

Advanced Placement Biology (2015-2016) 'Honey' Guide

Instructor: Jason Logsdon



The following passage was excerpted from Robert Dunn's 'The Wild Life of Our Bodies' (p.186-187)

'The honeyguide lives in much of Africa, where it eats the wax, brood and eggs of honeybees. In this, it is relatively unique. Wax is indigestible to most animals. The honeyguide has been simultaneously blessed with the ability to eat wax and cursed with the dilemma of how to obtain it. Honeyguide beaks are too small to break into beehives. Humans have a different problem. We crave beehives for their honey. We are willing to do almost anything to get to the honey.'

The problem for humans, though, other than the stings (which we have learned to more or less avoid) is in finding hives. Together, honeyguides could find hives and humans could break them open, which could yield a sweeter life for both man and bird. So it was that over hundreds if not thousands or even hundreds of thousands of years, the honeyguide and East Africans came to realize each other's talents and to depend on one another, bird and human.

Many bird biologists have watched the interaction between the greater honeyguide (Indicator indicator, the name itself an indication of its story) and humans. A honeyguide, when it has found a hive, will come to the nearest house or person. There it will call, "tiya, tiya," flash the white of its tail, and fly toward whoever is lucky enough to look on. It will continue to do so until someone follows it to a hive. At the hive, it will call again and wait. With luck, the hive is low enough to climb to, whereupon the person, a gatherer of honey, finds a food that rewards his or her sweet taste buds and the honeyguide finds it taste a rewards its too. No other mammals are known to follow the honeyguide, and so every bit of its elaborate act seems to have evolved for us, that we might help it and it us to sate our respective taste buds.'

Birds? Bees? Honey... What does this have to do with AP Biology?

The essence of an advanced placement course is not a title, not even a list of collegiate topics, but a group of people who share some common goals. For most, these goals include success on the A.P. Biology exam. For some these goals also include a true interest to deeply explore and understand Biology. For all those desiring high marks (A or B), the goals must include a collegiate level of thinking and dedication. At its bare bones (anatomy pun intentional) this class is an examination of freshman-level college Biology material.

This material is something I've been through. This material is something I enjoy. This material is something I seek out... much like a honeyguide. As your instructor, I am the chief locator of the 'sweet stuff'. To include those two little letters (AP) in the title of our course, we must follow a path determined by the College Board based upon survey results of hundreds of collegiate professors. As much as I may like to entertain every little every pretty little flower or juicy grub along the way, I have a responsibility to the class, the school and your future institutions to see that you get fed on time. Aptitudes and interests will vary. Each member of our class starts off with different tastes. However, we agree on some intrinsic value to this honeypot and agree to seek it together. Like any long journey, it will be critical to your academic sanity to get along! **Study partners/groups are a must.** No one wants to get swarmed alone. Very few experiences are not enriched by sharing them with colleagues and friends. At the very least, you should get together once a week to organize your complaints/compliments to and about me!

Oh... and don't forget the Maasai proverb about failing to feed your honeyguide!



But I don't like honey.

Biology is inherently the most fascinating of all the science disciplines. As it is the study of *life* and all the living processes and interactions, it is impossible not to make personal connections to the material. You are after all alive... right?! A.P. Biology is particularly exciting because students enrolled *should* have the working knowledge of math, chemistry and physics necessary to really dissect (another intentional pun) the material in a way that is rigorous and relevant. I emphasize the “*should*” because we all arrive with slightly different experience and expectations. To some extent your prior knowledge and prior study habits will determine how comfortable of a ride you will have. Reading, writing and laboratory skills will play a large role in our class. Whether these are well established or fledgling skills for you, we will continue to hone, develop and nurture their development so as to prepare you for a collegiate learning environment.

Who is this flighty guy you're following?

