

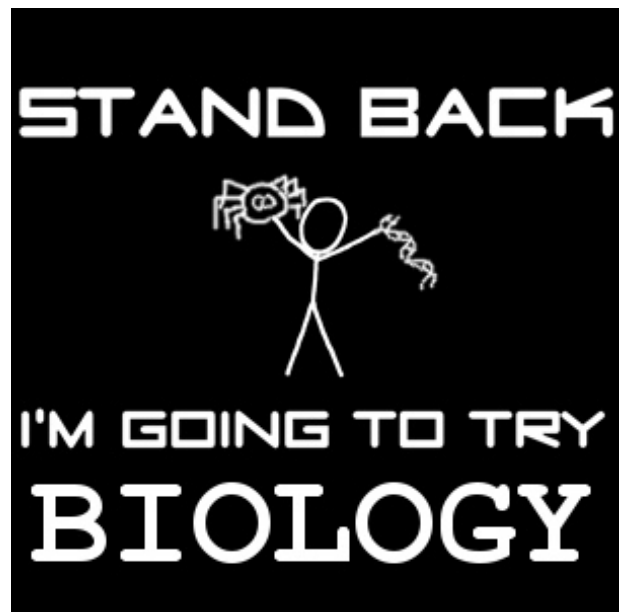
**Class of 2017**

**Summer Homework**

**AP/Honors Biology**

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*xkcd.com*

Hello future AP Biology scholars of Golder College Prep! Next year you will take the lessons you have learned in your chemistry and physical science classes, and apply them to the living world!

This summer homework assignment is designed to help your teacher learn more about your experience with science, and also introduce you to the core principles of your junior science class. Our class will focus on a few core principles that are addressed in the summer homework:

- 1) **Science is Human.** (400-800 words, about 45 minutes)
- 2) **Reflection and Growth.** (300-600 words, about 30-60 minutes)
- 3) **DOING Science – Part 1.** (400-600 words, about 30-60 minutes)
- 4) **Breaking Down New Vocabulary** (30-90 minutes)

**Format:** The summer homework can be submitted as a single, typewritten document, which is separated into sections for each of the three different parts.

**Length Requirement:** Use the word count guidelines for each section to determine if you have met the length requirement. If you are using Microsoft Word, you can highlight the section you are typing, then click “Tools” > “Word Count” to find out how many words you have written. You can also go to [wordcounter.net](http://wordcounter.net) online and paste the text in the box to find out how many words each section is.

### **Part 1 - Science is Human: An Autobiography (400-800 words, about 45 minutes)**

In our biology class, we are not just focused on learning how life works, but also learning how WE learn. The first part of your assignment will be a “Science Autobiography,” so I can learn a little bit about you, and how you feel about science.

Everyone comes to their science classes with a lot of baggage: not just pencils and paper, but the previous experiences they’ve had with science, both in and out of school. This part is your opportunity to think about those experiences and tell me something about them so I can get to know you and be a better teacher for you.

- Overall, how do you feel about science? Have you always felt that way, or were there specific experiences or moments that have given you that feeling? If the latter, what were they, and why were they important?
- What was your best experience in a science class? Thinking back on it, was your success primarily a result of your own efforts, of luck, or what? What about your worst experience (what was it, and why did it happen?)
- Describe one time when you were very successful outside of math or science/biology class—something you accomplished that you’re really proud of. Again, was your success primarily a result of your own efforts, of luck, or what?

- What is something you wouldn't expect me to know about you? This could be your favorite flavor of ice cream, the fact that you're a syndicated music reviewer, or that you never learned how to swim—but it should be something that I wouldn't know from seeing your name on a class list. This question is optional, but gives you a chance to tell me something about who you are outside our classroom.

An example of Ms. McDaniel's science autobiography can be read at :

<http://bit.ly/gcpbio-shauto>

**Part 2: Reflection and Growth (400-800 words, about 60-80 minutes, computer required)**

Research has shown that students who spend time “thinking about what they know” end up being more successful in college – they earn higher GPAs and are less likely to drop out. The skill of checking in on yourself – “do I really understand this?” – is crucial to being a successful learner, and one that many students do not have practice doing. Knowing when to say “IDK...Yet!” is the first step toward learning something new!

