

In what order do the layers of a rock form? a) from right to left b) bottom to the top c) all form at the same time d) top to the bottom
What is rock dating? Rock dating is finding out where the rock came from. Rock dating is finding how old a rock is. Rock dating is finding out the color and texture of a rock. Rock dating is finding out what elements are in the rock.
What is one disadvantage of relative-age dating? It can only be used on rocks containing fossils. It can only be used for rocks with radioactive elements. It can only be applied to rocks that are older than 1 million years. It does not give the exact age of a rock or fossil.
Which rock layer is the youngest? The top layer The bottom layer All layers are the same age The middle layer
Which rock layer in this picture is the oldest. The bottom layer The middle layer All layers are the same age. The top layer
How do scientists find the relative age of a rock? by studying the color of the rock by comparing rocks in different layers by measuring what the rock is made of by breaking the rock to see what is inside What is the absolute age of a rock?
Absolute age is the age of a rock compared to other rocks nearby.

Absolute age is how much a rock has changed in size since it was made. Absolute age is the age of a rock in years. Absolute age is the relative age of a rock compared to similar rocks.
Fossils tell us about the types of _____ that existed _____ of years ago. Rocks millions rocks hundreds organisms
How is mass extinction identified in the fossil record? a) sudden disappearance of many types of fossils b) increase in fossil diversity c) gradual appearance of new species d) slow decline of species over time
What is the purpose of studying fossils in different rock layers? to understand the sequence of life forms over time to identify volcanic activity to measure rock strength to measure rock density
How do the characteristics of fossils change from older to younger rock layers? they become simpler they become more complex they show no change they disappear What do fossils help scientists interpret? 1. the relative age of rocks 2. the absolute age of rocks
How do fossils provide clues about ancient life on Earth? by showing weather patterns from millions of years ago. by indicating the chemical composition of rocks by preserving evidence of past life forms by showing how rocks form over time
How can you determine the relative age of each layer in your model? by the shape of the layers by the size of the layers

by the color of the layers by the order they are stacked
Why do geologists study rocks? geologists do not study rocks to learn how the Earth stays the same to learn how the Earth changes to draw the Earth
The topmost rock layer is the ____ layer in this image. smoothest newest oldest widest
What is the primary goal of correlation in geology? to find the age of the Earth and other planets to match rock layers and fossils from different locations to predict future geological events to identify minerals in rock layers in different locations Correlation helps geologists piece together the Earth's history by linking similar
Which of the following is not a type of unconformity? nonconformity angular unconformity disconformity transconformity
What is an unconformity? a type of fossils a gap in the rock records a continuous layer of rock a weathering process

Which type of unconformity in geology involves older rock layers being tilted and eroded before newer layers are deposited on top? disconformity angular unconformity conformity nonconformity
What does the presence of an unconformity suggest about a region's geological history? frequent volcanic eruptions covered the area erosion occurred or there were periods when no new rocks formed the area was always calm with no changes continuous rock formation occurred without interruption
Which of the following is not a type of unconformity? transconformity nonconformity disconformity angular unconformity
Name the method during which scientist study the composition and color of rock layers from different locations to compare and match them in order to determine their relative ages. eruption correlation unconformity stratification
_____ occurs when layers of sedimentary rock are found on top of older, eroded igneous rocks. Disconformity Angular unconformity Nonconformity Transconformity
Which of the following scenarios best shows the usefulness of correlation in understanding geological history?

studying the fossil content in rock layers from different locations to determine the age of the layers analyzing the colors in a single rock layer to determine its mineral composition examining the surface features of a mountain to identify erosion patterns over time. measuring the thickness of sedimentary layers to determine the rate of sediment deposition
Which type of unconformity involves horizontal sedimentary layers? nonconformity angular unconformity conformity disconformity
Which of these can cause a key bed to form? a thunderstorm a volcanic eruption an unconformity a blizzard
What is the primary purpose of the geologic time scale? to identify rock types to organize Earth's history to predict future geologic events to measure the age of the universe
How do meteorite impacts differ from volcanic eruptions in terms of the evidence they leave in the geologic record? Both leave the exact same type of evidence. Volcanic eruptions leave ash, while meteorite impacts leave craters. Meteorite impacts leave no trace in the record. Volcanic eruptions have greater long-term effects.
How can major geologic events help build Earth's timeline? by leaving behind evidence that mark specific moments in Earth's history by removing rock layers and creating gaps in the timeline by making rock layers difficult to correlate across different regions

by erasing all fossils, making it hard to determine the age of rock layers
The geologic time scale is a timeline used to organize Earth's history based on evidence found in a) ocean currents b) soil types c) rock layers
What is the geologic time scale? a chart showing the distribution of plants and animals a timeline showing Earth's history and major geologic events a map of different rock types and their locations a calendar used to predict future geological changes
Which statement best describes the connection between key beds and the geologic time scale? Key beds mark events to help date rock layers. Key beds form in every type of rock. Key beds are used to predict future events. Key beds are not related to the time scale.
How are key beds helpful to geologists? Key beds help with discovering new fossils. Key beds help with finding where a fossil came from. Key beds create gaps in the rock record. Key beds help with correlating rocks from different places.
How does correlation improve our understanding of Earth's geological history? by matching rock layers and events across regions by providing exact dates for all geological events by predicting future geological events on Earth by determining the chemical makeup of rocks
Why is the principle of superposition important in constructing the geologic time scale? It proves that all rocks are the same age, making it easier to determine the timeline of geological events. It explains how rocks turn into fossils, which allows scientists to understand how fossils form. It shows that all rocks form at the same time, simplifying the process of dating different rock.

