

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

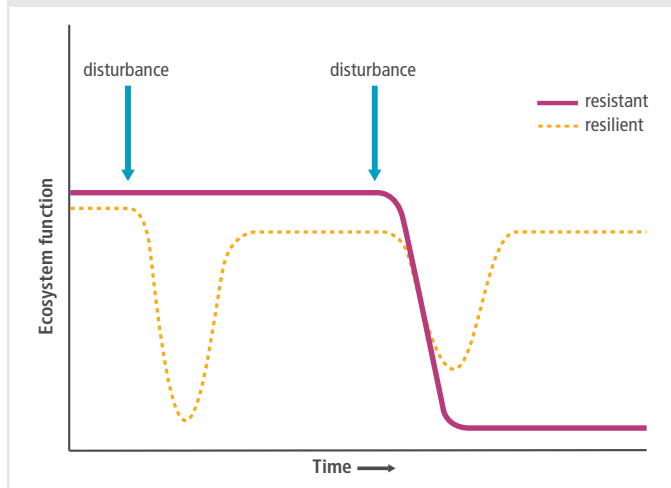
1. Over the course of a year, a population of 25 penguins gained 5 penguins through births and lost 3 penguins to death. In addition, 10 adult penguins moved into the population through immigration and 6 adult penguins moved out of the population through emigration. What is the yearly growth rate of this population?
 - a. 19
 - b. -8
 - c. -2
 - d. 6
2. Which of the following would result from the expansion of a species into a new habitat with no predators and evenly spaced resources? Select all correct answers.
 - a. logistic growth
 - b. uniform dispersion
 - c. exponential growth
 - d. type III survivorship
 - e. partial relief from density-dependent limiting factors
3. Which type of interaction is most responsible for energy transfer in a food chain?
 - a. competition
 - b. mutualism
 - c. parasitism
 - d. predation
4. What is the relationship between population number and carrying capacity in a stable population?
 - a. The population number matches the carrying capacity exactly through births, deaths, immigrations, and emigrations.
 - b. The population number oscillates around the carrying capacity as resources and population growth rates change slightly over time.
 - c. The carrying capacity and population number increase when resources are scarce and decrease when resources are abundant.
 - d. Carrying capacity and population numbers are inversely proportional. An increase in carrying capacity will be accompanied by a decrease in population numbers.
5. An invasive species moves into three niches that were once occupied by three different native species and outcompetes the native species, producing larger population numbers than the three native species combined. What happens to the biodiversity of the ecosystem?
 - a. Biodiversity increases because the number of individuals increases.
 - b. Biodiversity decreases because only native species count toward biodiversity in an area.
 - c. Biodiversity remains the same because the same ecological niches are still being filled.
 - d. Biodiversity decreases because the number of species decreases.

Ecosystem A is resistant to periodic small-scale floods. Ecosystem B displays resilience to small and large floods. A small flood occurred as a disturbance in both ecosystems, followed by a larger flood. The graph indicates the general reaction of the two ecosystems to the disturbances.

Use Figure 4 to answer Questions 6–8.

Ecosystem Resilience and Resistance

FIGURE 4: Resistance and Resilience in Ecosystems



Source: ©Dr. Jeremy P. Stovall

6. How does succession relate to the decrease in ecosystem function shown in the graph?
 - a. Decreases in ecosystem function represent the ecosystem being reset to an earlier successional state.
 - b. Decreases in ecosystem function represent the ecosystem progressing through succession back toward a climax community.
 - c. Climax communities cause decreases in ecosystem function as types of species and population numbers stabilize.
 - d. Succession ends when ecosystem function decreases.
7. Which ecosystem would experience more periods of exponential growth after disturbances? Explain your answer.
8. Which characteristics would make Ecosystem B more stable? Select all correct answers.
 - a. resilient tertiary consumers
 - b. resilient primary producers
 - c. high level of biodiversity
 - d. early successional state

9. What type of ecosystem would be most affected by a sequence of widespread, heavy rainfall that leads to significant regional flooding over the course of several months?
 - a. resilient ecosystem
 - b. resistant ecosystem
 - c. both resilient and resistant ecosystems
 - d. neither resilient nor resistant ecosystems

10. A limiting factor keeps population size down and can be density-dependent or density-independent. Which of these is the best explanation for why a disease outbreak is considered a density-dependent limiting factor?
 - a. Disease will only affect population size if the population has a very low density.
 - b. Disease will spread at the same rate throughout the population, regardless of population density.
 - c. Disease spreads more readily in a population with closely packed individuals.
 - d. Disease will not spread if individuals are evenly dispersed in their environment.

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 hypothesis, data, analysis, and conclusions.

Remember these tips while evaluating:

- Was your hypothesis supported by your data?
- Look at the empirical evidence gathered from your wetland model—evidence based on observations and data. Does the evidence support your claim and reasoning regarding the impact of wetlands on populations and ecosystems?
- Consider if the evidence and explanation are logical. Does your research contradict any evidence you have seen?