

## Peppered Moth – An Activity in Natural Selection

Peppered moths are common insects living in England, Europe and North America. They are small moths, only 1 ½ to 2 ½ inches across. Their light wings are “peppered” with small dark spots.



Predators of the peppered moth include flycatchers, nuthatches, and the European robin. Like most moths, peppered moths avoid predators that hunt in the daylight by flying at night and resting during the day. Any animal sitting still is harder to see than a moving one.

Peppered moths have extra camouflage to help hide them. The trees they live in have light colored bark and are covered with small fungi called lichens. The pattern on peppered moths wings look very similar to lichens.



While the typical peppered moth is light, some have dark, almost black bodies. These moths are given the name *carbonaria*. In the past, these darker moths were very rare.



### Pre-Activity Questions:

1. Describe the variation in phenotype for the peppered moths.
2. What is biological fitness? What factors will affect the biological fitness of the peppered moth?

## Activity

### Scenario I – Pre-industrial Revolution

The trees that the moths settled on during the day have a very light coloration.



*Illustration of tree coloration pre-industrial revolution*

You start with a population of moths that are 50% light coloration and 50% dark coloration.

#### Predict:

1. Predict what will happen to the colors in the population over time, and why you think that this will happen.
2. Which color phenotype will be selected for by natural selection?
3. After a long period of time, what could eventually happen to the dark phenotype in the population?  
The light phenotype?

Dark phenotype:

Light phenotype:

#### Observe:

Observe the simulation and record the results below.

#### Explain:

Using what you know about Natural Selection explain why you observed the results you did. (Why did we see survival of one color over another?)

## Scenario 2 – Post-industrial Revolution

During the time known as the industrial revolution factories were being built, and they ran by burning coal. The result was a dark smoke that covered the surrounding countryside. Trees that had once been light and covered by lichens now were dark and bare.



*Illustration of tree coloration post-industrial revolution*

You start with a population of moths that are 50% light coloration and 50% dark coloration.

### Predict:

1. Predict what will happen to the colors in the population over time, and why you think that this will happen.
2. Which color phenotype will be selected for by natural selection?
3. After a long period of time, what could eventually happen to the dark phenotype in the population?  
The light phenotype:  
Dark phenotype:

Light phenotype:

### Observe:

Observe the simulation and record the results below.

### Explain:

Using what you know about Natural Selection explain why you observed the results you did. (Why did we see survival of one color over another?)

**Post Lab Question:**

Some scientist thought that the darker coloration on the moths was from coal silt depositing on the moths changing them from a light coloration to dark coloration. If this were the case would natural selection occur in this population? Explain why or why not.