

TEKS 3.B.7.A**Biology****STANDARD PRACTICE**

- 1 Biologists look at how organisms are related and when they first appeared on Earth. Which of the following is true about the organisms that live on Earth today?
 - A All organisms that have ever lived on Earth can still be found alive today.
 - B Some of the organisms alive today have been around for 4.6 billion years.
 - C The organisms alive today are the same as the ones that are found in fossils.
 - D The organisms alive today evolved from organisms that previously lived on Earth.

- 2 Scientists discover that cells from two species of organisms are made up of similar proteins, suggesting a close evolutionary relationship. If the scientists do further biochemical analyses, which additional finding would support this conclusion?
 - A The fossils of both organisms are found relatively close to each other in the fossil record.
 - B The anatomical structure of both organisms is similar.
 - C The DNA nucleotide sequences of both organisms are very similar.
 - D Both populations of organisms have undergone natural selection over time.

- 3 The pictures below show similarities among the forelimbs of three mammals.



These similarities provide evidence for which of the following hypotheses?

- A Legs and wings may have evolved from flippers.
- B All mammals have evolved from an ancestor that was a bat.
- C A cat's leg, a dolphin's flipper, and a bat's wing have identical functions.
- D Cats, dolphins, and bats had the same ancestor millions of years ago.

TEKS 3.B.7.B**Biology****STANDARD PRACTICE**

- 1 Evolutionary biologists use the fossil record to provide evidence for evolution. Stasis and sudden appearance of species in the fossil record help support the idea that evolution occurs—
 - A gradually
 - B only to multicellular organisms
 - C when individuals adapt to changing environments
 - D in periods of speciation followed by periods of equilibrium

- 2 *Archaeopteryx* often is referred to as a transitional fossil because its fossils suggest that it is an intermediate organism between dinosaurs and birds. Transitional forms in the fossil record, such as *Archaeopteryx*, provide evidence for which pattern of evolution?
 - A Punctuated equilibrium
 - B Gradualism
 - C Coevolution
 - D Convergent evolution

- 3 A paleontologist is studying the distribution of ancient gastropods using the fossil record. What can she infer about the age of the fossils based on their location in the fossil record?
 - A Fossils found in lower layers are generally younger than those found in upper layers.
 - B Fossils found in lower layers are generally older than those found in upper layers.
 - C Fossils found in lower layers are too old to undergo Carbon-14 dating, and are therefore more than 60,000 years old.
 - D Fossils found in consecutive layers always are the same age, based on radiometric dating.

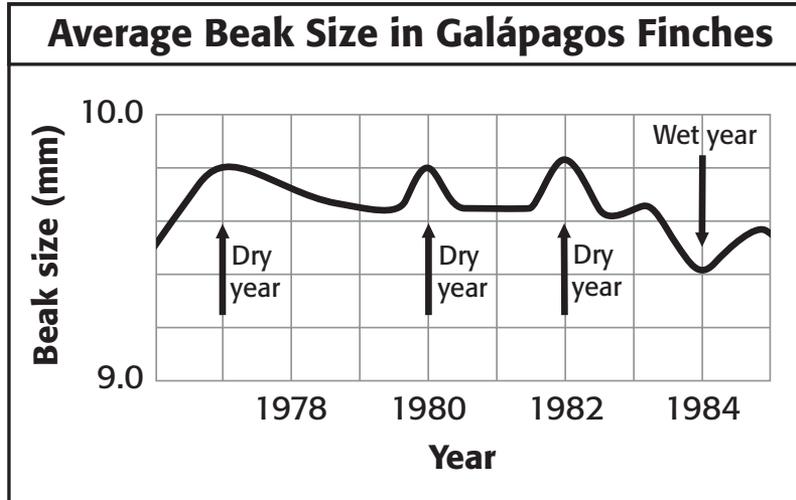
TEKS 3.B.7.C**Biology****STANDARD PRACTICE**

