Peppered Moth Simulation

LT: I can simulate changes in moth population due to pollution and predation, **to describe how species can adapt.**

Introduction:

Charles Darwin accumulated a tremendous collection of facts to support the theory of evolution by natural selection. One of his difficulties in demonstrating the theory, however, was the lack of an example of evolution over a short period of time, which could be observed as it was taking place in nature. Although Darwin was unaware of it, remarkable examples of evolution, which might have helped to persuade people of his theory, were in the countryside of his native England. One such example is the evolution of the peppered moth *Biston betularia*.

The economic changes known as the industrial revolution began in the middle of the eighteenth century. Since then, tons of soot have been deposited on the country side around industrial areas. The soot discolored and generally darkened the surfaces of trees and rocks. In 1848, a dark-colored moth was first recorded. Today, in some areas, 90% or more of the-peppered moths are dark in color. More than 70 species of moth in England have undergone a change from light to dark. Similar observations have been made in other industrial nations, including the United States.

Instructions:

Visit the link below to read more information on Kettlewell's study of moths. At the end, you will run two simulations, during this time you will play the part of a blue jay that eats moths.
Peppered Moth Simulation at **peppermoths.weebly.com**

Birdseye View

Open the simulation and play the role of the bird in both the dark and the light forest. Try to behave as a bird would behave, choosing the moths that are the most obvious. At the end of each simulation, record the percent of moths captured in a data table.

Investigation Design Diagram:

Independent Variable:				
Levels of IV (How you will change it)				
Number of Trials (Number of times you will test IV)				

Dependent Variable: _____

Constants: _____

	3	2	1
Investigation Design	There are no errors that interfere with the scientist's credibility or the reader's understanding of the experiment. All of the following lab report sections are thorough and correct: -Title -Question -Hypothesis (SMRT) -IDD	The investigation is designed with few errors that interfere with the scientist's credibility and/or the reader's understanding of the experiment. Most of the following lab report sections are thorough and correct: -Title -Question -Hypothesis (SMRT) -IDD	The investigation is designed with many errors that interfere with the scientist's credibility and/or the reader's understanding of the experiment. Few of the following lab report sections are thorough and correct: -Title -Question -Hypothesis (SMRT) -IDD
Data Table(s)	Table(s) show individual and larger sample data with a title, units and numbers (including averages) rounded to the nearest tenth. All data is calculated and recorded thoroughly and accurately. There are no major errors.	Most data is calculated and recorded thoroughly and accurately. There are few major errors.	Little data is calculated and recorded thoroughly and accurately. There are many major errors.
Graph	The graph clearly shows the relationship between both variables (for individual and larger sample data). The graph accurately includes all of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values -a key (or labels) identify all lines/bars	The graph shows the relationship between both variables. The graph accurately includes most of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values -a key (or labels) identify all lines/bars	The graph partially shows the relationship between both variables. The graph accurately includes few of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values - a key (or labels) identify all lines/bars
Conclusion	Conclusion is thorough and describes how variations/mutations caused the moth to adapt. Specific data evidence and reasoning are included.	Conclusion is general. Specific data evidence/reasoning is limited.	Conclusion is incomplete. Specific data evidence/reasoning is not used.
Analysis	Analysis contains many thorough, thoughtful, and relevant reflections that communicate purpose, sources of error and next steps.	Analysis contains several thorough, thoughtful, and relevant reflections that communicate purpose, sources of error and next steps.	Analysis contains few thorough, thoughtful, and relevant reflections that communicate purpose, sources of error and next steps.