

Name: _____ Date: _____ Class: _____

Lab: Nature at Work

Problem: How does the habitat that a species lives in affect its population?

Hypothesis: _____

Materials:

- 25 Orange “Mouse” Cards “**W**” Dominant Allele for White fur.
- 25 Orange “Mouse Cards “**w**” Recessive allele for brown fur.
- 5 Green “Event” Cards “**S**” Mouse Survives
- 1 Green “Event” Card “**D**” Disease Kills mouse.
- 1 Green “Event” Card “**P**” Predator Kills mouse.
- 18 Green “Event” Cards “**C**” Predator kills mouse if it contrasts with its environment.

Procedure:

1. Work in groups of 3-4.

Part 1: White Sand Environment

2. Mix up the Mouse cards.
3. Begin by using the cards to model what might happen to a group of mice in an environment of white sand dunes. Choose two Orange Mouse cards. Allele pairs WW and Ww produce a white mouse, while ww produces a brown mouse. Record the color of the mouse with a tally mark in the data table under Color of Mouse.
4. Choose a Green Event card. An “S” card means the mouse survives. A “D” or a “P” card means the mouse dies. A “C” card means the mouse dies if its color contrasts with the white sand dunes (only brown mice will die when a “C” card is drawn). Record each death with a tally mark in the data table under Deaths.
5. If the mouse lives, put the two mouse cards in a “live mice” pile. If the mouse dies, put the cards in a “dead mice” pile. Put the event card at the bottom of the pile.
6. Repeat steps 3 through 5 with the remaining mouse cards to study the first generation of mice. Record your results. If you did it correctly, you should have a total of 25 mice with some of them dying.
7. Leave the dead mice cards untouched, they are out of the game. Mix up the cards from the live mice pile. Mix up the Event cards.
8. Repeat Steps 3 through 7 for the second generation (using only the cards from the live mice pile).
9. Repeat Steps 3 through 6 for the third generation (using only the cards from the live mice pile).

Part 2: A Dark Forest Floor Environment

10. How would the traits differ if the mice in this model lived on a dark brown forest floor? Record your prediction above the Part 2 Data Table.
11. Repeat the procedure for Part 1. Remember that a “C” card now means that any mouse with white fur will die because it contrasts with its environment.

Data/Evidence:**Part 1**

Env=White sand	Color of Mouse		Deaths	
Generation	White Mice	Brown Mice	White Mice	Brown Mice
1				
2				
3				

Part 2

Prediction: _____

Env=Forest floor	Color of Mouse		Deaths	
Generation	White Mice	Brown Mice	White Mice	Brown Mice
1				
2				
3				

Conclusion

1. In each generation, which color mouse had the higher death rate? To calculate the death rate for white mice, divide the number of white mice that dies, by the total number of white mice, then multiply by 100. Do the same for brown mice.

For Part 1	Death Rate Part 1 (# died/total X 100)		Death Rate Part 2 (# died/total X 100)	
Generation	White Mice	Brown Mice	White Mice	Brown Mice
1				
2				
3				

2. If the events in Part 1 occurred in nature, how would the group of mice change over a long period of time?

3. How did the results in Part 2 differ from those in part Part 1?

4. How would it affect your model if you increase the number of “C” cards?

How would it affect your model if you decreased the number of “C” cards?

Write a Claim, Evidence, Reasoning to answer the following question; How does an organism’s environment affect its ability to survive?

Claim: _____

Evidence (use data from this lab): _____

Reasoning (how your evidence supports your claim): _____

Using a bar graph, graph the starting number of each color of mice in each generation as well as the final number of each color of mice at the end of the third generation. Don’t forget a good title.