- 1 There are three species of birds on an island. Bird *A* has a heavy bill and eats seeds. Bird *B* has a pointed bill and eats insects. Bird *C* has a sharp bill and eats insects and seeds. If all insects suddenly disappeared, which bird or birds would be least affected?
- A Bird *A*
 - B Bird *B*
 - C Bird *C*
 - D Bird *A* and Bird *B*
- 2 A biologist notices that a species of moth has either dark coloration or light coloration. In a certain area where tree bark is dark, birds tend to prey on light moths more often than on dark moths. Which of the following is a reasonable conclusion?
- A The light moths are more likely to lay eggs on trees with light bark.
 - B The light moths have a better chance of surviving than the dark moths.
 - C More of the light moths will survive once the dark moths have evolved.
 - D More of the dark moths will survive to pass on their traits to their offspring.

TEKS 3.B.7.C

Biology

- 3 The graph below shows how the average beak size in Galápagos finches has changed over time.

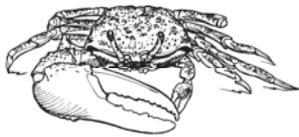


Which of the following is a reasonable conclusion drawn from the data in the graph?

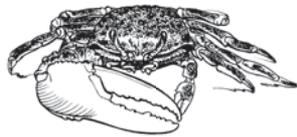
- A Beak size has steadily increased over the years.
- B The wetter the year, the shorter the average beak size of the Galápagos finch is.
- C Beak size has remained the same, while climate has changed over time.
- D The longer the beak size of the Galápagos finch, the fewer seeds there are.

TEKS 3.B.7.D**Biology****STANDARD PRACTICE**

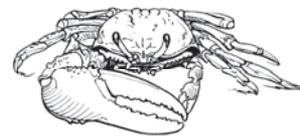
- 1 Which of these best describes how limited resources can lead to differential reproductive success?
- A Those organisms that have traits that allow them to outcompete other organisms for resources will survive and reproduce.
 - B When resources are limited, individuals choose to migrate to other areas where food is plentiful.
 - C Individuals will acquire new adaptations that allow them to make use of alternative resources.
 - D Within a population, individuals will show a variety of traits, which decreases a population's chance of survival when resources are limited.

PHENOTYPES AND GENOTYPES OF CRABS

Speckled (Bb)



Dark Brown (BB)



Light Brown (bb)

- 2 A population of crabs living on a sandy beach exhibits three colors: dark brown, light brown, and speckled, as shown above. The genotypes for these colors are *BB* for dark brown, *bb* for light brown, and *Bb* for speckled. The speckled crabs blend in extremely well with the color of the sand on the beach. The pattern appears to provide the speckled crabs with some protection from predatory birds. Which of the following conclusions can be drawn from the information above?
- A Only the speckled crabs will survive, and all of their offspring will be speckled.
 - B The allele for light brown color will be lost because of predatory birds eating light brown crabs.
 - C The allele for dark brown color will be lost because of predatory birds eating dark brown crabs.
 - D Both the light brown and dark brown alleles will continue to be passed on in the crab population.
- 3 Which of the following mutations would most likely improve the chances that an organism would survive and reproduce?
- A A stronger scent that makes an animal easier to find
 - B A weaker scent that makes a flower less attractive to bees
 - C Weaker eyesight that makes an animal less likely to find prey
 - D Stronger leg muscles that allow an animal to jump away from danger

TEKS 3.B.7.E**Biology****STANDARD PRACTICE**

- 1 In what way does natural selection favor a particular animal behavior?
 - A Natural selection favors traits that benefit any type of behavior.
 - B Natural selection favors behavioral traits that benefit the species.
 - C Natural selection favors behavioral traits that benefit the individual.
 - D Natural selection favors behavioral traits that benefit the environment.

