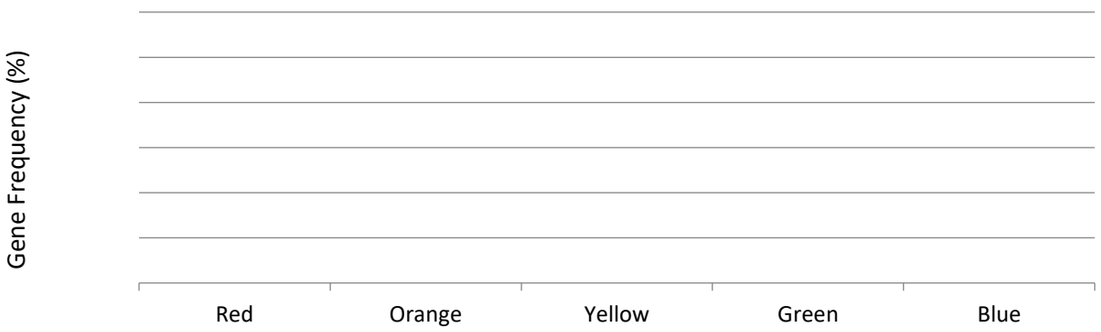
Name: _____ Class Period: _____ Island Set: _____

Modes of Selection using Froot Loops

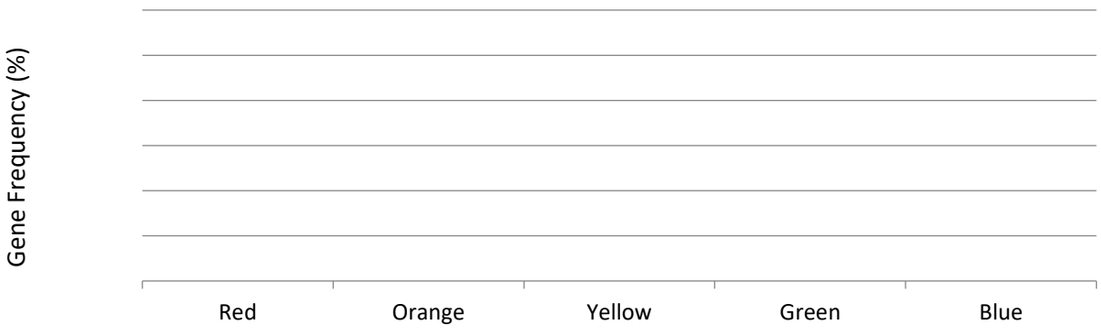
On a group of tropical islands, there grows an indigenous species of tree called *Frutis loope*. It creates a variety of colored flowers each producing the same colored round fruit. Twenty years ago, scientists came to Kellogg Island and recorded the gene frequency for each color of fruit. Their data collected needs to be graphed into the "Initial Distribution" chart below. Your job is to also record the changes in gene frequency on three other different islands. (+10 points)

Initial Distribution of *Frutis loopes* alleles on Kellogg Island

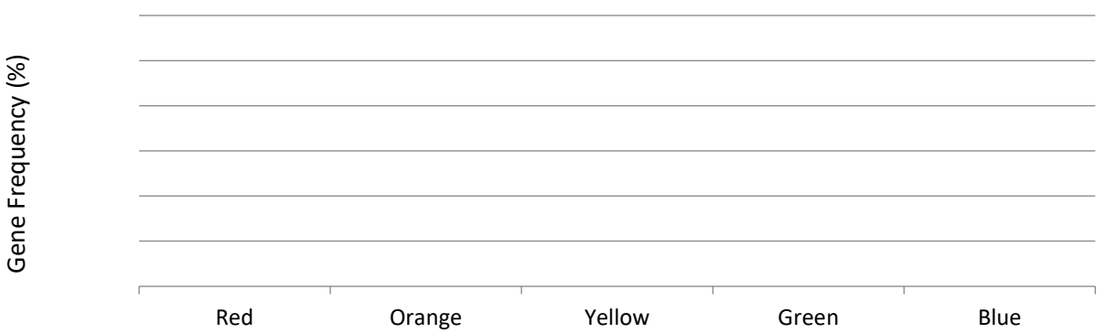


Red- 10
Orange- 25
Yellow- 30
Green- 25
Blue- 10

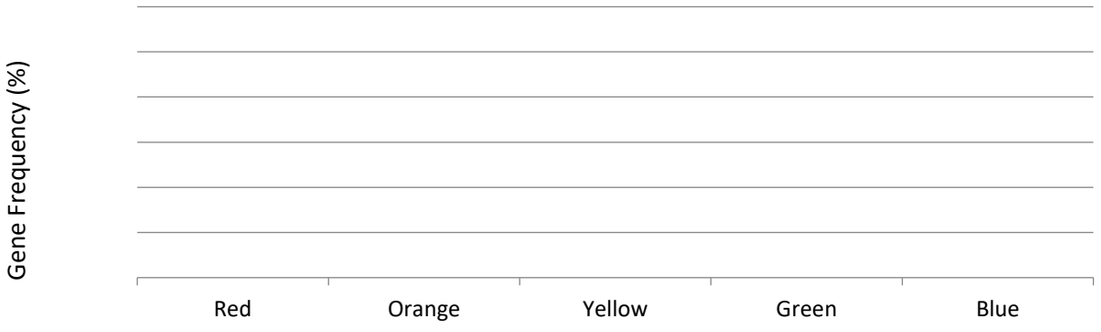
Initial Distribution of *Frutis loopes* alleles on _____ Island



