

Trinity Catholic High School

Advanced Placement Summer Work



AP Biology

AP Biology

Mr. Denys Rios

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Welcome to your best AP Bio class of the year. I look forward to meeting with you. My name is Prof. Denys R. Ríos Grafals, and I have been teaching since 2008 (you do the math). This is my third year at TC and my fourth teaching AP Bio. The main goals of AP Bio are to help you develop a conceptual framework for model biology and to gain deeper appreciation of science as a process, not facts. The course curriculum centers around the four Big Ideas.

1. The process of evolution drives the diversity and unity of life
2. Biological systems utilize free energy and molecular building blocks to grow, reproduce, and to maintain dynamic homeostasis.
3. Liven systems store, retrieve, transmit and respond to information essential to life processes.
4. Biological systems interact, and these systems and their interactions possess complex Properties.

Students that sign up for AP Bio are expected to meet the following requirements before the first day of school.

1. Communicate with your teacher via email: drios@tchs.us
 - a. Student can also text the teacher only to inform that he/she sent an email, and it requires an urgent response. (787) 235-8508
 - b. Make sure to include your first and last name
 - c. Text messages are not considered official communications.
2. Complete your profile and submit via email ASAP
 - a. Name
 - b. Any hobby(ies), job(s), sport(s), club(s) and/or any extracurricular activities
 - c. Any other AP courses this semester
 - d. Future career or major
 - e. Why are you taking AP Bio?
 - f. Picture (I want to begin putting faces and names together)
3. Read Chapter 1: Evolution, the themes of biology, and scientific inquiry
Campbell Biology AP Edition 11th -12th Ed.
4. Complete practice exam [Chapter 1 Exam](#)
 - a. Submit a screenshot with your score. It doesn't matter if you got 0% or 100%
 - b. Due date: **August 8th, 2023**
 - c. Submit via email
5. Complete the Graphing and Stat practice
 - a. Due date: **August 9th, 2023**
 - b. Submit via email

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Graph and Stats Practice

Student can use sources other than the ones listed if needed to help refine their understanding.

- Go to <https://tinyurl.com/GuidetoGraphing> and take notes
 - What type of graph uses a “best fit” line?
 - Explain the difference between a bar graph and a histogram.
 - Which type of graph shows a change over time?
 - Which type of graph displays a correlation of variables?
 - Distinguish between the independent variable and dependent variable in an experiment, and where their axes are on a graph.
 - Which type of graph is best for comparing two or more different groups?
 - Which type of graph is better for showing distribution of data?
 - Explain when a pie chart/graph should be used and give an example.
 - State at least five elements that any graph should always display.
- Watch Bozeman: Statistics for Science <https://tinyurl.com/StatsforScience> and take notes
 - What is n ?
 - What is x ?
 - What is M ?
 - What was the range of the sample in his video?
 - Explain “degree of freedom” with any example and the formula for it is $n - 1$.
- Watch Bozeman: Standard Deviation <https://tinyurl.com/y6ffcvtv> and take notes
 - What is meant by normal distribution?
 - What does standard deviation (SD) measure?
 - Can 2 sets of data have the same mean but a different SD? Explain
 - Calculate the SD from the 2nd set of the data given by hand. SHOW YOUR WORK
- Watch Bozeman: Standard Error <https://tinyurl.com/y4ltazk3> and Kevin Piers: Standard Deviation and Standard Error of the mean <https://youtu.be/3UPYpOLeRJg>
 - From Bozeman: explain the significance of the standard error among two different sets of data with different sample sizes that have the same mean. (in terms of position)
 - From Piers:
 - what do SEM bars that have overlapping means on the graph indicate?
 - explain the significance if SEM bars overlap, but the means do not overlap.
 - explain that inefficiency if there is no overlap between SEM bars.

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5. Solve the following problems in pencil. You must show your work. All graphs have titles and are properly labeled with units.
- Graph the following sample data set showing the number of leaf disks that rise in a solution overtime as photosynthesis occurs.

Time (min)	Number of Disks Floating
1	0
2	0
3	0
4	0
5	0
6	0
7	1
8	1
9	1
10	2
11	5
12	8
13	10
14	14
15	14
16	15
17	20
18	20
19	20
20	18

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- b. Calculate the mean and standard deviation for the data set of annual monthly rainfall. Use the data to sketch the appropriate type of graph.

Month	Rainfall (cm)
January	2.0
February	1.8
March	1.2
April	5.7
May	6.2
June	5.9
July	1.0
August	1.1
September	1.1
October	2.3
November	2.7
December	2.5

- c. Below are two samples of data that were collected.

Sample A: 12, 13, 14, 15, 16, 17, 18

Sample B: 10, 15, 20

- i. Calculate the mean for sample A.
- ii. Calculate the mean for sample B.
- iii. Are the calculated means sufficient in explaining the data? Why or why not?
- iv. Calculate the SD for sample A.
- v. Calculate the SD for sample B.
- vi. Explain the significance of the results.
- vii. Calculate the SEM for sample A
- viii. Calculate the SEM for sample B
- ix. Graph the results, showing error bars for each.
- x. Do bars overlap?
- xi. Do means overlap?
- xii. Explain where there are "significant" differences between two population or not.