

## *AP Biology 2024 Summer Assignment*

Hello AP Biology students!

It is important to acknowledge that the Advanced Placement biology course you are about to begin is equivalent to an introductory college-level biology class. With this said, there is much to cover, and we will begin the year with a jump start. You will read “A Crack in Creation”, a bestseller, and a thought-provoking read. This book covers many topics we will discuss this year: evolution, disease, the immune system, enzymes, proteins, molecules, etc. We will also get a jump start on how we analyze data, using statistics. Read the guidelines for your summer assignment below carefully.

### **Assignment Overview:**

- Part one: Free write entries
- Part two: Edpuzzle Videos
- Part three: Graphing and Statistical Analysis Practice

Due September 10, 2024, at the start of class

### **Part one:**

Read “A Crack In Creation” by Jennifer A. Doudna

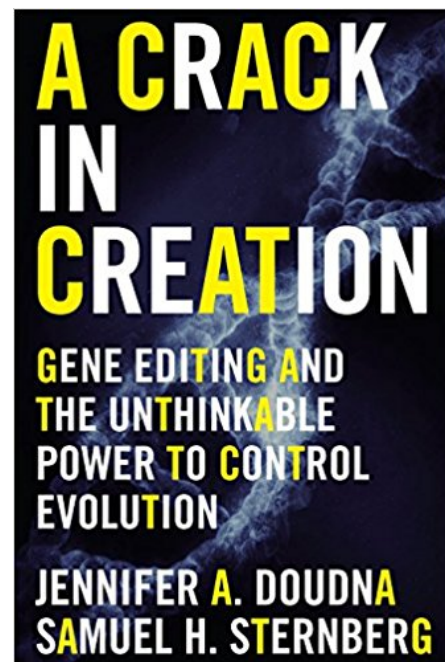
You may either purchase a copy or check out a copy at your local library. There are also copies available at the POB library and online. We will be reading the first part: the tool. You will also need a blank writing journal (or some loose leaf stapled together) for the reading assignment.

**What to write:** Instead of writing a traditional “book report”, you will write a collection of “free writes” as you read the book. **YOU ONLY NEED TO CREATE ENTRIES FOR PART ONE:** The tool (pages 1- 105, including the prologue). You are encouraged to read the remainder of the book, but will not be necessary for this assignment. You may have your journal close by and jot things down as you read. Or after every chapter, perhaps you set a timer for 15-20 minutes and write your thoughts and reflections on the whole chapter. All journal entries **MUST** be **HANDWRITTEN**. For every journal entry, please include the relevant chapter titles. The goal is to record your thoughtful reflection on the whole book. We will have a class discussion on the book, and you will turn in your completed journal on September 10th in class. It will be graded as your first lab activity.

**Important Note: No typed journals.** Sorry! We need to know that it is your work and your thinking. Research studies suggest handwriting (versus typing) helps you remember what you write and enables you to make stronger connections.

For each chapter, make sure to:

- Reflect on the big ideas/main points
- Include 1-2 interesting anecdotes (stories) the author uses to get a point across.
- Include your thoughts/reactions to what you read
- Include your own questions (at least FIVE for full credit) as they form in your mind while you read



Here are the guidelines that will determine your first grade in AP Biology.

“A Crack in Creation” Reading & Journal Scoring Rubric:

<b>Reading Journal</b>	
<p>Your journal is neatly handwritten (pictures/doodles are encouraged!)</p> <p>Your name and the book title appear on the first page of your journal (or on the outside cover).</p> <p>You have a chapter heading for each of the chapters.</p>	_____/ 15 pts
<p>You include the big ideas/main points from each chapter, as well as 1-2 anecdotes (a story about a real incident or a real person) used in the reading.</p>	_____/25 pts
<p>You have included a thoughtful reflection (what did you find interesting, gross, questionable, etc) for each chapter.</p> <p>You have included <b>AT LEAST FIVE</b> of your own questions for each chapter.</p>	_____/20 pts
	Total Points Possible for Reading Journal _____/60 pts
<b>Class Discussion</b>	
<p>You are actively listening and engaged during the discussion. You offer thoughtful questions and comments related to the reading. You encourage classmates to respond if they are quiet and haven't contributed much. You are respectful to each other.</p>	Total Points Possible for Discussion ____/40 pts

Total: \_\_\_\_\_/100 pts

**Part II:**

**Edpuzzle Videos**

Go to [edpuzzle.com](https://edpuzzle.com), log in and join a class. The class code is **jafemog**. When prompted for a nickname, please use your full (first and last) legal name. The videos to watch are listed below. Here's a link <https://edpuzzle.com/open/jafemog>

1. Bozeman- Beginners Guide To Graphing Data
2. Bozeman- Statistics for Science
3. Bozeman- Standard Deviation
4. Bozeman- Standard Error
5. Kevin Piers- Standard Deviation and Standard Error of the mean

*\*If additional review is needed, one good site is [www.mathisfun.com](http://www.mathisfun.com).*

**Solve the following problems IN PENCIL. You must show ALL WORK. Make sure graphs have Titles and are properly labeled WITH UNITS:**

