

- 1 The process by which traits pass from parents to offspring is called
- A spontaneous generation.
 - B cell movement.
 - C heredity.
 - D specialization.
- 2 Which type of reproduction results in offspring that have some genetic information in common with each parent?
- A cloning
 - B asexual
 - C budding
 - D sexual
- 3 When sex cells combine to produce offspring, the offspring gets
- A all of its chromosomes from one parent cell.
 - B none of its chromosomes from either parent cell.
 - C 50 percent of its chromosomes from each parent cell.
 - D 25 percent of its chromosomes from one parent cell and 75 percent of its chromosomes from the other parent cell.
- 4 Genes determine whether you have dimples, what color eyes you have, and even your ability to roll your tongue. What is the role of a gene in inheritance?
- A The gene contains chromosomes that show an organism's traits.
 - B The gene gets messages from its cell about showing certain traits.
 - C The gene has nerves that send messages to the brain, controlling specific traits.
 - D The gene is a section of DNA that controls a trait that the organism inherits.
- 5 Many traits such as height and hair color that include a wide range of phenotypes are controlled by which of the following?
- A only dominant genes
 - B only recessive genes
 - C many genes
 - D sex-linked genes

6 Which is an example of a human trait that is controlled by a single gene?

- A ability to read
- B attached or free earlobes
- C eye color
- D skin color

7 Scientists call an organism that has two different alleles for a trait

- A a hybrid.
- B homozygous.
- C purebred.
- D a factor.

8 Blood type is determined by a single gene with three alleles. The chart shows which combinations of alleles result in each blood type. A baby has blood type AB. What can you infer about the baby's parents?

| Blood Types | |
|-------------|--|
| Blood Type | Combination of Alleles |
| A | $A A$ $I I$ or $A I$ $I i$ |
| B | $B B$ $I I$ or $B I$ $I i$ |
| AB | $A B$ $I I$ |
| O | ii |

- A Neither has type AB blood.
- B Both have type AB blood.
- C One has type A blood, and the other has type B blood.
- D Neither has type O blood.

9 Mendel concluded that the alleles for tall stems in pea plants are dominant. Thus, crossing a purebred tall pea plant with a purebred short pea plant should result in

- A all tall plants.
- B all short plants.
- C all medium height plants.
- D half short and half tall plants.

- 10 In the Punnett square above, which fraction of the offspring are capable of passing on either the trait

F₂ generation

| | | |
|----------|-----------|-----------|
| | <i>W</i> | <i>w</i> |
| <i>W</i> | <i>WW</i> | <i>Ww</i> |
| <i>w</i> | <i>Ww</i> | <i>ww</i> |

W = white flower *w* = purple flower

for white flowers or the trait for purple flowers to their offspring?

- A .25
- B .5
- C .75
- D 1

- 11 In the Punnett square above, which is the probability that the offspring will have purple

F₂ generation

| | | |
|----------|-----------|-----------|
| | <i>W</i> | <i>w</i> |
| <i>W</i> | <i>WW</i> | <i>Ww</i> |
| <i>w</i> | <i>Ww</i> | <i>ww</i> |

W = white flower *w* = purple flower

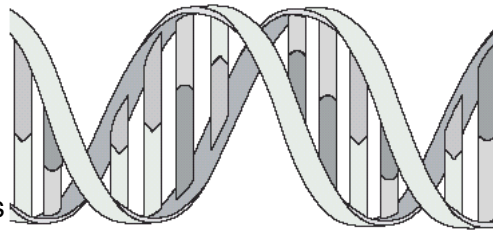
flowers?

- A 1 in 4
- B 2 in 4
- C 3 in 4
- D 4 in 4

- 12 Some people have hair on the middle segment of each finger and some people do not. This characteristic is under genetic control. Which of the following statements is true?

- A The hair results from a mutation.
- B Each person has two or more alleles for this trait.
- C The genes that cause this trait are codominant.
- D The genes that cause this trait are unknown.

13



The diagram shows

- A DNA.
- B RNA.
- C proteins.
- D ribosomes.

