



AP biology information packet 24-25



I am glad you have signed up for AP biology!!! I am sure you may have some questions about how the course will work, so I will attempt to address a few of them. Please feel free to contact me at home (859-258-9187) or by email (kjasper@lexingtonchristian.org) if you or your parents have further questions.

What books do I need?

1. **For the summer work, you will need Barron's AP biology 2022-2023 (PREMIUM with 5 practice tests) book. *This will need to be NEW because this is a recently released version* - but is easily accessed on Amazon and other sellers for \$20 or less.**

INFORMATION FOR BARRON's book:

Publisher : Barrons Educational Services; Premium edition (**February 1, 2022**)

ISBN-13 : 978-1506280363

This is the only textbook you will need for AP BIOLOGY.

What is the focus of AP biology?

This class is like taking a first year college biology majors class.

This course takes the concepts learned in general or Honors biology and covers them in a significant amount of detail. We will also attempt to link processes and systems to give you a big-picture understanding of the living world and the understanding of how to apply your knowledge. We will spend about 20% of the class in laboratory activities. Since this is a second year course for you, it is expected that some of the material will be a review, allowing us to move quickly to applying the information in lab context.

What are the summer assignments?

OK, so you maybe were NOT asking that question. Anyway, to get us started, here are a few things you need to do over the summer. All are due **THE FIRST MONDAY OF SCHOOL, August 19th.**

NOTE: If you have never had an AP class or haven't taken/didn't do well in Honors Biology, it would be wise to look over the assignments early to see if you feel the class is a good fit for you. If these assignments are difficult, the class is going to push you and maybe another class is a better fit.

SUMMER ASSIGNMENTS LIST (Best done in order)

1. AP BIOLOGY SCAVENGER HUNT – See page 2 (canvas turn in)
Create a powerpoint of pictures, with terms and definitions from the ecology unit
2. Graphing review exercises (I'll look at in class Monday 8/19)
3. Chp 3 in Barron's book – Water (I'll look at in class Monday 8/19)
Read the chapter in the book and complete all (10 MC and 3 FR) questions at the end of the chapter. Check your work and note any questions or issues you have.

I am looking forward to working with you this coming year. This class is a difficult challenge for both teacher and student, but we will have fun along the way. I have been praying this verse over the class as we embark on this exciting journey of learning more about the Lord through HIS creation. "Let the favor of the Lord our God be on us; establish for us the work of our hands – establish the work of our hands!" Psalm 90:17.

Blessings,

ASSIGNMENT ONE, SUMMER SCAVENGER HUNT

Part 1 – Below is a list of 50 biological terms and concepts related to the class. Locate **25 of those items** and have someone take a picture of you with the item, or take a selfie with the item. **Everyone must do #49 and 50 and it will be our way of getting to know each other day one.**

Stuffed versions of animals, fake plants and props are acceptable. However, you cannot use pictures printed from the internet in any way. **You must be in the photo or place your student id in the photo to get credit!**

1. Aquatic Ecosystem (Freshwater lake or stream) 2. Population 3. Autotrophic organism 4. Heterotroph organism 5. Organism that performs cellular respiration 6. Community (different populations in the same area) 7. Flower (describe why plants use them) 8. A C4 plant or CAM plant (define both) 9. An endotherm 10. An ectotherm 11. You eating/holding something with a low pH. 12. A parasite/parasitic relationship 13. A mutualistic relationship 14. A decomposer 15. Solid form of water 16. Herbivory or predation 17. A primary consumer 18. The ultimate source of all energy on Earth (hint: it's not on Earth). 19. A plant organ/structure that performs photosynthesis 20. surface tension in water 21. Something with a basic pH 22. Biome/Ecosystem 23. Biotic factor 24. Abiotic factor 25. a dominant genetic trait 26. a recessive genetic trait 27. symbiosis (an organism that is part of one) 28. invasive species	29. Genetically modified organism (or a labelled NON GMO product) 30. monoculture 31. a keystone species 32. an organism that has undergone artificial selection/hybridization 33. an organism that displays hybrid sterility 34. a simple Carbohydrate 35. a complex carbohydrate 36. a protein 37. a denatured protein (a high protein item that is cooked) 38. a lipid 39. a phospholipid (easiest – egg yolk) 40. (part of) the water cycle (ex. Precipitation) 41. a eukaryotic organism 42. a prokaryotic organism (or the product of one) 43. phototropism 44. melatonin 45. metabolic rate – pic of an organism that could have a high metabolic rate 46. cohesion/surface tension of water 47. evaporative cooling (something sweating) 48. a mixture of polar and nonpolar liquids 49. Something related to biology that you absolutely love and why. 50. Something related to biology that you absolutely hate (doesn't have to be a selfie) and why **everyone does these two
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Create a powerpoint presentation using the following format.

Slide 1: Your name and grade

Slide 2/3: The biologically relevant definitions or explanations of the terms or ideas you did not take a picture of.

Slides 3/4 through 28/29: Each slide should contain three (3) pieces of information, and be in the order listed below.