*IDK...Yet!* 

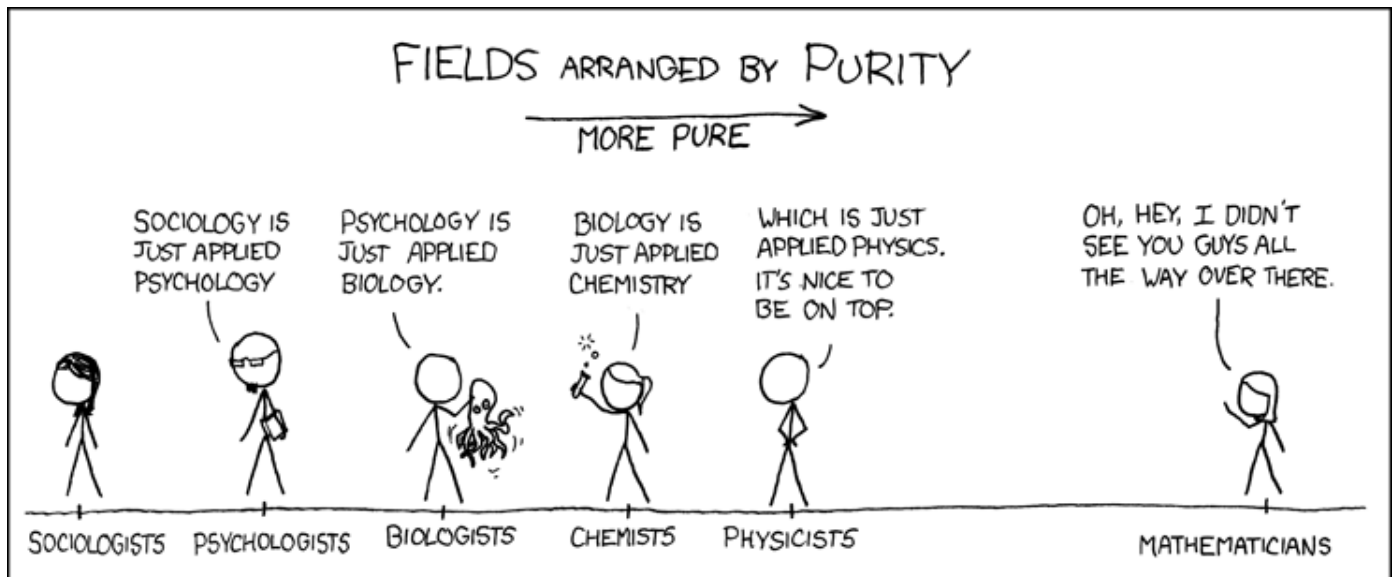
In our biology class, you will maintain a ‘reflective journal’, which you will use to track your own growth and development over the course of the class. As we learn new content and practice new skills, you will monitor your level of understanding and write entries in a journal.

Each link below will take you to a Reflective Journal entry written by a student. Both entries were written by students describing how they learned what it means to ‘control’ something in an experiment.

Read and compare the two entries, and answer the following questions. **Back every answer up with specific evidence and even quotes from the entries.**

- What are the main differences between the 2 students, in terms of their understanding?
- Which student do you think has a better understanding of ‘controlled variables,’ and how can you tell?
- Pretend that you are giving each of the two students advice on what to do next. What would you say to them, and what should they do? Give them specific advice on how to improve their reflection skills, and how to go about re-learning “controlled variables.”

Links to student reflections: <http://bit.ly/gcpbio-shreflection>



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**Well, purity isn't everything.**

**Part 3: Doing Science (400-600 words, 30-60 minutes, computer or phone required)**

*IDK...Yet!* 

Science is not just something you read about in a book – it is something you DO. Every day, we will be asking questions, investigating, and making arguments about the world. While it is important to learn about what other people have already found out, we will develop our own new questions, and hopefully by the end of the year you will learn something completely new. Maybe you will even uncover something that no one else in the world has ever known before.

The links below will take you to two Youtube videos, that tell the stories of groups of amateur scientists that are pursuing their own questions in the rainforest. All of their questions are connected to life in some way.

**For every question below, you must BACK up your claims with specific examples from the videos.**

- What behaviors or characteristics did you notice that all of the people in every movie had in common?
- How did you see “IDK...Yet” showing up in each video?
- Were the people in the movies ‘doing science’? How could you tell?
- How was the ‘research’ that the people in the videos did similar to work you’ve done in science class? How was it different?
- The attached list of “scientific values” describes behaviors and traits that people employ when they are thinking scientifically. What are specific examples where you see people in the videos embodying these values?
- Which of the scientific values resonates with you? How do you bring it into your life?