It shows that older rocks are always at the bottom, which helps scientists figure out the order of events in Earth's history.
Which of the following is the longest unit of geologic time? Era Epoch Period Eon
What does each millimeter on the yarn model represent in years? 1,000,000 years 100,000 years 1,000 years 10,000 years
The timeline of the Earth is called the _____ Time Scale. Geologic fossil physic
Why is DNA often compared to a ladder? because it is used to measure the cell's height because it is flat and straight, like a ladder because it helps cells climb through the nucleus because the backbone forms the sides, and the bases form the rungs
Which of the following is an example of a trait? the DNA structure of a chromosome the ability of bacteria to reproduce the process of photosynthesis in plants the color of an Arctic rabbit's fur in winter
Which nitrogen bases always pair together in DNA? a) A with T and C with G b) A with C and T with G
The order of nitrogen bases in DNA is very important for the following reason: The order of nitrogen bases determines the genetic traits of an organism. The order of nitrogen bases modifies the cell's lifespan. The order of nitrogen bases influences the cell's size and shape. The order of nitrogen bases affects the cell's ability to produce energy.
What is the role of the nucleus in the cell in relation to DNA and genes? The nucleus controls the cell's activities and houses the DNA. The nucleus produces proteins for the cell. The nucleus has no relation to DNA or genes.

The nucleus stores energy for the cell.
Which statement accurately describes the function of genes? Genes are the structural components of the cell membrane. Genes serve as instructions for building proteins. Genes provide energy for cellular functions. Genes are involved in the replication of DNA.
How does DNA influence the traits of an organism? by providing the instructions for making proteins that determine traits by controlling the cell's energy production when a cell divides by determining the overall size and weight of the organism's total fat by directly forming the physical traits without any other processes
Fill in the sequence that correctly bind with the bases of this sequence: ATAGCA AAGTCA AGCTAA TATCGT
What is a chromosome made of? carbohydrates and lipids only nucleic acids DNA and proteins only proteins
Which of the following is NOT correct about DNA? DNA is composed of a double helix structure. DNA is located outside the cell nucleus. DNA is made up of backbone and base pairs. DNA contains genetic instructions for traits.
Which type of RNA is responsible for bringing amino acids to the ribosome? sRNA mRNA tRNA rRNA
What is a codon, and how does it relate to amino acids? A codon is a sequence of three DNA bases that signals the end of a protein. A codon is a sequence of three amino acids that forms part of a protein. A codon is a sequence of three nucleotides that make up the structure of RNA.

A codon is a sequence of three nitrogen bases on mRNA that codes for an amino acid.
How are transcription and translation related? both processes involve the synthesis of proteins both processes occur in the cell's cytoplasm transcription provides the RNA that is used in translation translation modifies the DNA that is created during transcription
How does the sequence of nitrogen bases in DNA determine the sequence of amino acids in a protein? The sequence of nitrogen bases is directly translated into amino acids by the ribosome during protein synthesis. The sequence of nitrogen bases forms hydrogen bonds with amino acids, which then combine into proteins. The sequence of nitrogen bases in mRNA, copied from DNA, determines the order in which amino acids are arranged into a protein. The sequence of nitrogen bases alters the shape of the ribosome, guiding the production of specific amino acids during translation.
The _____ helps form chemical bonds between amino acids during translation. sRNA mRNA tRNA rRNA
_____ is the process of making a protein using instructions from RNA, with the help of other RNA types. Translation Transcription
Which of the following is NOT a step in DNA replication? pairing new bases with exposed bases unwinding the DNA double helix forming new amino acid chains re-forming the double helix structure
During translation, what is the role of ribosomes? to move RNA from the nucleus to the cytoplasm to convert DNA into mRNA strands to copy DNA and pass on information

to read mRNA and build amino acid chains
Why is DNA replication important before cell division? to reduce the number of chromosomes in the cell to ensure each new cell receives an identical copy of the DNA to ensure that each cell has enough RNA to allow cells to produce proteins
How did James Watson and Francis Crick contribute to the discovery of DNA's structure? They created the first genetic code for making protein. They discovered the double helix shape of DNA using x-ray image. They developed the theory of evolution through natural selection. They identified the four nitrogen bases in DNA for the first time.
Which of the following is one of the roles of RNA in protein synthesis? RNA modifies DNA molecules before cell division. RNA helps in the replication of DNA. RNA forms the structure of chromosomes. RNA carries genetic information from DNA to the ribosome.
Exposure to _____ and ultraviolet light can damage DNA, leading to _____ in an organism's genetic material. Mutations X-rays
What are the different types of mutations? substitution, insertion, and deletion mutations addition, inversion, and expansion mutations transcription, translation, and replication mutations deletion, inversion, and expansion mutations
A mutation is a _____ change in the sequence of DNA that can affect the genetic information within a cell. Permanent Temporary
What is the difference between positive, negative, and neutral mutations? Positive mutations always cause changes, negative mutations have no effect, and neutral mutations harm traits.

Positive mutations harm traits, negative mutations improve traits, and neutral mutations always cause changes. Positive mutations improve traits, negative mutations harm traits, and neutral mutations have no effect on traits. Positive mutations have no effect, negative mutations always cause changes, and neutral mutations improve traits.
Here is a DNA sequence: TACGTA . After a mutation, it becomes TACCGTA . What type of mutation has occurred? no mutation substitution deletion insertion
Can mutations occur without any external factors? How? Yes, mutations can occur randomly during DNA replication. No, mutations require exposure to harmful chemicals. No, mutations only happen due to environmental changes. Yes, mutations happen only when the organism is injured.
If a mutation occurs in a gene that controls eye color, how might this affect the organism? The organism would lose its vision. The mutation would only affect the organism's height. The mutation would not be visible. The mutation could change the eye color of the organism. Even though a neutral mutation doesn't affect the organism's survival or health,
What is a mutation? the replication of genetic material during cell division a process by which cells divide to produce new cells a temporary change in the structure of a protein a permanent change in the sequence of DNA in a gene
The DNA sequence AAGGTC changes to AAGTC after a mutation. This type of mutation is called Deletion substitution insertion
What happens when a DNA mutation occurs? The DNA sequence changes permanently. The DNA sequence gets completely deleted.

