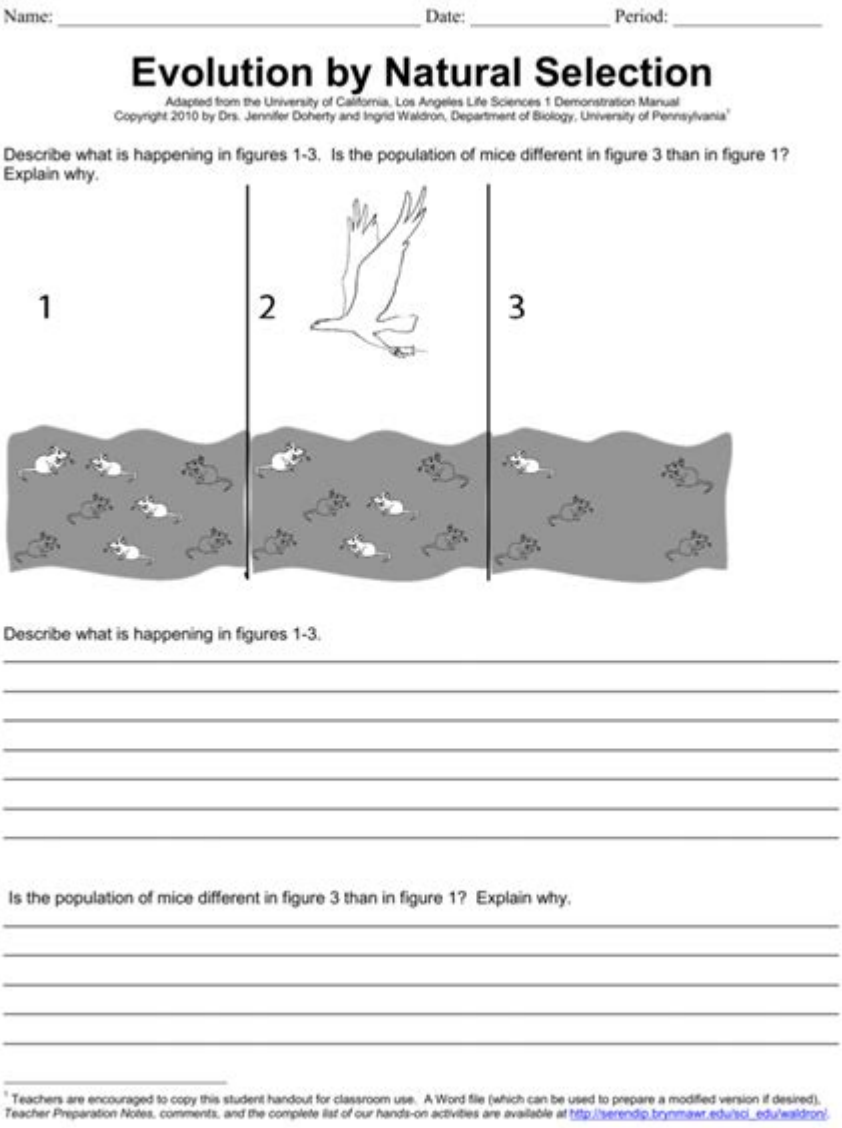
Evolution By Natural Selection Worksheet



Name: _____ Date: _____ Period: _____

Evolution by Natural Selection

Adapted from the University of California, Los Angeles Life Sciences 1 Demonstration Manual
Copyright 2010 by Drs. Jennifer Doherty and Ingrid Waldron, Department of Biology, University of Pennsylvania[1]

Describe what is happening in figures 1-3. Is the population of mice different in figure 3 than in figure 1? Explain why.

1 2 3

Describe what is happening in figures 1-3.

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Is the population of mice different in figure 3 than in figure 1? Explain why.

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[1] Teachers are encouraged to copy this student handout for classroom use. A Word file (which can be used to prepare a modified version if desired), *Teacher Preparation Notes, comments, and the complete list of our hands-on activities are available at* http://serendip.brynmawr.edu/sci_edu/waldron/.

Evolution by Natural Selection Worksheet: A Comprehensive Guide

Are you struggling to grasp the intricacies of evolution by natural selection? Feeling overwhelmed by complex terminology and abstract concepts? This comprehensive guide provides you with not just an understanding of natural selection, but also a practical, downloadable evolution by natural selection worksheet to solidify your learning. We'll break down the key principles, provide examples, and offer a structured approach to mastering this fundamental biological concept. This post will equip you with the tools and resources you need to confidently tackle any evolution by natural selection question, whether it's for homework, a test, or simply to expand your knowledge.

