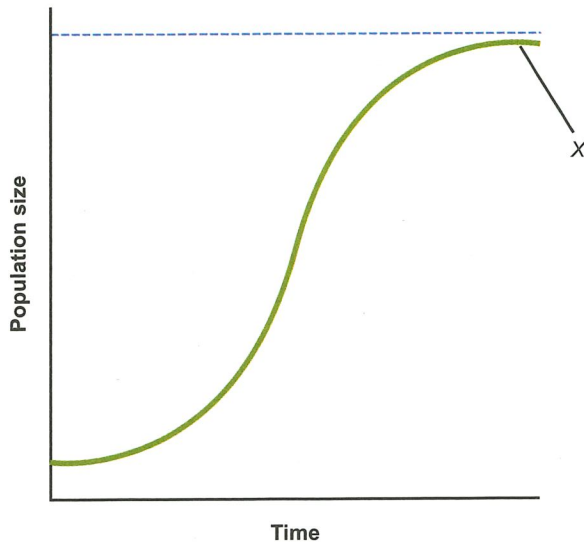


Unit 1 Review

DIRECTIONS: Study the graph, read each question, and choose the **best** answer.

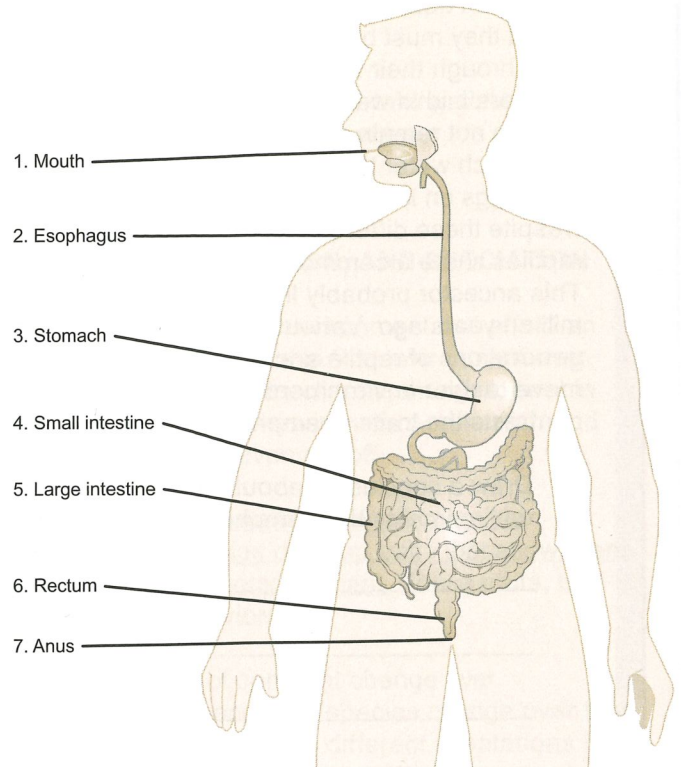
The graph shows the growth of one population of living things in a grassland ecosystem.



1. What happened to the population at point X?
 - A. It began to grow more quickly.
 - B. It suddenly decreased.
 - C. It stopped growing.
 - D. It disappeared from the ecosystem.
2. Which statement explains the **most likely** cause for what happened to the population at point X?
 - A. The ecosystem reached carrying capacity for the population.
 - B. A predator of the population was introduced in the ecosystem.
 - C. Resources needed by the population became unlimited in the ecosystem.
 - D. Adult members of the population were unable to find mates.
3. Suppose that the growth of the population followed the same curve as shown in the graph but the population size at point X was smaller. Which factor would be the **most likely** cause?
 - A. introduction of a disease
 - B. an increase in number of offspring
 - C. an unlimited food supply
 - D. fewer available resources

DIRECTIONS: Study the information and illustration, read each question, and choose the **best** answer.

The digestive system does the important job of extracting nutrients from food to be absorbed into the blood and carried to cells in the body. The process of digestion breaks down food into its smallest parts so that the body can use them for energy. The illustration shows body parts involved in digestion.



4. Based on the information, what must happen before food mixes with digestive juices in the stomach?
 - A. The body must absorb nutrients from the food.
 - B. Waste must accumulate in the large intestine.
 - C. Waste must pass out of the rectum.
 - D. The food must travel through the esophagus.
5. In which part of the digestive system does the absorption of nutrients into the blood occur?
 - A. mouth
 - B. esophagus
 - C. small intestine
 - D. rectum

DIRECTIONS: Study the table, read each question, and choose the **best** answer.

