Biology 11: Peppered Moth Analysis

Name_____

Block_____

Purpose:

- To replicate Kettlewell's famous experiment with the peppered moth
- To explain the events that lead to the industrial melanism of this insect
- To collect, analyze and interpret data collect from the peppered moth simulation
- To discuss how the peppered moth reinforces Darwin's theory of natural selection

Website simulation from: http://www.techapps.net/interactives/pepperMoths.swf

Procedure: From the homepage, click on the appropriate circles and answer the questions below

1. **Background information: click on the first circle and go through the slides of the 'Life cycle' of the peppered moth**
   A. Are these common insects in England?

   B. Why are they called peppered moths?

   C. What is the moth's predator?

   D. When do they sleep?

   E. Why do they sleep when they do?

   F. How do the caterpillars of the peppered moth avoid predation?

   G. Why do the moths form a cocoon in the winter?

   H. When did the color change in moths become more visible?

2. **Click on the next circle: Impact of Pollution**
   A. What was the great discovery in 1848?

   B. What % was now dark?

   C. What cultural phenomenon was occurring at the same time?

   D. What was making the trees darker?

   E. Give the 2 hypothesis that scientist thought were responsible for the color change in moths?(2)

F. Were they right in their assumptions?

G. What caused the color change in the moths?

H. Give 3 points of Darwin's theory of Natural selection.

I. What did Tutt discover?

3. **Click on Dr. Kettlewell Tests Natural Selection**

A. What does a hypothesis need to become a theory?

B. What is an entomologist study?

C. What is industrial melanism?

D. What was Kettlewell's finding with the color of the moth and the soot on the trees?

E. After much experimenting, what was Kettlewell's finding?

4. **A Bird's Eye View of Natural Selection**

- READ THE INSTRUCTIONS ON THE FIRST 2 PAGES TO UNDERSTAND WHAT YOU ARE TO DO DURING THE SIMULATION.
- DO THE SIMULATION FOR THE LIGHT AND DARK FOREST
- Fill in the data table below:
- % is indicated on the screen after the minute simulation

	% light moth	% dark moth
Lichen forest		
Sooty forest		

Analyze questions:

1. Did the data you collected in the light forest support the theory of natural selection? Why or why not?(3)

2. Did the data you collected in the sooty forest support the theory of natural selection? Why or why not?(3)

3. How does the color change from light to dark come about in the moth? (Be specific)(2)

4. How does the relationship between predation and pollution affect the phenotype (dark or light moth) in forest near coal burning factories?(3)

5. How does this case study of the peppered moth provide evidence of Natural Selection?(4)

6. If you released 200 light moths into a sooty forest, what % of light colored moths might you see if you were to return in two weeks? Why? (3)