

Statistics and Graphing Review for AP Biology

Complete this packet as you view the Video Series at the following link:

https://www.youtube.com/playlist?list=PLIIVwaZQkS2omBpLjQm_BAQKsQ7Iq86ku

Video 1: Statistics for Science:

1. What is the difference between the population and a sample?
2. Why is sample set more useful than population?
3. Define and provide the symbol for each of the following:
 - Range=
 - Mode =
 - Median =
 - Mean =
 - Degrees of Freedom =

Video 2: Standard Deviation:

4. Define Standard Deviation =

5. *Practice Problems:*

Consider the following three data sets **A**, **B**, and **C**

A = {9, 10, 11, 7, 13}

B = {10, 10, 10, 10, 10}

C = {1, 1, 10, 19, 19}

a) Calculate the mean of each data set.

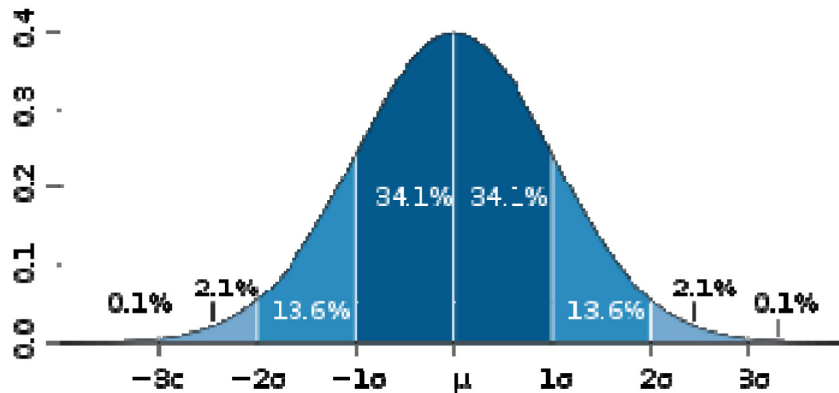
b) Calculate the standard deviation of each data set.

c) Which data set has the largest standard deviation? Offer an explanation of what this means in relation to the standard deviations of the other two data sets.

6. Using the graph below

- indicate the area of the graph that includes about 69% of the population.
- indicate the area of the graph that includes about 95% of the population.
- indicate the area of the graph that includes about 99% of the population.
- How do each of these percentages relate to standard deviations?

Figure 1



Source: Jerry Kemp 2005-02-09 [<http://pbeirne.com/Programming/gaussian.ps>]