While the College Board, the UCS superintendent, Eisenhower principals, counselors and previous teachers have done much work to establish our little wildlife preserve (Rm 229), I am ultimately the one flitting around to find you your just desserts. My name is Jason Logsdon and I have travelled this road before. During the 1993-1994 school year you would have found me exactly where you are now. A proud Eisenhower alumnus, I was able to use my A.P. Biology experience/score as a foundation for a wonderful science career at Michigan State University. Enrolled as a Biochemistry major, I spent my freshman year in a research lab, investigating the function of genetic variations in membrane bound proteins in *E. coli*. I then spent a summer living and studying at the world-renown Kellogg Biological Station. During my later years at MSU I was employed in researching the effect of multi-valence metals on the formation of organic thin films (*similar to the stuff that makes the screen on your iPod Touch*). During this time, at the suggestion of a group I had been tutoring through freshman sciences, I enrolled in the Teacher Education program (*U.S. News and World Report annually rates MSU's program top in the country*). I soon found teaching science to be as interesting and rewarding as researching science. In 1999 I graduated from Michigan State University with a teaching certificate and two Bachelor's degrees; one major/minoring in Chemistry/Biology and the other from the Lyman Briggs School (now Lyman Briggs College). I have since taught high school and junior high in Lapeer and Utica Schools with stops at Lapeer East, Malow, Stevenson and Eppler before finally returning home to Ike. In 2003 I earned a Master's degree in Multidisciplinary Science from Wayne State University. Along the way I managed to marry my high school sweetheart (*awww*) and father two wonderful kids.

How can you reach me (Mr. Logsdon)?

Room: 229 (feel free to drop by; if the door is closed, knock)

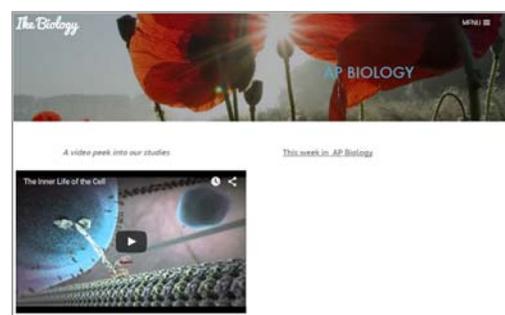
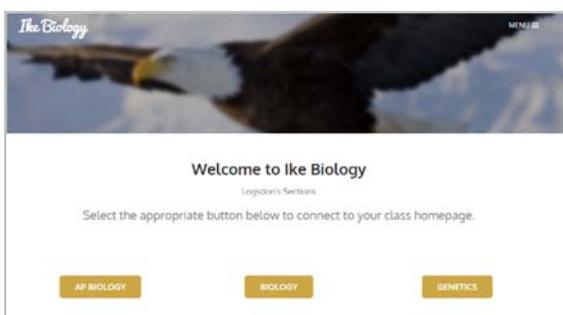
Phone: 797-1479 (there's voicemail there, but email is usually quicker)

Email: jason.logsdon@uticak12.org

How do you reach the course web site?

ikebio.weebly.com

This is the gateway site to a handful of others that we will use to supplement and guide our trek through the AP year. Some sites (like Blackboard) will be used for assessment and require secure log-in. Details for logging-in will be provided on our central weebly site or in a separate handout.

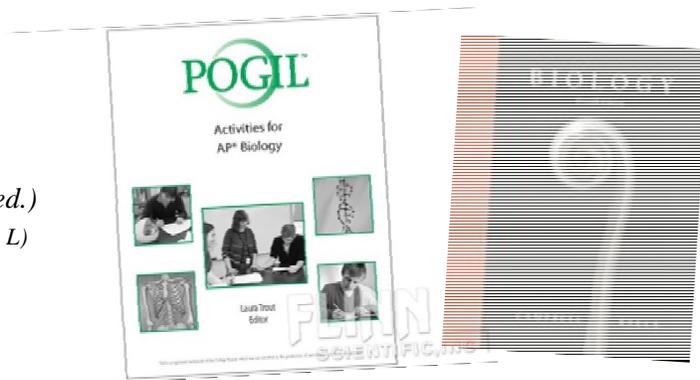


So why is this 'Guide' so long?

The more information shared with students, the more comfortable and in-control they are, and the better they learn. This packet contains lots of information. Besides telling you about the mechanics of the course, this packet tells you a lot about my teaching style. I used to provide my students with a separate "statement of teaching philosophy." It now occurs to me that it is weird to separate teaching philosophy from teaching materials. My teaching style, methods, and philosophy do evolve over time, thanks to students who tell me what does and doesn't work. I'm counting on you to give me lots of feedback about what is working for you and what is not, and most importantly *why*. It is very important to me to do a good job for you.

Which should you pack for the trip (materials)?

- Pen/pencil
- paper and/or a notebook
- colored pencils /highlighter(s)
- binder for POGIL packet (*which will be copied for you by Mr. L*)
- lab notebook
- school agenda
- text (*Campbell 7th ed.*)



How does this course work in terms of the day-to-day?