14 What is DNA?

- A an energy-rich organic compound made of carbon, hydrogen, and oxygen
- B a drug that slows down the activity of the central nervous system
- C the genetic material that is passed from parent to offspring
- D the region of a cell located inside the cell membrane in prokaryotes

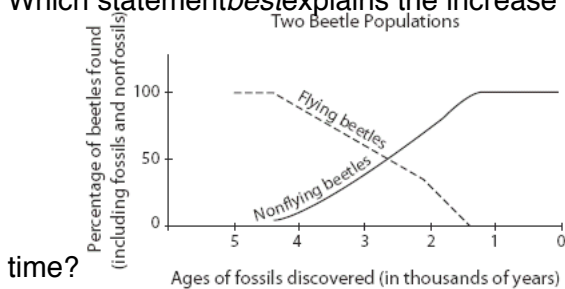
15 Which of the following is made up of strands of DNA?

- A allele
- B chromosome
- C gene
- D nucleus

16 The random variations on which natural selection operates are changes in

- A niches.
- B Earth.
- C homologous structures.
- D genes.

17 Which statement *best* explains the increase of non-flying beetles over



- A They were better adapted to the environment.
 - B They arrived from other islands 5,000 years ago.
 - C They mutated and produced flying beetles.
 - D They became extinct about 1.5 thousand years ago.
- 18 If a population of a single species becomes separated into two isolated groups, a new species may evolve after
- A alleles are shuffled in each gene pool.
 - B one group stops reproducing.
 - C characteristics in both groups change gradually over many generations.
 - D one group faces extinction, while the other overpopulates.
- 19 What did Darwin observe about finches in the Galápagos Islands?
- A Their feathers were adapted to match their environment.
 - B Their beaks were adapted to the foods they ate.
 - C They had identical phenotypes in all locations.
 - D They had identical genotypes in all locations.
- 20 Which of the following *did not* influence Darwin as he developed his theory of natural selection?
- A fossils that resembled living organisms
 - B similarities between animals in the Galpagos and in South America
 - C similarities in DNA between organisms
 - D the use of selective breeding among animal breeders
- 21 Darwin reasoned that limited resources in an area would lead to
- A competition among organisms.
 - B extinction of all organisms in an area.
 - C genetic variation among organisms.
 - D increases in population.
- 22 Scientists combine evidence from fossils, body structures, early development, and DNA sequences to do which of the following?
- A determine what bones an animal has in its forelimbs
 - B determine the evolutionary relationships among species
 - C decide which fossils are older than others
 - D determine whether an organism will have gills during its early development

23 Which of the following is *not* explained by Darwin's theory of evolution by natural selection?

- A the fossil record
- B the origin of Earth
- C the diversity of living things living on Earth today
- D the variety of beaks among finches on the Galpagos Islands

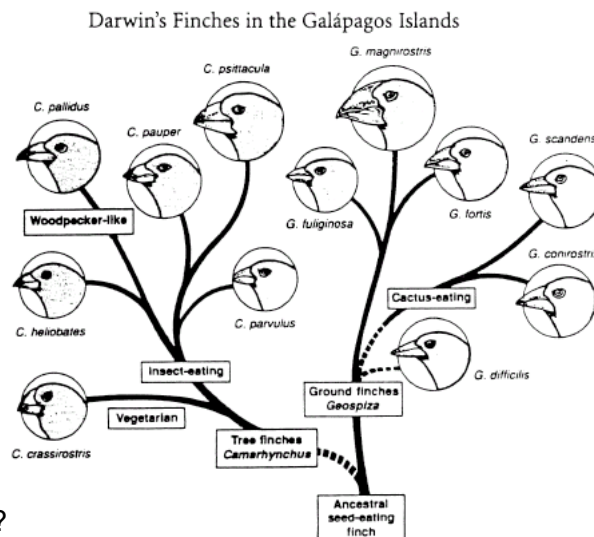
24 The bones in a bird's wing and a dolphin's flipper show strong similarities. What do scientists infer from these similarities?

- A Birds evolved from dolphins.
- B Dolphins evolved from birds.
- C Birds and dolphins evolved from a common ancestor.
- D Dolphins and birds are not related.

25 A branching tree shows

- A how different groups of organisms are related.
- B where different fossils of organisms can be found.
- C how embryos of different organisms develop.
- D which DNA bases are found in different organisms.

