JD's REGENTS PREPARATION, LLC.

-Presents-

BIOLOGY

REVIEW MANUAL

WITH 6 REGENTS EXAMS, 4 TOPICALLY ORGANIZED

SPECIAL EDITION
Each Question Linked is to a Solution Video QR Coded for One to One Initiative

Biology Review
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Similarity and Diversity Amongst Living Things - Life Processes

1 Scientists have recently discovered a community of bacteria and clams living under an ice shelf in Antarctica. These organisms live under 600 feet of ice, in the absence of sunlight, and in temperatures considered too cold for most living organisms. The location where these organisms live is unusual because

06 17 30

(1) only biotic factors control the size of the populations
(2) bacteria and clams are found in the same area
(3) of the abiotic factors found in their environment
(4) green plants make energy-rich compounds available

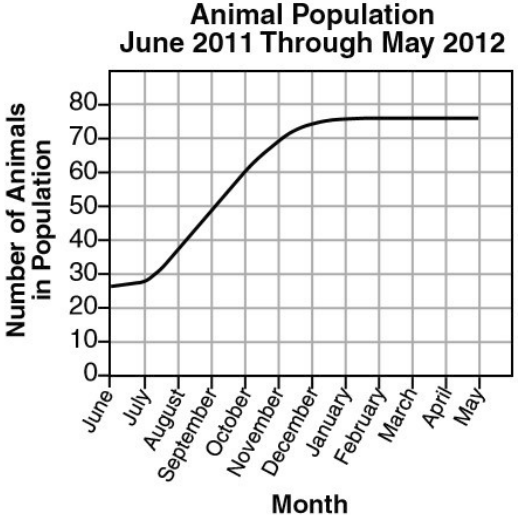
2 On various Galapagos islands, finch species have different diets: seeds, insects, flowers, the blood of seabirds, and leaves. This is evidence that each species has a different

06 17 73

(1) mating behavior
(2) nesting material
(3) niche
(4) predator

Unique populations of giant tortoises live in the Galapagos Islands. This is the same group of islands where Darwin studied his famous finches. It is thought that the original ancestors of today's giant tortoises came from the mainland of South America. These animals left and drifted in the ocean to the islands where they began to live, reproduce, and evolve. Each of the islands has a different habitat. Each species varies in shell shape and body structure.

Base your answers to questions 18 and 19 on the information and graph below and on your knowledge of biology. The graph shows the number of animals in a population throughout the course of a year. The population migrated into the area at the beginning of 2011.



18 The graph can best be used to illustrate

08 18 33-34

(1) a food chain
(2) ecological succession
(3) natural selection
(4) carrying capacity

19 The approximate number of animals that were found in June 2012 was most likely

(1) 16
(2) 26
(3) 76
(4) 86

(1) Measure their pulse rate after squeezing the clothespin until fatigued. Then increase the resistance of the clothespin for the next trial.
(2) Squeeze a clothespin until fatigued, rest, and repeat. Over time, they should gradually increase the resistance of the clothespins they are squeezing.
(3) Measure their pulse rate, squeeze a clothespin for one minute, rest, and measure their pulse rate.
(4) Squeeze a clothespin for as long as they can, measure their pulse rate, rest, eat some candy. Increase the resistance of the clothespin for the next trial.

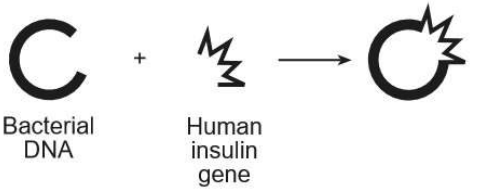
17 Students following the principles of PRE monitored their ability to lift weights. Which observation would indicate that their exercise program was successful?

(1) They could eventually lift heavier weights than when they started.
(2) Their pulse rate increased more rapidly as they kept lifting weights.
(3) The number of weights their group could lift during competition decreased.
(4) Males and females could lift the same weight an equal number of times during competition.

(1) Some flowering plants that inherit a gene for white flowers and a gene for red flowers will produce pink flowers.
(2) Some animals that inherit genes for brown fur will grow white fur if the outside temperature falls below a certain level.
(3) In some breeds of cat, certain fur-color genes are found only in females.
(4) A pea plant is short-stemmed only if it inherits the genes for the trait from both parents.