We will meet five times a week for this class and our meetings will consist of discussions of the readings and activities related to the topics we are investigating. Do the readings assigned for the day **before** you come to class and spend enough time thinking about the readings before class. You should come to class ready to summarize the readings and to ask and answer questions about them. Quizzes will often be given on the readings. Always give yourself plenty of time to do your work, and feel free to contact me whenever you need help or clarification. I enjoy teaching and often when you learn something new, I learn, too. Generally we will stick very closely to the following guidelines, however, the point of this class is for you to learn. If we need to change our scheduled plans to achieve that goal, we will do so within the confines of our race-to-May deadline. If you feel that you need things to be done somewhat differently in class for you to better learn, please let me know and I will work to adjust our schedule or classroom dynamics so that we can maximize learning.

OK, then, what is this course *about*? What's to be seen along this trip?

The short answer is Life. By Monday May 9, 2016 you will be able to discuss in detail the mechanisms and interactions that govern all life, from the simplest bacterium to the most complex mammal (*that'd be you*). As much as I'd like to take credit for, or divorce myself from, most of the course design, once again the responsibility falls mostly on the College Board. The following pages include a list of the topics and practices to be covered in every sanctioned A.P. Biology course, starting with 'E₂I₂'.

E 2 I 2

(Evolution, Energy, Information, Interaction)

Big Idea 1: The process of evolution drives the diversity and unity of life.

- Enduring understanding 1.A: Change in the *genetic makeup* of a population over time is evolution. **(4EKs)**
Enduring understanding 1.B: Organisms are linked by lines of *descent from common ancestry*. **(2EKs)**
Enduring understanding 1.C: Life *continues to evolve* within a changing environment. **(3EKs)**
Enduring understanding 1.D: The *origin of living systems* is explained by natural processes. **(2EKs)**



Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

- Enduring understanding 2.A: Growth, reproduction and maintenance of the organization of living systems *require free energy and matter*. **(3EKs)**
Enduring understanding 2.B: Growth, reproduction and dynamic homeostasis require that cells create and *maintain internal environments* that are different from their external environments. **(3EKs)**
Enduring understanding 2.C: Organisms use *feedback mechanisms* to regulate growth and reproduction, and to maintain dynamic homeostasis. **(2EKs)**
Enduring understanding 2.D: Growth and dynamic homeostasis of a biological system *are influenced by changes in the system's environment*. **(4EKs)**
Enduring understanding 2.E: Many biological processes involved in growth, reproduction and dynamic homeostasis include *temporal regulation and coordination*. **(3EKs)**



Big Idea 3: Living systems store, retrieve, transmit and respond to information essential to life processes.

- Enduring understanding 3.A: *Heritable information* provides for continuity of life. **(4EKs)**
Enduring understanding 3.B: *Expression of genetic information* involves *cellular and molecular Mechanisms*. **(2EKs)**
Enduring understanding 3.C: The *processing of genetic information* is *imperfect* and is a source of genetic *variation*. **(3EKs)**
Enduring understanding 3.D: Cells *communicate* by generating, transmitting and receiving *chemical signals*. **(4EKs)**
Enduring understanding 3.E: Transmission of information results in *changes* within and between biological systems. **(2EKs)**



Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

- Enduring understanding 4.A: *Interactions* within biological systems lead to *complex properties*. **(6EKs)**
Enduring understanding 4.B: *Both competition and cooperation* are important aspects of biological systems. **(4EKs)**
Enduring understanding 4.C: Naturally occurring *diversity* among and between components within biological systems affects interactions with the environment. **(4EKs)**

Science Practices for AP Biology

Science Practice 1:

The student can use representations and models to communicate scientific phenomena and solve scientific problems.

Science Practice 2:

The student can use mathematics appropriately.

Science Practice 3:

The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

Science Practice 4:

The student can plan and implement data collection strategies appropriate to a scientific question.

Science Practice 5:

The student can perform data analysis and evaluation of evidence.

Science Practice 6:

The student can work with scientific explanations and theories.

Science Practice 7:

The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains.





But I'm scared of bees!

If all of this makes you a bit anxious, well then thank you for paying close attention! If not, then we will soon be making a pit stop at the A.P. Biology diner where you may find yourself served a heaping slice of humble pie. There is a **LOT** of information to be covered and not nearly enough time. You will shoulder some of the work on your own, over weekends, weeknights and even breaks. I cannot stress enough that you must keep up with reading. I will offer 'Threshold Quizzes' that are meant to refresh your memory as to what you learned in Biology I. Keeping current on the reading will ensure strong grades on these quizzes (or indicate a lack of reading). Weekly reading, labs & analysis, writing practice and quizzes make for a packed schedule. Still... do not be overwhelmed! With a little time management and classmate camaraderie, you will find this course accessible and the skills you develop will pay dividends in all science courses to come.