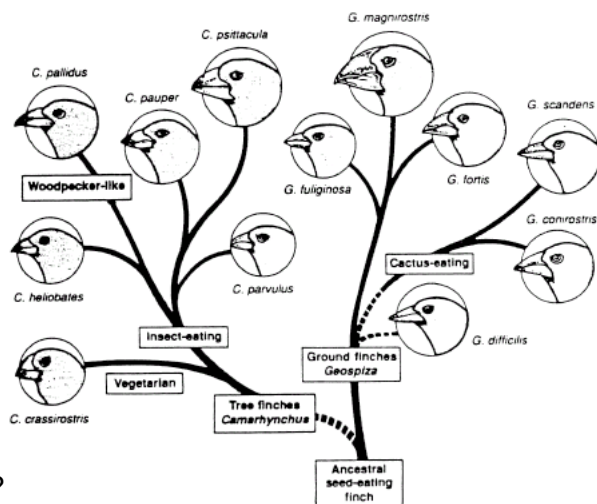
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What does the diagram show?

- A how finch species are related
- B how finch species mate
- C which finch species can interbreed
- D which finch species will die out

- 27 According to the diagram, which species is most closely related to *G. fortis*?



fortis?

- A *C. pauper*
 - B *C. pallidus*
 - C *G. difficilis*
 - D *G. fuliginosa*
- 28 Large-scale extinctions in the past happened when
- A a species competed against other species.
 - B the range of variation within a species became too great.
 - C organisms could not adapt to an environmental change.
 - D organisms produced more offspring than the food supply could support.
- 29 Which of the following could cause the extinction of a species of plants?
- A an ice age
 - B an earthquake
 - C a thunderstorm
 - D a summer with low rainfall
- 30 A species of grass is adapted to a wet climate. If the climate becomes much drier, what will *most* likely happen to the grass?
- A It will become a new species.
 - B It will become extinct.
 - C It will grow in a new location.
 - D It will produce more offspring.

- 31 Which of the following natural events occurs during the longest period of time?

- A tsunami
- B lightning strike
- C plate movement
- D volcanic eruption

32 Geologic processes may cause sudden change or produce change over a long period of time. Which of the following is a result of major geologic processes that occurred over a long period of time?

- A formation of the Atlantic Ocean
- B pollution of the Great Lakes
- C lowering of the summit of Mount St. Helens
- D change in the course of the Mississippi River

33 The slowest change in Earth's climates would be caused by

- A volcanic eruptions.
- B an asteroid impact.
- C earthquakes.
- D crustal movements.

34 What is thought to have caused the sudden cooling that resulted in the mass extinction of the dinosaurs 65 million years ago?

- A a sudden ice age
- B the burning of fossil fuels
- C the impact of an asteroid
- D excess carbon dioxide in the atmosphere

35 Which of the following provides evidence of the catastrophic events that have shaped Earth?

- A index fossils
- B greenhouse gases
- C ice ages
- D mass extinctions

36 Which of the following is *least* likely to cause widespread change in the climate on Earth?

- A an earthquake
- B a volcanic eruption
- C an asteroid impact
- D an ice age

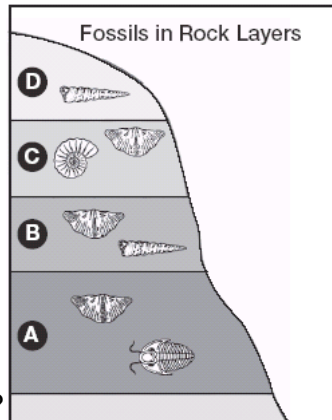
37 The law of superposition states that, in horizontal layers of sedimentary rock, each layer is

- A younger than the layer above it and older than the layer below it.
- B neither older nor younger than the other layers.
- C older than the layer above it and younger than the layer below it.
- D always older than any vertical layers.

38 Which is the correct order of the processes that form rock from sediment?

- A deposition, cementation, compaction, erosion
- B erosion, cementation, deposition, compaction
- C cementation, compaction, deposition, erosion
- D erosion, deposition, compaction, cementation

39



Which rock layer is the *most* recent?

- A A
- B B
- C C
- D D

40 What allows geologists to determine the absolute age of a rock sample?

- A index fossils
- B radioactive dating
- C the law of superposition
- D the presence of bacteria

41 Geologists believe that Earth is approximately

- A 46,000 years old.
- B 4.6 million years old.
- C 4.6 billion years old.
- D 4.6 trillion years old.