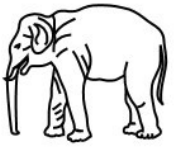
6 The process shown below is used to

06 17 36



(1) determine if a person has a genetic disease
(2) produce human growth hormone
(3) identify the father of a newborn
(4) produce a hormone to regulate blood sugar

Scientists at Penn State have sequenced the DNA of the extinct woolly mammoth. The data suggested that the woolly mammoth was more closely related to present-day elephants than previously believed.



Elephant

Woolly mammoth

31 Which statement could account for the similarities between the woolly mammoth and present-day elephants?

08 18 20

(1) Common gene mutations were caused by agents such as industrial chemicals and radiation.
(2) Present-day species developed from earlier, different species.
(3) Selective breeding results in offspring better able to survive.
(4) Both animals have identical genetic information.

LIFE SCIENCE: BIOLOGY
June 2025
Answer all questions in this part.

Directions **Use your knowledge of Life Science: Biology to answer all questions in this examination. Note that diagrams are not drawn to scale unless otherwise noted.**

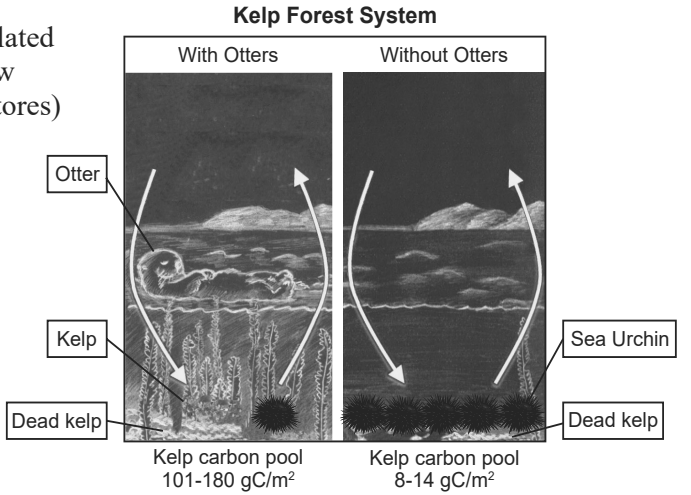
Base your answers to questions 1 through 5 on the information below and on your knowledge of Biology.

Carbon! Where Does It Come From? Where Does It Go?

On Earth, carbon compounds are found in the oceans, atmosphere, and living organisms, as well as stored in rocks and sediments. Earth and its atmosphere can be considered a closed system. The amount of carbon in different locations within Earth's system is always changing.

Sea otters help maintain the carbon balance in their ecosystem. Otters eat sea urchins. Eating sea urchins is important, as sea urchins are herbivores that can destroy a kelp forest. Kelp are large autotrophic algae that grow much faster than most plants. When kelp die, they sink into the deep ocean. The low oxygen conditions of the sea floor cause decomposition to be slow or incomplete.

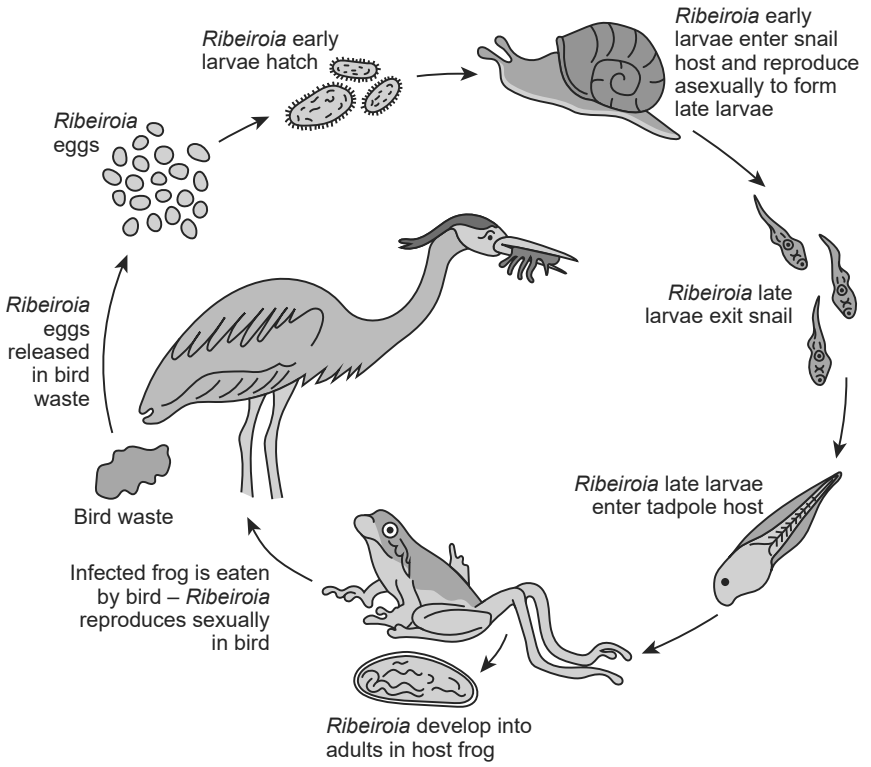
Scientists calculated the carbon pool (how much carbon kelp stores) with and without sea otters, as shown in the model.