The DNA sequence always becomes longer. The DNA sequence returns to its original form.
What determines the effect of a mutation on an organism? the type of mutation and the organism's age the type of mutation and its location in the DNA sequence the type of mutation and the environment's temperature the type of mutation and the organism's diet
If a mutation occurs in a gene that controls eye color, how might this affect the organism? The organism would lose its vision. The mutation would not be visible. The mutation could change the eye color of the organism. The mutation would only affect the organism's height.
How does a substitution mutation change the DNA sequence? A substitution duplicates a section of the DNA sequence. A substitution replaces one base pair with a different base pair in the DNA sequence. A substitution removes one or more base pairs from the DNA sequence. A substitution adds one or more base pairs to the DNA sequence.
What is a mutation? a process by which cells divide to produce new cells a temporary change in the structure of a protein the replication of genetic material during cell division a permanent change in the sequence of DNA in a gene
In DNA, the base Adenine (A) will always connect with what other base? Cytosine (C) Guanine (G) Uracil (U) Thymine (T)
What are the instructions that cells follow to express traits called? Mutations Genes Variations Proteins
What type of structure does the DNA look like? A rug A chair A door A twisted ladder
Natural selection leads to changes in the traits of a population over time, a process known as

Evolution revolution promotion
A permanent change in the DNA sequence of a gene is called a _____.
Mutation reproduction evolution population
Which of the following is an example of a variation within a population? different species of rabbits living in different habitats all rabbits having the same fur color rabbits grow in size during their life cycle different fur colors in a group of rabbits
How can a mutation that changes fur color affect an animal's ability to survive in its habitat? The animal will be able to blend better with its surroundings. The animal will be to communicate better with other members of its species. The animal will be able to move faster in its environment. The animal will have better chances to catch prey.
How can variations help organisms survive in their habitats? Variations can help organisms live longer without needing to find food in their habitats. Variations can allow organisms to create new species in their habitats. Variations can help organisms blend into their environment and avoid predators. Variations can make organisms weak and easily hunted by predators.
A plant develops larger leaves, allowing it to capture more sunlight. Does this lead to a positive, negative, or neutral variation? neutral variation because the leaf size doesn't affect the plant's growth negative variation because it makes the plant too large positive variation because it helps the plant produce more energy neutral variation because all plants need sunlight
What is a beneficial mutation? A mutation that does not affect an organism's chance of survival. A mutation that increases an organism's chance of survival. A mutation that decreases an organism's chance of survival. A mutation that prevents an organism from reproducing.

A permanent change in the DNA sequence of a gene is called a _____.
Mutation reproduction population evolution
How does natural selection affect organisms that have variations in their traits? Natural selection removes organisms with beneficial traits from a population. Natural selection favors organisms with harmful traits for survival. Natural selection favors organisms with traits that help them survive. Natural selection increases the number of organisms with neutral traits.
What key observation did Darwin make about finches in the Galapagos Islands that contributed to his theory of evolution by natural selection? The finches on all islands ate the same type of food regardless of their beak shape. The finches were unable to survive due to the lack of food variety on the islands. The finches all had the same beak shape and size on every island. The finches' beak shapes varied depending on the food available on each island.
How do different beak shapes benefit birds in their environment? Beak shapes help birds attract mates during the breeding season. Beak shapes help birds obtain food suited to their environment. Beak shapes help birds fly faster in colder environments. Beak shapes help birds defend themselves from predators.
How do variations in traits occur in a population? Variations can occur through genetic mutations and sexual reproduction. Variations can occur when organisms remain exactly the same over time. Variations can occur by removing all differences in a population. Variations can occur only through environmental changes.
What process allows organisms with favorable traits to survive and reproduce more successfully than others? Environmental change Genetic mutation Natural selection Sexual reproduction

A fish is born with brighter scales, making it more visible to predators. Does this lead to a positive, negative, or neutral variation? Negative variation because it increase risk of predation. Positive variation because it makes the fish stand out. Positive variation because it attracts other fish. Neutral variation because it doesn't affect its environment.
What is the difference between structural adaptation and functional adaptation? Structural adaptation involves internal body systems, while functional adaptation involves color and size. Structural adaptation involves behavior, while functional adaptation involves physical traits. Structural adaptation involves physical traits, while functional adaptation involves how internal body parts work. Structural adaptation involves blending into the environment, while functional adaptation involves feeding habits.
What special adaptation might an animal develop to avoid being seen by predators? moving in groups to avoid predators growing larger to scare predators camouflage to blend in with its environment running faster to escape from danger
How does camouflage help animals survive? It allows animals to blend into their environment to avoid predators. It allows animals to mimic the appearance of other species to find food. It allows animals to change their environment to suit their needs. It allows animals to grow faster by absorbing sunlight from their surroundings.
What is an adaptation? A temporary change in an organism's behavior to adjust to its surroundings. An inherited trait that helps organisms survive and reproduce in an environment. A characteristic that all animals develop during their lifetime. A behavior that animals learn from their parents to find food.
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What is an adaptation? An inherited trait that helps organisms survive and reproduce in an environment. A characteristic that all animals develop during their lifetime. A temporary change in an organism's behavior to adjust to its surroundings. A behavior that animals learn from their parents to find food.
How are natural selection and adaptation related? Adaptation only occurs when natural selection stops acting on a species. Natural selection allows organisms with helpful adaptations to survive and reproduce. Natural selection occurs after adaptations are fully developed in a population. Adaptation occurs randomly, while natural selection actively creates new traits.
Which of the following is an example of a behavioral adaptation? the thick fur of polar bears for warmth the color of a butterfly's wings for camouflage birds migrating to warmer regions during the winter a cheetah's ability to run at high speeds
Which of the following is an example of a structural adaptation in birds? birds flying south during the winter to find food birds building nests in tall trees for protection birds hunting for insects during the night to avoid predators birds having different beak shapes to eat specific foods Different beak shapes allow birds to access specific types of food more effectively.
Which structural adaptation allows animals to use their physical appearance to avoid predators? living in herds to protect themselves from predators mimicking other species to confuse predators using bright colors to attract predators

