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Warm-Up | Factors Affecting Biological Diversity

Lesson Objectives

By the end of this lesson, you should be able to:

- Explain how new or varied species _____ via natural selection.
- Examine how _____, _____, and _____ selection affect biological diversity.

Science Practice: Judge _____ made by scientific explanations, data, or arguments.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

adaptation	an _____ or learned _____ that increases an organism's chance of survival in its environment
biodiversity	the total _____ of organisms that live in the _____
directional selection	a process by which one of the extreme _____ of a trait is favored

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Words to Know

disruptive selection	a process by which individuals with either [ ] of a trait are favored
natural selection	a process by which organisms better [ ] to their environment tend to survive, reproduce, increase in number, and [ ] traits to succeeding generations
speciation	the evolutionary process through which new [ ] emerge
stabilizing selection	a process by which [ ] individuals in a population are favored

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Slide 1

Lesson Question

Slide 2

Defining Natural Selection

Darwin's theory of evolution is driven by _____,

a process by which organisms better adapted to their environment tend to:

- survive.
- reproduce.
- _____ in number.
- pass their _____ to succeeding _____.

Natural Selection

Natural selection requires:

- variation
- _____, the environment cannot support all of the members of the population over time.
- _____, an inherited or learned trait that increases an organism's chance of survival in its environment.

Natural selection leads to _____, a process of _____ in a population through genetic variation over time.

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Slide 4

Speciation

_____, the evolutionary process through which a new _____, a group of organisms that breed and produce offspring that can breed, emerges.

- Two phases:
  - _____ isolation: species separated from each other geographically cannot reproduce.
  - _____ isolation: individuals cannot find a mate, so gene flow stops.
- Results of speciation:
  - Change of _____ species
  - Splitting of existing species into _____ or more different species

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Slide 4

Examples of Speciation

- [ ] lemurs:
  - [ ] living species
  - 10 [ ] species
  - Believed to have originated from one species [ ] years ago
- [ ] silverswords:
  - [ ] species
  - Believed to have originated on Hawaiian islands [ ] years ago from one species

Slide 7

Distribution of Traits

- Natural selection shows a [ ] distribution of traits.
- A change in an [ ] changes the distribution of traits.
- Change in distribution of traits causes a varying effect on [ ], the total variety of organisms that live in the biosphere.

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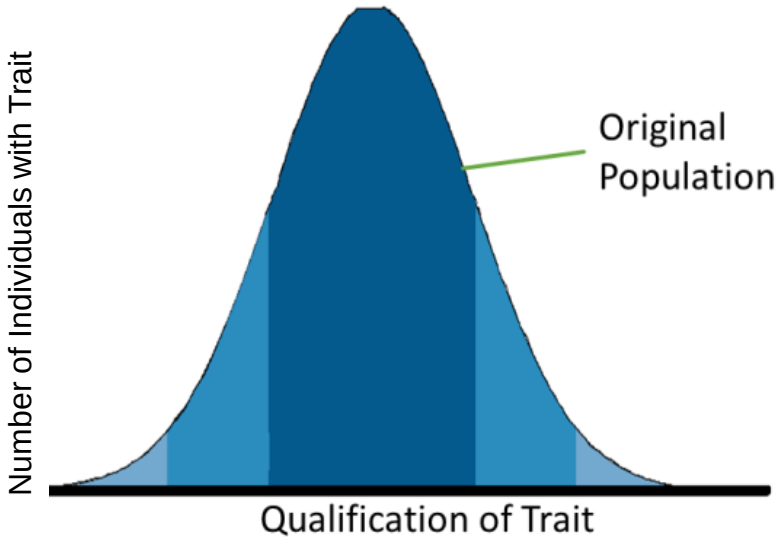
Slide 7

Distribution of Traits

Box the area of the distribution curve where the most common distribution of traits occurs.



E. O. Wilson and the Encyclopedia of Life

REAL-WORLD CONNECTION

- This project started in 2007 with the goal of providing _____ on _____ the species of plants, animals, insects, and microbes on Earth.

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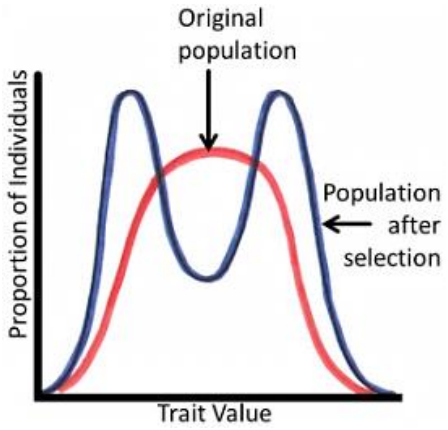
Slide 9

Modes of Natural Selection

- _____ selection is a process by which _____ of the extreme variations of a trait is favored.
- _____ selection is a process by which individuals with _____ extreme of a trait are favored.
- _____ selection is a process by which an _____ individual in a population is favored.

Identify the type of selection shown in each graph.



