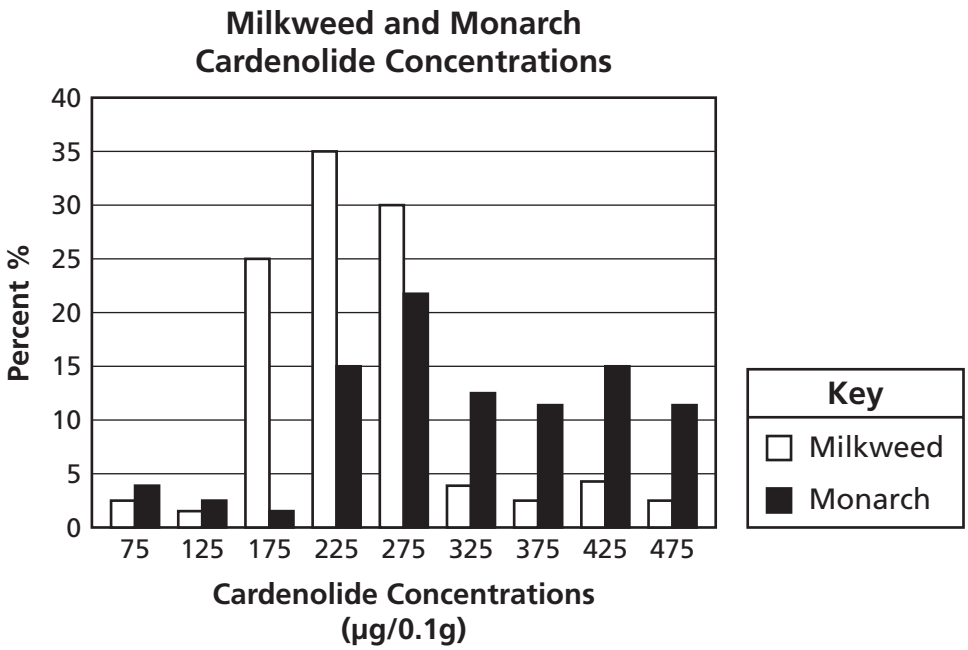
C environmental change

D natural selection

Item Information

Item Code:	TEB120225	Passage Title:	
Standard Code:	3210.Inq.5	Passage Code:	
Standard Text:	Defend a conclusion based on scientific evidence.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	D	DOK Level:	3-4

The graph shown represents data collected that compare the various concentrations of cardenolides found in different milkweed plants and the concentrations found in adult monarchs that fed on milkweed as caterpillars.



Scientists concluded that cardenolide concentrations are maintained throughout the life stages of the monarch butterfly. Based on the graph, which statement <u>best</u> defends the scientists' conclusion?

A The cardenolide concentration in the milkweed decreased as the caterpillars consumed the milkweed.

B The cardenolide concentration decreased in the monarchs when they became adults.

C The cardenolide concentration in the adult monarchs is dependent on the concentration found in the milkweed.

D The cardenolide concentration remained in the adult monarchs regardless of the concentration in the milkweed.

Item Information

Item Code:	GS040023	Passage Title:	
Standard Code:	3210.5.4	Passage Code:	
Standard Text:	Describe the relationship between the amount of biodiversity and the ability of a population to adapt to a changing environment.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	A	DOK Level:	2

Which population would be <u>best</u> suited for adapting to an environment that undergoes a sudden change in climate?

A a population with many phenotypes

B a population with a higher number of males than females

C a population with individuals that all express dominant traits

D a population with a high rate of emigration

Item Information

Item Code:	GS040183	Passage Title:	
Standard Code:	3210.5.4	Passage Code:	
Standard Text:	Describe the relationship between the amount of biodiversity and the ability of a population to adapt to a changing environment.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	A	DOK Level:	2

Geneticists have discovered that cheetahs share approximately 99% of the same genes, resulting in an extremely low genetic diversity in the cheetah populations of the world. Which is the <u>most</u> likely result of this lack of genetic diversity?

A reduced ability to adapt to a changing environment

B lengthened reproductive cycles

C decreased rates of allele mutations

D increased rate of expression of dominant traits

Item Information

Item Code:	TEB120327	Passage Title:	
Standard Code:	3210.5.4	Passage Code:	
Standard Text:	Describe the relationship between the amount of biodiversity and the ability of a population to adapt to a changing environment.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	A	DOK Level:	3-4

The number of migratory birds along the main migration corridors has been declining in recent years. Vulnerable to environmental changes, migratory birds, such as the Canada Warbler, are dependent on stopover sites to rest and refuel as they make their long journey from northern Canada to South America. The cause of the overall decline in migratory birds is complex and specific to certain species. However, it is a reflection of a larger environmental problem

A tied to the loss of habitats the birds need for resources.