ORGANISMS IN A TIDAL ECOSYSTEM

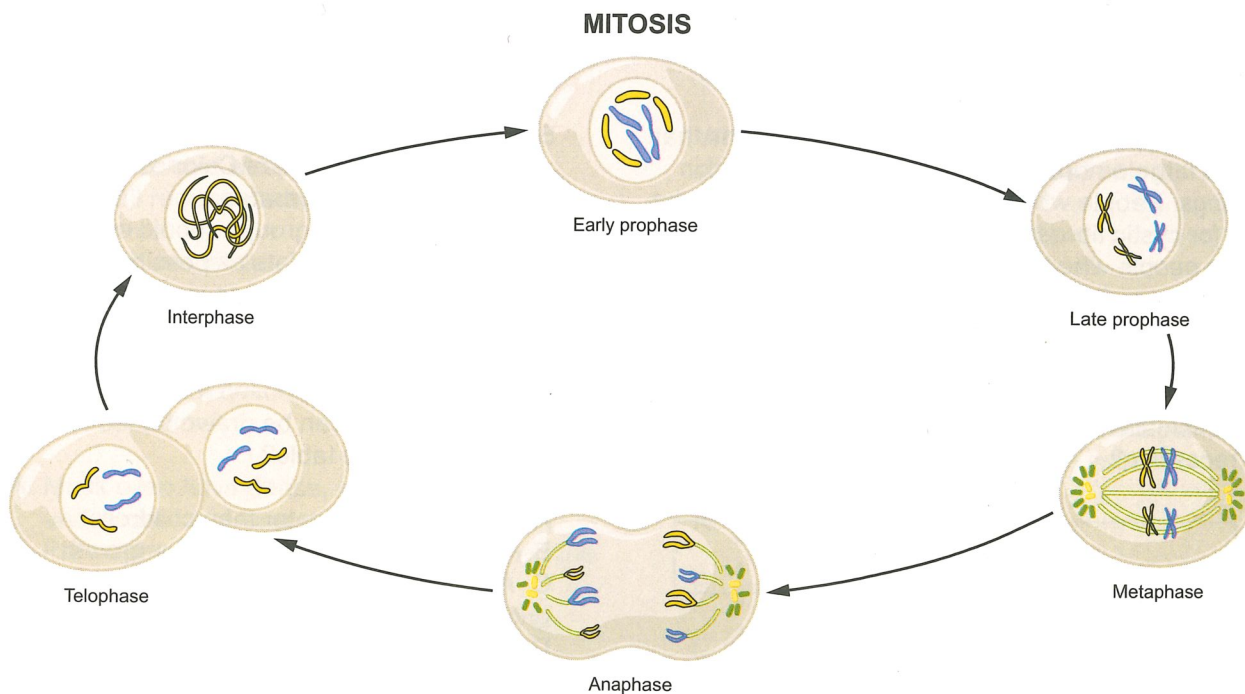
Species	Primary Diet
Clam worm	Zooplankton
Cordgrass	N/A
Herring gull	Soft-shelled clam, smelt
Marsh periwinkle	Cordgrass
Peregrine falcon	Herring gull, snowy egret, short-billed dowitcher
Phytoplankton	N/A
Short-billed dowitcher	Clam worm, marsh periwinkle
Snowy egret	Smelt
Soft-shelled clam	Phytoplankton
Smelt	Zooplankton
Zooplankton	Phytoplankton

- Based on the information in the table, which simple food chain is **most likely** to occur in the ecosystem?
 - herring gull → soft-shelled clam → phytoplankton
 - cordgrass → marsh periwinkle → short-billed dowitcher
 - peregrine falcon → herring gull → smelt
 - cordgrass → zooplankton → clam worm
- What is a likely effect of removing cordgrass from the ecosystem represented by the table?
 - The populations of marsh periwinkles and short-billed dowitchers would decrease.
 - All consumers would be eliminated from the ecosystem.
 - Phytoplankton populations would increase.
 - Peregrine falcons would have greater food resources.

DIRECTIONS: Read the passage and question, and then answer by marking the appropriate hot spot.

Mitosis is one way in which the cell nucleus divides during the cell division process. The phases of mitosis are prophase, metaphase, anaphase, and telophase. Cytokinesis is the part of the cell division process by which the cytoplasm of the parent cell divides.

- Cytokinesis occurs concurrently with mitosis over two phases of mitosis. Mark an X on the phase of mitosis during which cytokinesis completes.



