01_Themes in Biology Questions

For all questions select all answers that apply (some questions may have more than one correct answer)

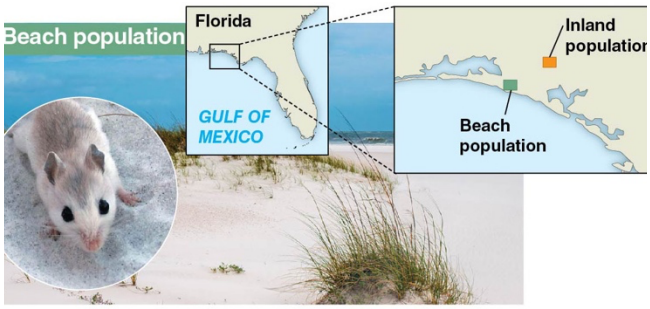
1) Which correctly orders the levels of biological organization from smallest to largest?
    a. cells, organelles, organ system, community, ecosystems
    b. molecules, organism, population, communities, biosphere
    c. molecules, cells, tissues, ecosystems, communities
    d. organelles, cells, population, biosphere, ecosystems
    e. cells, organs, population, ecosystems, communities

2) All the gray squirrels that inhabit an oak forest is an example of a(n) _____. (select all that apply)
    a. ecosystem
    b. biosphere
    c. community
    d. population

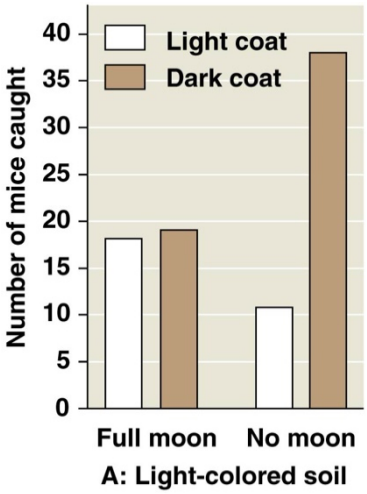
3) Imagine that you have just discovered a new multicellular microscopic organism in a pond. It is propelled by external cilia. What can you say about the evolutionary relationships of this organism?
    a. The presence of cilia shows that it is more closely related to *Paramecium* than to humans.
    b. The presence of cilia shows that it shares a common ancestor with *Paramecium* and humans.
    c. It is probably closely related to pond algae.
    d. It is probably most closely related to prokaryotes.
    e. The presence of cilia demonstrates the diversity, but not the unity, of life.

4) An experimental study is conducted to determine whether a new drug reduces high blood pressure. The change in blood pressure values of the participants represents the _____.
    a. independent variable
    b. dependent variable
    c. hypothesis
    d. theory
    e. control group

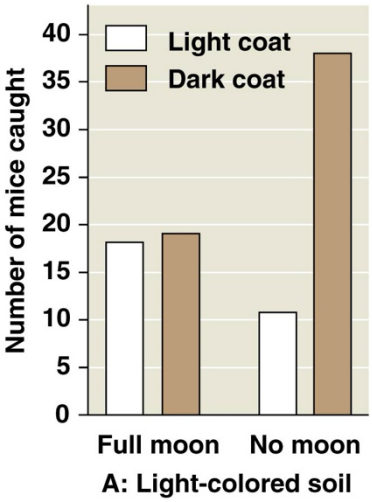
Two populations of mice of the same species, but with different color patterns reside in different environments. Predators of these mice are all visual hunters. The beach mouse lives on white sand dunes with sparse vegetation. The inland mouse lives on darker soil. Scientists conducted several experiments to understand how presence of moonlight affects the ability of the mice to avoid predators.

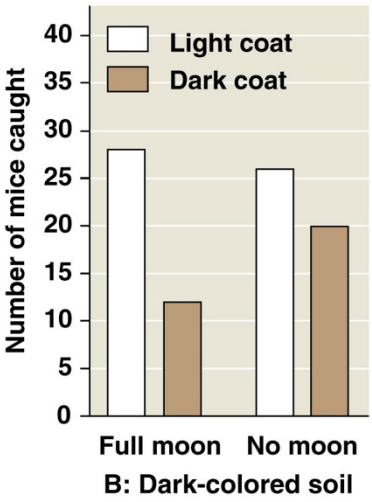


5) In this figure to the right, what is the **dependent variable**, (the response to the independent variables being tested)?
   a. the presence or absence of moonlight
   b. the mouse coat color
   c. the number of mice caught
   d. the color of the soil



6) These data to the right are from two enclosures: one with light-colored soil (left), and one with dark-colored soil (right). How many dark brown mice were caught in the light-colored soil enclosure on a moonlit night?
   a. 12
   b. 17
   c. 19
   d. 37





7) What combination of independent variables led to the highest predation level in light-colored soil? Use the above graph (Q6)
    a. light brown coat with no moon
    b. light brown coat with full moon
    c. dark brown coat with full moon
    d. dark brown coat with no moon

8) Which is/are an example of biological interaction?
    a. Two species of finch compete for food.
    b. Information from the nucleus travels to a ribosome.
    c. Chlorophyll absorbs light.
    d. A bird lays an egg.

9) Which of the following statements best distinguishes hypotheses from theories in science?
    a. Theories are hypotheses that have been proved.
    b. Hypotheses are guesses; theories are correct answers.
    c. Hypotheses usually are relatively narrow in scope; theories have broad explanatory power.
    d. Theories are proved true; hypotheses are often contradicted by experimental results.

10) Which of the following is an example of qualitative data?
    a. The fish swam in a zigzag motion.
    b. The contents of the stomach are mixed every 20 seconds.
    c. The temperature decreased from 20°C to 15°C.
    d. The six pairs of robins hatched an average of three chicks each

11) Which sentence best describes the logic of scientific inquiry?
    a. If I generate a testable hypothesis, tests and observations will support it.
    b. If my prediction is correct, it will lead to a testable hypothesis.
    c. If my observations are accurate, they will support my hypothesis.
    d. If my prediction turns out to be correct, my hypothesis is supported.

12) Can you pick out the mossy leaf-tailed gecko lying against the tree trunk in this photo? How is the appearance of the gecko a benefit in terms of survival? Given what you learned about evolution, natural selection, and genetic information, describe how the gecko's coloration might have evolved. (point form)