

Lab: Peppered Moth Simulation

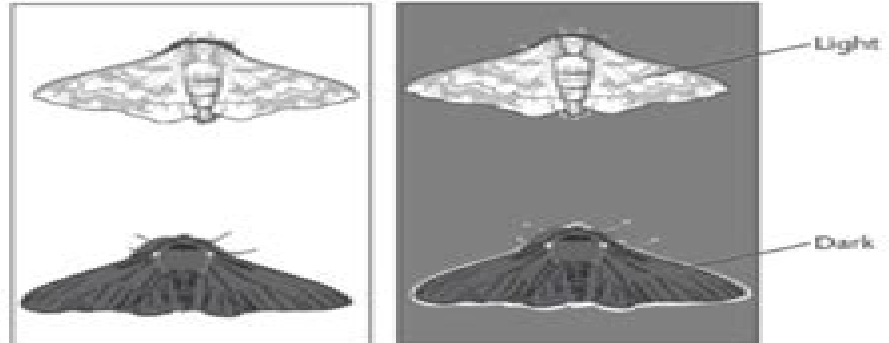
BIOLOGY: CHAPTER 10-PRINCIPLES OF EVOLUTION

Objectives:

- Describe the importance of coloration in avoiding predation
- Relate environmental change to changes in organisms
- Explain how natural selection causes populations to change

Materials

- 8½" x 11" sheet dark background
- 8½" x 11" sheet light background
- Forceps
- Clock with second hand
- 30 light circles (made with hole punch)
- 30 dark circles (made with hole punch)



Purpose: In this lab, you will simulate how predators locate prey in different environments. You will analyze how color affects and organism's ability to survive in certain environments.

Background: The usual form of the peppered moth *Biston betularia* in northern Europe has a light "peppered" pattern of coloration. The moth rests on tree branches and its color pattern **camouflages** it against predatory attack. The camouflage only works against the right background: birds are more likely to eat poorly camouflaged moths, which therefore have a lower **fitness**.

The light coloration of tree branches is mainly caused by lichens that grow there. Smoke pollution in the industrial revolution in the UK killed these lichens near to industrial areas, leaving tree branches black. At about this time, around 1830, a '**melanic**' form of the peppered moth becomes increasingly common in contemporary moth collections. The melanic form is camouflaged on dark tree branches. Through the 19th century, the melanic form increased in frequency until, near industrial regions, it was the normal type of the moth. The increase was almost certainly driven by natural selection.

The moths satisfy all four conditions for natural selection:

- they reproduce;
- their color pattern is inherited;
- there is variation in their color patterns;
- the different forms have different fitnesses.

Before you begin the lab, complete the hypothesis below:

Hypothesis: If the color of the prey matches the background color then

Virtual Lab Peppered Moth

N Colangelo

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

Virtual Lab Peppered Moth:

Genetics A. Jamie Cuticchia, 2009 As science has discovered more and more about genetics the legal implications have also grown Genetics A Handbook for Lawyers the third book in the ABA Fundamentals series explores these implications with easy to understand discussions of the science and its application in real cases This book is a must for any lawyer whose practice touches upon the field of genetics

Biology ,1999 **The Hundred Years' Trial** Alexander Gouzoules, Harold Gouzoules, 2025-07-01 A new account of the enduring cultural legal and scientific legacy of the 1925 Scopes Trial In The Hundred Years Trial Alexander and Harold Gouzoules explore the century long impacts of the historic 1925 Scopes Monkey Trial starting with the development of evolutionary theory and charting the resulting cultural and legal conflicts over evolution in the United States Through a blend of legal history scientific exploration and cultural analysis the authors reexamine how this landmark trial remains a pivotal moment in shaping modern debates on science religion and education The Scopes Trial became a symbol of a larger culture clash where questions of academic freedom the role of religion in public life and the boundaries of state intervention are fiercely debated This book uncovers the complex layers of this conflict offering readers a broader perspective that extends beyond the courtroom drama In tracing the legacies of Clarence Darrow and William Jennings Bryan the authors analyze how the trial s outcomes reverberated through later Supreme Court cases and shaped public policies and educational standards well into the twenty first century The authors further illustrate how the dialogue surrounding evolution has contributed to contentious debates not merely over the acceptance of evolutionary theory itself but regarding emergent claims and interpretations that continue to generate public and legal scrutiny One hundred years later the tensions between science and religious belief that were so brightly illuminated by Scopes are not only still with us but also increasingly relevant to the perpetual cultural issues in the American political consciousness abortion climate change and vaccines The Hundred Years Trial is vital for understanding not only how we arrived at our current political moment but also where we go next in communicating science to a skeptical public

Hands-On General Science Activities With Real-Life Applications Pam Walker, Elaine Wood, 2008-04-21 In this second edition of Hands On General Science Activities with Real Life Applications Pam Walker and Elaine Wood have completely revised and updated their must have resource for science teachers of grades 5 12 The book offers a dynamic collection of classroom ready lessons projects and lab activities that encourage students to integrate basic science concepts and skills into everyday life

Inquiry Skills Development Holt Rinehart & Winston, 1998-01-27 **Report of the Annual Meeting** British Association for the Advancement of Science. Meeting, 1925 The Science Teacher ,1993 SCC Library has 1964 cur Current Bibliography of Epidemiology ,1970 Monthly with annual cumulations Comprehensive current index to periodical medical literature intended for use of practitioners investigators and other workers in community medicine who are concerned with the etiology prevention and control of disease Citations are derived from MEDLARS tapes for Index medicus of corresponding date

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Table of Contents Virtual Lab Peppered Moth

1. Understanding the eBook Virtual Lab Peppered Moth
 - The Rise of Digital Reading Virtual Lab Peppered Moth
 - Advantages of eBooks Over Traditional Books
2. Identifying Virtual Lab Peppered Moth
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Virtual Lab Peppered Moth
 - User-Friendly Interface
4. Exploring eBook Recommendations from Virtual Lab Peppered Moth
 - Personalized Recommendations
 - Virtual Lab Peppered Moth User Reviews and Ratings
 - Virtual Lab Peppered Moth and Bestseller Lists

5. Accessing Virtual Lab Peppered Moth Free and Paid eBooks
 - Virtual Lab Peppered Moth Public Domain eBooks
 - Virtual Lab Peppered Moth eBook Subscription Services
 - Virtual Lab Peppered Moth Budget-Friendly Options
6. Navigating Virtual Lab Peppered Moth eBook Formats
 - ePub, PDF, MOBI, and More
 - Virtual Lab Peppered Moth Compatibility with Devices
 - Virtual Lab Peppered Moth Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Virtual Lab Peppered Moth
 - Highlighting and Note-Taking Virtual Lab Peppered Moth
 - Interactive Elements Virtual Lab Peppered Moth
8. Staying Engaged with Virtual Lab Peppered Moth
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Virtual Lab Peppered Moth
9. Balancing eBooks and Physical Books Virtual Lab Peppered Moth
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Virtual Lab Peppered Moth
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Virtual Lab Peppered Moth
 - Setting Reading Goals Virtual Lab Peppered Moth
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Virtual Lab Peppered Moth
 - Fact-Checking eBook Content of Virtual Lab Peppered Moth
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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