B related to an increase in the number of bird predators.

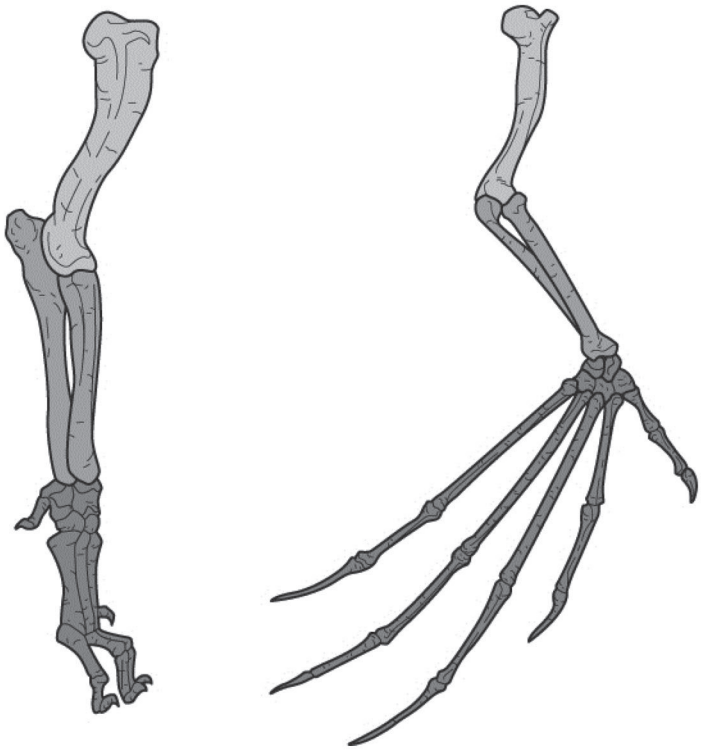
C tied to competition among nonmigratory bird species.

D related to an increase in the number of bird watchers.

Item Information

Item Code:	GS010174	Passage Title:	
Standard Code:	3210.5.5	Passage Code:	
Standard Text:	Apply evidence from the fossil record, comparative anatomy, amino acid sequences, and DNA structure that support modern classification systems.		
Reporting Category:	Biodiversity & Change		
Correct Answer:	D	DOK Level:	2

The diagram below shows the bone structure of two animals.



What do these two animals <u>most</u> likely have in common?

A They shared the same habitat.

B Their limbs served the same function.

C They are of the same species.

D They share a common ancestor.

Item Information

Item Code:	TEB120065	Passage Title:	
Standard Code:	3210.Inq.1	Passage Code:	
Standard Text:	Select a description or scenario that reevaluates and/or extends a scientific finding.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	3-4

In 1796, Edward Jenner investigated the relationship between cowpox and smallpox. People who became ill with cowpox, a nonfatal disease, did not catch smallpox, a deadly disease. Jenner injected a patient with the cowpox virus and several months later injected the same patient with smallpox virus. The patient did not contract smallpox. Jenner's research influenced the development of

A painkillers.

B anesthetics.

C vaccines.

D antibiotics.

Item Information

Item Code:	GS040295	Passage Title:	
Standard Code:	3210.Inq.2	Passage Code:	
Standard Text:	Analyze the components of a properly designed scientific investigation.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	2

A student is designing an investigation to compare the effectiveness of organic fertilizers to chemical fertilizers. Which best represents the correct process the student should follow to prepare for this investigation?

A hypothesize, research, collect data from experiment, conduct experiment, and discuss conclusions and applications

B hypothesize, collect data from experiment, discuss conclusions and applications, and research

C research, hypothesize, conduct experiment, collect data from experiment, and discuss conclusions and applications

D research, discuss conclusions and applications, conduct experiment, hypothesize, and collect data from experiment

Item Information

Item Code:	GS040071	Passage Title:	
Standard Code:	3210.Inq.3	Passage Code:	
Standard Text:	Determine appropriate tools to gather precise and accurate data.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	1

A researcher wants to observe the process of cell division in bacteria. Which tool would be <u>most</u> appropriate for the researcher to use for gathering accurate data?