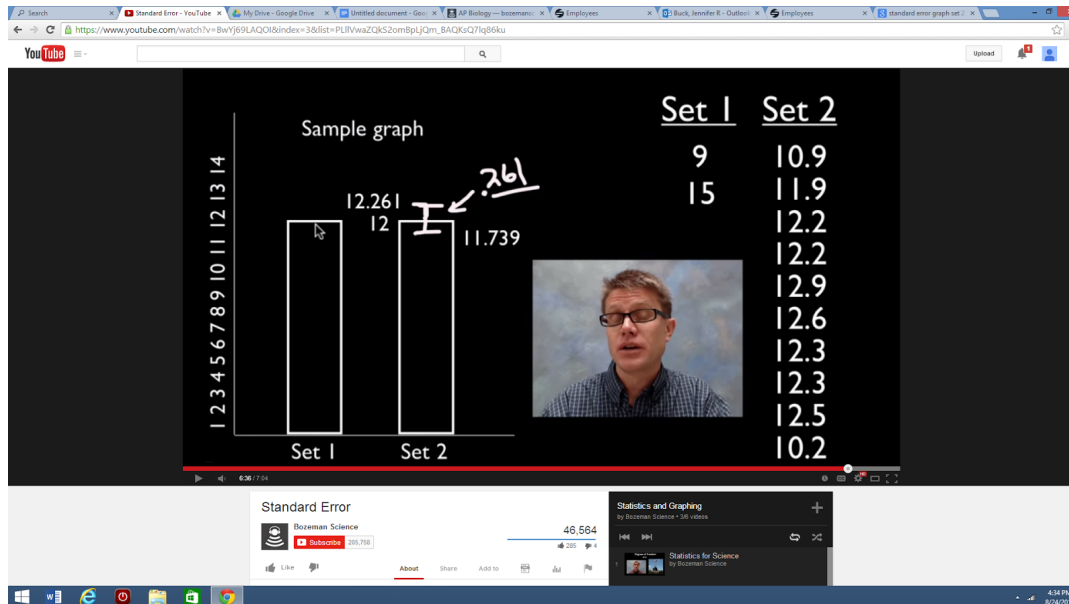
Video 3: Standard Error

7. Define Standard Error=

8. Calculate the standard error for each data set in # 5 above (A,B, and C)

9. In general, how is standard error affected by sample size or amount of data?

10. Calculate the Standard Error of the Mean for data Set 1 in the screen shot below AND draw in the appropriate error bar on the graph.(Screen shot on next page)



Video 4: A Beginner's Guide to Graphing

11. **Describe** when you would use each type of graph and **provide and example**.

a) Line Graph

b) Scatter Plot

c) Bar Graph

d) Histogram

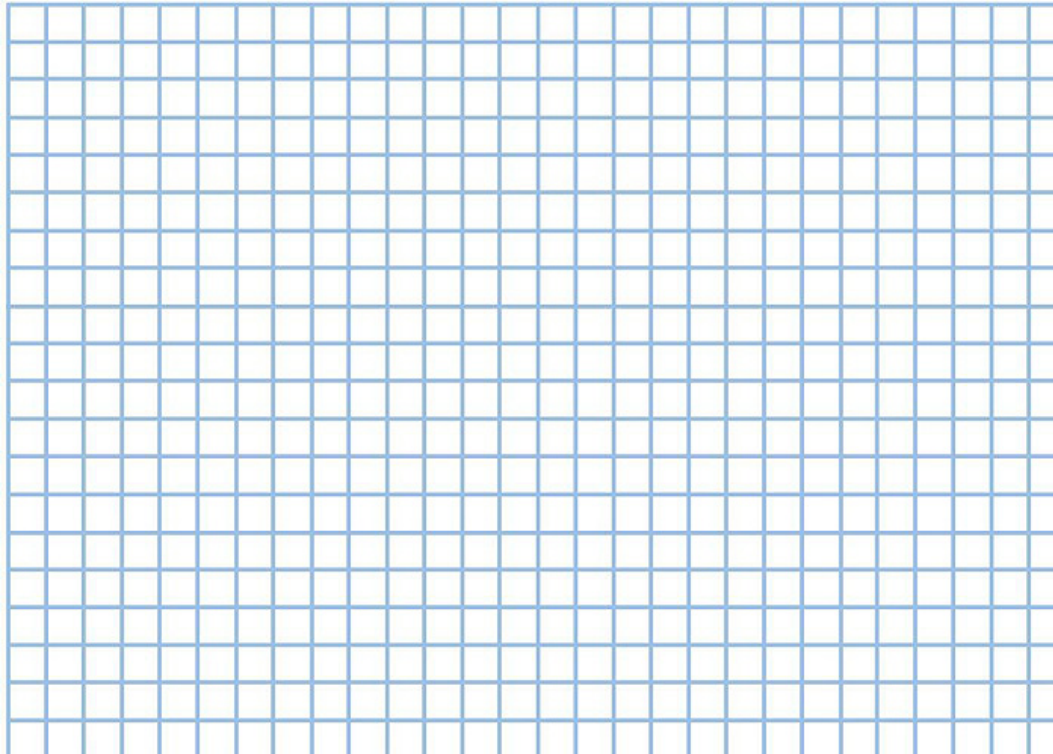
e) Pie Chart

12. Describe all the components to a really good graph.

Video 5: Graphing by Hand

13. Use the data set in this video (Plant growth as a relation of fertilizer) to draw a scatterplot graph below. Be sure to include proper labels, units, and an appropriate title.

Warning: The grid below is larger than the one on the video (larger than 21 x 15 squares)



- Why is fertilizer on the x-axis and height on y-axis?
- Why is a scatterplot appropriate for this set of data instead of a line graph?
- Why shouldn't you include 0,0 data point on this graph?
- How do you draw a line of best-fit?

Video 6: Graphing by Spreadsheet

14. Watch the video. We will practice making graphs using EXCEL during class.