- 2 Why do the genetically-determined behaviors of individuals best adapted to survive become more common in each new generation?
 - A Individuals with those behaviors do not breed frequently.
 - B Well-adapted individuals with those behaviors rarely survive.
 - C Fewer offspring without those behaviors survive and reproduce.
 - D The alleles responsible for those behaviors increase or decrease randomly.

- 3 Over time, how will selection pressure from predators affect prey species populations?
 - A They will evolve into parasites.
 - B They will evolve into a new niche.
 - C They will evolve ways to avoid predation.
 - D They will evolve into secondary consumers.

- 4 The tail feathers of some male birds of paradise are extremely long and showy. Which of the following statements best describes a selective advantage for having this trait?
 - A The bird is easier for predators to spot.
 - B The bird must eat more to produce extra-large feathers.
 - C The bird flies slowly because of drag created by the feathers.
 - D The bird attracts more females and therefore mates more frequently.

TEKS 3.B.7.F**Biology****STANDARD PRACTICE**

- 1 Gene flow is one force that can cause evolutionary change. Which example best illustrates gene flow?
 - A A flock of migrating geese enters into the territory of another flock and begins interbreeding.
 - B A flock of geese becomes isolated on an island, and over time, the population begins to exhibit new characteristics.
 - C Some individuals in a flock of geese have genes that are more advantageous, and over time, the numbers of these geese increase.
 - D A flock of migrating geese loses its way to its wintering grounds, leaving other geese without competition for resources and enabling those geese to produce more offspring.

- 2 Genetic drift states that the random effects of everyday life can cause differences in the survival and reproduction of individuals. What is one effect of genetic drift on evolution?
 - A It produces only the traits in a population that are best adapted to the environment.
 - B It can cause an unusual amount of genetic variation within a single population of a species.
 - C It can cause a population's allele frequencies to stay in genetic equilibrium.
 - D It can cause certain traits in a population to increase in frequency even if those traits are not the ones that are best adapted to the environment.

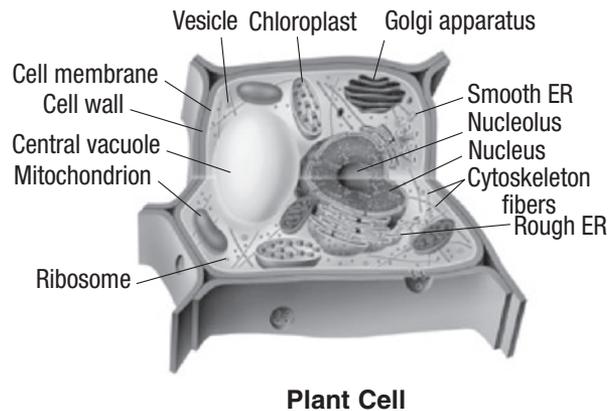
TEKS 3.B.7.F

Biology

- 3 Hunting and habitat destruction have led to a decline in the cheetah population, and therefore a decrease in genetic variation within the cheetah population. What evolutionary mechanism most likely has contributed to this decrease in the population's genetic diversity?
- A Recombination
 - B Mutation
 - C Genetic drift
 - D Gene flow

TEKS 3.B.7.G**Biology****STANDARD PRACTICE**

- 1 Biologists have proposed that cells that contain mitochondria and chloroplasts first came about when ancient bacteria entered large cells either as parasites or as undigested prey and began to live inside the host cell. Which term best describes this explanation for the origins of mitochondria and chloroplasts?
- A A hypothesis
 - B A scientific theory
 - C A scientific question
 - D An experimental result



- 2 Which structure of the cell shown above most likely descended from a photosynthetic eubacteria?
- A Chloroplast
 - B Vesicle
 - C Ribosome
 - D Mitochondrion
- 3 The visible structures inside the cell above help the cell to perform the functions that sustain life. What are these structures known as?
- A DNA
 - B The nucleolus
 - C Organelles
 - D The cytoplasm

TEKS 3.B.8.A**Biology****BIOLOGICAL EVOLUTION AND CLASSIFICATION**

The student will demonstrate an understanding of the theory of biological evolution and the hierarchical classification of organisms.