A hand lens

B digital camera

C video microscope

D graphing calculator

Item Information

Item Code:	GS040386	Passage Title:	
Standard Code:	3210.Inq.4	Passage Code:	
Standard Text:	Evaluate the accuracy and precision of data.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	B	DOK Level:	2

The table shows the results of students measuring the length of an acorn. The acorn is exactly 2.00 centimeters long.

Trial	Student Measurements in Centimeters			
	1	2	3	4
1	2.15	2.01	2.025	2.00
2	2.16	1.95	2.00	2.45
3	2.30	2.00	1.875	2.20
4	2.21	2.00	2.10	2.10
5	2.00	1.95	2.10	2.20

Which student made the <u>most</u> accurate and precise measurements of the acorn?

A Student 1

B Student 2

C Student 3

D Student 4

Item Information

Item Code:	GS040115	Passage Title:	
Standard Code:	3210.Inq.4	Passage Code:	
Standard Text:	Evaluate the accuracy and precision of data.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	2

Students in a science class measured the length of three different leaves and recorded the data in the table below.

Leaf Measurement Results

Leaf Number	Actual Length	Student 1	Student 2	Student 3	Student 4
1	10.5 cm	10 cm	11 cm	10.4 cm	15 cm
2	4.2 cm	4 cm	6 cm	4.2 cm	42 cm
3	2.3 cm	2 cm	4 cm	2.5 cm	5 cm

Which student recorded the length of the leaves <u>most</u> accurately?

A 1

B 2

C 3

D 4

Item Information

Item Code:	GS040116	Passage Title:	
Standard Code:	3210.Inq.5	Passage Code:	
Standard Text:	Defend a conclusion based on scientific evidence.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	A	DOK Level:	2

A laboratory exercise simulating the activities of the cell membrane is conducted using dialysis tubing filled with a sucrose solution. The initial mass of each bag is measured and recorded. Each bag is placed in a beaker containing distilled water. After 24 hours each bag is massed and recorded again. The results are shown below.

Cell Membrane Activity

Contents in Dialysis Tubing Bag	Initial Mass	Final Mass	Percent Change in Mass
Distilled Water	25.1 g	26.3 g	4.78%
2% Sucrose	25.9 g	28.4 g	9.65%
6% Sucrose	26.3 g	30.1 g	14.45%
10% Sucrose	30.7 g	37.6 g	22.48%

Students conclude that water molecules, not sucrose molecules, moved into and out of the bag. Which statement <u>best</u> defends the conclusion?

A The distilled water in the beakers had the least change in mass.

B The change in mass indicates the movement of sucrose molecules.

C Only distilled water can cross a semipermeable membrane.

D Molecules only move when the sucrose concentration is above 5.00%.

Item Information

Item Code:	GS050213	Passage Title:	
Standard Code:	3210.Inq.5	Passage Code:	
Standard Text:	Defend a conclusion based on scientific evidence.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	B	DOK Level:	2

A biology class investigated the rate of photosynthesis of aquatic plants at varying distances from a light source in their classroom aquarium. The class concluded that the rate of photosynthesis increases when the plants are closer to the light source. Which statement best supports the students' classroom conclusion when applied in a pond ecosystem?

A Most aquatic plants found in a pond have small leaves.

B Most aquatic plants in a pond are found in shallow waters.

C Most aquatic plants found in a pond belong to the same species.

D Most aquatic plants in a pond are found in areas of moving water.

Item Information

Item Code:	GS050310	Passage Title:	
Standard Code:	3210.Inq.6	Passage Code:	
Standard Text:	Determine why a conclusion is free of bias.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	D	DOK Level:	2

A research company evaluated a two-year study on the use of asthma inhalers conducted by Agency X. Agency X had concluded that the data they collected were valid and the inhalers were effective in the treatment of certain asthmatic conditions.

The research company followed the same procedure set up by Agency X. They used a double blind study with the same number of different patients, for the same time period. The research company determined that the conclusion of Agency X is valid and that the inhalers are effective. To ensure their results are free of bias, Agency X

A performed a two-year study.

B researched a previously published paper.

