

# 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

# Peppered Moth Simulation Lab Answers

**Anne DONNELLY**



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The Science Teacher ,1993 SCC Library has 1964 cur **Inquiry Skills Development** Holt Rinehart & Winston,1998-01-27 *IBM Software Directory* International Business Machines Corporation,1984 *The Software Encyclopedia* ,1988 **Illinois Chemistry Teacher** ,1992 Biology ,1996 **Reports of the National Center for Science Education** ,2005 *Bibliography of Agriculture* ,1990 Would-Be Worlds John Casti,1997 Simulation of the complex forces shaping geopolitics And we take a drive through TRANSIMS a model of the city of Albuquerque New Mexico to discover the root causes of events like traffic jams and accidents Along the way Casti probes the answers to a host of profound questions these would be worlds raise about the new science of simulation *Genetics Abstracts* ,1981 **Entomology Abstracts** ,1981 R.R. Bowker's Software for Schools ,1987 **Bibliography of Agriculture** ,1990 **Bibliography of Agriculture with Subject Index** ,1990 **Agrindex** ,1993 *A Simulation Model of the Gene Frequency Cline of the Peppered Moth* Anne DONNELLY,1966 *The Peppered Moth* ,1968 *Natural Selection* John Hewitson,1978 **Observing Evolution** Bruce S. Grant,2021-08-10 The author presents a firsthand narrative about discovering the parallel evolution of melanism in American and British peppered moths *Biston betularia* *Taking the Peppered Moth with a Grain of Salt* David Wÿss Rudge,1999

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