DIRECTIONS: Read the passage and question, and choose the **best** answer.

Symbiotic relationships exist between many species in an ecosystem. Three categories of symbiotic relationships are mutualism, commensalism, and parasitism. An example of mutualism is the relationship between bees and flowers. From flowers, bees obtain nectar for food. Bees also carry pollen from flower to flower, allowing the plants to reproduce. Viceroy butterflies and monarch butterflies have a commensalistic relationship. The viceroy mimics the color pattern of the monarch because monarchs contain cardiac glycosides that make them distasteful to birds. Birds avoid monarchs and, by default, viceroys. Fleas are considered parasites of dogs, cats, and other animals. Fleas bite the skin of the animals and suck their blood for nourishment.

9. Which statement accurately contrasts mutualism and commensalism?
- Both species benefit in mutualism, whereas only one species benefits in commensalism.
 - Neither species benefits in mutualism, whereas one species benefits in commensalism.
 - One species benefits in mutualism, whereas both species benefit in commensalism.
 - Both species benefit in mutualism, whereas one species benefits while harming the other species in commensalism.

DIRECTIONS: Read the passage. Then read the question, and fill in your answer in the box.

Cystic fibrosis is a genetic disease in humans that causes large amounts of mucous to be secreted in the lungs. People who have two normal alleles of the gene for cystic fibrosis do not have cystic fibrosis. Nor do people who have one normal allele and one mutant allele of the gene. However, people having two mutant alleles of the gene have cystic fibrosis.

10. Which allele of the gene for cystic fibrosis is recessive?

DIRECTIONS: Study the information and table, read each question, and choose the **best** answer.

The main sources of Calories in a person's diet are carbohydrates, proteins, and fats. These nutrients are considered to be macronutrients. Carbohydrates and proteins each provide four Calories per gram. Fats provide nine Calories per gram. The table shows the recommended macronutrient proportions by age based on the percentage of total Calorie intake.

Age Group	Carbohydrate	Protein	Fat
Young children (1–3 years)	45–65%	5–20%	30–40%
Older children and adolescents (4–18 years)	45–65%	10–30%	25–35%
Adults (19 years and older)	45–65%	10–35%	20–35%

Source: United States Department of Agriculture's Center for Nutrition Policy and Promotion

11. What percentage of an adult's Calorie intake should be proteins?
- 10 percent to 30 percent
 - 10 percent to 35 percent
 - 20 percent to 35 percent
 - 45 percent to 65 percent
12. Which statement describes a recommendation suggested by the information in the table?
- A young child should consume a higher percentage of Calories from fats than from carbohydrates.
 - An older child or adolescent should consume a higher percentage of Calories from proteins than from carbohydrates.
 - People in all age groups should consume as few Calories from fats as possible.
 - Carbohydrates should account for a higher percentage of an adult's total Calorie intake than fats.
13. What conclusion can be drawn based on the information in the table?
- Adults burn fat faster than children.
 - The human body needs fat for growth.
 - A person should eat the same number of Calories of carbohydrates throughout life.
 - Fats provide more nutrients than carbohydrates or proteins.

DIRECTIONS: Study the information and table, read each question, and choose the **best** answer.

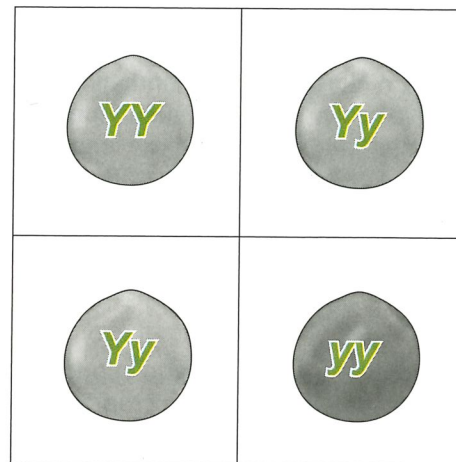
Different plants and animals live in different ecological communities. In general, the plants and animals in a specific ecological community have adaptations that allow them to survive in that area's climate. As an alternative, an animal might migrate in and out of an area, depending on the range of conditions the animal can withstand. Temperature and amount of rainfall are two of the most important climate factors to which living things must adapt. The table gives information about plants and animals in two types of climate regions.