1. Which claim about the kelp carbon pool is best supported by evidence from the information and the model above?
(1) The carbon storage is higher with the otters present because the sea otters eat the sea urchins.
(2) The carbon storage is higher with the sea urchins present because they control the kelp population.
(3) The carbon storage is lower with the otters present because the sea otters eat the kelp.
(4) The carbon storage is lower with the sea urchins present because they carry out autotrophic nutrition.

After further research, scientists discovered that these deformities in frogs were not caused by genetic mutations. The actual cause was a parasitic flatworm called *Ribeiroia*. *Ribeiroia* completes a complex life cycle by inhabiting several hosts. This life cycle is summarized in the diagram below.

***Ribeiroia* Life Cycle**



12. A student claims that the *Ribeiroia* parasites that cause the most severe limb abnormalities in frogs have a greater chance of survival and reproduction than those that do not. Which explanation best supports this claim?

(1) The frogs with the most severe limb deformities will be more likely to be caught by birds, allowing the adult *Ribeiroia* to be more likely to survive and reproduce.

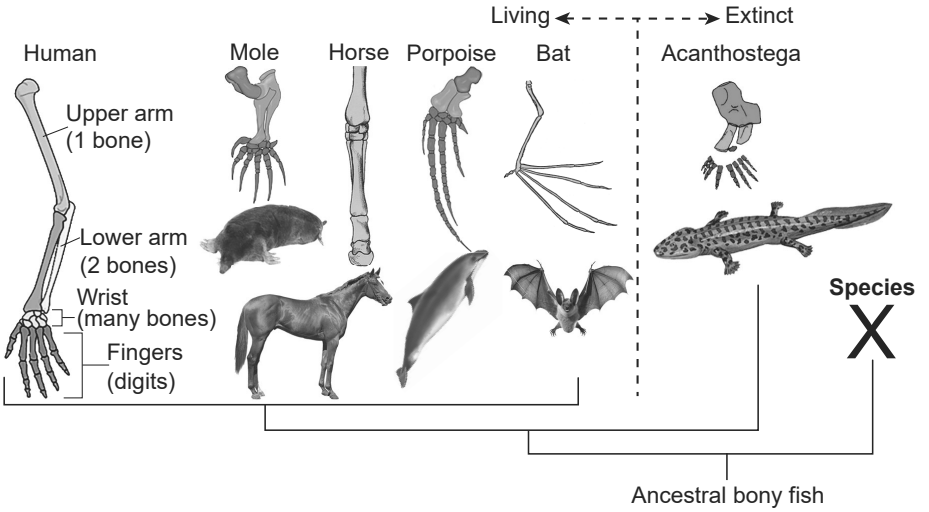
(2) The adult *Ribeiroia* will have a greater chance of remaining in the frog to complete all phases of its life cycle, allowing it a better chance to survive and reproduce.

(3) The *Ribeiroia* will have a greater chance of reproducing sexually because it stays in the snail, releasing larvae with this trait back into the water.

(4) The *Ribeiroia* larva will have a greater chance of reproducing asexually and completing its life cycle in the bird.

The diagram summarizes some of the current structural and fossil information regarding front limb evolution in some living animal species and some extinct water-dwelling animal species.

Evolution of Tetrapod Front Limbs



29. Which statement below identifies the evolutionary relationships presented in the diagram?

(1) The forelimbs of *Acanthostega* and the living species have a bone structure best suited to life on land, therefore the forelimb of all species evolved from an extinct land-dwelling ancestor.

