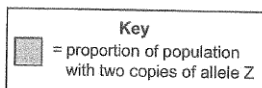
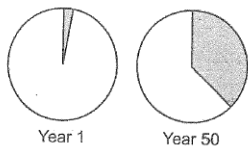


Keystone Practice Questions #3
Gene Tech., Evolution, Ecology= Module 2

- Which statement correctly describes how nitrogen in the soil returns to the atmosphere?
 - Soil bacteria convert nitrates into nitrogen gas.
 - Decomposers directly convert ammonium into nitrogen gas.
 - Plants assimilate nitrites and convert them into nitrogen gas.
 - Nitrogen-fixing bacteria in plant roots convert nitrates into nitrogen gas.
- Agricultural runoff can carry fertilizers into lakes and streams. This runoff can cause algae populations to greatly increase. Which effect does this change in the algae population sizes **most likely** have on affected lakes and streams?
 - an increase in water level
 - an increase in water clarity
 - a reduction in dissolved oxygen needed by fish and shellfish
 - a reduction in temperature variations near the water's surface
- Genetic engineering has led to genetically modified plants that resist insect pests and bacterial and fungal infections. Which outcome would **most likely** be a reason why some scientists recommend caution in planting genetically modified plants?
 - unplanned ecosystem interactions
 - reduced pesticide and herbicide use
 - improved agricultural yield and profit
 - increased genetic variation and diversity
- A mutation occurs in the genes that code for coat color in deer. Which change will **most likely** result from this mutation?
 - a change in the selection pressures acting on coat color
 - a change in the coat-color genes of deer predator species
 - an increase in coat-color diversity in the population
 - an increase in the number of genes for coat color in the population
- Use the circle graphs below to answer the question.

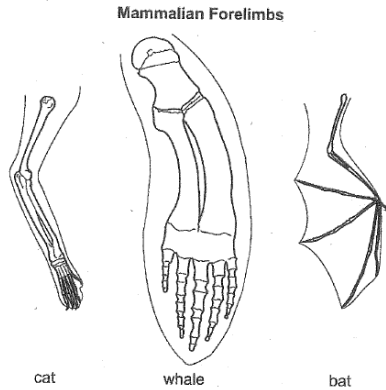
Changes in Allele Frequency Over Time



The graphs illustrate change in a lizard population over time. Which process **most likely** led to the change in the lizard population?

- natural selection acting on a harmful trait
- natural selection acting on a beneficial trait
- natural selection acting on a dominant trait
- natural selection acting on a recessive trait

6. Use the illustrations below to answer the question.



The skeletons of mammalian forelimbs represent variations of a structure that was present in their common ancestor. What has **most likely** caused the variation in forelimbs?

- A. changes in muscle structure
- B. changes in the genetic codes
- C. trait formation due to behaviors
- D. development of vestigial structures

7. Use the table below to answer the question. (use a separate sheet)

**Sequence Differences between
COII Genes in Some Animals**

Animal	Number of Base Differences from a Rat
mouse	101
cow	136

The gene COII is in the genome of many organisms. A comparison of the number of base differences between the COII gene in a rat and that of two other animals is shown.

Part A: Based on the data, describe a possible evolutionary relationship between rats, mice, and cows.

Part B: Describe how different organisms having a common gene such as COII supports the theory of evolution.

8. Use the table below to answer the question.

Student's Observations of a Pond Ecosystem

Quantitative	Qualitative
37 fish and 3 frogs	Leaves lie on the bottom of the pond.
2 types of aquatic grass	Water insects move along the water's surface.
12 small rocks and 1 medium rock	All 3 frogs are sitting on a pond bank.
sand	

A group of students measured a ten-square-meter section of a pond ecosystem and recorded observations. Which statement is a testable hypothesis?

- A. The frogs living in the pond represent a population.
- B. Water is an abiotic component in the pond ecosystem.
- C. If the fish are given more food, then they will be happier.
- D. If the frogs are startled, then they will jump in the water.

9. Use the list below to answer the question.

Observations

- Two grey wolves
- Five moose
- Several species of conifer trees
- Large granite rock
- Shallow pond

A student wrote several observations in a field notebook. Which term **best** classifies all of the student's observations?

- A. population
- B. food chain
- C. ecosystem
- D. community

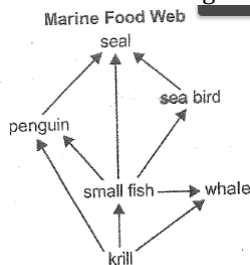
10. A researcher observing an ecosystem describes the amount of sunlight, precipitation, and type of soil present. Which factors is the researcher **most likely** describing?