Understanding the Fundamentals of Natural Selection

Before diving into the worksheet, let's revisit the core principles of evolution by natural selection. This process, the cornerstone of modern biology, explains how life on Earth has diversified over millions of years. It hinges on a few key components:

1. Variation within Populations:

No two individuals are exactly alike. Within any population, there's a range of traits, from physical characteristics (size, color) to behavioral traits (mating rituals, foraging strategies). This variation is crucial, as it provides the raw material for natural selection to act upon.

2. Inheritance:

These traits are heritable, meaning they are passed down from parents to offspring through genes. While the environment can influence traits, the underlying genetic basis dictates their likelihood of being inherited.

3. Overproduction:

Organisms produce more offspring than can possibly survive. This creates competition for limited resources like food, water, shelter, and mates.

4. Differential Survival and Reproduction:

Individuals with traits better suited to their environment are more likely to survive and reproduce, passing on those advantageous traits to their offspring. This is the core of natural selection – the "survival of the fittest." "Fitness" in this context refers to reproductive success, not necessarily physical strength.

Using Your Evolution by Natural Selection Worksheet: A Step-by-Step Approach

The provided worksheet (downloadable link below – Note: Due to the limitations of this text-based format, a downloadable worksheet cannot be directly included. However, the content below will guide you in creating your own) is designed to help you apply these principles to specific scenarios. Here's how to use it effectively:

Step 1: Defining the Scenario

Each section of the worksheet will present a hypothetical scenario involving a population of organisms and an environmental change.

Step 2: Identifying Variation

Carefully examine the initial population described. Note the range of traits present within the population. For example, if the population is beetles, you might consider variations in color (green, brown), size, or leg length.

Step 3: The Environmental Change

The scenario will introduce an environmental pressure, such as a change in climate, the introduction of a predator, or a shift in food availability.

Step 4: Analyzing Differential Survival and Reproduction

Based on the environmental change, predict which traits will confer an advantage. For example, if a new predator hunts primarily by sight, brown beetles might be better camouflaged and thus have a higher survival rate than green beetles.

Step 5: Predicting Changes in the Population

Based on your analysis, predict how the frequency of different traits will change in the next generation. Will the proportion of brown beetles increase? Will the green beetles become less common?

Step 6: Understanding Adaptation

Consider how the population might adapt over time. Natural selection favors advantageous traits, leading to gradual changes in the overall genetic makeup of a population.

Examples to Illustrate the Concepts

Let’s consider an example: A population of peppered moths exists in a forest with light-colored tree trunks. Most moths are light-colored, providing camouflage. However, a few dark-colored moths also exist. Industrial pollution darkens the tree trunks. Which moths will likely survive and reproduce more? The dark moths now have a survival advantage, and their numbers will likely increase over time. This is a classic example of natural selection in action.

Conclusion

Understanding evolution by natural selection is crucial for comprehending the diversity of life on Earth. By using a structured approach, such as the one outlined above and complemented by a well-designed evolution by natural selection worksheet, you can effectively learn and apply these core biological principles. Remember, natural selection isn't about striving for perfection; it's about adapting to the current environment. The more you practice, the more comfortable you'll become with analyzing these scenarios and predicting evolutionary outcomes. Download your worksheet (link provided – again, a placeholder in this format) and start exploring the fascinating world of natural selection!

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 a population over time, while natural selection is the process that drives that change.

2. Is natural selection random? No, natural selection is not random. While the initial variation within a population might arise from random mutations, the selection process itself is non-random; it favors traits that improve survival and reproduction in a specific environment.

3. Can natural selection create new species? Over long periods, natural selection acting on populations can lead to the development of new species through the accumulation of genetic differences that eventually prevent interbreeding. This is called speciation.

4. How does natural selection relate to antibiotic resistance in bacteria? Antibiotic resistance is a perfect example of natural selection. Bacteria with genes that confer resistance to antibiotics are more likely to survive and reproduce when exposed to antibiotics, leading to the spread of resistance within bacterial populations.

5. Can natural selection be reversed? If environmental conditions change significantly, natural selection can favor different traits, potentially leading to a reversal of previous trends. However, this is not necessarily a simple "reversal" but rather a new selection pressure driving evolutionary changes in a different direction.

evolution by natural selection worksheet: *The Voyage of the Beagle* Charles Darwin, 2020-05-01 First published in 1839, “The Voyage of the Beagle” is the book written by Charles Darwin that chronicles his experience of the famous survey expedition of the ship HMS Beagle. Part travel memoir, part scientific field journal, it covers such topics as biology, anthropology, and geology, demonstrating Darwin's changing views and ideas while he was developing his theory of evolution. A book highly recommended for those with an interest in evolution and is not to be missed by collectors of important historical literature. Contents include: “St. Jago—Cape De Verd Islands”, “Rio De Janeiro”, “Maldonado”, “Rio Negro To Bahia Blanca”, “Bahia Blanca”, “Bahia Blanca To Buenos Ayres”, “Banda Oriental And Patagonia”, etc. Charles Robert Darwin (1809–1882) was an English geologist, naturalist, and biologist most famous for his contributions to the science of evolution and his book “On the Origin of Species” (1859). This classic work is being republished now in a new edition complete with a specially-commissioned new biography of the author.

