Genetic Drift and Mutations Activity Handout

Follow the instructions for each question. The allele you're looking at may be different for different questions (for example, for one question you could be looking at the dominant allele, for the another, the recessive).

*NOTE: DO NOT CLEAR YOUR GRAPH UNTIL YOU ARE TOLD TO DO SO IN THE WORKSHEET!!!!!

1. The allele you're observing is the dominant allele. The dominant allele carries the trait for a favorable adaptation in polar bears for thicker fur (Make sure you keep track of which line is which allele frequency).

a. Set p=0.1, N=100 and generation=100. Click start.
b. Set p=0.5, N=100 and generation=100. Click start.
c. Set p=0.9, N=100 and generation=100. Click start.

Copy your graph below. Which allele frequency corresponds to which trend line?

2. How did your allele frequencies change over time? (2-3 sentences).

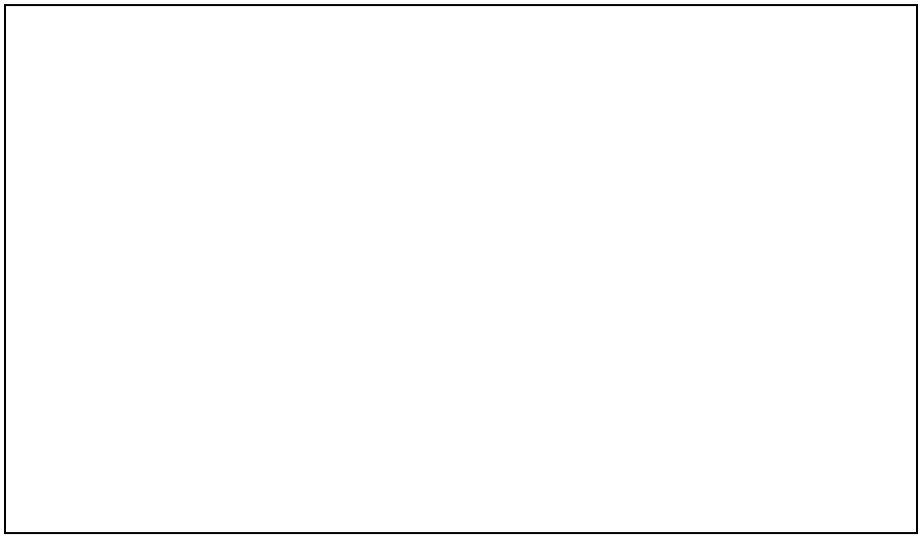
3. If the allele you're observing is the dominant allele for thicker fur, what would this change in gene frequencies (if we're not looking at genetic drift and we're looking at natural selection) tell you about the environment and how natural selection is acting on the population? (2-3 sentences).

4. Now CLEAR your graph. Do the same thing as question 1 tells you to do (a-c). Why do you think your graph looks different than the one before even though everything is the same?

5. This time you're looking at the alleles for feather color in a population of birds. The two alleles are green (dominant) and red (recessive). For the simulation you're going to look specifically at the dominant allele (or the green feather color). Each trend line you look at this time represents a *different population* of the same species of bird.

a. Set p=0.5, set N=25, set generation=100. Click start.
b. Set p=0.5, set N=50, set generation=100. Click start.
c. Set p=0.5, set N=100, set generation=100. Click start.
d. Set p=0.5, set N=250, set generation=100. Click start.

6. Copy your graph below. Which allele frequency corresponds to which trend line?

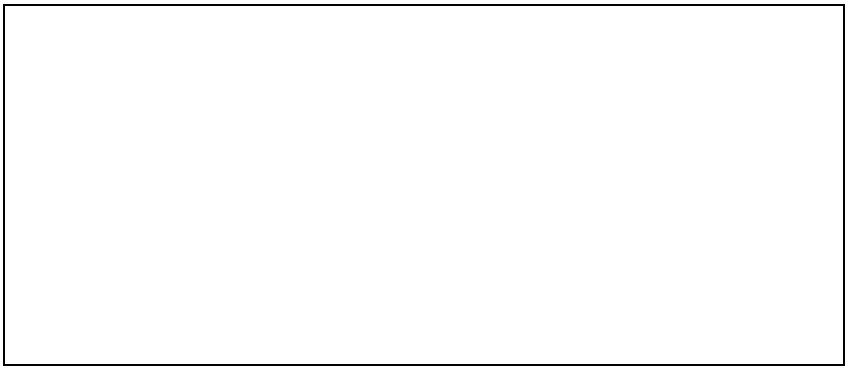


7. Which population of this bird species in the end has the most birds with green feathers?

8. Which population of this bird species in the end has the most birds with red feathers?

9. With REGARDS to genetic drift, does this graph tell us about natural selection and how it changes the populations? Why or why not? (1-2 sentences)

10. Click clear again. Now set all of your parameters yourself (p, N and generation). Click start 4 times. Record your graph below.



11. Why do the trend lines look different even though everything is the same?