Name:_____ Block:_____ Date:_____

Peppered Moth Scenario

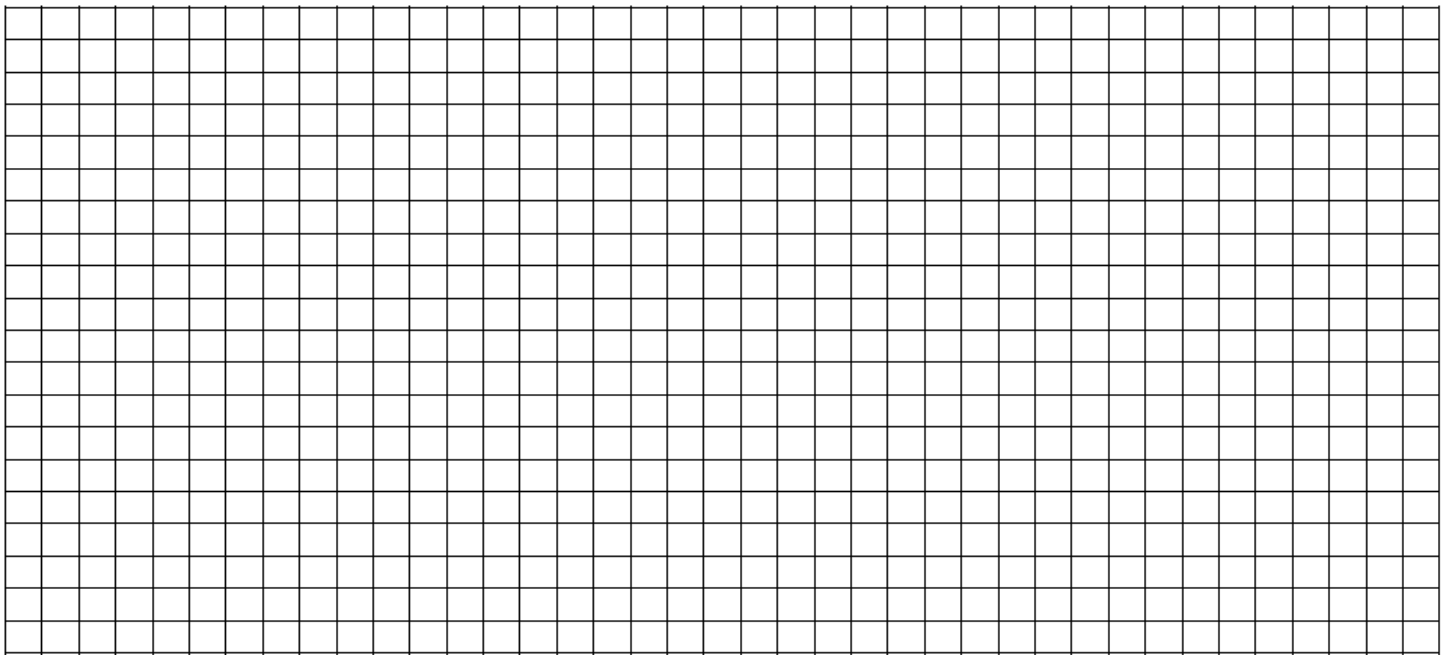
Natural selection is the reproductive success of organisms that are best suited for an environment. It is the driving force of evolution. Natural Selection occurs within populations, which are interbreeding groups of individuals of the same species. Genetic variation is one factor that influences natural selection. Genetic variation occurs when a population has multiple versions of a trait. For example, some organisms in a population of moths are dark colored, while some are light colored. Natural selection over time results in adaptations, where certain traits are favored due to their influence on survival. Adaptations over many generations can lead to evolution. Peppered moths have lived in the forest of Manchester England for hundreds of years. There are two genetic variations for color in peppered moths- DARK WITH LIGHT SPOTS and LIGHT WITH DARK SPOTS.

Before the 1800's the trees were light colored and the light colored moths were well camouflaged. After the 1800s, when the industrial revolution began, the pollution from factories darkened trees. **Use the data to show how natural selection affected the population of peppered moths**

Data Table: Population of Peppered Moth

Year	Light Colored Population	Dark Colored Population
1	537	112
2	484	198
3	392	210
4	246	281
5	225	357
6	193	412
7	147	503
8	84	594
9	53	638
10	38	673

Graph:



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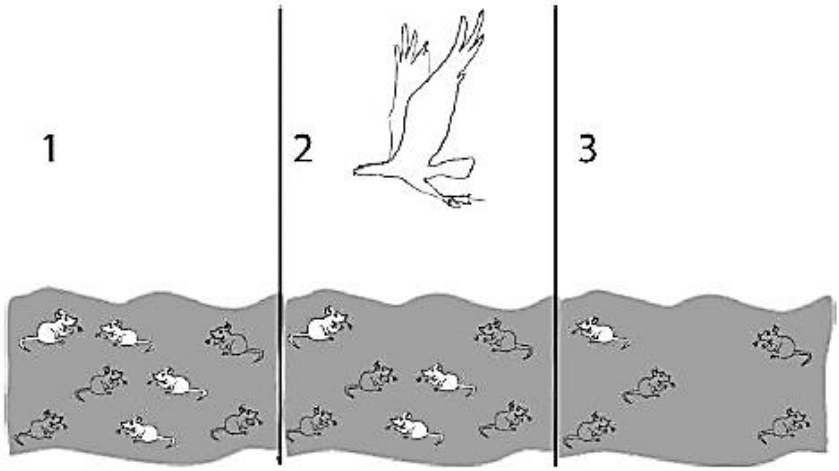
Analysis Questions for Peppered Moth:

1. What changes occurred in both forms of the moth over these ten years?

2. Why do you think these changes occurred? Your explanation needs to include the following ideas: reproduction, adaptation, survival.

3. England has recently cleaned up their factories and now produces much less pollution. As a result, the trees are slowly becoming lighter. What might happen to the populations of each moth in the next 10 years? Why?

Scenario 2



1. Describe what is happening in the figure above? Is the population of mice varying from start to finish? Explain why.

2. An adaptation is a characteristic that increases fitness, which is defined as the ability to survive and reproduce. What characteristic of the mice is an adaptation that increased their fitness in box 3?

3. The table below gives descriptions of four female mice that live on a beach area which is mostly tan sand with scattered plants. According to the definition of fitness, which mouse would biologist consider the fittest? Explain.

Color of fur	Black	Tan	Tan and black	Cream
Age at death	2 months	8 months	4 months	2 months
# of pups from each female	0	11	3	0
Running Speed	8 cm/sec	6 cm/sec	7 cm/sec	5 cm/sec