	Boreal Forest	Tundra
Average yearly temperature range	-40°C to 20°C	-40°C to 18°C
Average yearly precipitation in centimeters (cm)	30 cm to 90 cm	15 cm to 25 cm
General climate description	Long, cold winters and short, cool summers	Very long, cold winters and short, cool summers
Common animals	Moose, coyote, bobcat, elk, porcupine, snowshoe hare	Caribou, lemming, musk ox, ptarmigan, arctic fox, wolf, polar bear
Common plants	Evergreen trees, mosses	Mosses, various flowers and shrubs

14. What inference can be made about how the animals living in boreal forests and tundras are similar?
- They have adaptations that allow them to survive in cold weather.
 - They all require the same amount of water to survive.
 - They all use tall trees for food and shelter.
 - None can survive without long periods of warm weather.
15. Which statement describes the use of migration as an adaptation?
- Musk oxen have dense, waterproof undercoats and long, coarse outercoats.
 - Ptarmigans have plumage that is brown in the summer and white in the winter.
 - Small shrubs preserve warmth by growing low to the ground.
 - Caribou live in the tundra during the growing season and in the boreal forest during winter.

DIRECTIONS: Study the information, read each question, and choose the **best** answer.

In pea plants, yellow seed color is a dominant trait, and green seed color is a recessive trait. This means that green seed color occurs only if an offspring receives the allele for the recessive trait from both parents. The Punnett square shows the potential genotypes for seed color in the offspring of a cross between two particular pea plants.



Y = yellow-seed allele
y = green-seed allele

16. What must be true about the genotypes of the parent plants for the trait of seed color?
- Neither parent carries the recessive allele.
 - Both parents carry the recessive allele.
 - Only one parent carries the dominant allele.
 - Only one parent carries the recessive allele.
17. What must be true about the phenotypes of the parent plants for the trait of seed color?
- Both produce yellow seeds.
 - Both produce green seeds.
 - One produces green seeds, and the other produces yellow seeds.
 - Each produces both green and yellow seeds.
18. What is the probability that the parent plants will produce an offspring with green seeds?
- $\frac{1}{8}$
 - $\frac{1}{4}$
 - $\frac{1}{2}$
 - $\frac{3}{4}$

DIRECTIONS: Read the passage and question, and choose the **best** answer.

Once a top predator throughout the southeastern United States, the red wolf nearly vanished due to loss of habitat and human persecution. As a result, a managed breeding program was established in 1973 at Point Defiance Zoo & Aquarium to conserve the remaining red wolves and increase their numbers. The success of the breeding program led to the reintroduction of red wolves in 1987 in the Alligator River National Wildlife Refuge, North Carolina. Red wolves now inhabit a five-county area in northeastern North Carolina, and although their numbers have grown, human caused mortalities, such as gunshot and vehicle strikes, can threaten their survival. The red wolf is one of our planet's most endangered species.

Credit: U.S. Fish and Wildlife Service; RED WOLVES brochure, fws.gov, accessed 2013

19. Which detail from the passage supports the conclusion that the drastic decrease in red wolf numbers resulted from the actions of people?
- Red wolves are one of the world's most endangered species.
 - A program for breeding red wolves was established.
 - Red wolves were nearly eliminated due to loss of habitat and persecution by humans.
 - Human-caused deaths, such as vehicle strikes, pose a current threat to red wolves.

DIRECTIONS: Read the passage and question, and choose the **best** answer.

To stay healthy, the human body works to maintain homeostasis. Feedback systems in the body cause it to respond to fluctuating internal conditions by changing in various ways. The purpose for these changes is to ensure that conditions in the body remain stable.

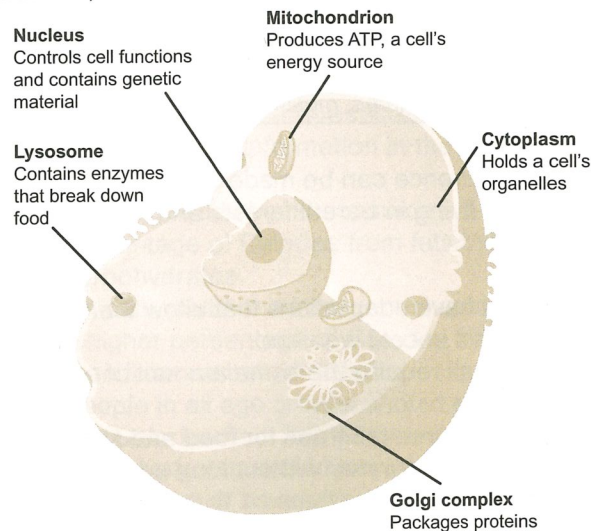
20. Which phrase is **most similar** in meaning to **homeostasis**?
- ability to react quickly
 - tendency toward a balanced state
 - capacity for fluctuation
 - condition of being healthy

DIRECTIONS: Read the passage and question, and choose the **best** answer.