making loud noises to scare predators away
An adaptation that helps an animal blend into its environment is called mimicking camouflage
What special adaptation might an animal develop to avoid being seen by predators? running faster to escape from danger growing larger to scare predators camouflage to blend in with its environment moving in groups to avoid predators
Which of the following is NOT an adaptation? a bird's beak shape suited for its specific diet thick fur in polar bears to survive cold climates a scar on an animal's body that resulted from an attack by a predator migration of birds to warmer regions during winter
Which of the following is an example of camouflage? a green chameleon blending in with surrounding plants Bears lowering their body temperature during hibernation A stick insect resembling a plant stem to avoid predators Zebras moving in herds to protect themselves from predators
What is artificial selection? a process where animals naturally adapt to their environment a process where organisms randomly develop new traits over time a process where humans select traits they find desirable in organisms a process where nature selects traits that best help organisms survive
How is selective breeding used to change organisms? In selective breeding, humans select specific traits in organisms and breed them to enhance those traits. In selective breeding, organisms are chosen for breeding based on their survival and reproduction in the wild. In selective breeding, organisms are left to evolve through random mutations over time.

In selective breeding, humans randomly breed organisms, allowing them to adapt naturally.
A farmer wants to breed sheep that produce more wool. Describe how artificial selection can help the farmer achieve this goal. The farmer allows random sheep to mate to increase wool production. The farmer selects sheep that grow faster and breeds them for more wool production. The farmer selects sheep with more wool and breeds them to enhance this trait in the offspring. The farmer waits for the sheep to naturally adapt to produce more wool.
Which of the following is an example of selective breeding? fish evolving to swim faster in rivers over time birds growing brighter feathers to attract mates wolves adapting to hunt in colder climates cats bred to have long white fur and blue eyes
How does artificial selection differ from natural selection? Artificial selection creates random variations, while natural selection is controlled by selective breeding. Artificial selection happens over many generations, while natural selection is a faster process. Artificial selection involves humans choosing traits, while natural selection occurs as a result of environmental changes. Artificial selection is a natural process that occurs randomly, while natural selection is controlled by humans.
Which statement is TRUE about natural selection and artificial selection? Natural selection happens quickly due to human involvement. Artificial selection is a slower process that occurs over many generations. Artificial selection is a faster process that occurs over only a few generations. Natural selection is a faster process controlled by humans.
What similarity did Charles Darwin see between artificial and natural selection? Both processes are controlled entirely by humans to produce desired traits. Both processes occur randomly without any external influence on trait selection. Both processes happen quickly and only affect animals, not plants. Both processes involve the selection of traits that are passed on to future generations.

What is artificial selection? a process where animals naturally adapt to their environment a process where nature selects traits that best help organisms survive a process where humans select traits they find desirable in organisms a process where organisms randomly develop new traits over time What should your first step be if you want to use selective breeding to breed a horse that can win the UAE Derby (horse racing) in the future? letting all your horses mate randomly and hoping one will be fast enough to win the race selecting the youngest and smallest horse to start training without considering its traits choosing a very strong female to mate with one of the horses that won the Derby in the past to get a foal that will grow to win waiting for the horses to naturally adapt and develop faster running abilities without intervention
Farmers breeding cows to produce more milk is an example of _____ Organisms better adapted to the environment reproduce more is an example of _____ Artificial mutation Selective breeding Natural selection
How does artificial selection differ from natural selection? Artificial selection involves humans choosing traits, while natural selection occurs as a result of environmental changes. Artificial selection creates random variations, while natural selection is controlled by selective breeding. Artificial selection happens over many generations, while natural selection is a faster process. Artificial selection is a natural process that occurs randomly, while natural selection is controlled by humans.
Which of the following statements best describes a characteristic of artificial selection? Artificial selection relies on random mutations to improve traits. Artificial selection is a slow process caused by environmental changes. Random variations in traits occur naturally in artificial selection. Humans select specific traits to pass on in artificial selection.

Wild chickens were originally small and laid few eggs. Humans were able to breed chickens that are larger in size and lay more eggs. This is an example of (selective breeding, Natural selection) by humans for desired traits.
What information can be gathered about selective breeding from studying domesticated animals? Selective breeding helps organisms survive better in the wild without human intervention. Selective breeding is based solely on environmental factors affecting traits. Selective breeding allows specific traits to be transmitted over generations. Selective breeding can only produce short-term changes in traits.
A pelican has a long beak to scoop up water and food quickly. What is this an example of? selective breeding artificial selection natural selection
What do humans selectively breed for in artificial selection? a new organism changed genes a desired trait
Arrange the steps of using recombinant DNA to produce chemicals for medicine in bacteria cells. Take the gene of interest from one organism. () Insert the gene of interest into the bacterial DNA. () Cut a section of bacterial DNA and remove it. () Introduce the modified DNA back into the bacteria. () The bacteria produce the desired chemical. ()
What is genetic engineering? a biological process of modifying the DNA of organisms for desired traits a method of selecting organisms for breeding without altering their DNA a process that selects organisms for natural traits they already have a method of using DNA to create completely new organisms from scratch
What happens after the DNA of two organisms is combined in recombinant DNA? The organism expresses new traits from the combined DNA. The DNA sequences return to their original form without changes. The organism is unable to reproduce and grows slower. The new DNA dissolves and disappears in the organism.
The process of treating diseases by inserting new genes into cells to replace missing or faulty ones is called (DNA replication artificial selection gene therapy)

