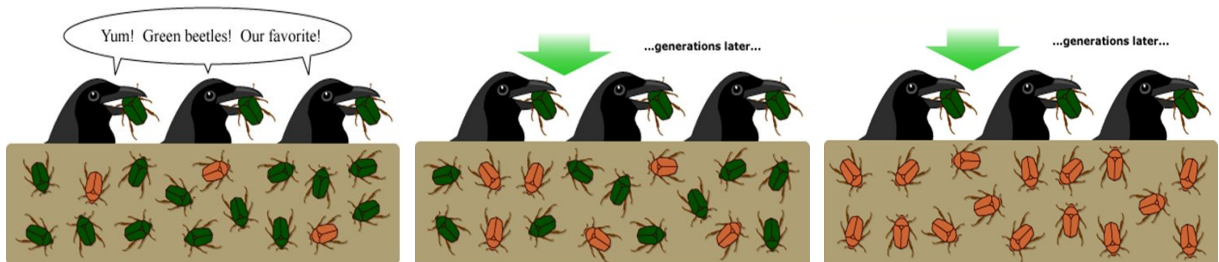


Name _____ Date _____ Period _____

MODELING CAMOUFLAGE & NATURAL SELECTION

PURPOSE:

In this investigation, you will observe the effect of camouflage on natural selection. By completing this activity, you will see how genetics and the environment influence natural selection and the evolution of a population of prey.



HYPOTHESIS:

1. If there are many different colored “prey” on an orange background, then the color(s) selected *most* often will be _____.
2. If there are many different colored “prey” on an orange background, then the color(s) selected *least* often will be _____.

MATERIALS:

- various colored “dots” of construction paper
- large orange tablecloth
- two large tables pushed together

PROCEDURE:

1. Place the orange tablecloth over the two large lab tables. Spread the construction paper “dots” around evenly. Make sure that the different colored dots are evenly distributed. Students are to arrange themselves evenly around the four sides of the lab tables.
2. The students will use their fingers to serve as the predator for the dots. Students must place one hand behind their back while hunting for prey. Prey may only be captured by using their thumb and pointer finger like a bird’s beak.

3. Set a timer for one minute. Students will collect as many dots as possible before the timer goes off. Students are to look away from the table and then immediately look down to select a dot. Only select the dot that is most visible at the time. Then look away again before selecting the next dot. Repeat this process until the time is up.

REMINDER: STUDENTS MAY NOT CHEAT. IN REAL LIFE, PREDATORS WILL ONLY HUNT FOR THE FOOD THAT IS MOST VISIBLE TO THEM.

4. Tally up the number of dots recovered. Record this information in Data Table #1. Evenly spread the dots back onto the table and mix them around. All students are to rotate clockwise around the table.
5. Repeat steps 3 and 4 two more times.
6. Calculate the total, average, and percentage of dots collected. With your teacher's assistance, record the class total and then calculate the class percentage. Record all of this information in Data Table #1. All calculations should be rounded to one decimal point.
7. Use Microsoft Excel, Apple Numbers or Google Sheets to create the following:
 - a. Data Table #2: Bar Graph of My Data
 - b. Data Table #3: Pie Chart of Class Data

QUESTIONS TO HELP YOU WITH YOUR LAB REPORT:

1. Identify the independent and dependent variables for this lab.
2. According to your individual data, which color dot was picked up most frequently? Which color dot was picked up 2nd most frequently?
3. According to the class data, which color dot was picked up most frequently? Which color dot was picked up 2nd most frequently?
4. Compare and contrast the individual and class data for the two most frequently picked up colors of dots. If they are different, propose a reason why.
5. Was your first hypothesis correct? Explain using CLAIM → EVIDENCE → REASONING.
6. According to your individual data, which color dot was picked up least frequently? Which color dot was picked up 2nd least frequently?
7. According to the class data, which color dot was picked up least frequently? Which color dot was picked up 2nd least frequently?

8. Compare and contrast the individual and class data for the two least frequently picked up colors of dots. If they are different, propose a reason why.
9. Was your second hypothesis correct? Explain using CLAIM → EVIDENCE → REASONING.
10. Is it better to analyze your hypothesis based on individual data or class data? Why?
11. Identify 1 or 2 sources of error for this lab. Explain your answer(s).
12. Identify 1 or 2 ways to improve this lab. Explain your answer(s).
13. What conclusion(s) can you draw regarding natural selection?

POST-LAB QUESTIONS:

1. Natural selection always involves the interaction of three terms: genetics, the environment, and evolution. Answer the following questions with regard to this lab:
 - a. What was the “gene” being studied?
 - b. What was the environment?
 - c. What did natural selection favor, and why?
2. Choose one other example of natural selection that you have discussed in class. Think about how genetics, the environment, and evolution were involved. Answer the following questions with the regard to that example:
 - a. What was the “gene” being studied?
 - b. What was the environment?
 - c. What did natural selection favor, and why?
3. What is meant by the term “Darwinian fitness”? How does that term apply to this investigation?
4. Based on your data, how would the population of “prey” micro-evolve in future generations? Write your answer in paragraph form, following the 5 steps of natural selection. The first sentence of your paragraph should say: **There are dots of many different colors.**

Data Table #1: _____ (title)

Color	Trial			My Total	My Average	My Percentage	Class Total	Class Percentage
	1	2	3					
Black								
Blue								
Brown								
Green								
Orange								
Purple								
Red								
White								
Pink								
				Total =				
					Total =			