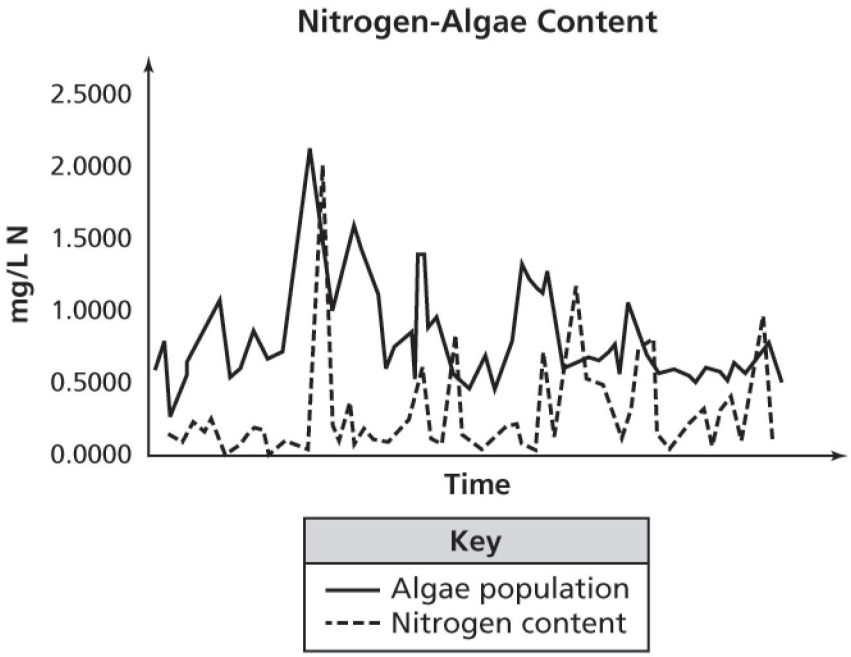
C had the research company use the same patients.

D sent the results to an independent research company.

Item Information

Item Code:	GS040160	Passage Title:	
Standard Code:	3210.Math.1	Passage Code:	
Standard Text:	Interpret a graph that depicts a biological phenomenon.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	B	DOK Level:	3-4

A graph comparing the nitrogen content to the algae population size is shown below.



The shape of the lines on the graph indicates that nitrogen

A is a toxin to algae.

B is used by algae as a nutrient.

C supports the growth of algae competitors.

D prevents overgrowth of algae.

Item Information

Item Code:	GS050143	Passage Title:	
Standard Code:	3210.TE.1	Passage Code:	
Standard Text:	Distinguish among tools and procedures best suited to conduct a specified scientific inquiry.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	2

A biology class is investigating whether the amount of dissolved oxygen in an aquarium changes when water temperature changes. They set up two aquariums, one as a control and the second as the variable. They will record the dissolved oxygen content over a 3-month period using an oxygen monitor. What other tool is necessary to conduct this investigation?

A pH meter

B microscope

C thermometer

D graduated cylinder

Item Information

Item Code:	GS040119	Passage Title:	
Standard Code:	3210.TE.3	Passage Code:	
Standard Text:	Evaluate the overall benefit to cost ratio of a new technology.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	2

A chart comparing three types of light bulbs is shown below.

Light Bulb Type	Features	Per Unit Cost
Incandescent Light Bulbs	Life span is 1,500 hours Uses 3,600 KWh of electricity for 60,000 hours	$0.67 per bulb
Compact Fluorescent Light Bulbs (CFL)	Life span is 10,000 hours Uses 840 KWh of electricity for 60,000 hours	$3.00 per bulb
Light-Emitting Diode Light Bulbs (LED)	Life span is 60,000 hours Uses 360 KWh of electricity for 60,000 hours	$54.95 per bulb

A school district concerned with reducing CO_2 emissions is evaluating which type of light bulb would be the most efficient. Which statement explains why the compact fluorescent light bulb (CFL) is the best choice?

A The CFL light bulb lasts longer than the incandescent light bulb.

B The CFL light bulb is cheaper than the light-emitting diode light bulb (LED).

C The CFL light bulb provides the longest life span for the least cost.

D The CFL light bulb uses more electricity per hour than the light-emitting diode light bulb (LED).

Item Information

Item Code:	TEB120363	Passage Title:	
Standard Code:	3210.TE.3	Passage Code:	
Standard Text:	Evaluate the overall benefit to cost ratio of a new technology.		
Reporting Category:	Inquiry, Technology & Engineering, Mathematics		
Correct Answer:	C	DOK Level:	3-4

A company has produced an absorbent polymer that helps remove oil from contaminated ecosystems. However, this polymer is expensive to produce in mass quantities. Which statement best explains how this technology is beneficial, even though it is expensive to produce?

A It reduces the likelihood of oil spills.

B It ensures the survival of endangered species.

C It helps the environment return to a healthy state.

D It produces clean drinking water for human consumption.

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