What is the role of bacteria in producing genetically engineered chemicals for medicine? Bacteria consume chemicals and convert them into medicine. Bacteria are used to transfer medicine directly to patients. Bacteria help break down chemicals that are naturally found in medicine. Bacteria are genetically modified to produce desired chemicals.
What is genetic engineering? a process that selects organisms for natural traits they already have a biological process of modifying the DNA of organisms for desired traits a method of using DNA to create completely new organisms from scratch a method of selecting organisms for breeding without altering their DNA
Which of the following is TRUE about the recombinant DNA process? combining all the genes of one organism with the full DNA sequence of another organism to create a mutation using high temperature to break down the DNA strands of two organisms and then fusing them together through chemical reactions cutting specific DNA sequences from two different organisms and joining them together to form a new DNA molecule mixing various proteins to naturally combine the DNA from two organisms inside a laboratory setting
In what ways can genetic engineering help address the global challenge of food shortages? by creating crops that produce higher yields and are disease-resistant by making plants grow naturally without any human help by reducing the need for water and sunlight in crop production by eliminating the need for traditional farming methods
Which of the following is an example of beneficial genetic engineering projects? developing tomatoes that spoil faster after harvest engineering glowing plants for decorative purposes creating crops that require more water to grow modifying animals to reduce their milk production
What is genetic engineering?

a method of using DNA to create completely new organisms from scratch a biological process of modifying the DNA of organisms for desired traits a process that selects organisms for natural traits they already have a method of selecting organisms for breeding without altering their DNA
Why do scientists use genetic engineering? to eliminate all natural organisms to modify organisms to develop useful traits to prevent organisms from reproducing to create organisms with harmful traits
What is the role of bacteria in producing genetically engineered chemicals for medicine? Bacteria help break down chemicals that are naturally found in medicine. Bacteria are used to transfer medicine directly to patients. Bacteria consume chemicals and convert them into medicine. Bacteria are genetically modified to produce desired chemicals.
Why do scientists use genetic engineering? to create organisms with harmful traits to prevent organisms from reproducing to eliminate all natural organisms to modify organisms to develop useful traits
How does genetic engineering make corn more resistant to diseases? by increasing the growth rate of the corn plants by reducing the need for water and sunlight during growth by changing the size and color of the corn kernels by inserting genes that help fight off diseases
How is DNA from two different organisms combined in recombinant DNA? by cutting and joining specific DNA sequences together by inserting all the genes of one organism into another organism by using chemicals to dissolve the original DNA by naturally fusing the cells of both organisms in a lab

Which Fossils are preserved parts or traces of organisms that lived long ago. Different types of fossils form under different geological processes. Process occurs when minerals carried by water replace the tissues of an organism, turning it into stone over time? Carbonization purification sedimentation mineralization
What conditions must exist for an organism to be preserved through carbonization? The organism must be covered in volcanic ash and hardened over time. The organism must be buried quickly under high pressure in sediment. The organism must be trapped in tree sap, which turns into amber. The organism must be frozen instantly and kept in low temperatures.
A fossilized footprint was discovered during a dig. What type of fossil is this and how was it formed? Carbonization: pressure forced liquids and gases out, leaving a carbon imprint. Molds and Casts: a mold formed around the organism's hard tissue, and a cast later filled it. Mineralization: minerals replaced the tissue of the organism over time. Trace fossils: the footprint was left in soft sediment that later hardened.
How are fossils formed? Fossils are formed when organisms dissolve completely, leaving no trace behind. Fossils are formed when organisms are buried under sediment and preserved over time. Fossils are formed when organisms freeze instantly in the atmosphere. Fossils are formed when organisms are exposed to the air and decompose quickly.
How do scientists analyze data from fossils to estimate the age of fossils? Scientists use the texture of the fossil surface to estimate its age. Scientists use the color of fossils to estimate their age accurately. Scientists use radioactive materials to determine the age of fossils. Scientists use the size of fossils to determine how old they are
How do fossils help scientists trace the development of different species over time? Fossils reveal gradual changes in the physical structure of living organisms. Fossils show the exact DNA sequence of ancient organisms. Fossils demonstrate how organisms can reappear after extinction. Fossils predict the future evolutionary changes of living organisms.

What is the importance of using relative age dating when studying fossils in different rock layers? It allows scientists to arrange fossils in the correct sequence of formation. It reveals the specific species that lived in each time period. It helps determine the exact age of each fossil in years. It identifies the chemical composition of fossils in each layer.
A scientist has found a fossil and wants to know its exact age in years. What method would he use to determine the fossil's exact age? He can use relative dating with rock layers to determine its exact age. He can use absolute dating with radioactive decay to determine its exact age. He can use fossil comparisons with modern species to determine its exact age. He can use relative dating with fossil patterns to determine its exact age.
You discover a shell fossil in sedimentary rock. Describe the process that likely occurred for this fossil to form. The shell was heated by magma and crystallized into fossil form. The shell was exposed to intense sunlight, which caused it to harden and fossilize. The shell floated on water and slowly solidified into a rock over time. The shell was buried in sediment, and minerals replaced its tissues over time.
The (fossil record , DNA) is the collection of all known fossils, providing evidence of life on Earth What is a fossil? A type of living plant that grows in the desert. A living organism that changes over time. The bones of organisms that are still alive today. The remains or evidence of once-living organisms preserved in rock.
How do scientists use fossils to learn about organisms that lived millions of years ago? by examining the preserved fossil remains or traces of ancient organisms by melting fossils to extract the living tissue of ancient organisms by transforming fossils into modern versions of the organisms using technology by using fossils to recreate the exact DNA of ancient organisms
Scientists study the fossil record to understand how (life , weather) has changed throughout Earth's history.