42 Approximately when did life begin on Earth?

- A more than 3 billion years ago
- B about 1 billion years ago
- C about 245 million years ago
- D about 1.8 million years ago

43 What does a mass extinction look like in the fossil record?

- A Many new kinds of fossils suddenly appear in the fossil record.
- B No fossils can be found during these layers in the fossil record.
- C Many kinds of fossils suddenly stop appearing in the fossil record.
- D There is a large gap in the fossil record caused by an unconformity.

44 The fossil record shows that fossils occur in a particular order. What does this order tell us about life on Earth?

- A Life forms have changed over time.
- B Life forms have become more simple over time.
- C Life forms have become less diverse over time.
- D Life forms represented by fossils are now extinct.

45 Which statement best describes what the study of fossils allows scientists to do?

- A They can describe past environments and the history of life.
- B They can study present ocean temperatures at different depths.
- C They can analyze the chemical composition of sedimentary rocks and minerals.
- D They can describe the details of the process by which life began.

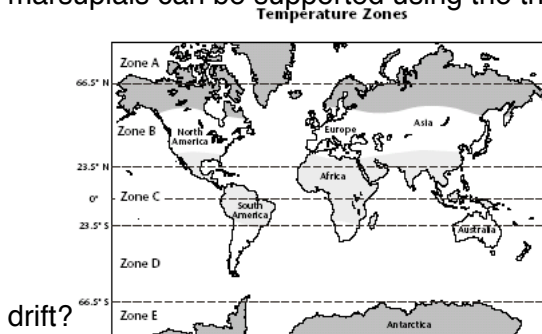
46 The mass extinction at the end of the Paleozoic may have been the result of the formation of a(n)

- A supercontinent.
- B ice age.
- C asteroid.
- D desert.

47 Fossils of dinosaurs such as *Brachiosaurus* have been found in Europe, Africa, and North America. What does the presence of these fossils in separate places suggest?

- A *Brachiosaurus* evolved three separate times.
- B The climate of Europe and Africa changed over time.
- C The continents were once joined.
- D The three dinosaurs are not the same species.

48 Almost all species of marsupials (pouched mammals) live in Australia. Which statement about marsupials can be supported using the theory of continental

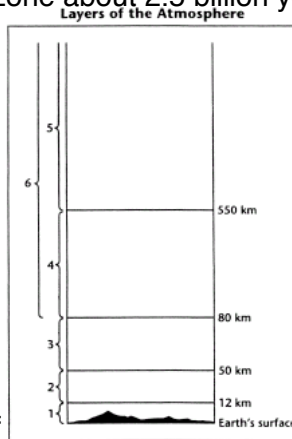


- A Australia has the best climate for marsupials.
- B Marsupials are uniquely adapted to Australia.
- C Australia must have separated from the other continents about the time that marsupials evolved.
- D Marsupials must have evolved after Australia separated from the other continents.

49 How were the major divisions of the geologic time scale determined?

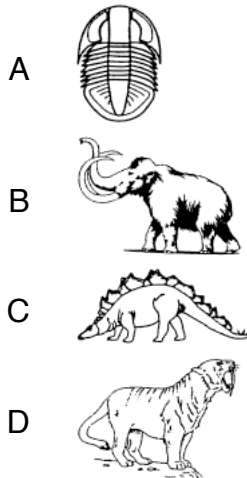
- A evidence of asteroids hitting Earth
- B evidence of the distribution of glaciers on Earth
- C evidence of major changes in the composition of the atmosphere
- D evidence of major changes in the life forms on Earth

- 50 The layer of the atmosphere labeled 2 in the diagram above is called the stratosphere. The stratosphere developed a layer rich in ozone about 2.5 billion years ago. The ozone in this layer of



the atmosphere developed as a result of

- A oceans absorbing large amounts of Earth's carbon dioxide.
 - B comets releasing frozen gases on Earth.
 - C photosynthetic organisms releasing oxygen into the atmosphere.
 - D volcanic eruptions releasing carbon dioxide into the atmosphere.
- 51 Which of these organisms lived during the Paleozoic Era?



- 52 Chad wants to learn more about the effects of asteroid impacts on climate. Which would be the *best* source for him to use?

- A an article on asteroid impacts in an encyclopedia
- B the Internet site for a movie about an asteroid crashing into Earth
- C a magazine article about the climate of North America
- D a novel about a visit to an asteroid

- 53 Rosa wants to learn more about how fossils are discovered. Which would *not* be a reliable source on this topic?