I understand that the vast majority of A.P. students are quite grade conscious. It is by design that desired grades will be accessible. Your instruction will include some traditional mechanisms (i.e. homework, labs, tests & quizzes) and some less-frequented techniques (like Socratic circles and ancillary research/readings). These exercises are often class-driven and require participation. It is not only essential for you to be in-class as often as possible, but your voice needs to be heard! If you prefer not to speak-up, I feel your pain. However, now is as good a time as any to work through it. ***Our class depends upon active participants.*** How else will I know when to slow the bus? To this end, you will receive some form of participation grade.

Grading will be weighted to somewhat reflect the areas of emphasis highlighted by the College Board. For example, to be an A.P. class we must spend at least 25% of our time in lab (*in reality it will be much more*). Therefore, labs will be worth 30% of your grade. Tests and quizzes will comprise roughly 60% of your grade. Homework, class activities, readings and seminars will make up the remaining 10%.

Extra credit will appear from time to time within assignments and assessments. A few large scale extra credit assignments may be presented. Extra credit is just that... extra. I offer no 'instead-of' credit. I am very deliberate in my planning and issue only assignments that I feel will enhance your learning. If you skip one, you will not be allowed to substitute it with "instead-of" credit. In other words, extra credit is only for those with no missing assignments.

Teachers can use grades in two ways: they can use grades to "sort" students into "A" students, "B" students, etc.; or they can use grades as learning incentives and rewards. Unfortunately the first system generally sorts according to "talents" students already have or don't have before they ever reach a particular classroom (like being able to memorize and recall a lot of things). I would rather use grades to encourage students to develop their skills, to expand their understanding and evolve their thinking. Each student will get whatever grade she or he has earned by the end of the semester. Nothing would make me happier than if everyone worked hard, learned a lot, aced the A.P. exam and got A's.

Remember, if at any point you feel confused or distressed about your grades, please come and talk to me!

UCS Grading Scale:

100% – 94%	A	76% – 74%	C
93% – 90%	A-	73% – 70%	C-
89% – 87%	B+	69% – 67%	D+
86% – 84%	B	66% – 64%	D
83% – 80%	B-	63% – 60%	D-
79% – 77%	C+	59% and below	F

The correlation between attendance and performance is unmistakable. You must be in class, on time to succeed. Eisenhower's tardy (4-8-12) and absence policies are in effect. Absent work is the timely responsibility of the student. No late work will be accepted.

What else besides being in class will be required of you?

A common weekly standard in collegiate courses is 2 hours of study for every one hour spent in class. Our class may not to that that level of work each week, but it would not be extraordinary to spend between 4 and 8 hours on homework, reading, writing and analysis outside of the classroom. Though you may be set in your study ways, I once again must emphasize the benefits of study groups. At this point in your high school career the difference between active, engaged collaboration and mindless copying should be clear. Work with people who will challenge you and hold you to a high standard. As the A.P. test nears, it is also suggested that you make it to some of my after-school study sessions.

Citizenship is rarely an issue in our A.P. classes as long as everyone abides by the following 'Golden Rule':

No student shall act in a manner that keeps themselves, classmates or the instructor from learning.

Behaviors that violate this expectation will be dealt with on a case-by-case contextual basis. Failure to address behaviors in violation of this rule can result in administrative action. Not to nit-pick (an interesting ethnographic behavior), but to be absolutely clear...

UNAPPROVED USE OF CELL PHONES IN THE CLASSROOM is a violation of this expectation.

Take a deep breath. Stretch. Jog in-place (exercise is good for the brain). This year will be challenging. This year will be exhausting (at times)... but most of all, this year will be fun.

Welcome! I'm glad to have you in the course.

J. Logsdon

- I believe that every educated individual has had at least one teacher who has influenced his or her life for the better. Perhaps you've already encountered this teacher. I've been fortunate to have had and worked with a few such instructors, and each has shaped my perspective on teaching. The most profound influence, however, was a Lyman Briggs professor by the name of Dr. Alice Dreger. In an effort to maintain full disclosure (a staple of good science), I would like to note that my teaching philosophy repeats many of her themes, and I must cite Dr. Dreger's STS-492 syllabus (which I still have 16 years later).*