

Patterns Of Natural Selection Worksheet

Name _____ Per _____

Patterns of Natural Selection Worksheet

Define the following terms:

1. stabilizing selection _____
2. directional selection _____
3. disruptive selection _____

Write the correct type of selection below (Disruptive, Directional, or Stabilizing). Then draw what you would expect on the graph.



Starlings produce an average of five eggs in each clutch. If there are more than five, the parents cannot adequately feed the young. If there are fewer than five, predators may destroy the entire clutch. As a result, five eggs becomes the most common clutch size.



Seed cracker birds have either large beaks or small beaks. They do not have medium sized beaks because medium sized beaks do not allow for adequate cracking of seeds.



A scientist measures the circumference of acorns in a population of oak trees and discovers that the most common circumference is 2 cm. There are very few acorns with circumferences of 3 cm or circumferences of 1 cm. Only the 2 cm circumference acorns survive.



A population of Madagascar hissing cockroaches lives in a woodpile. The cockroaches are eaten by lizards. Because the lizards have small heads, the lizards are unable to eat the very largest adult cockroaches, and instead prey upon small and medium sized adults. Over time, only the large headed lizards survive.



Female birds that lay close to the optimum number of eggs have the most surviving offspring. Those that lay fewer or more eggs have lower relative fitness.



A population of birds with various size beaks eats seeds. Small seeds can be eaten by birds with small beaks. Larger, thicker seeds can only be eaten by birds with larger, thicker beaks. During a drought, only large thick seeds exist so only the large, thick-beaked birds survive.



Black rabbits (BB) and white rabbits (bb) are both able to survive because they can camouflage into the white and black rocks in their environment. However, the intermediate gray rabbits (Bb) do not survive. This results in only white and black rabbits.

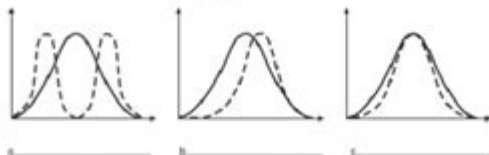


Small lizards have difficulty defending territories so they end up dying out. Large lizards are more likely to be preyed upon by owls. Over time, only medium sized lizards end up surviving.



Women often have complications during labor while giving birth to very large babies, whereas very small babies tend to be underdeveloped. As a result, medium sized babies are the ones that end up surviving to adulthood.

Label the three types of selection illustrated by the graphs below.



Patterns of Natural Selection Worksheet: A Comprehensive Guide

Introduction:

Are you struggling to understand the complex mechanisms of natural selection? Do you need a robust resource to solidify your grasp of this fundamental concept in biology? This post provides you with more than just a simple "patterns of natural selection worksheet"—it offers a complete guide, breaking down the key patterns and providing you with the tools and knowledge to not only complete any worksheet but also deeply understand the driving force behind evolution. We'll explore

various examples, dissect the underlying principles, and equip you to confidently tackle any natural selection challenge. Get ready to master this crucial aspect of biology!

Understanding Natural Selection: The Basics

Before diving into specific patterns and worksheets, let's establish a firm foundation. Natural selection, the cornerstone of evolutionary theory, describes the process where organisms better adapted to their environment tend to survive and produce more offspring. This process isn't random; it's driven by specific, observable patterns. We'll explore these patterns in detail, providing clear examples to enhance your understanding.

Key Components of Natural Selection

Four key components underpin natural selection:

Variation: Individuals within a population exhibit variations in traits. These variations can be physical, behavioral, or physiological.

Inheritance: Many of these traits are heritable, meaning they can be passed from parents to offspring through genes.

Overproduction: Organisms produce more offspring than can possibly survive in a given environment. This creates competition for limited resources.

Differential Survival and Reproduction: Individuals with traits that provide an advantage in their environment are more likely to survive and reproduce, passing those advantageous traits to their offspring.

Common Patterns of Natural Selection Worksheet Questions

Now let's address the types of questions you're likely to encounter on a "patterns of natural selection worksheet." Understanding these patterns will allow you to successfully analyze and interpret scenarios relating to natural selection.

1. Directional Selection

This pattern favors individuals at one extreme of a trait distribution. For example, if a population of moths predominantly lives on dark tree bark, those with darker coloration will be better

camouflaged from predators, leading to an increase in the frequency of dark-colored moths over time. Worksheet questions might involve analyzing data showing a shift in the average trait value towards one extreme.

2. Stabilizing Selection

In contrast to directional selection, stabilizing selection favors individuals with intermediate traits. Think of human birth weight: extremely low or high birth weights are associated with higher mortality, while intermediate weights have higher survival rates. Worksheet questions here could involve interpreting data showing a reduction in variation around the average trait value.

