Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_

Your genome wars report will consist of the following:

 1. completed scorecard

 2. line graph of your population as a function of time

 3. Bar graph representing the change in initial and final gene frequencies.

 4. Analysis questions

Graph 1: Your team’s population changes over time.

Starting alleles: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Starting environment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw and label a vertical line indicating when the following events took place: mass extinctions, environment changes, and mutations. For a mutation or environment change, indicate the changes that took place.

POPULATION AS A FUNCTION OF TIME



Graph 2: Allele frequency changes. For each allele, use 2 bars. The first is for the allele frequency before the game, and the second for after.

ALLELE FREQUENCY CHANGES



Analysis questions. Answer each with SEVERAL complete sentences on a separate sheet of paper.

1. Did the allele that provided an advantage in the starting environment increase in frequency? If so, by how much? Explain how this happened, from an evolutionary perspective.

2. Did you expect the allele frequency of the alleles that DID NOT provide an advantage in the environment to increase or decrease? Were there any surprises? Why might an allele that IS NOT an advantage become more common over time? If you aren’t sure, look up something called the “founder effect,” and see if that helps.

3. Explain the effect of the environment on the gene pool. How does natural selection act on genes as well as on individuals?

4. (BONUS) From *The Selfish Gene* "We are survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes. This is a truth which still fills me with astonishment. Though I have known it for years, I never seem to get fully used to it. One of my hopes is that I may have some success in astonishing others." Animals, plants, and every other manner of organism reproduce in order to create copies of their genes in future generations. Are we organisms simply the tools of our genes? Provide several reasons why you agree or disagree.