Initial Distribution of *Frutis loopes* alleles on _____ Island



Initial Distribution of *Frutis loopes* alleles on _____ Island



Post-Lab Questions (+6 points)

Using the graphs on the front, and your notes, answer the following questions with complete sentences.

1. What is natural selection?

2.) Excluding Kellogg Island, which island(s) from the previous page represent a stabilizing selection graph?

3.) If you have Island Set A, what type of selection graph does Mini-Wheat Island demonstrate? If you have Island Set B, what type of selection graph does Raisin Bran Island demonstrate?

4.) If you have Island Set A Apple Jacks Island is an example of what type of selection graph? If you have Island Set B, Pops Island is an example of what type of selection graph?

5.) Explain why natural selection may not always favor the same variation, or trait, on each island. Use the data from your graphs to support your answer.

6.) Suppose there was a mutation that resulted in a purple *Frutis loopes*. Which island(s) would you expect to find the new fruit on, and <u>why?</u>

7.) What are the five genetic variations on every island?

The following are examples of stabilizing, disruptive, and directional selection graphs. Label each with the correct type of selection, explain why it fits that category, draw a new line with a different color to show how the graph changes and write at the bottom of each graph the 3 different variations for each scenario.

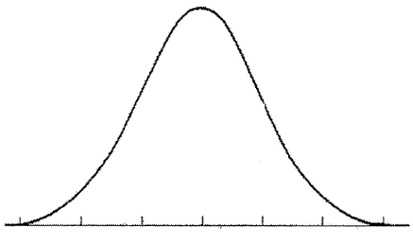
8.) Large squirrels can carry larger acorns to their burrows, and they outcompete smaller squirrels when acorn supplies are unlimited.

Type of Selection: _____

Explanation: _____

_____

_____.



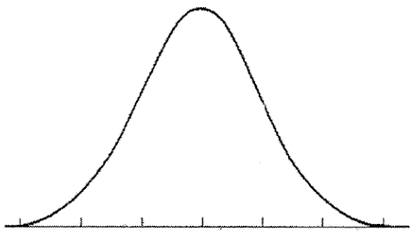
9.) Panthers with teeth that are too short have difficulty capturing prey, while panthers with teeth that are too long have difficulty chewing their food.

Type of Selection: _____

Explanation: _____

_____

_____.



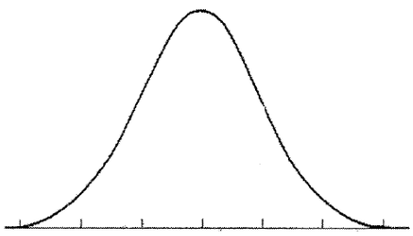
10.) Gray and Himalayan Gray rabbits are better able to blend into a rocky environment compared to white rabbits.

Type of Selection: _____

Explanation: _____

_____

_____.



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Island Scenarios

Island Set A	***Island Set B***
Mini-Wheat Island An indigenous population of pig-like mammals eats the orange flowers. As a result, orange *Frutis loope* produce very few fruit. Red- 1 Orange- 1 Yellow- 2 Green- 6 Blue- 10	Frosted Flakes Island When birds eat *Frutis loope*, they distribute the seeds around the island. You observe a group of birds on the island seem to prefer the yellow fruit. The birds avoid redder and bluer fruits. Red- 2 Orange- 3 Yellow- 10 Green- 3 Blue- 2
Rice Krispies Island You observe lots of small bugs eating the roots of the red and blue fruit trees. Some of the small bugs also eat the orange and green fruit trees. Very few are found on the yellow fruit. As a result, the yellow *Frutis loope* dominate the island. Red- 1 Orange-2 Yellow- 14 Green- 2 Blue- 1	Raisin Bran Island A small, shrew-like creature seems to avoid eating the yellow fruit. You decide to test their preference and present several of the creatures with all different color fruit. When given a choice they never chose yellow, but when only given the yellow fruit they do eat it. Red- 6 Orange- 3 Yellow- 2 Green- 3 Blue- 6
Apple Jacks Island A group of butterflies only eats the nectar from the red-flowered *Frutis loopes*. You also observe a group of humming birds preferring to eat nectar from blue flowers. Red- 7 Orange- 3 Yellow-1 Green- 3 Blue- 6	Pops Island Local monkeys enjoy eating the red fruit, but seem to avoid the darker-fruited *Frutis loopes*. Red- 7 Orange- 6 Yellow- 4 Green- 2 Blue- 1