How do fossils help scientists understand what kinds of organisms lived during different geologic periods?
Fossils show how organisms adapted to human civilizations
Fossils provide clues about an organism's physical structure.
Fossils are formed randomly and do not provide any reliable information about past life.
Fossils show how organisms will look like in the future.
A fossil that shows traits from both ancient organisms and more recent species is called a (an) (Transitional, transaction) fossil.
Similarities between fossils and living species suggest they share a common Ancestor environment adaptation mutation
How do major changes in rock layers and fossils help in defining the divisions of the geologic time scale?
They show the gradual growth of new species over time.
They help identify when humans first appeared on Earth.
They mark significant shifts in life forms and extinction events.
They reveal patterns of seasonal climate changes over time.
How can scientists use fossils to trace the gradual changes in a species over millions of years?
by studying the physical characteristics of fossils from different time periods
by comparing the DNA of ancient fossils with modern species
by observing the patterns in rock layers without analyzing the fossils
by using fossils to track the migration patterns of species across continents
What are some major causes of extinction that scientists have identified from studying fossils?
gradual shifts in Earth's magnetic field
the expansion of oceans reducing landmass
sudden volcanic eruptions and meteor impacts
frequent changes in species' diets across habitats
What role do fossil records play in understanding mass extinctions?
Fossil records provide detailed evidence of how all living species are closely related.
Fossil records reveal the exact causes of every mass extinction event in history.

Fossil records show when species appeared and went extinct, helping identify mass extinction events.
Fossil records help predict when the next mass extinction event will occur.
How do fossils help scientists understand the process of evolution?
Fossils are randomly scattered in the rock layers and do not show any clear patterns of change over time.
Fossils are created by scientists in the laboratory to support their theories about evolution.
Fossils provide physical evidence of organisms that lived in the past, allowing scientists to study how species have changed over time.
Fossils only show the final forms of organisms and do not provide any information about the process of evolution.
What changes define the boundaries of time units in the geologic time scale?
major changes in rock layers and fossil records
movements in tectonic plates and landforms
variations in the Earth's magnetic field
shifts in ocean currents and air pressure
What can scientists learn about modern species by comparing them to their fossilized ancestors?
Modern species have not changed significantly from their ancestors
Modern species have more complex diets than their ancestors.
Modern species have evolved from their fossilized ancestors over time.
Fossilized ancestors were always larger than modern species.
How does the fossil record provide evidence that support the theory of evolution?
It shows that organisms have remained the same throughout history.
It indicates that all organisms appeared suddenly and at the same time.
It proves that living organisms do not share any common ancestors.
It demonstrates that organisms gradually change over time.
What can scientists learn from studying fossils?
the traits and adaptations of organisms that lived in specific areas
how fossils form instantly in modern ecosystems
the exact age of every fossil found on Earth
the exact colors of prehistoric animals' skin and feathers

Which two of the following can we learn about from fossils?
Where an organism lived
Nothing, fossils only teach us about the ages of organisms
What an organism ate before it died
Changes to the Earth
Vestigial structures are:
newly developed body parts
fully functional body parts
structures found only in aquatic animals
body parts that no longer serve a function
The flippers of whales and the wings of bats are examples of _____ structures.
Homologous analogous vestigial functional
How does comparative anatomy support the theory of evolution?
Comparative anatomy explains why all animals change in the same way.
Comparative anatomy shows how all animals have the same body parts.
Comparative anatomy helps scientists understand how animals use their body parts.
Comparative anatomy shows that similar body structures indicate a common ancestor.
Which of the following structures provides evidence for evolution? Choose two
body temperature natural structures nonsimilar structure
vestigial structures behavioral traits homologous structures
What is the primary characteristic of homologous structures?
They have different structures but similar functions.
They are features that lost their function over time.
They have similar structures but different functions.
They are unrelated features found in different species.
Comparative anatomy supports evolution by providing evidence of ____ and ____ between species.
Migration behavior similarities differences
What does the presence of vestigial structures suggest about evolution?
species evolve and retain some nonfunctional body parts

vestigial structures develop new functions over time
vestigial structures are unique to mammals
traits evolve independently
The flippers of whales and the wings of bats are examples of _____ structures.
Homologous vestigial analogous functional
In a deep cave, scientists discovered fish with tiny, non-functional eyes that live in complete darkness and rely on other senses. What can the scientists conclude from this discovery?
The eyes are analogous structures and are evidence that all species develop better senses over time.
The nonfunctional eyes are homologous structures since they show that natural selection always enhances vision.
The eyes help the fish find food in the dark, and they are considered analogous structures.
The eyes are no longer useful due to adaptation to darkness, and they are considered vestigial structures.
A biologist studies the forelimbs of humans, cats, whales, and bats. Although the limbs have different functions, their bone structures are similar. What can the biologist infer about the evolutionary relationship between these animals from their similar bone structures?
These animals evolved their bone structures through random mutations.
These animals evolved independently and do not share a common ancestor.
These animals have similar structures due to living in the same environment.
These animals share a common ancestor and have homologous structures.
Bird wings and butterfly wings are _____ structures. They have the same ____ but are different in ____
Function ancestor structure analogous
The human and octopi eyes have evolved to do the same job. However, they do not have a common ancestor. Which statement is true?
The octopi eye and human eye have been genetically engineered.
The octopi eye and human eye are a result of a selective breeding.
The octopi eye and human eye are homologous structures.
The octopi eye and human eye are analogous structures.
_____ are patterns of nucleotides that scientists compare to show how species are related to each other.
Protein sequences DNA sequences Pharyngeal pouches Fossil records