For natural selection to occur, three factors are necessary: genetic variability, differential survivability, and inheritability. Consider an example of a population of insects in which some are brown, matching the tree bark on which they live, and others are green. Each successive generation of insects has more brown insects than green insects. The brown insects are more likely to survive because they are camouflaged; therefore, the trait of brown color is naturally selected.

21. Why is inheritability necessary for natural selection to occur?
- Differences must exist in the traits of a population of individuals.
 - Offspring must receive a different allele for the trait of color from each parent.
 - Individuals must have a trait that helps them survive and reproduce in their environment.
 - Organisms must be able to pass on a beneficial trait to future generations.

DIRECTIONS: Study the illustration, read the question, and choose the **best** answer.



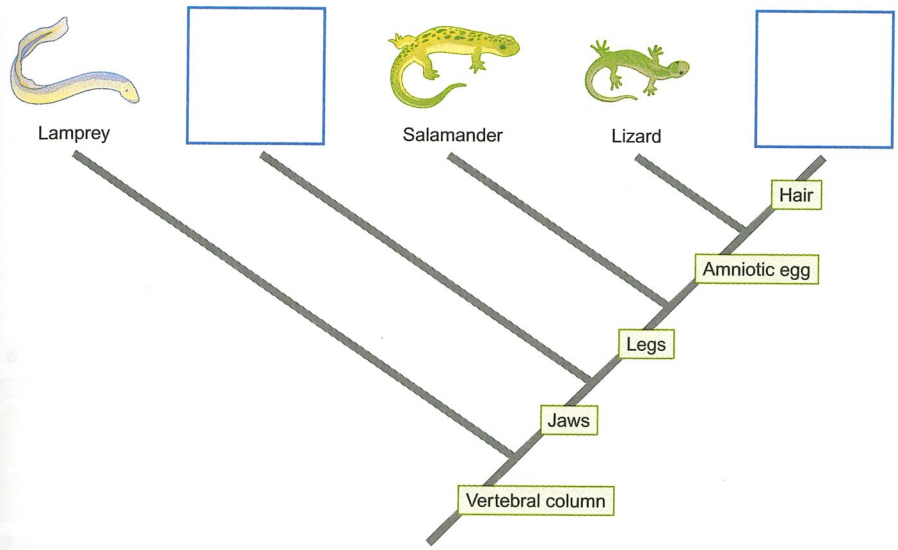
Processes cells must perform are digesting food, making energy, and reproducing.

22. Which part of a cell is involved in the cellular process of making energy?
- nucleus
 - cytoplasm
 - Golgi complex
 - mitochondrion




DIRECTIONS: Read the passage and question. Then use the drag-and-drop options to complete the diagram.

A cladogram organizes organisms with similar traits. It is a useful tool for understanding how organisms are related through common ancestors. Cladograms may focus on a very small amount of time and only minor differences or on a period of millions of years and major changes.

23. The cladogram shows how animals diverged at some major turning points in evolution. Determine whether each drag-and-drop option represents a derived characteristic on the cladogram. Then record each animal name in the appropriate part of the cladogram.



Drag-and-Drop Options

 Rabbit
 Pigeon
 Shark

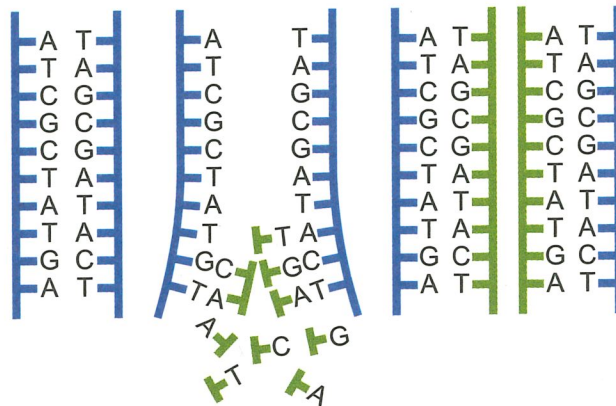
DIRECTIONS: Read the passage and question, and choose the **best** answer.

Dengue fever is an illness caused by one of four related bloodborne viruses. It is spread to humans through the bites of mosquitoes. This form of transmission is known as indirect contact because there is no direct human-to-human contact. Dengue fever is most prevalent in tropic and subtropic regions having warm weather and adequate rainfall—ideal conditions for mosquitoes to thrive. A person with dengue fever experiences a high fever and may experience fatigue, aches, nausea, and vomiting. Using mosquito repellent, wearing protective clothing, and reducing mosquito habitat are precautions that help people avoid contracting dengue fever.