- A. biotic factors in a forest
- B. biotic factors in a tundra
- C. abiotic factors in a prairie
- D. abiotic factors in an ocean

11. A farmer observed that an increase in a field's soil nitrogen content was followed by an increase in producer productivity. What does this observation **most likely** indicate about the relationship between nitrogen and the producers in the field?

- A. Nitrogen was a biotic factor.
- B. Nitrogen was a limiting factor.
- C. Nitrogen became a surplus resource.
- D. Nitrogen became a selection pressure.

12. Use the diagram below to answer the question.

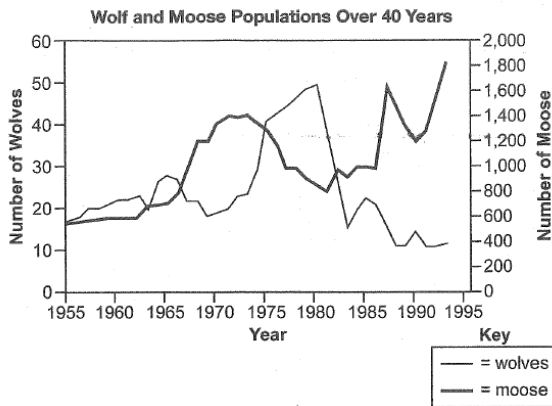


Which sequence correctly describes the flow of energy between organisms in the marine food web?

- A. from seals to penguins to krill
- B. from whales to krill to small fish
- C. from sea birds to seals to penguins
- D. from small fish to penguins to seals

13. A species of snapping turtle has a tongue that resembles a worm. The tongue is used to attract small fish. Which best describes the interaction between the fish and the snapping turtle?
- predation
 - symbiosis
 - parasitism
 - competition
14. In North America, the eastern spotted skunk mates in late winter, and the western spotted skunk mates in late summer. Even though their geographic ranges overlap, the species do not mate with each other. What **most likely** prevents these two species from interbreeding?
- habitat isolation
 - gametic isolation
 - geographic isolation
 - reproductive isolation

15. Use the graph below to answer the question.



Isle Royale is located in Lake Superior. Isle Royale is home to populations of wolves and moose. The interactions between wolves and moose, as well as the individual population sizes, have been studied since 1958. The graph shows the population sizes over time for both wolves and moose.

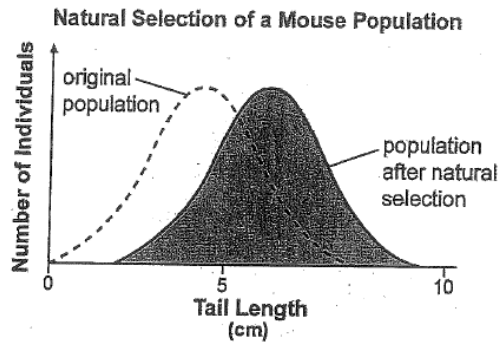
Part A: Describe one limiting factor for the moose population.

Part B: Explain one likely reason why the wolf population rapidly increased between 1975 and 1980.

Part C: Predict what will happen to the moose population's size after 1994 by describing the shape of the curve. In your answer, be sure to explain the reasoning behind your prediction.

16. The frequency of an allele in the fly population changes from 89% to 20% after three generations. Which other events **most likely** occurred during the same time period?
- an environmental change and a fly population increase
 - an environmental change and a fly population decrease
 - interbreeding of flies with an invasive species and fly population speciation
 - interbreeding of flies with an established local species and fly population speciation

17. Use the graph below to answer the question.



Tail length in mice varies within a population. Scientists observed change in the distribution of tail lengths in a mouse population over time. At the genetic level, what has **most likely** happened to the allele for the shortest tail lengths?

- A. The allele changed from being dominant to being recessive.
- B. The allele changed from being autosomal to being sex-linked.
- C. The allele became less frequent than the alleles for longer tail lengths.
- D. The allele began to code for long tail lengths instead of the shortest ones.

18. Scientists observed that the populations of top-level consumers in a particular ecosystem were rapidly decreasing. Further studies revealed that there was also a decline in producer productivity. Which other changes did the scientists **most likely** observe in the ecosystem?

- A. increased producer diversity
- B. decreased population size at all levels
- C. decreased primary consumer populations only
- D. increased primary and secondary consumer diversity