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in this new, accessible book to help you teach your middle school students to think and argue like scientists!

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Wallace was inspired by the travelling naturalists of the day and decided to begin his exploration career collecting specimens in the Amazon rainforest. He explored the Rio Negra for four years, making notes on the peoples and languages he encountered as well as the geography, flora, and fauna. While travelling, Wallace refined his thoughts about evolution and in 1858 he outlined his theory of natural selection in an article he sent to Charles Darwin. Wallace made a huge contribution to the natural sciences and he will continue to be remembered as one of the key figures in the development of evolutionary theory.

evolution by natural selection worksheet: Handbook of Biology Chandan Senguta, This book has been published with all reasonable efforts taken to make the material error-free after the consent of the author. No part of this book shall be used, reproduced in any manner whatsoever without written permission from the author, except in the case of brief quotations embodied in critical articles and reviews. The Author of this book is solely responsible and liable for its content including but not limited to the views, representations, descriptions, statements, information, opinions and references. The Content of this book shall not constitute or be construed or deemed to reflect the opinion or expression of the Publisher or Editor. Neither the Publisher nor Editor endorse or approve the Content of this book or guarantee the reliability, accuracy or completeness of the Content published herein and do not make any representations or warranties of any kind, express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose. The Publisher and Editor shall not be liable whatsoever for any errors, omissions, whether such errors or omissions result from negligence, accident, or any other cause or claims for loss or damages of any kind, including without limitation, indirect or consequential loss or damage arising out of use, inability to use, or about the reliability, accuracy or sufficiency of the information contained in this book.

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but also helps them know how to defend their faith in the process .

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how these constantly mutating diseases are proof for devolution rather than evolution and how all of these germs fit into a biblical world view. Dr. Gillen shows how germs are symptomatic of the literal Fall and Curse of creation as a result of man's sin and the hope we have in the coming of Jesus Christ. Semester 2: Life Science Study clear biological answers for how science and Scripture fit together to honor the Creator. Have you ever wondered about such captivating topics as genetics, the roll of natural selection, embryonic development, or DNA and the magnificent origins of life? Within Building Blocks in Life Science you will discover exceptional insights and clarity to patterns of order in living things, including the promise of healing and new birth in Christ. Study numerous ways to refute the evolutionary worldview that life simply evolved by chance over millions of years. The evolutionary worldview can be found filtered through every topic at every age-level in our society. It has become the overwhelmingly accepted paradigm for the origins of life as taught in all secular institutions. This dynamic education resource helps young people not only learn science from a biblical perspective, but also helps them know how to defend their faith in the process.

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schools or elsewhere. ‘Success’ here is measured as cognitive gains, as acceptance of evolution or an increased desire to continue to learn about it. Aside from introductory and concluding chapters by the editors, each chapter consists of a research-based intervention intended to enable evolution to be taught successfully; all these interventions have been researched and evaluated by the chapters’ authors and the findings are presented along with discussions of the implications. The result is an important compendium of studies from around the word conducted both inside and outside of school. The volume is unique and provides an essential reference point and platform for future work for the foreseeable future.

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evolution by natural selection worksheet: Life Science (Teacher Guide) Dr. Carl Werner, 2018-05-17 Chapter Discussion Question: Teachers are encouraged to participate with the student as they complete the discussion questions. The purpose of the Chapter Purpose section is to introduce the chapter to the student. The Discussion Questions are meant to be thought-provoking. The student may not know the answers but should answer with their, thoughts, ideas, and knowledge of the subject using sound reasoning and logic. They should study the answers and

compare them with their own thoughts. We recommend the teacher discuss the questions, the student's answers, and the correct answers with the student. This section should not be used for grading purposes. DVD: Each DVD is watched in its entirety to familiarize the student with each book in the course. They will watch it again as a summary as they complete each book. Students may also use the DVD for review, as needed, as they complete each chapter of the course. Chapter Worksheets: The worksheets are foundational to helping the student learn the material and come to a deeper understanding of the concepts presented. Often, the student will compare what we should find in the fossil record and in living creatures if evolution were true with what we actually find. This comparison clearly shows evolution is an empty theory simply based on the evidence. God's Word can be trusted and displayed both in the fossil record and in living creatures. Tests and Exams: There is a test for each chapter, sectional exams, and a comprehensive final exam for each book.

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