

PEPPERED MOTH LAB INSTRUCTIONS

Overview

During the Industrial Revolution, scientists observed a rapid change in the coloration of peppered moths in Manchester, England. This change in the mid- to late 1800s was an example of “industrial melanism,” a term used to describe a population’s adaptation to pollution. Before the Industrial Revolution, trees in the Manchester area had lichens that made their trunks a light grayish-green color, and most peppered moths were light-colored with tiny dark spots. Over time, the boom in factories and eventually cars filled the air with soot that covered the tree trunks and caused them to darken. By 1900, dark peppered moths were more common than the light variety in areas around English cities.

Learning Objectives

Investigate the role of natural selection in changing populations, explain why coloration is important for organisms’ survival, and make connections between environmental change and changes in organisms.

Procedure

1. Review the questions on the “Peppered Moth Lab Data Sheet” on the next page. Answer the first question before beginning the lab.
2. Go to the following website: [Peppered Moth Game](#).
3. When asked to select a forest to play, choose the “Light Forest” first.
4. You will play the predator, the bird, who is searching for prey, the moth. You will have one minute to retrieve as much prey as you can.
5. Add your results to the data table on the next page.
6. Click “New Game” at the top and select the “Dark Forest.” Repeat Steps 4 and 5.
7. Submit your completed Google/Word document and your data tables in **[insert LMS]**.

PEPPERED MOTH LAB DATA SHEET

Answer the first question before beginning the lab.

Hypothesis

1. Create a hypothesis on what you think will happen to the prey based on their environment.

Data Table

- 2.

	Percentage of Dark Moths	Percentage of Light Moths
Light Forest		
Dark Forest		

Analysis

3. Did you accept or reject your hypothesis?
4. What was an advantage and a disadvantage to survival based on the moths' colors in relation to their environment?
5. What did the experiment show about how prey are selected by predators? Did your experiment support your hypothesis?
6. Predict what would happen to the moth population if there were no predators. What color(s) would you expect them to select and why?
7. In the 1970s, the Environmental Protection Agency (EPA) was created to reduce the harmful impact that human activity has on the environment. If the EPA were to order factories to reduce the pollution they emit, what do you think would happen to the moths? Explain your answer.
8. With the data provided in the table below, create a graph with two lines using the shared **Peppered Moth Lab Grid**. Plot the data points on your graph. Be sure to label the x- and y-axes. Create a key to distinguish between the two different sets of data.

	Year								
	2	3	4	5	6	7	8	9	10
Number of Dark Moths	537	484	392	246	225	193	147	84	56
Number of Light Moths	112	198	210	281	337	412	503	550	599

Sources

Berry, H.G. (2012). *Peppered Moth Lab*. University of Notre Dame.
<https://www3.nd.edu/~hgberry/biology2012/mod1/1.1.3%20peppered%20moth%20lab.pdf>

Tevis, C. (2003). *Peppered Moths: Natural Selection*. Ask a Biologist | Arizona State University.
<https://askabiologist.asu.edu/peppered-moths-game/natural-selection.html>