

CALCULUS

Unit One Project: "Analyzing Trends in Data"

OBJECTIVES:

- ✓ Use mathematics as a predictor.
- ✓ Use different functions and their graphs.
- ✓ Graph data and trend curves.
- ✓ Summarize one's mathematical findings.

In this unit, you will be spending time working with expressions, equations, and functions. These are the foundation for analyzing data and creating pictures or graphs of what data is doing. Data is abundant in today's world. What does it mean? We must be able to sort through data and make it meaningful. This unit project will give you a little taste of just that. All of you will spend time in your career making meaningful decisions about data. The data may deal with money, products sold, miles per gallon, student achievement level, crime statistics, ..., just about anything imaginable!

*This project will allow you to use some of the skills you will be exploring in this unit. Throughout the unit, you will experience everything you need to learn to complete this project. **This project is worth 50 points, will be scored using the rubric that follows, and is due the day before the unit one exam.***

*You are to find real numerical data (at least 15 pieces) about a certain subject in order to predict future data. The more data, the more accurate your findings. You are to create a **poster** showing your mathematical data and your analysis made. Along the way, you will do a little research to detail some highlights of your subject selected. Your poster will contain the information detailed as follows in a neat and creative way. **Enjoy** and have a little fun with color and a little glue!!! **Just don't eat any paste!!!** 😊😊😊*

DESCRIPTION

1. **AS SOON AS YOU HAVE A SUBJECT, LET MR. BARNARD KNOW SO NO DUPLICATE TOPICS EXIST!**
Use Mr. Barnard's website (it can be accessed through the BPS/BHS Staff page (www.beatricepublicschools.org) to discover information that may relate to your subject. Go to the Calculus page and click on the link that says "Unit 1 Project Resources". You may use other credible information that you can find from published resources or online.
2. Write a paragraph description of your subject. You should use the six-traits of writing.
 - Idea Development: The writing is clear, purposeful, and has detail.
 - Organization: The writing has structure and flows together well.
 - Voice: The writing is driven by the writer and engages the reader.
 - Word Choice: The writing uses clear language to develop a true picture.
 - Sentence Fluency: The writing flows together well and has clarity.
 - Conventions: The writing shows accuracy in mechanics.Make sure to have an introduction sentence, a body giving general yet interesting facts, and a conclusion sentence. Do not plagiarize! You will be citing your sources on the back of the poster.

DATA

3. Print the data analysis work sheet from my website and complete it for the data section. It is entitled "Unit 1 Project: Data Analysis". Your first year should correspond to $x = 1$. You may choose how you want to set up your data. For example, if your data is recent annual data such as data from 1985 to the present, $x = 1$ could be 1985, $x = 2$ could be 1986, $x = 3$ could be 1987, etc... However, if your data is taken over time such as from 1800 to the present, you may choose each unit of x to be equal to 10 years. Here 1800 would be $x = 1$, 1810 would be $x = 2$, 1820 would be $x = 3$. If you had data in 1825, then $x = 3.5$.
4. Show the data and the years for your subject (table form). I have a table template available on my website. It is entitled "Unit 1 Project: Data Table and Chart". By entering this information, you will have created your table that you can print along with your scatter plot. You may have to edit the template in terms of size and other details as you see fit.
5. Identify the best type of equation to predict the future of the data based on the shape of your data (not necessarily on the best correlations calculated (linear, quadratic, ...). Due to the small amount of data, trends may appear better from observation rather than from the r^2 value.
6. Show the full equation (with #s) for the equation type you chose (round each value to the nearest hundredth).

7. Identify and label the coefficient of determination to the nearest hundredth (r^2) for your chosen type.
8. Show your predictions for 2020 and 2050 based on your chosen equation. If the prediction is a negative number, write 0.
9. Make a graph showing a scatter plot of your data. Then sketch in your “chosen” best-fit equation’s graph. If you use the newest version of Microsoft Excel (2007), there is a feature where the computer can draw in some of the types of curves of best fit.

DETAILS

10. Use paper no bigger than 12” x 18” but no smaller than 11” x 17”. Your poster can be made lengthwise or widthwise on the paper. Make sure the name of your subject is clearly visible as are all other parts required. Include any other details you wish. Be neat, be creative, and be different!!! Use color and other “frills” to enhance your work. Include your first and last name and the date in the bottom right hand corner on the front. These will be on display for all to see.
11. **CITE ALL SOURCES USED ON THE BACK OF YOUR POSTER!!!** The format of your citations doesn’t matter as long as I know and can easily locate your resources used.

RUBRIC FOR SCORING THE PROJECT

4	3	2	1	0	
<u>Paragraph</u> (x 4)	The attention of the reader is caught immediately. The writer summarizes & ends well with exceptional use of mechanics, structure, & voice.	All elements are present but some errors in mechanics or weak voice.	All elements are present but errors in mechanics & weak voice.	Some elements missing with errors and little voice.	No paragraph present or plagiarism exists.
<u>Data Analysis Sheet</u> (x 2)	All elements are complete and correct.	All tables are complete with a minor inaccuracy in a response.	Tables are complete but responses are not complete.	Tables and responses are not fully complete.	Data sheet not turned in with the poster.
<u>Data Table</u> (x 1)	Data table is present with headings and the years each with their corresponding values.	-	Data table is present with years and corresponding values.	-	No table present.
<u>Graph</u> (x 1)	The graph shows a scatter plot, the best fit curve, values on each axis, and the labels on each axis.	The scatter plot, best fit curve and values on each axis are present without labels.	The scatter plot and best fit curve are present.	The scatter plot or the best fit curve is present.	No graph present.
<u>Identification of Required Poster Elements</u> (x 3)	Type of equation, the actual equation used, r^2 , two predictions, sources, and name are all identifiable.	One of the required elements is missing.	Two of the required elements are missing.	Three of the required elements are missing.	Four or more of the required elements are missing.
<u>Creativity & Neatness</u> (x 1)	Creative way of organizing the poster with use of color and other details.	Creative way of organizing the poster with some use of color and details.	Use of color and other details.	Some color utilized.	Little to no thought put into the appearance.
<u>Professional</u> (x 1)	-	-	The poster has many items typed and appears professional.	The poster has some items typed.	Most items are handwritten