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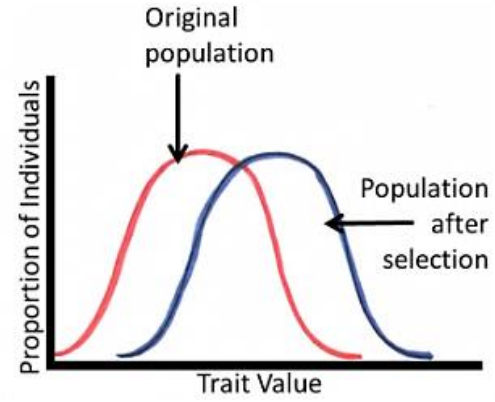

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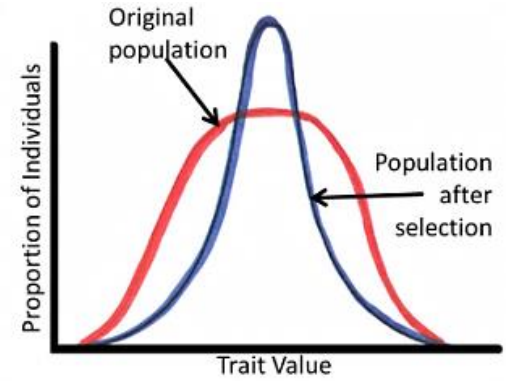

_____

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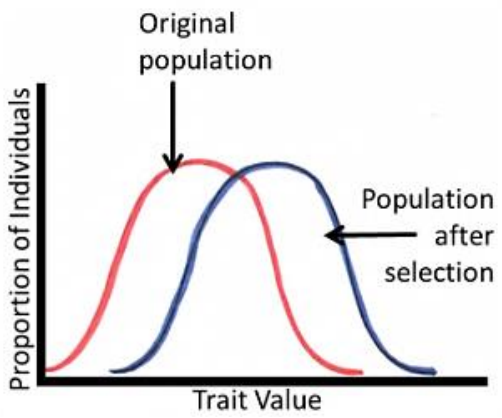
Slide 9

Directional Selection

- One [ ] trait favored
- Effects:
  - Evolution of [ ]
  - No [ ] in biodiversity
- Examples:
  - Giraffe [ ]
  - Pink [ ] size

Draw an arrow showing the direction of selection.



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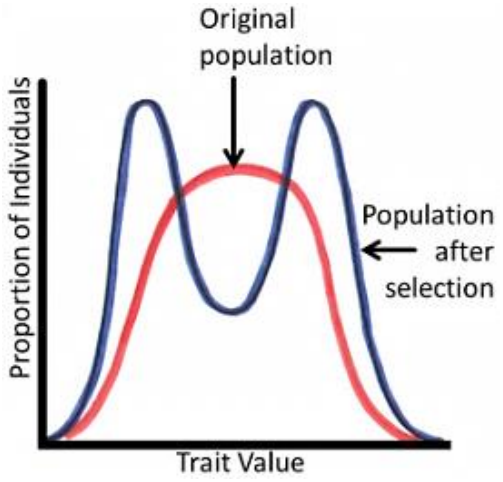
Slide 9

Disruptive Selection

- Selection favoring two extremes rather than the _____
- Effects:
  - Evolution of _____ species (speciation)
  - _____ variation
  - Increase in _____
- Example:
  - _____ color

Draw circles around the traits that have increased after disruptive selection.



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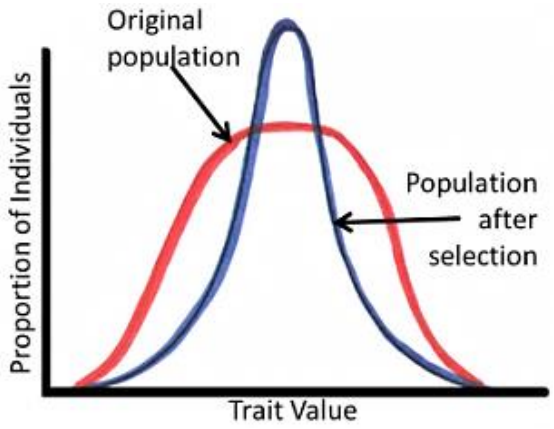
Slide 9

Stabilizing Selection

- Two extremes of a trait selected [ ]
- Effects:
  - No [ ] change or evolution
  - Diversity [ ]
  - Population looks more [ ] over time
- Example
  - Weaver [ ]

Circle the area of the graph where traits cluster after stabilizing selection.



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Summary | Factors Affecting Biological Diversity

Lesson Question

What are the types of selection and how do they alter biodiversity?

Answer

Slide 2

Review: Natural Selection

Natural selection:

- is a process by which organisms _____ adapted to their environment tend to _____, reproduce, _____ in number, and pass their traits to succeeding generations.
- Requires _____, overpopulation, and _____.
- can result in _____, the change of an existing _____ or the splitting of existing species into two or more different species.

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Summary | Factors Affecting Biological Diversity

Slide 2

Review: Modes of Natural Selection

- Directional selection—evolution and adaptive _____
- Disruptive selection—evolution, _____ and genetic variation
- Stabilizing selection—no adaptive change or evolution, _____ variation

_____ varies as a result of each mode of selection.

Use this space to write any questions or thoughts about this lesson.

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