**Video 1:** <http://bit.ly/gcpbio-shvideo1>

Video 2: <http://bit.ly/gcpbio-shvideo2>



[undsci.berkeley.edu](http://undsci.berkeley.edu)

## Scientist's Code of Conduct – How to Behave Scientifically!

1. **Pay attention to what other people have already done.** Scientific knowledge is built over time. If you want to discover exciting new things, you need to know what people have already discovered before you. This means that scientists spend a lot of time studying their own fields.
2. **Expose your ideas to testing.** Try to describe and perform the tests that might suggest you are wrong and/or allow others to do so. This may seem like shooting yourself in the foot but is critical to the progress of science. Science aims to accurately understand the world, and if people shield their ideas, it's impossible to figure out if they are actually accurate!
3. **Bring in the evidence.** Evidence is the ultimate judge of an idea. Scientists are not free to ignore evidence. When faced with evidence that contradicts their idea, a scientist has a choice to make. They might wait for more experiments to draw a conclusion. They might conclude their idea is wrong. They might find another way

- to explain the contradicting evidence. But a scientist cannot allow themselves to push forward an idea that does not match evidence.
4. **Openly communicate ideas and tests to others.** Communication is important for many reasons. If a scientist keeps knowledge to her- or himself, others cannot build upon those ideas, double-check the work, or figure out new ways to test the ideas.
  5. **Play fair: Act with scientific integrity.** Hiding evidence, in full or in part, or faking evidence, flies in the face of science's main goal. We are working together to learn accurate knowledge about the natural world. Hence, maintaining high standards of honesty, integrity, and objectivity is critical to science.

#### **Part 4: Expanding Vocabularies (approximately 30-90 minutes)**

During our year together, you are going to learn a lot of new words. In fact, the average AP Biology textbook contains more new vocabulary words than the vocabulary in a foreign language textbook!

Fortunately, all the words will be derived from Greek and Latin, and follow predictable structures using prefixes and suffixes. We will be able to infer the meaning of most words by breaking them down.

Assignment: Use the following words on the following page to predict the definitions for the 38 words on the final page. Try not to use any other resources. This is an exercise to demonstrate the power of knowing word parts, not to be able to copy down the definition of words.

<b>Word Part</b>	<b>Meaning</b>	<b>Word Part</b>	<b>Meaning</b>
a- or an-	not or non	-kary-	cell nucleus
aero-	needing oxygen or air	-kinesis	movement, motion
amphi-	both, doubly	-lateral	side
anti-	against	-logy	study of
aqua-	water	lys-	break down
anthro-	man	mal-	bad, abnormal
arthro-	joint	macro-	large
auto-	self	meso-	middle
bi-	two, twice, double	-meter	measurement
bio-	life, living	micro-	small
carni-	meat, flesh	mono-	one, single
cephal-	head	-morph	form
chloro-	green	multi-	many
chromo-	color	mid- or meta-	middle, above
-cide	killer, kill, killing	omni-	all
contra-	against	pachy-	thick
crani-	skull	-ped	foot
cyto-	cell	-philia	like
derm-	skin	-phobia	dislike, fear
di-	two, double	photo-	light
eco-	house	-plasm	form
ecto- or exo-	outer, external	-pod	foot
endo-	internal	poly-	many
epi-	above	proto-	first
eu-	true, well	pseudo-	false
gastro-	stomach	-septic	infection
-genesis	origin, beginning	sub-	lesser, below
hemo-	blood	-sis	condition, state
herb-	plants	-synthesis	to make
hetero-	different	-therm	heat
homo-	alike, similar	tri-	three
hydro-	water	-troph	eat, consume
hyper-	above	uni-	one
hypo-	below	-vor	devour, eat
intra-	within, inside	-zoo or -zoa	animal
inter-	between	-zyg	joined together



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Use the list on the other side of the page to define each of the following terms:

1. Biology
2. Cytology
3. Protozoa
4. Epidermis
5. Hydrology
6. Cytoplasm
7. Abiotic
8. Dermatitis
9. Hypodermic
10. Hemophilia
11. Endocytosis
12. Insecticide
13. Anaerobic
14. Bilateral
15. Endotherm
16. Subspecies
17. Arthropod
18. Micrometer
19. Hypothermia
20. Bilateral
21. Autotroph
22. Photosynthesis
23. Pseudopod
24. Gastropod
25. Pachyderm
26. Biped
27. Cytokinesis
28. Unicellular
29. Craniometer
30. Homicide
31. Eukaryote
32. Zoology
33. Anthropoid
34. Biped
35. Ecology
36. Antiseptic
37. Omnivore
38. Lysis