1. **The picture of you and the biology term.** If you just want a partial selfie that's fine too OR you can sit your school id in the picture. Do not simply copy and paste images you find online. You will not get credit for stock images

2. **The biologically relevant definition** of the term. You can use the glossary of your Barron's book or an online dictionary, just make sure the term relates to biology.

3. **The date and general location** of the picture.

Once you have completed the AP Biology Summer Scavenger Hunt and created your powerpoint, submit it on canvas.

Assignment 1, Part 2

For the items you did NOT photograph, create a word document with the biologically relevant definition for each term. This will be submitted on canvas separately.

ASSIGNMENT 2 -AP BIO GRAPHING AND DATA ANALYSIS PRACTICE

Read this first! Barron's book - pages 11 (null hypothesis) skip chi square, and then read p 13-18 on descriptive statistics. I will check the worksheets in class on Monday

Watch this second! Graphing <https://www.youtube.com/watch?v=9BkbYeTC6Mo>

1. Line graphs – Show change over _____ and Scatter plots show correlation of _____

FOR BOTH OF LINE GRAPHS AND SCATTER PLOTS

X axis is for the _____ variable

Y axis is for the _____ variable

3. Bar graph Comparing _____

4. Histogram - Distribution of _____

5. Pie Chart Parts of a _____

6. List 5 elements that all graphs should display

Read the following article

<https://www.biologyforlife.com/interpreting-error-bars.html>

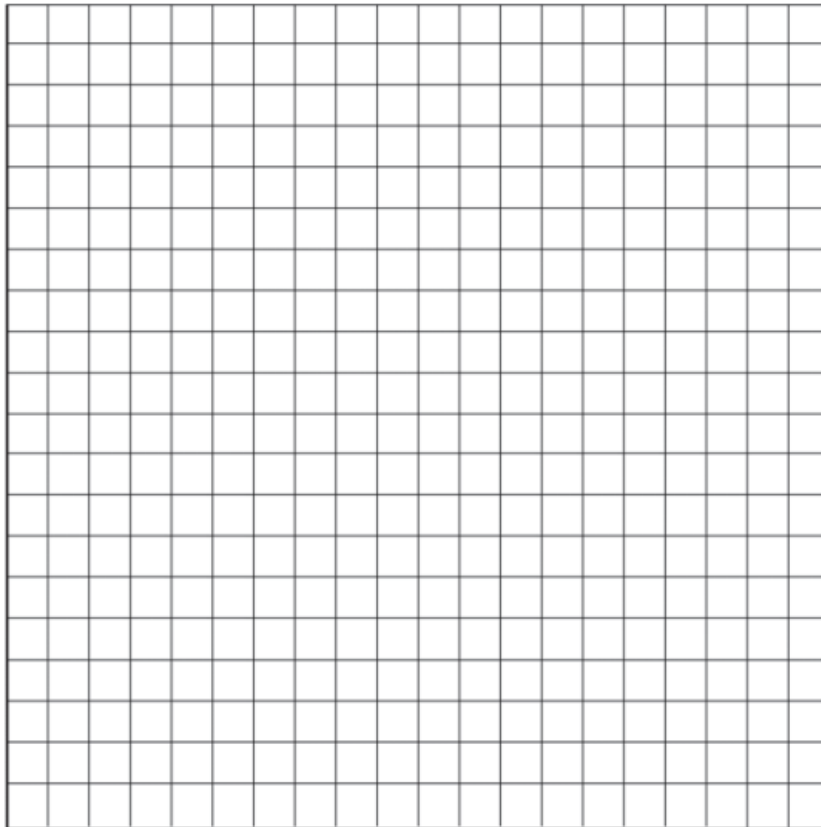
After watching the video and reading the article, answer the following practice AP Biology questions. You should answer in COMPLETE SENTENCES and label each part of the question (a, b, etc)

Question 1 – Use the graphing grid to answer part a, then write the rest of the answers on the following page

TABLE 1. EFFECT OF 0.1 mM CAFFEINE ON MEMORY IN BEES

Treatment	Memory (average probability of revisiting a nectar source $\pm 2SE_{\bar{x}}$)	
	10 Minutes	24 Hours
Control	0.72 \pm 0.09	0.41 \pm 0.07
Caffeine	0.83 \pm 0.07	0.78 \pm 0.08

1. In flowering plants, pollination is a process that leads to the fertilization of an egg and the production of seeds. Some flowers attract pollinators, such as bees, using visual and chemical cues. When a bee visits a flower, in addition to transferring pollen, the bee can take nectar from the flower and use it to make honey for the colony. Nectar contains sugar, but certain plants also produce caffeine in the nectar. Caffeine is a bitter-tasting compound that can be toxic to insects at high concentrations. To investigate the role of caffeine in nectar, a group of researchers studied the effect of 0.1 mM caffeine on bee behavior. The results of an experiment to test the effect of caffeine on bees' memory of a nectar source are shown in Table 1.



