

Peppered Moth Simulation



Objective: Simulate changes in moth population due to pollution and predation, and observe how species can change over time.

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.

Procedures:

1. Click the link below to read more information on Kettlewell's study of moths. At the end, you will run two simulations for 5 minutes each, during this time you will play the part of a bluejay that eats moths.
2. After 5 minutes record the % of dark moths and light moths - you will need this information later.
3. Peppered Moth Simulation at peppermoths.weebly.com

Data and Analysis

Read the background information and answer the questions as you go.

Part A: Life Cycle of the Peppered Moth

1. Why are these moths called "peppered moths?"
2. What animals eat the peppered moth?
3. What is a lichen?
4. What do the larvae of the moth eat?
5. How do peppered moths spend the winter?
6. Moths that have more dark spots than the average moth are called what?

Peppered Moth Answers

Chad Price



Peppered Moth Answers:

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performance The mammalian eye for example has the function of perceiving and processing light and possession of this property tempts us to claim that token eyes are supposed to perceive and process light That is we tend to evaluate the performance of token eyes against the norm described in the attributed functional property Hence the norms of nature What then are the norms of nature Whence do they arise Out of what natural properties or relations are they constituted In Norms of Nature Paul Sheldon Davies argues against the prevailing view that natural norms are constituted out of some form of historical success usually success in natural selection He defends the view that functions are nothing more than effects that contribute to the exercise of some more general systemic capacity Natural functions exist insofar as the components of natural systems contribute to the exercise of systemic capacities This is so irrespective of the system's history Even if the mammalian eye had never been selected for it would have the function of perceiving and processing light because those are the effects that contribute to the exercise of the visual system The systemic approach to conceptualizing natural norms claims Davies is superior to the historical approach in several important ways Especially significant is that it helps us understand how the attribution of functions within the life sciences coheres with the methods and ontology of the natural sciences generally

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