- A an article written by a paleontologist about her discoveries
- B a book on fossils published by a university geology department
- C a CD-ROM produced by a major science magazine
- D an Internet site written by another student

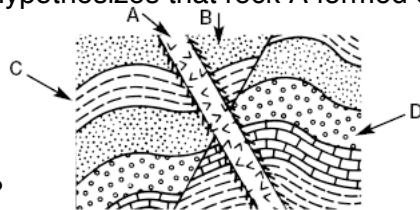
54 Julia wants to learn more about the Burgess Shale, an important fossil site in Canada. She uses a search engine to find more information on the Internet. Which of the following would be the *most* useful terms for her to search for?

- A Burgess Shale fossils
- B fossils in Canada
- C more fossils
- D rock Burgess

55 A new species of tree begins growing in an area. These trees have darker bark than the previous trees in the area. A biologist observes that a species of lizard that had commonly been light-colored appears more and more often in a dark variety. Which is the *most* reasonable explanation for these observations?

- A Dark lizards are more likely to escape predators because they are harder to see.
- B Dark lizards are more likely to produce healthy offspring than light lizards.
- C Light lizards are being killed by a chemical in the trees.
- D Light lizards have stopped producing as many offspring.

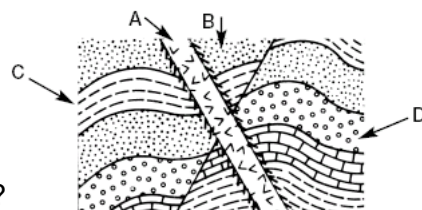
56 A scientist hypothesizes that rock A formed earlier than rock D. Does the diagram support her hypothesis?



hypothesis?

- A Yes, because layer A occurs below layer D in one area.
- B Yes, because layer D occurs at two different levels.
- C No, because layer A is an intrusion that cuts through the rock layers.
- D No, because it is impossible to identify the order of the layers.

57



What order of events can be inferred from the diagram?

- A faulting, volcanic activity, sedimentary rock formation
- B sedimentary rock formation, faulting, volcanic activity
- C sedimentary rock formation, volcanic activity, faulting
- D volcanic activity, sedimentary rock formation, faulting

58 Amelia is making a model of the geologic time scale. She uses a scale of 1 cm = 4 million years. How long should she make the Jurassic Period in her time line?

| Geologic Time Scale | | | |
|---------------------|--|-----------------------|------------------------------|
| Era | Period | Millions of Years ago | Duration (millions of years) |
| Cenozoic | Quaternary | 1.8 to present | |
| Tertiary | 1.8 | 65 | |
| Mesozoic | Cretaceous | 66.4 | 78 |
| Jurassic | 144 | 64 | |
| Triassic | 208 | 37 | |
| Paleozoic | Permian | 245 | 41 |
| Carboniferous | 286 | 74 | |
| Devonian | 360 | 48 | |
| Silurian | 408 | 30 | |
| Ordovician | 438 | 67 | |
| Cambrian | 505 | 39 | |
| Precambrian | 544 million years ago 4.6 billion years ago | | |

- A 4 cm
- B 16 cm
- C 32 cm
- D 64 cm

- 59 If Amelia showed the entire Paleozoic Era on her model, how long would it be?

| Geologic Time Scale | | | |
|---------------------|--|-----------------------|------------------------------|
| Era | Period | Millions of Years ago | Duration (millions of years) |
| Cenozoic | Quaternary | 1.8 to present | |
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| Cambrian | 505 | 39 | |
| Precambrian | 544 million years ago 4.6 billion years ago | | |

- A 10.25 cm
 B 65 cm
 C 126.25 cm
 D 260 cm

- 60 Amelia's class is designing an outdoor model to show the geologic time scale. They want to show the Precambrian Era through the present. If they use a scale of 1 m = 100 million years, how long will their model be?

| Geologic Time Scale | | | |
|---------------------|--|-----------------------|-----------------------------|
| Era | Period | Millions of Years ago | Duration(millions of years) |
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| Cambrian | 505 | 39 | |
| Precambrian | 544 million years ago 4.6 billion years ago | | |

- A 46,000 m
- B 460 m
- C 46 m
- D 4.6 m