2023-2024 Gr8 Science Benchmark Unit 1

Question 1.
A difference in beak shape among members of the same finch species is an example of variation. _____

A. True

B. False

Question 2.
Food we eat has not been modified through selective breeding.

A. True

B. False

Question 3.
Which of the following is a behavioral adaptation?

A. blue whales migrating to mate and give birth

B. tree frogs having long, sticky tongues

C. alligators' eyes being on top of their heads to help them see above the water

D. hedgehogs having stiff spines sticking out of their bodies

Question 4.
Which of the following is an inherited trait that increases an organism's chance of survival and reproduction?

A. adaptation

B. mutation

C. natural selection

D. selective breeding

Question 5.
A mutation cannot be inherited.

A. True

B. False

Question 6.
Small changes in traits that cause variation are frequently caused by _____.

A. natural selection

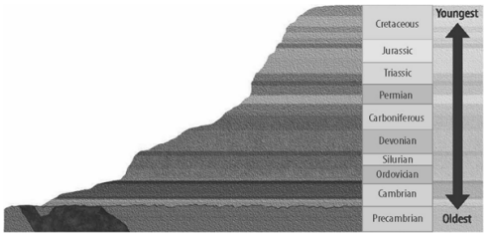
B. competition

C. mutations

D. migration

Question 7.

What statement is true about the rock layers?



A. Only the older rocks contain fossils of complex life forms.

B. Only the younger rocks contain simple life forms.

C. Both older and younger rocks contain more complex life forms.

D. Only the younger rocks contain fossils of complex life forms.

Question 8.

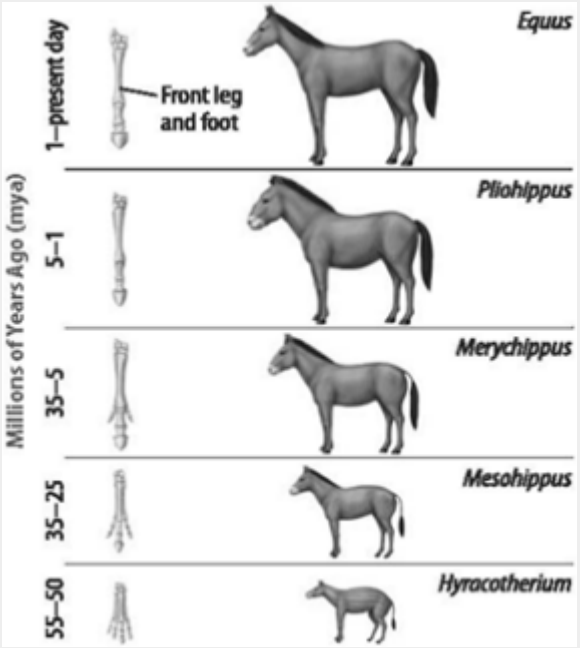
The changes over time in the inherited traits of a type of organism are _____.

A. growth

B. biogenesis

C. spontaneous generation

D. evolution



Question 9.

What does the figure suggest?

A. Horses appeared up to a million years ago and did not have any ancestors before that time.

B. Between 55 and 50 million years ago there weren't any animals that could be considered as related to horses.

C. The modern horse is related to other extinct species.

D. The hyracotherium is the same species as the modern horse.

Word bank

extinct
related
massive

Question 10.

Species go _____ when they cannot adapt to environmental changes.

Question 11.

Biological evolution is the change over time of populations of _____ organisms.

Question 12.

A _____ extinction occurs when many species go extinct in a relatively short period of time.

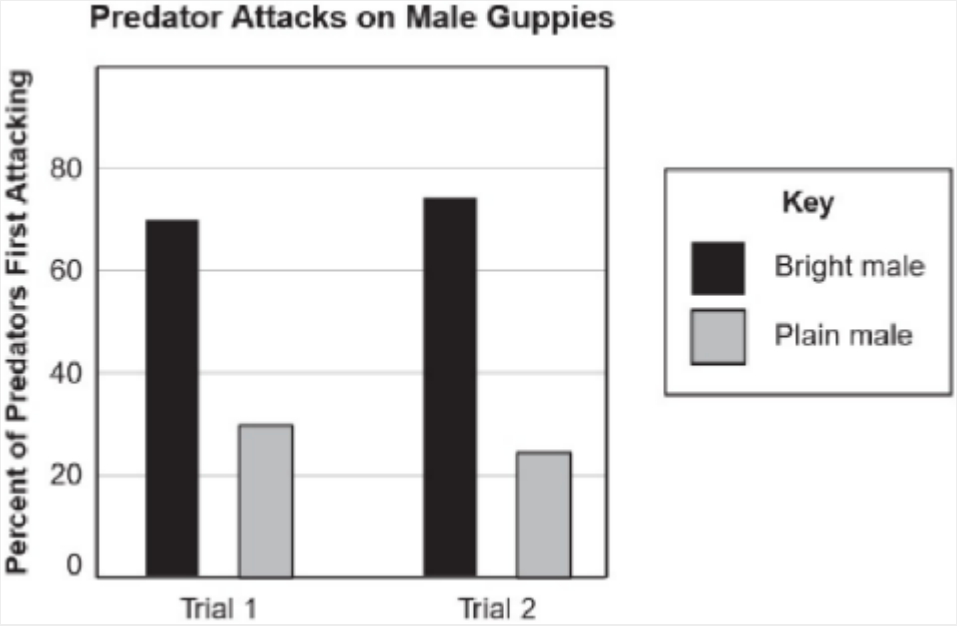
Question 13.