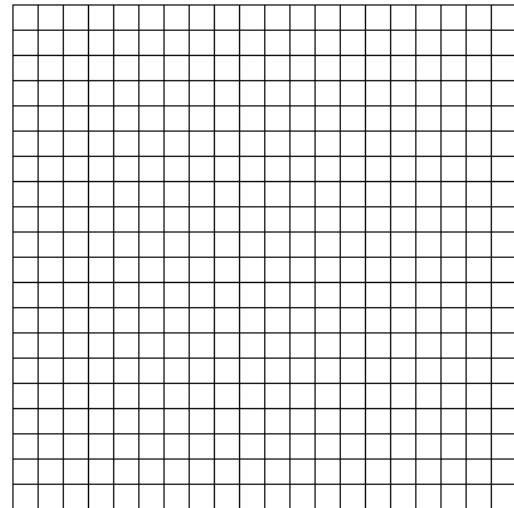
1. Two sets of plants were grown in two different conditions:

Sample A: Plants grown without music: 30cm, 32cm, 30cm, 40cm, 28cm

Sample B: Plants grown with music: 27cm, 30cm, 24cm, 35cm, 37cm

- a. Calculate the mean for Sample A \_\_\_\_\_
- b. Calculate the mean for Sample B \_\_\_\_\_
- c. Are the calculated means sufficient to explain the data? Why or why not? (*\*Be specific!*)

d. Calculate the Standard Deviation for both samples (*\*SHOW YOUR WORK*)



e. Standard Deviation for Sample A \_\_\_\_\_

f. Standard Deviation for Sample B \_\_\_\_\_

g. **Explain** the significance of the results.

h. Calculate the Standard Error of Mean for both samples (*\*SHOW YOUR WORK.*)

i. Standard Error of Mean for Sample A \_\_\_\_\_

j. Standard Error of Mean for Sample B \_\_\_\_\_

k. Graph your results, showing error bars (2x SE) for each.

l. Do the bars overlap?

m. Do the means overlap?

n. Explain whether or not there are 'significant' differences between the 2 populations.

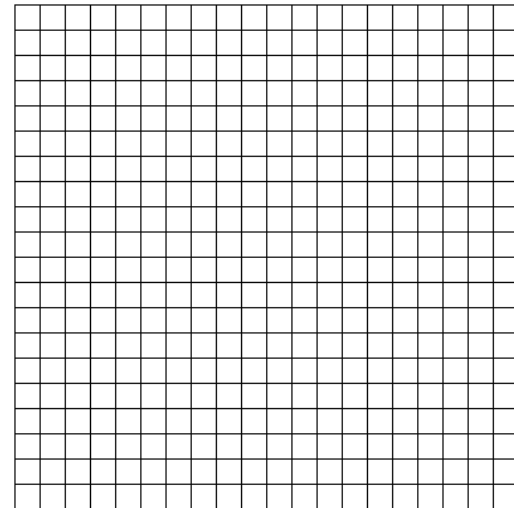
2. Below are 2 samples of data that were collected:  
Two sets of plants were grown in two different conditions:

Sample A: Plants grown with glucose: 10cm, 15cm, 22cm, 23cm, 30cm

Sample B: Plant growth without glucose: 5cm, 2cm, 1cm, 4cm, 6cm

- a. Calculate the mean for Sample A \_\_\_\_\_
- b. Calculate the mean for Sample B \_\_\_\_\_
- c. Are the calculated means sufficient to explain the data? Why or why not? (*\*Be specific!*)

d. Calculate the Standard Deviation for both samples (*\*SHOW YOUR WORK.*)



e. Standard Deviation for Sample A \_\_\_\_\_

f. Standard Deviation for Sample B \_\_\_\_\_

g. **Explain** the significance of the results.

h. Calculate the Standard Error of Mean for both samples (*\*SHOW YOUR WORK.*)

i. Standard Error of Mean for Sample A \_\_\_\_\_

j. Standard Error of Mean for Sample B \_\_\_\_\_

k. Graph your results, showing error bars (2x SE) for each.

l. Do the bars overlap?

m. Do the means overlap?

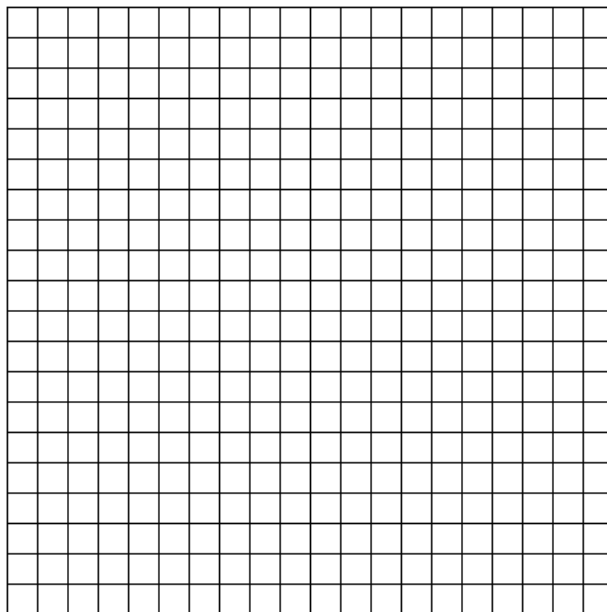
n. Explain whether or not there are 'significant' differences between the 2 populations.

3. A student noticed that the ivy leaves growing on the shady side of a building were larger than ivy leaves growing on the sunny side of the same building. The student collected and measured the maximum width, in centimeters, of 30 leaves from each habitat. Use statistical analysis to determine if it's likely that there is a significant difference in leaf size between the shady and sunny ivy plants with 95% confidence ( $\pm 2$  SE).

a. Graph the data and indicate error bars.

**Calculated Results (from collected data):**

	Shady Leaves	Sunny Leaves
Mean	7.43	5.88
Standard Deviation	1.63	1.32
<i>N</i>	30	30
Standard Error	0.30	0.24



b. Using the data given and constructed graph, justify the significance between the two samples.