(2) The extinct, water-dwelling *Acanthostega* and porpoise share the most similar habitat, therefore they share the most recent, extinct common ancestor.

(3) Each of the living species has different forelimb bone structures because they developed different structures in order to evolve within their specific habitats.

(4) The forelimbs of the extinct, water-dwelling species and the living species have a similar arrangement of bones, which provides evidence of common ancestry.

30. Construct an explanation, based on evidence, that the evolution of limb development can be the result of environmental factors.

LIFE SCIENCE: BIOLOGY
August 2025
Answer all questions in this part.

Directions **Use your knowledge of Life Science: Biology to answer all questions in this examination. Note that diagrams are not drawn to scale unless otherwise noted.**

Base your answers to questions 1 through 4 on the information below and on your knowledge of Biology.

Trees Have Organ Systems

Trees have two systems, compared to the multiple systems that are present in animals. Trees are multicellular organisms with organ systems that enable them to carry out specific functions necessary for maintaining homeostasis. However, that does not diminish the importance of these two systems, which have numerous critical functions.

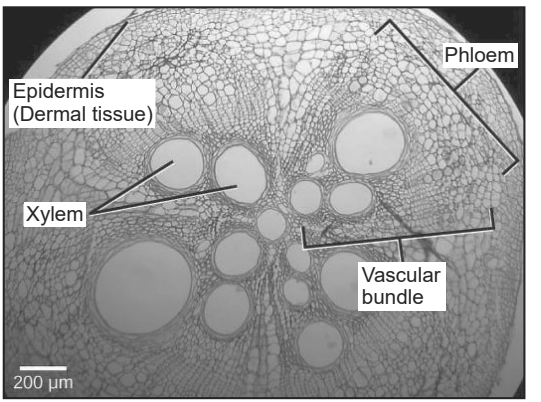
The table below contains information about the structures and functions of the systems found in trees.

Systems in Trees

	Root System	Shoot System
Structures	roots	stem/trunk, branches, leaves
Functions	– anchor the tree – absorb water and minerals from the soil – store and modify products of photosynthesis	– connect roots to branches – transport material – perform photosynthesis – contain reproductive structures

The model is a cross section of a stem as viewed through a microscope that was observed during an investigation. The stem contains the xylem and phloem, which together make up the vascular bundle, a structure that transports materials within a tree.

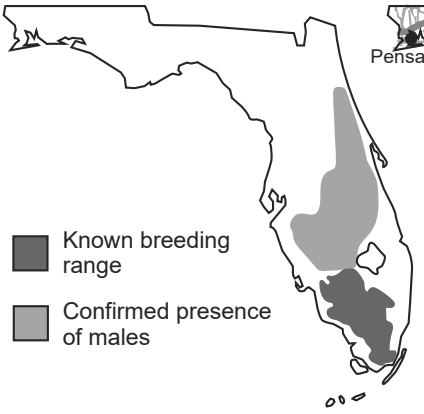
Cross Section of a Stem



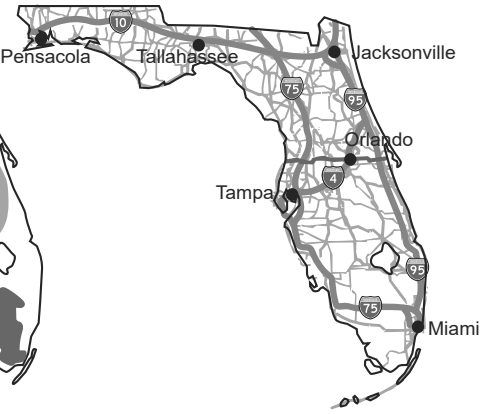
1. Describe an interaction between the vascular bundle with both the root and shoot systems in a plant.

Some conservationists are now concerned that their original efforts to restore the Florida panther population may have been undone. They claim that new proposals to increase the number of housing developments and highways within the Florida panther breeding range will reduce the panther population to levels that occurred in the 1980s.

Florida Panther Range



Map of Major Florida Highways



A proposed solution to reduce panther deaths caused by cars is to build wildlife bridges. When designing wildlife bridges, engineers in Florida prioritized the criterion of panther survival while also considering constraints such as cost, driver safety, environmental impacts, and aesthetics.

A Wildlife Bridge

45. Evaluate wildlife bridges as a solution to reduce the impact on panther populations, based on prioritized criteria *and* constraints.