What similarities are observed in the early development of vertebrate embryos?
All vertebrate embryos develop wings during early stages.
Vertebrate embryos show unique color patterns in the early stages.
All vertebrate embryos have pharyngeal pouches in the early stages.
Vertebrate embryos develop scales in the early stages.
Which structure, found at the embryonic level, suggests a common ancestry among vertebrates?
pharyngeal pouches limb buds skin cells digestive tract
Which branch of research involves studying DNA and gene sequences to determine evolutionary relationships between species?
fossil records embryology comparative anatomy molecular biology
Which type of evidence compares the physical structure of body parts in different organisms to show relationships?
molecular biology fossil records embryology comparative anatomy
Why do scientists consider vertebrate embryos as evidence of a common ancestor?
Vertebrate embryos never show any developmental similarities.
Vertebrate embryos develop into identical adult forms in all species.
Vertebrate embryos have unique traits that differ completely from each other.
Vertebrate embryos have similar structures in early development stages.
What can scientists conclude if two species have nearly identical gene sequences for many genes?
The two species are closely related and likely have a common ancestor.
The two species evolved in completely different environments.
The two species developed similar sequences due to random chance.
The two species are unrelated but have similar sequences.
Why are pharyngeal pouches significant in the study of evolutionary biology?
Pharyngeal pouches help control calcium levels in all species, indicating identical functions across organisms.
Pharyngeal pouches develop into wings in birds, showing their ability to fly.
Pharyngeal pouches appear in different vertebrate embryos, suggesting they share a common ancestor.
Pharyngeal pouches develop into fins in fish, proving that fish evolved from reptiles.

If you walk along a circle whose radius is 2.0 m and end where you started, what is your displacement?
double the distance the radius of the circle zero equal to the distance walked
A _____ is a place that is used to describe the position or motion of an object.
reference point reference path reference direction
If you run 50 meters to the east and then 30 meters to the north, then the distance you cover is _____ m and your displacement is _____ m.
80 62 20 58
How can you tell that the car has moved from Figure A to Figure B?
its position has changed the building is different
there is a different car there is no reference point
"A racehorse is moving away from the starting line" is a description of which of the following?
Distance how fast position motion
An athletic track is 400 m in length. Shaheen runs around the track four times completing four laps. The distance that Shaheen covered is _____ m and his displacement is _____ m.
400 1600 0 800
Which is an example of a reference direction?
10 kilometers west 30 degrees Celsius a traffic light
An airplane is flying at 360 km/h, going west. This measurement describes the _____ of the plane.
Speed velocity acceleration
The motion of a motorcycle over time is shown on the graph. Which time intervals show that the motorcycle has no motion ?
steeper line horizontal line
An object's speed and _____ is called velocity.
frame of reference direction motion
If a car is slowing down, what happens to its speed?
speed decreases speed increases speed stays the same the car stops
What does a steeper line on a distance-time graph represent?
faster motion reversed motion slower motion no motion

Airplane A travels 810 kilometers every hour. Airplane B travels 740 kilometers every hour. What is the velocity of Airplane B?
740 km/h West 740 km/h
Which of the following is a vector quantity?
810 km/h 740 km/h West 740 kg 810 km/h
A car moves north at 25 m/s. After 1 minute, the car moves west at 25 m/s. Which of the following statements about the car's velocity is true?
The car's velocity increases. The car's velocity changes.
The car's velocity decreases. The car's velocity remains the same.
What is true about an object's speed when the object moves the same distance in a shorter time?
the speed increases the speed becomes zero
the speed decreases the speed stays the same
What does it mean if the slope of the distance-time graph decreases over time?
The object is stopped and not moving at all. The object is speeding up as it moves.
The object is moving at a constant speed. The object is slowing down as it moves.
Which of the following is an example of an object acted upon by unbalanced forces?
a car accelerating down a hill a book resting on a table
a chandelier hanging from the ceiling a boat floating on still water
Friction is an example of a(n) _____ that _____ motion.
acceleration contact force velocity opposes
Acceleration is the change in the _____ an object.
mass of velocity of
You pull a wagon with a force of 25 N to the right and friction applies 5 N. The net force then is _____ N to the _____.
Right left 20 30
Sami is riding his scooter really fast on a horizontal track. What should Sami do to slow his motion?
apply a force to oppose the motion pedaling harder
apply a perpendicular force to the motion pedaling slower
What does the expression of balanced forces mean?
the net force is equal to friction the net force is larger than zero the net force is zero

A soccer ball is kicked with a force of 18 N and experiences 8 N of air resistance. Which of the following statements about the ball's motion is true?
The ball will not move. The ball's speed does not change.
The ball speeds up as it moves. The ball slows down as it moves.
What is the formula that expresses Newton's second law?
acceleration = force ÷ mass force = mass ÷ acceleration
speed = distance ÷ time force = acceleration ÷ mass
_____ is the SI unit to measure force.
Meter Second Newton
According to Newton's _____ law of motion, an object will remain at rest or in constant motion if no _____ acts on it.
Mass net force first second
An object has a mass of 15 kg accelerates by _____ m/s ² when pushed with a force of 75 N.
10 5 15 20
What happens if you push two objects with different masses with the same force?
neither object will accelerate
the object with more mass will accelerate more
the object with less mass will accelerate more
both objects will accelerate the same
If an object moves with constant velocity, what is the net force acting on it?
equals to its mass smaller than its mass
greater than its mass equals to zero
In which direction does a baseball hit by a bat accelerate?
perpendicular to the force in the direction of the force
opposite to the bar opposite the force
Which statement is correct regarding the car's motion on the road, considering the role of friction in controlling the vehicle?
It is easier to drive on a dry road because there is more friction to control the car.
It is easier to drive on a dry road because there is less friction to resist motion.
It is easier to drive on an icy road because there is less friction to slow you down.
It is easier to drive on an icy road because the car slides more smoothly.

