

# Natural Selection

## Peppered Moth Simulation

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

**Natural selection** is the process by which certain heritable traits—those that make it more likely for an organism to survive and successfully reproduce—become more common in a population over successive generations. It is a key mechanism of evolution.

The natural genetic variation within a population of organisms means that some individuals will survive and reproduce more successfully than others in their current environment. For example, the peppered moth exists in both light and dark colors in the United Kingdom, but during the industrial revolution many of the trees on which the moths rested became blackened by soot, giving the dark-colored moths an advantage in hiding from predators.

Industrial Melanism is a term used to describe the adaptation of a population in response to pollution. One example of rapid industrial melanism occurred in populations of peppered moths in the area of Manchester, England from 1845 to 1890. Before the industrial revolution, the trunks of the trees in the forest around Manchester were light greyish-green due to the presence of lichens. Most of the peppered moths in the area were light colour with dark spots. As the industrial revolution progressed, the tree trunks became covered with soot and turned dark. Over a period of 45 years, the dark variety of the peppered moth became more common. This gave dark-colored moths a better chance of surviving to produce dark-colored offspring, and in just a few generations the majority of the moths were dark.

Factors which affect reproductive success are also important, an issue which Charles Darwin developed in his ideas on sexual selection.

The purpose of this lab is for you to simulate how predators locate prey in different environments. You will analyze how colour affects and organism's ability to survive in certain environments.

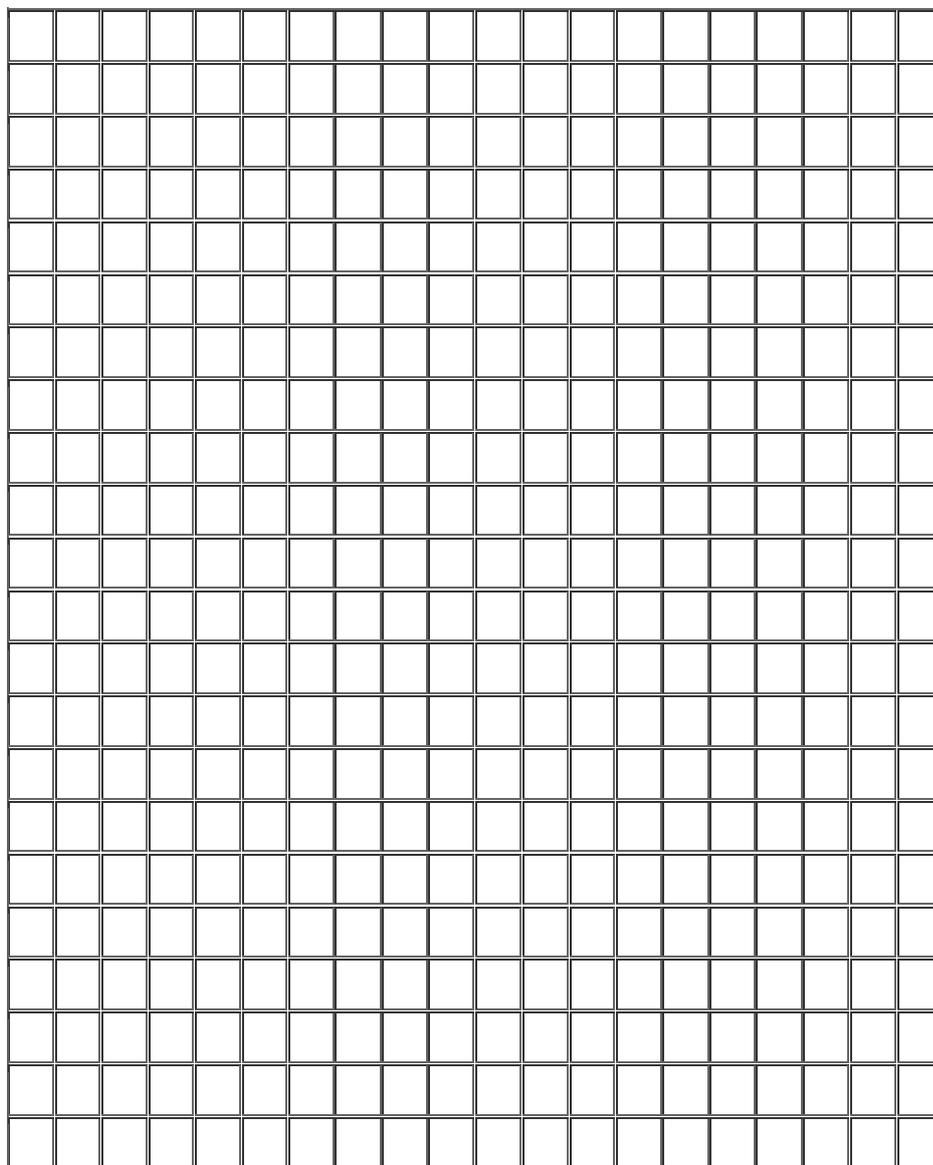
### Materials

Sheet of white paper  
Newspaper  
Forceps  
Colour Pencils  
Clock with Second Hand  
30 newspaper circles (made with hole punch)  
30 white circles (made with hole punch)



4. How does the simulation model natural selection?

5. Examine the table and construct a graph. Plot the years of the study on the X-axis, and the number of moths captured on the Y axis. You should have 2 lines on your graph - one for light moths, and one for dark moths.



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

6. Explain in your own words what the graph shows.

7. Describe a situation where this type of selection might occur.