B

Biology Standard
B.8.a.

Teacher's Masters

California Education and the Environment Initiative

Differential Survival of Organisms

California Education and the Environment Initiative
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The Education and the Environment Curriculum is a cooperative endeavor of the following entities:
California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

Key Leadership for the Education and Environment Initiative:
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Key Partners:
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Lesson 1 Where and Why of Species Distribution

None required for this lesson.

Lesson 2 Patterns of Change over Time

None required for this lesson.

Lesson 3 Selection Pressures Drive Evolution

Selection Pressures Cards 2

Lesson 4 Natural Factors and Human Activities Change Environments

None required for this lesson.

Lesson 5 Human Activities, Natural Factors, and Differential Survival

None required for this lesson.

Assessments

Differential Survival of Organisms—Traditional Unit Assessment Master 3

Case Study of Differential Survival of Organisms—
Alternative Unit Assessment Master 6

Need for Energy

Examples of survival traits: teeth that can grasp prey, large eyes that help find prey, sensitive noses to smell prey

Predation

Examples of survival traits: speed for escaping from predators, camouflage to hide from predators, hard exoskeleton

Abiotic Environmental Factors

Examples of survival traits: layers of fat to protect from cold, feathers that shed water, feet that help running through sand

Need to Reproduce

Examples of survival traits: ability to sing to find mates, pouches to carry young, nest-building behavior

Name: _____

Part 1

Instructions: Select the best answer and circle the correct letter. (1 point each)

1. Which of the following is not a natural factor that influences the differential survival of organisms?
   - a. changes in weather patterns
   - b. predation
   - c. competition
   - d. water pollution

2. Which of the following are examples of natural factors that can increase the rate at which environmental changes occur?
   - a. chemical changes in the air or water
   - b. development of areas for recreation
   - c. changes in nutrient type or availability
   - d. a and c

3. Shifts in the fittest phenotype can occur due to all of the following except _____.
   - a. changes in substrate type
   - b. introduction of a new predator
   - c. removal of a food source
   - d. None of the above.

4. All of the following activities will likely have the direct effect of reducing the population of a particular species except _____.
   - a. hunting
   - b. introduction of nonnative species that acts as a predator
   - c. conservation efforts
   - d. habitat destruction

5. The concept of differential survival includes _____.
   - a. the idea that all phenotypes in a population have an equal chance of survival
   - b. the idea that not all species can survive a change in the environment
   - c. the idea that different species survive using different mechanisms
   - d. the idea that only the number of genotypes change

6. The ability of a species to survive a change in the environment depends on _____.
   - a. the survivability of the phenotypes of the species
   - b. the survivability of the genotype of the species
   - c. the existence of other species
   - d. the absence of other species

Name: _____

7. Which of the following does not result from natural selection?
- a. Rock mice living on sandstone are mostly beige.
- b. A hurricane kills off an entire population of lizards on an island.
- c. Some species have developed toxins.
- d. During drought, birds with smaller beaks that eat smaller seeds survive better than birds with larger beaks.

8. All of the following activities have influenced the survival of sea otters off California, except _____.
- a. hunting
- b. climate change
- c. parasites
- d. pollution

9. All of the following are human activities that have a beneficial effect on environments and native species, except _____.
- a. planting of nonnative species in coastal wetlands
- b. creation of marine protected areas
- c. implementation of breeding programs
- d. restoration of habitat

10. What might happen to the distribution of a species if local environmental conditions change substantially?
- a. All the organisms survive.
- b. Some of the members of a population might survive while others die.
- c. A species might go extinct across its whole range.
- d. b and c

Part 2

Instructions: Read each statement and write your responses in the spaces provided.

11. Select a marine organism that we have studied. Describe three adaptations of that organism that influence its ability to survive. (3 points)

Name: _____

12. Describe two ways that human activities can change the rate at which environmental changes occur in a coastal wetland ecosystem. (2 points)

13. Discuss what happens to a group of organisms when an environment changes. How do some adapt? What happens to those that do not? How does the population change over time? (5 points)

Name: _____

Instructions: Use the information provided in **Case Study: Great Barrier Reef, Australia** (Student Edition, pages 8–11) to complete the following chart. (1 point per cell, 15 points total)

1. In the left-hand column, list five changes to the environment. Then complete the other two columns.

Changes to the Environment	Cause: Natural Factors or Human Activity	Effects on Species

Name: _____

Instructions: Use the information provided in **Case Study: Great Barrier Reef, Australia** to answer the following questions in the spaces provided. (10 points each)

2. Identify and describe the effects of natural and human factors that have affected the survival of the population of coral in the Great Barrier Reef.

3. What would be the long-term effects if a large population of crown-of-thorns sea stars continues to eat the coral? What adaptations might allow coral to survive and avoid local extinction?

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