24. Which statement is a valid generalization based on the information in the passage?
- A. Recommendations for controlling the spread of dengue fever involve reducing the risk of mosquito bites.
 - B. Illnesses caused by bloodborne viruses are more likely to occur in tropic or subtropic regions.
 - C. Someone who has dengue fever must seek medical attention.
 - D. Diseases transmitted through indirect contact are more dangerous than those transmitted through direct contact.

DIRECTIONS: Read the passage, and study the illustration. Then read the incomplete passage that follows. Use information from the first passage and the illustration to complete the second passage. For each drop-down item, choose the option that **best** completes the sentence.

New traits can occur in a population over time due to mutations. A mutation is caused by an error that occurs during DNA replication and changes a gene. When a cell divides to form new cells, the DNA contained in the cell's chromosomes replicates. In DNA replication, a new strand of DNA is made by new nucleotides that have bases that pair with the bases on the existing strand of DNA. The process of DNA replication is shown in the illustration.



25. The process of DNA replication begins with the unwinding of the double helix and the unzipping of the two strands of DNA. Next, individual **25. Drop-down 1** bind to the nucleotides on an existing strand of DNA. This binding is very specific. Adenine (A) binds only with thymine (T), and cytosine (C) binds only with guanine (G). Sometimes an error occurs during DNA replication, causing **25. Drop-down 2**. An example of this would be the nucleotide base pairing **25. Drop-down 3**. Mutations can result from mitosis or meiosis. A mutation formed during meiosis could create a gene with a new **25. Drop-down 4** that can be passed on to offspring.

Drop-Down Answer Options

- 25.1 A. double helixes
 B. strands
 C. nucleotides
 D. adenines

- 25.2 A. a gene
 B. a replication
 C. a mutation
 D. a base pairing

- 25.3 A. C-A
 B. C-G
 C. A-T
 D. T-A

- 25.4 A. nucleotide
 B. trait
 C. cell
 D. allele

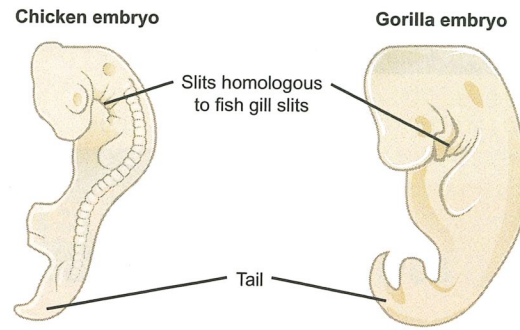
DIRECTIONS: Read the passage and question, and choose the **best** answer.

Desertification is the degradation of dryland ecosystems due to human activities and climate change. Over time, tree and plant cover is removed through overgrazing and unsustainable farming practices. Wind and water erosion carry away topsoil, leaving dust and sand behind. Desertification drastically changes ecosystems, and many animals and plants are unable to survive in the new environment.

26. An inference supported by the passage is that desertification results in
- A. an increase in production of crops.
 - B. a loss of biodiversity.
 - C. an influx of invasive species.
 - D. an increase in flooding.

DIRECTIONS: Read the passage, and study the illustration. Then read the question, and write your response on the lines. This task may take approximately 10 minutes to complete.

Evolutionary theory suggests that the wide variety of species in existence today came from a common ancestor. Every organism carries evidence of evolutionary change. Some evidence is most visible when an organism is a developing embryo. During their development, the embryos of many organisms pass through stages that look similar to embryonic stages of their ancestors. Scientists study these similarities to determine how species may be related. The illustration shows a chicken embryo and a gorilla embryo.



27. Based on the passage and illustration, what evidence exists to support the idea that chickens and gorillas have a common ancestor?

DIRECTIONS: Read the passage and question, and choose the **best** answer.

In multicellular organisms, cells differentiate during reproduction to produce specialized cells. Specialized cells work together to form tissues. Tissues work together to form organs. Organs work together to form body systems. In this way, levels of organization in a multicellular organism become increasingly complex.

28. Which statement explains how an organ and a body system are similar?

- A. Their organization is less complex than tissues but more complex than cells.
- B. Both are made up of tissues that are made up of cells.
- C. They represent the least complex levels of organization in an organism.
- D. Both are made up of cells that did not differentiate.