Investigation: Peppered Moth Survey
CLASS SET – Please return!

Purpose
To observe the effect of environmental changes on the peppered moth, *Biston betularia*

Objective
Use research data to graph the results of an environmental adaptation in the peppered moth.

Introduction
Industrial melanism is the term used to describe the adaptation of an organism in response to industrial pollution. One example of rapid melanism occurred in the peppered moth, *Biston betularia*, in the area of Birmingham, England from 1845-1890.

Before the Industrial Revolution, the trees in the forest around Manchester were light, grayish-green due to the presence of the lichens on their trunks. Peppered moths, which lived in the area, were light with dark spots. Their coloring served as camouflage against predators.

As the Industrial Revolution progressed, the trees became covered with soot, turning the trunks dark. Over a period of 45 years, the peppered moth population "changed" to a predominantly dark species, with only a few light colored individuals remaining.

In this investigation, you will observe the effects of industrial melanism in the peppered moth over the course of several years.

Materials
Graph paper Pencils, colored (2) Textbook

Procedure
The table below represents data from a ten-year study of two varieties of the same species of peppered moth. The numbers represent moths captured in traps for ten consecutive years. The traps were located in the same area each year.

Year	Number of Light Moths Captured	Number of Dark Moths Captured
1	556	64
2	537	112
3	484	198
4	392	210
5	264	281
6	225	357
7	193	412
8	147	503
9	84	594
10	56	638

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Answer the following questions on a separate piece of paper.

1. Using the data provided, construct a graph comparing the numbers of each variety of peppered moth. Label the axes as shown in the illustration, a key, and don't forget the title!

2. Use your textbook and your graph to answer the following questions.

A. What preys on the peppered moth?
B. If the bark of trees is dark and the moths that rest there are light what will happen to the dark moth variety? Explain.
C. What is a mutation?
D. What could have caused the first moths to "change" from a light variety to a dark variety?
E. What historical event caused the tree trunks of many trees in England to turn from light to dark?
F. Which variety of moth increased over the ten-year period?
G. What is the name of this *type of natural selection*?

Analysis and Conclusions:

1. Using the data on the graph, draw a conclusion concerning the population of peppered moths in the sampled area of England.
2. Explain the reason for the increase in the number of dark-colored moths in the population.
3. What could be done to return the environment of the peppered moth to its original state? Be specific.
4. What effects would cleaning up the environment have on the moths?