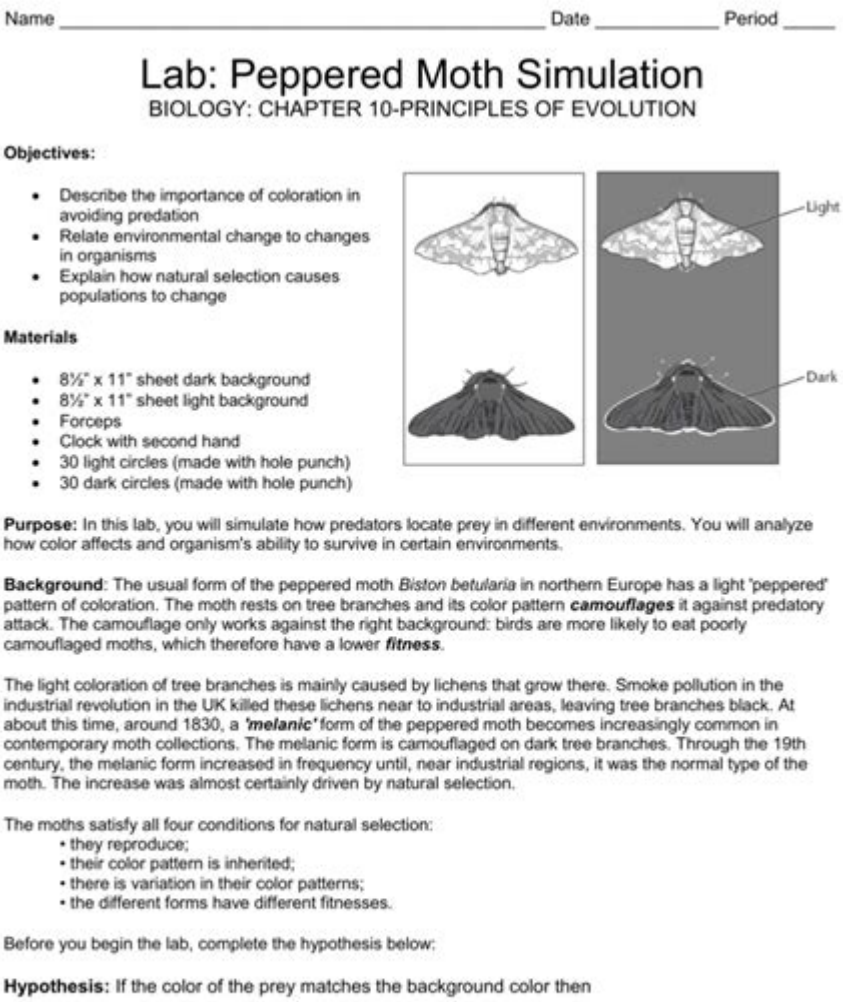
Peppered Moth Lab Answer Key



Name _____ Date _____ Period _____

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)

Light

Dark

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

Peppered moth lab answer key is an essential resource for students and educators alike, particularly in the fields of biology and environmental science. This lab exercise typically focuses on the study of natural selection using the peppered moth (Biston betularia) as a model organism. Through this experiment, participants can observe how variations in coloration affect the survival of these moths in different environments, particularly during the Industrial Revolution in England. This article will delve into the significance of the peppered moth, the methodology of the lab exercise, the key findings, and the implications for understanding evolutionary principles.

The Significance of the Peppered Moth

The peppered moth is a striking example of natural selection and evolutionary change.

Before the Industrial Revolution, the majority of peppered moths were light-colored, which allowed them to blend in with the lichen-covered trees in their natural habitats. However, as industrial pollution killed off the lichens and darkened the trees with soot, a previously rare dark-colored variant of the moth became more prevalent. This phenomenon provides a clear illustration of how environmental pressures can influence which traits are favored in a population.