SYNTHESIZE THE UNIT

In your Evidence Notebook, make a concept map, graphic organizer, or outline using the Study Guides you made for each lesson in this unit. Be sure to use evidence to support your claims.

When synthesizing individual information, remember to follow these general steps:

- Find the central idea of each piece of information.
- Think about the relationships between the central ideas.
- Combine the ideas to come up with a new understanding.

DRIVING QUESTIONS

Look back to the Driving Questions from the opening section of this unit. In your Evidence Notebook, review and revise your previous answers to those questions. Use the evidence you gathered and other observations you made throughout the unit to support your claims.

PRACTICE AND REVIEW

1. In a certain species of sea snake, a single gene controls tongue shape. The forked-tongue allele (*T*) is dominant, while the non-forked-tongue allele (*t*) is recessive. In this population, 16 individuals are homozygous recessive, 36 individuals are homozygous dominant, and 48 individuals are heterozygous. Using this information, answer the following questions:

a. How many total alleles for tongue shape are in this population?

b. How many *T* alleles are in the population?

c. How many *t* alleles are in the population?

d. What is the frequency of the *T* allele? Express your answer as a percentage.

e. What is the frequency of the *t* allele? Express your answer as a percentage.

2. Bright green tree frogs are generally more common in tropical rain forests than in temperate areas, where leaf colors change with the season. Why might this be true?

a. The frogs' numbers are similar in both environments but are easier to spot in green tropical rain forests.

b. The frogs' coloration provides better camouflage in temperate forests, where leaves may turn brown or other colors, than in green tropical rain forests.

c. The frogs' coloration helps them stand out better in green tropical rain forests, compared with temperate forests, where leaves may turn brown or other colors.

d. The frogs' coloration provides better camouflage in green tropical rain forests than in temperate forests, where leaves may turn brown or other colors.

3. Some individuals in a particular species of butterfly display coloration that mimics that of a different, poisonous butterfly species living in the same habitat. Place the elements in order to model what may happen to the first butterfly species if the poisonous butterfly species is removed from the habitat.

a. Predators will eat butterflies with mimicking coloration more often than before.

b. The proportion of individuals in the population with mimicking coloration will decrease.

c. The pressure on predators to avoid eating poisonous butterflies will decrease.

d. The survival advantage for mimicking butterflies will decrease.

4. In clam species, a thick shell can discourage potential predators such as sea otters who crack open the shells to eat the clams. In a habitat where sea otters are tending to grow larger and stronger, which type of evolution might be observed in local clams, in terms of shell thickness?

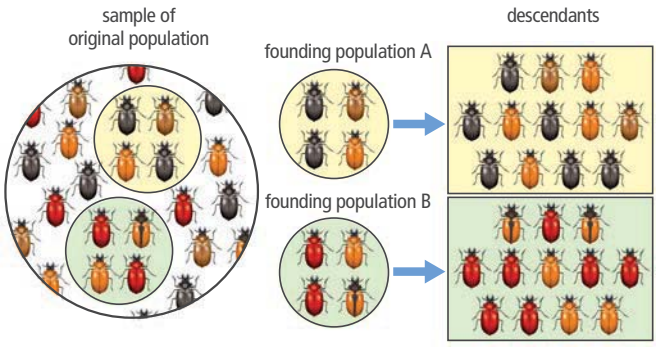
a. disruptive evolution, with the thickest and thinnest shells becoming more prevalent

b. stabilizing evolution, with shells around the average thickness becoming more prevalent

c. directional evolution, with the average tending toward thicker shells across the clam population

d. directional evolution, with the average tending toward thinner shells across the clam population

FIGURE 4: Founder effect in beetle populations.



5. Examine the image of founding beetle populations in Figure 4. What may be observed in the descendant populations that arise from a small number of founding individuals? Select all correct answers.

- **a.** Individuals in descendant populations are all heterozygous for traits.
- **b.** Allele frequencies in one descendant population may be very different from those in another descendant population.
- **c.** Some alleles may be completely lost in one or more descendant populations.
- **d.** The genetic variation of the descendant population is usually lower than in the original population.

6. Individuals from two different species of firefly, species A and species B, are brought together. It is determined that the females from species A do not recognize the mating signals flashed by males of species B, and females from species B do not recognize signals from males of species A. Based on this finding, what past phenomenon may have led to speciation in these fireflies?

- **a.** sexual isolation
- **b.** temporal isolation
- **c.** behavioral isolation
- **d.** geographic isolation

7. Cichlids are a group of more than 2,000 species of fish that live in African lakes and are thought to have evolved from adaptive radiation. Explain how so many species may have evolved from a common ancestor.

8. Explain a phenomenon related to climate change and how it can have negative impacts on species, and even directly lead to species extinction. Use a specific example to support your claims.

9. Herring are small ocean fish that often swim together in large schools. Though this behavior uses significant energy and can increase competition for resources, what advantages might the evolution of schooling behavior provide for herring? Select all correct answers.

- **a.** the ability for many individuals to spot predators
- **b.** the possibility of diving deeper as a school
- **c.** greater efficiency in searching for food together
- **d.** confusing potential predators by appearing to be one large animal

10. African wild dogs practice cooperative hunting, forming packs to hunt animals such as antelopes, warthogs, and wildebeest. Explain some of the advantages and disadvantages of group hunting.

UNIT PROJECT

Return to your unit project. Prepare your research and materials into a presentation to share with the class. In your final presentation, evaluate the strength of your analysis and conclusions.

Remember these tips while evaluating:

- Look at the empirical evidence—evidence based on observations and data. Does the evidence support the explanation?
- Consider if the explanation is logical. Does it contradict any evidence you have seen?
- Think of tests you could do to support and contradict the ideas.