Compare and contrast natural selection and selective breeding.

Question 14.

Suppose there is a large population of ptarmigan in Alaska. These birds have mostly white feathers in winter, and mostly brown feathers in summer. Now, because of a mutation, a few birds stay white all year. What would happen if the climate changed permanently, and the ground was snow-covered all year?

The tail fin of a male guppy, a small tropical fish, may be brightly colored or plain. The color variation is an inherited trait. A researcher studied if the cichlid, a predator fish, is more likely to attack male guppies with brightly colored tails than those with plain tails. In Trial 1, the researcher introduced brightly colored guppies and plain guppies, one at a time, into a clear tube in an aquarium containing cichlids. The tube protected the guppies but allowed the cichlids to easily see them. The researcher measured how often the cichlids tried to attack the guppies. In Trial 2, he repeated the experiment but used different guppies and cichlids. The number of each fish was the same in each trial. The graph shows the researcher's results.



Question 15.

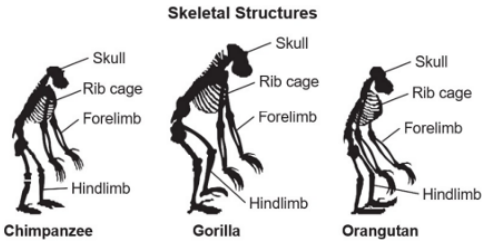
The following observations were made of natural ponds where guppies and cichlids interact:

- In natural ponds where cichlids eat guppies, most male guppies' tail fins are not brightly colored.
- In natural ponds where no cichlid predators are present, most male guppies' tail fins are brightly colored.

Explain the probabilities of survival for both brightly colored and plain male guppies in each natural pond. Support your answer with evidence from the results of the researcher's experiments.

Question 16.

The diagram shows the skeletal structure of three different species.



Scientists claim that the three species are related and they have placed them in the same family.

a. Identify two anatomical similarities shown in the diagram that support the scientists' claim. Explain why these similarities support the claim.

b. Identify two anatomical similarities shown in the diagram. Explain how these species changed over time until they became different from each other in the present time.

Question 17.

Figure 1 shows embryo development for four organisms.

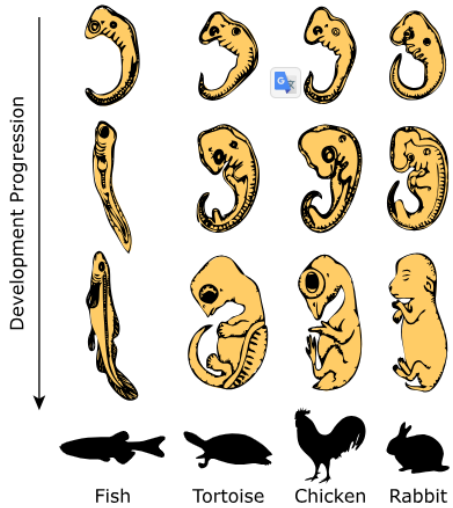


Figure 1. Embryo Development

Which statement can **best** be supported by Figure 1?

A. Chickens are more closely related to tortoises than rabbits are.

B. Rabbits, chickens, tortoises, and fish are equally related to each other.

C. Fish do not share a common ancestor with other vertebrates.

D. Fish and chickens are the least closely related.

Question 18.

Table 1 gives data about female mice that live on a beach with tan sand and few plants.

Table 1. Mouse Characteristics

Fur Color	Running Speed (cm/s)	Number of Offspring Produced over Lifetime	Age at Death (months)
Black	8	5	4
Tan	6	9	4
Cream	5	4	5

Complete the sentence by choosing the correct answers from the drop-down menus.

Over time, the number of mice with

A. black

B. tan

C. cream

fur would become the most common because they

A. run the fastest

B. blend in with the environment

and

A. produce the most offspring

B. live the longest

.

Question 19.

Students were investigating the effect of antibiotics on bacteria. The students exposed a colony of bacteria to an antibiotic and 10% of the bacteria survived. Over time, the surviving bacteria multiplied. When the second generation of bacteria was exposed to the same antibiotic, 85% survived. Which statement **BEST** explains the results of this investigation?

A. The original surviving bacteria passed a resistance to the antibiotic on to the next generation.

B. The original surviving bacteria multiplied faster when exposed to the antibiotic.

C. The second generation of bacteria changed their genes to be resistant to the antibiotic.

D. The second generation of bacteria inherited a weakness caused by the antibiotic.

Question 20.

In the 1970s, the pesticide DDT was used to kill insects that damaged fruit and vegetable crops. Most insects died from being exposed to DDT, but some survived. These surviving insects contributed to an increase in their population by

A. migrating to habitats that had different types of crops.

B. learning how to avoid being exposed to DDT.

C. passing the gene for DDT resistance to their offspring.

D. competing with other types of insects for food.