

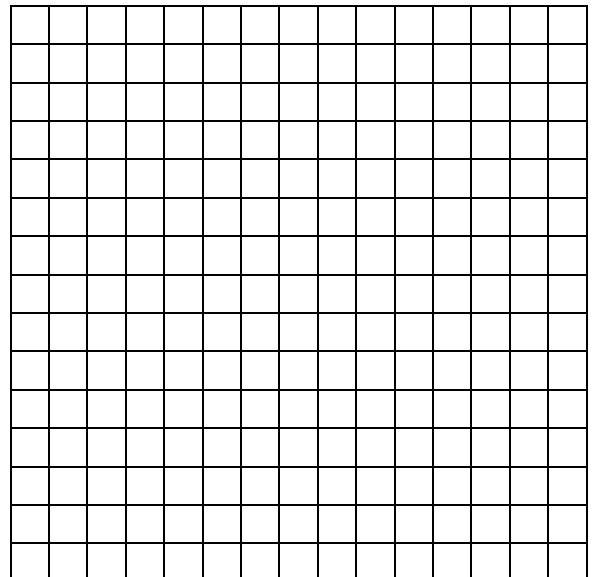
Name \_\_\_\_\_ Period \_\_\_\_\_ Assignment # \_\_\_\_\_

## Artificial Selection for Trichomes Experimental Design and Data Analysis

- 1) List as many biotic factors you can think of that could affect plant growth and/or development.
  
- 2) List as many abiotic factors you can think of that could affect plant growth and/or development.
  
- 3) What biotic and abiotic factors did our experimental design control for?
  
- 4) What biotic and abiotic factors did our experimental design fail to control for?
  
- 5) Describe an experimental design that would be an improvement over the one used in this experiment.

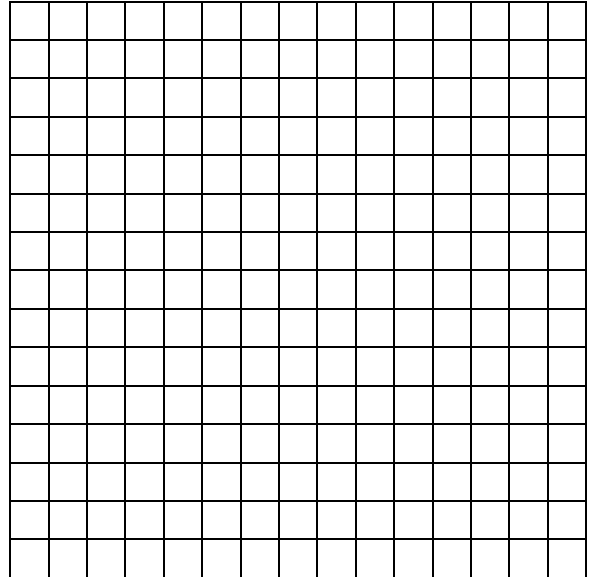
Sketch the pre and post selection box and whiskers chart below.

- 6) Use the box and whiskers data to justify the claim that we did or did not cause evolution. A justification has 3 components: 1) scientific knowledge and/or theory; 2) specific data from your analysis related to the knowledge; and 3) an explanation of HOW the data supports the knowledge.



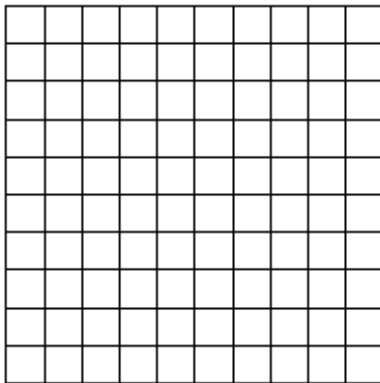
Sketch the class pre-selection data below. Label the mean and  $\pm 2$  standard deviations from the mean.

- 7) **Explain** what it means for a plant to be within 1 standard deviation from the mean. **Explain** what it means for a plant to be outside of 2 standard deviations from the mean.

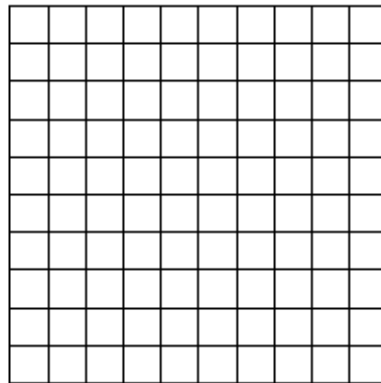


Sketch the pre-selection and post selection data below.

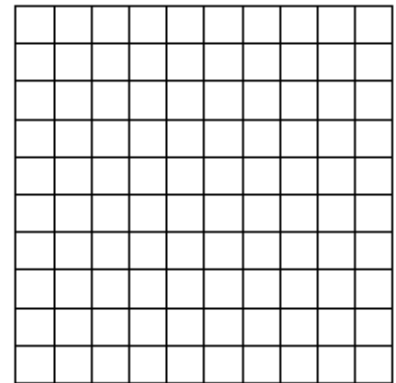
Offspring of bottom 90%



Pre-selection

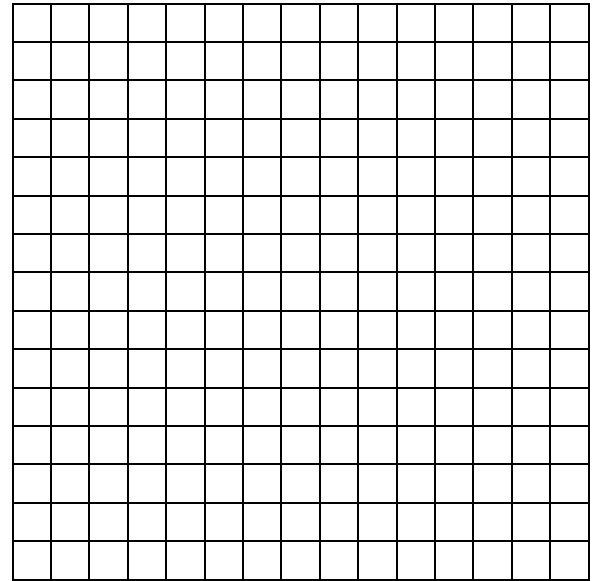


Offspring of top 10%



- 8) What kind of selection does the data above represent? How do you know? (review the pre-lab reading)

9) Graph the mean and error bars that represent  $\pm 2$  standard errors of the mean



10) Use the graph above, the central limit theorem, and the empirical rule to justify the claim that we did or did not cause evolution by artificial selection. A justification has 3 components: 1) scientific knowledge and/or theory; 2) specific data from your analysis related to the knowledge; and 3) an explanation of HOW the data supports the knowledge.