(B.8) **Science concepts.** The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to (A) define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community;

STANDARD REVIEW

More than 2,000 years ago, the Greek philosopher and naturalist Aristotle grouped plants and animals according to their structural similarities. Later Greeks and Romans grouped plants and animals into basic categories such as oaks, dogs, and horses. Eventually each unit of classification came to be called a *genus* (plural, *genera*), the Latin word for “group.” Starting in the Middle Ages, genera were named in Latin. The science of naming and classifying organisms is called taxonomy.

Until the mid-1700s, biologists named a particular type of organism by adding descriptive phrases to the name of the genus. These phrases sometimes consisted of 12 or more Latin words. They were called polynomials (from *poly*, meaning “many,” and *nomen*, meaning “name”). For example, the European honeybee once had a 12-part scientific name: *Apis pubescens, thorace subgriseo, abdomine fusco, pedibus posticis glabris, untrinque margine ciliatus*. As you can see, the polynomial became very large and awkward. Polynomials were often changed by biologists, so organisms were rarely known to everyone by the same name.

A simpler system for naming organisms was developed by the Swedish biologist Carolus Linnaeus. Linnaeus used a two-word Latin name for each species. Linnaeus’s two-word system for naming organisms is called binomial nomenclature (from *bi*, meaning “two”). His two-part name for the European honeybee was *Apis mellifera*, the genus name followed by a single descriptive word. This unique two-part name for a species is now referred to as its scientific name.

Linnaeus worked out a broad system of classification for plants and animals in which an organism’s form and structure are the basis for arranging specimens in a collection. The genera and species that he described were later organized into a ranked system of groups that increase in inclusiveness. The different groups into which organisms are classified have expanded since Linnaeus’s time and now consist of eight levels: domain, kingdom, phylum, class, order, family, genus, and species.

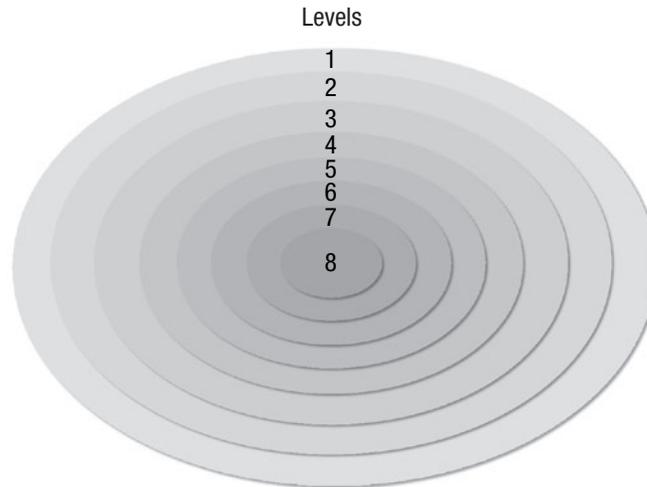
TEKS 3.B.8.A

Biology

- 4 The ancient Greeks grouped plants and animals according to their structural similarities. What are modern classification systems based on?
- A Solely on structural characteristics
 - B On similar behaviors as well as similar characteristics
 - C Solely on evolutionary relationships between organisms
 - D On evolutionary relationships as well as similar characteristics

TEKS 3.B.8.B**Biology****STANDARD PRACTICE**

- 1 In the Linnaean system of classification, organisms are grouped in successive levels of hierarchy based on similarities in their form and structure. The diagram models the eight basic levels of the modern Linnaean system.