- (a) On the axes provided, **construct** an appropriately labeled graph to illustrate the effect of caffeine on the probability of bees revisiting a nectar source (memory).
- (b) Based on the results, **describe** the effect of caffeine on each of the following:
- Short-term (10 minute) memory of a nectar source
 - Long-term (24 hour) memory of a nectar source
- (c) **Design an experiment** using artificial flowers to investigate potential negative effects of increasing caffeine concentrations in nectar on the number of floral visits by bees. **Identify** the null hypothesis, an appropriate control treatment, and the predicted results that could be used to reject the null hypothesis.
- (d) Researchers found that nectar with caffeine tends to have a lower sugar content than nectar without caffeine. Plants use less energy to produce the caffeine in nectar than they do to produce the sugar in nectar. **Propose ONE benefit** to plants that produce nectar with caffeine and a lower sugar content. **Propose ONE cost** to bees that visit the flowers of plants that produce nectar with caffeine and a lower sugar content.

2018 AP[®] BIOLOGY FREE-RESPONSE QUESTIONS

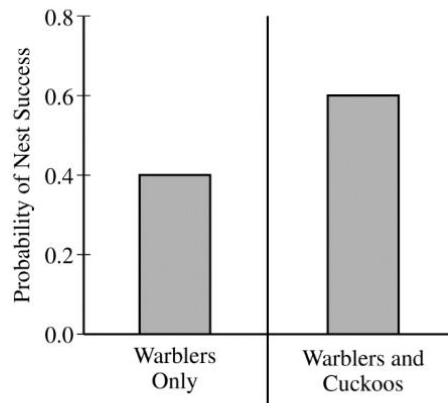


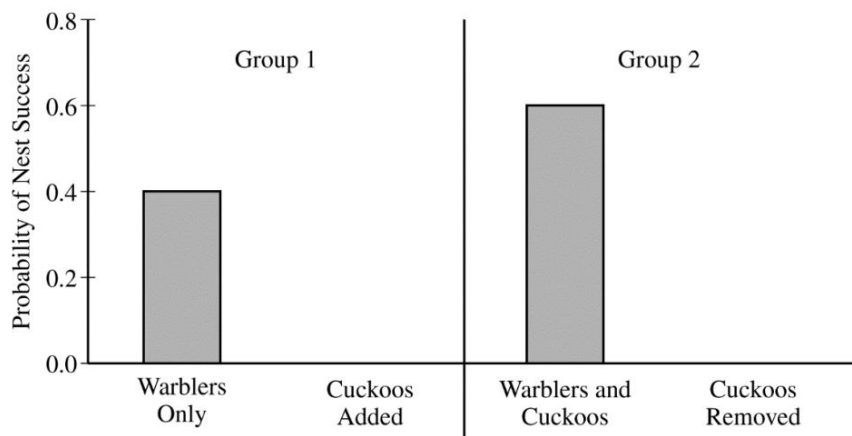
Figure 1. Probability of nest success in an environment with predators

5. Some birds, including great spotted cuckoos, lay their eggs in the nests of other birds, such as reed warblers. The warbler parents raise the unrelated chicks and provide them with food that would otherwise be given to their biological offspring. A researcher conducted an investigation to determine the type of relationship between warblers and cuckoos in an environment without predators. The researcher found that nests containing only warblers were more likely to be successful than nests containing warblers and cuckoos (data not shown). A successful nest is defined as a nest where at least one chick becomes an adult warbler.

In some geographic areas, several species of nest predators are present. Researchers have found that cuckoo chicks, while in the nest, produce a smelly substance that deters nest predators. The substance does not remain in the nest if cuckoo chicks are removed. Figure 1 shows the probability that nests containing only warblers or containing both warblers and cuckoos will be successful in an environment with predators. In a follow-up experiment, the researchers added cuckoos to a nest that contained only warblers (group 1) and removed cuckoos from a nest containing warblers and cuckoos (group 2).

- (a) **Describe** the symbiotic relationship that exists between the cuckoo and warbler in an environment without predators.
- (b) On the template provided, **draw** bars in the appropriate locations to predict the relative probability of success for the nest in the presence of predators where:
- the cuckoos were added to the nest containing only warblers (group 1)
 - the cuckoos were removed from the nest containing warblers and cuckoos (group 2)
- (c) **Identify** the symbiotic relationship that exists between the cuckoo and the warbler in the presence of predators.

Answer sheet (use graph template for part b)



ASSIGNMENT 3 – BARRON'S WATER CHAPTER

Read Barron's chapter 3 on water and answer the following questions/fill in the guided notes.

Water is a _____ molecule. This allows it to form _____ bonds between the molecules.

What is polar?

What is a covalent bond and what types of atoms does it form between?

Sketch a molecule of water, showing the polarity.

The book lists 5 properties of water. List them, and describe them in your own words.

What is pH and what does it measure?

Label the scale on the bottom with the following – pH values 0, 14 and 7, areas that are acid, basic and neutral (alkaline)

←-----→

If a substance has a H^+ concentration of 1×10^{-3} is it acidic or alkaline?

Define BUFFER:

Why do biological systems need buffers?

Use the space below to do the end of chapter questions in the Barron's book on pages 33-35.

Do all 10 multiple choice, and numbers 12 and 13 in the short answer. You should check your work at the end of the chapter and come to class prepared with any questions you had. These will be checked on the first Monday of class.