3. Disruptive Selection

Disruptive selection, also known as diversifying selection, favors individuals at both extremes of a trait distribution, while disadvantaging those with intermediate traits. For example, a bird population with two different beak sizes might thrive better if the available food sources consist of both large and small seeds, while birds with medium-sized beaks struggle. Worksheet questions often involve analyzing a bimodal distribution of traits within a population.

4. Sexual Selection

This special type of natural selection focuses on traits that increase an individual's mating success, even if those traits might reduce survival. Bright plumage in male birds, for example, attracts females but also makes them more visible to predators. Worksheet questions might explore the trade-offs between survival and reproductive success.

Analyzing Data on a Patterns of Natural Selection Worksheet

Many worksheets require you to interpret graphical data, such as histograms or line graphs, showing the distribution of traits over time. Here's how to approach these effectively:

Identify the trait: What characteristic is being measured?

Observe the distribution: Is it normal (bell-shaped), skewed, or bimodal?

Analyze changes over time: How has the distribution changed across generations? Is there a shift in the mean, a change in variance, or a splitting of the population?

Relate changes to environmental factors: What environmental pressures might be driving the observed changes?

Creating Your Own Patterns of Natural Selection Worksheet

To further solidify your understanding, consider creating your own worksheet. Think of different scenarios and devise questions that test your ability to identify the patterns of natural selection at play. This active learning approach will greatly enhance your understanding.

Conclusion

Mastering the patterns of natural selection is essential for a strong foundation in evolutionary biology. By understanding directional, stabilizing, disruptive, and sexual selection, and by practicing with data interpretation, you'll be well-equipped to tackle any patterns of natural selection worksheet. Remember to always consider the interplay between environmental pressures and the heritable traits of the organisms involved.

FAQs

1. What is the difference between natural selection and evolution? Natural selection is a mechanism of evolution. Evolution is the overall change in the heritable characteristics of biological populations over successive generations. Natural selection is one of the processes that drives evolution.
2. Can natural selection create new traits? No, natural selection acts on existing variations within a population. It cannot directly create new traits, but it can increase the frequency of advantageous traits already present. New traits arise through mutations.
3. Is natural selection always beneficial for a species? Not necessarily. Natural selection acts to increase the fitness of individuals within a given environment. What is beneficial in one environment might be detrimental in another.
4. How can I find more resources to practice with? Search online for "natural selection practice problems" or "evolutionary biology worksheets." Many educational websites and textbooks offer additional exercises.
5. What are some real-world examples of natural selection besides the ones mentioned? The development of antibiotic resistance in bacteria, the evolution of pesticide resistance in insects, and

the changes in beak shape of Darwin's finches are all excellent real-world examples.

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Opmålingsskibet Beagles togt til Sydamerika og videre jorden rundt

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Jill Sackler, in memory of her husband, Arthur M. Sackler.

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Christopher Williams, 2018-10-30 Biological evolution is a fact—but the many conflicting theories of evolution remain controversial even today. When *Adaptation and Natural Selection* was first published in 1966, it struck a powerful blow against those who argued for the concept of group selection—the idea that evolution acts to select entire species rather than individuals. Williams's famous work in favor of simple Darwinism over group selection has become a classic of science literature, valued for its thorough and convincing argument and its relevance to many fields outside of biology. Now with a new foreword by Richard Dawkins, *Adaptation and Natural Selection* is an essential text for understanding the nature of scientific debate.

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principles of planning and assessment. Part 2 specifically examines the five arts areas: dance, drama, media arts, music and visual arts. The final part of the text, Units of Inquiry, contains valuable sample learning activities and resources that demonstrate how to plan an effective lesson within a unit of inquiry.

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showing how to perform relevant simulations and calculations in R, a free statistical software environment.

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coauthor, e-Learning and the Science of Instruction; and author, Multimedia Learning

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engineering; scientific and engineering practices; and disciplinary core ideas in the physical sciences, life sciences, and earth and space sciences and for engineering, technology, and the applications of science. The overarching goal is for all high school graduates to have sufficient knowledge of science and engineering to engage in public discussions on science-related issues, be careful consumers of scientific and technical information, and enter the careers of their choice. A Framework for K-12 Science Education is the first step in a process that can inform state-level decisions and achieve a research-grounded basis for improving science instruction and learning across the country. The book will guide standards developers, teachers, curriculum designers, assessment developers, state and district science administrators, and educators who teach science in informal environments.

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