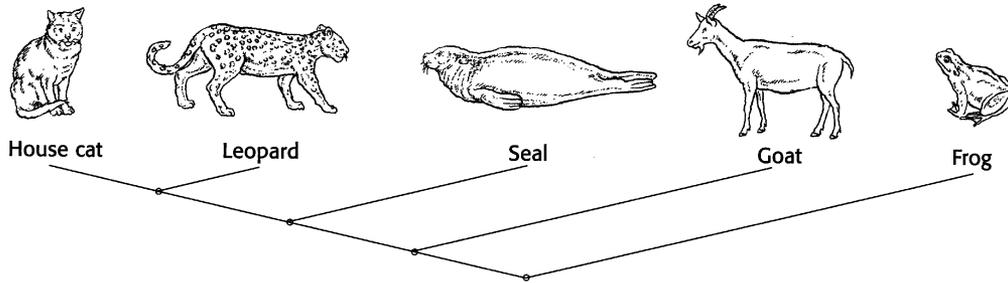
Which level of the Linnaean system does level 8 represent in the figure?

- A Class
 - B Domain
 - C Family
 - D Species
- 2 Which series represents the correct order of levels of classification, from broadest to narrowest?
- A Domain, kingdom, phylum, order, class, family, genus, species
 - B Domain, kingdom, phylum, class, order, family, genus, species
 - C Kingdom, phylum, domain, order, class, family, genus, species
 - D Species, genus, family, class, order, phylum, kingdom, domain

TEKS 3.B.8.B

Biology

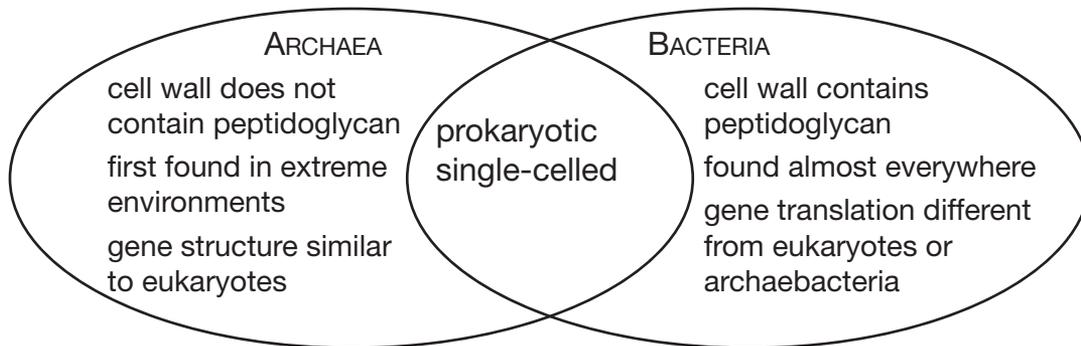
ANIMAL CLADOGRAM



- 3 The diagram above shows evolutionary relationships among five animals. What major characteristic is the same for all five animals?
- A All are carnivores.
 - B All have backbones.
 - C All spend their entire lives on land.
 - D All maintain a constant body temperature.

TEKS 3.B.8.C**Biology****STANDARD PRACTICE**

- 1 Scientists find a new organism that is composed of many cells, that gets its nutrition from decaying organisms, and that has cell walls. To what kingdom would the new organism belong?
- A Animalia
 - B Bacteria
 - C Fungi
 - D Protista
- 2 Which of the following properties could be used to distinguish between an organism in the domain Bacteria and one in the domain Eukarya?
- A Contains membrane-bound organelles
 - B Uses energy to carry out multiple functions
 - C Uses simple mechanical motion to move around
 - D Is composed of organic chemicals such as amino acids



- 3 The Venn diagram above compares the two kingdoms Archaea and Bacteria. Which of the following scientific explanations supports the division of archaea and bacteria into two different domains?
- A Archaea cause disease, but bacteria do not.
 - B Bacteria have a nucleus, but archaea do not.
 - C Archaea are single-celled, but bacteria often have more than one cell.
 - D Archaea and bacteria exhibit differences in cell walls, cell membranes, and gene structure.