A ball bouncing off the ground. The force the ground applies on _____ and the force the ball applies on _____ form a force pair. the air the ground the ball the water
When an object applies a force on another object, the object reacts with a force that is equal in _____ and opposite in _____. This is Newton's _____ Law. length strength Second Third distance direction
A hammer is pushing a nail into a piece of wood. Which of the following correctly identifies the forces of Newton's Third Law? F hammer on nail and F nail on wood F hammer on wood and F nail on wood F wood on nail and F hammer on nail F hammer on nail and F nail on hammer
What force acts perpendicular to a ramp when a box slides down? resisting force gravity pulling force normal force
Which direction does the normal force of the wall push when you lean your dresser against it? into the wall downwards upwards out of the wall
A cup of tea is placed on a table. If the force the table applies on the cup is 0.3 N, what is the normal force acting on the cup? 0 N 0.3 N 0.6 N 0.1 N
You feel heavier when you are in an elevator that is accelerating upwards. This is because the _____ increases. Gravity normal force
When two ceramic balls collide and bounce off each other, what is the collision type? Parallel I inelastic elastic normal
Which of the following statements is true about what happens when you rub a balloon on your hair? the balloon becomes heavier the balloon turns into a magnet the balloon loses mass the balloon becomes charged
When you rub a balloon on your hair, the balloon becomes charged and creates an electric field in the region of space around it.
Wherever on Earth you put a compass, its needle will rotate to point north. The _____ causes the needle's rotation. It is a _____ force. gravitational force magnetic force noncontact contact
What kind of force acts between two charged balloons attracting each other? noncontact electric force contact electric force contact magnetic force

Maha rubbed a balloon against her wool sweater. She noticed that the balloon could stick to the wall after rubbing. Why does the balloon stick to a wall after rubbing? Choose two a normal force pushes it a noncontact force acts on it a contact force holds it an electric force attracts it
ISS is the international space station that orbits the Earth at an average altitude of 405 km. Which force keeps the ISS orbiting Earth? the electric force of the ISS the magnetic force of the ISS the magnetic force of Earth the gravitational force of Earth
Gravity on the Moon is much lower than it is here on Earth. This is because the Moon's mass is (is less than , is greater than) Earth's.
What is the relationship between the normal force and weight when an object rests on a flat surface? The two forces are equal and opposite. The two forces push downwards. The normal force is weaker than the weight. The normal force is stronger than the weight.
ISS is the International Space Station. It is the largest man-made satellite orbiting Earth. The distance between Earth and the Moon is much larger than the distance between Earth and the ISS, yet the gravitational force between Earth and the Moon is much larger than that between Earth and the ISS. Why? The Moon's mass is much greater. The Earth's mass is small. The distance to ISS is much larger. The ISS's mass is much greater.
A scientist measured the weight of a heavy block at the Earth's surface. He found that the block's weight is 1540 N. What would be the block's weight if measured at the highest mountain? equal to 1540 N , less than 1540 N , equal to zero , greater than 1540 N
The _____ on the Earth's surface is 9.8 m/s ² . magnetic speed gravitational acceleration gravitational force
Which of the following factors affects the gravitational force between any two objects? the volume of the objects the mass of the objects the temperature of the objects the distance between the objects
How does air resistance affect falling objects? A) It speeds up falling objects as they approach the ground. B) It causes falling objects to slow down as they fall. C) It has no effect on the speed of falling objects. D) It makes falling objects move in a straight line without changing speed.

What is measured in newtons? Volume weight length mass
The _____ energy of this bowling ball depends on mass and speed. kinetic nuclear thermal magnetic
Which would have the greatest kinetic energy? low mass, low speed low mass, high speed high mass, high speed
A large truck and smaller cars driving on the road. Which of the following explains why the truck has more kinetic energy than one of the smaller cars if both are driving at the same speed? The truck is storing extra energy. The truck also has electrical energy. The truck has more mass. The truck is behind the car.
Which term is used to describe the energy caused by the interactions of objects or particles when distance changes? potential energy mechanical energy kinetic energy thermal energy
If a spring-loaded toy is compressed and then released, what kind of energy transformation happens? light to thermal elastic potential to kinetic gravitational to chemical chemical to heat
Dana places a spring between two supporting boards. When she pushes the boards to compress the spring by 5 cm and holds it still, the spring stores 20 J of energy. What is the potential energy of the same spring when it is stretched by 5 cm? 5 cm 20 J 0 J 20 cm
In which of the following cases does a rubber band store elastic potential energy? when the band is stretched out , when the band falls down , when the band lies flat
Ahmad is pulling the two ends of a spring to stretch it 12 cm so the spring then stores 320 J. What is true about the energy stored in the spring if Ahmad stretches the spring to 15 cm and hold it still? The stored energy is less than 320 J. The stored energy is greater than 320 J. The spring stores elastic potential energy. The spring stores kinetic energy.
What type of energy form is in food and substances in batteries? elastic potential energy magnetic potential energy chemical potential energy
Any object that has a position above the ground has the potential to fall. This is called _____. potential energy. chemical kinetic gravitational thermal
Two positive charges are tested in a vacuum chamber placed 1 m above the ground. Which of the following statements is true about the energy between these two charges when the amount of each charge doubles? a) electric potential energy increases b) magnetic potential energy decreases c) chemical potential energy increases d) gravitational potential energy disappears

What is mechanical energy? It is the kinetic energy of a moving object. It is the sum of kinetic and potential energy. It is the energy of objects only when they are at rest. It is the energy that an object creates.
What does the law of conservation of energy state? Mechanical energy is the sum of two energy types. All energy can be created and then destroyed. All energy can be created, but some can be destroyed. Energy can neither be created nor destroyed. A plane is speeding up while moving at the same level. Which of the following sentences about the plane's energy are true? the kinetic energy decreases the kinetic energy increases the mechanical energy remains the same the mechanical energy increases As a pendulum swings up, its _____ energy increases and its _____ energy decreases. kinetic chemical Potential thermal A roller coaster has high potential energy at the top because (it has no mechanical energy, it is close to the ground, it has no mechanical energy, it is high off the ground)



