

Winnacunnet H.S.

I'm glad you signed up for AP Biology. I'm always willing to work with students who are willing to challenge themselves. We'll work hard but we'll make sure it's all worth it.

The body of knowledge and depth of understanding in biology is growing every year. The AP Biology Text is 1262 pages long. However, the amount of time we have to study it in AP Biology has not increased. We meet in August and our AP exam is in early May. Every AP Biology class across the country struggles to cover all the topics. But if I plan well, and you participate 100%, you'll be ready for the exam. More important than the exam however is your continued interest to learn all things scientific.

I have attempted to make learning more efficient through some use of what is called the "The Flipped Classroom" If you're not familiar, then you will be.

First Steps

- I have a new class management site that you'll need to join. It's an online program called Sophia. You'll need to join our group to participate in the class. Here's how you join:
 - Log on to https://www.sophia.org/user_sessions/new
 - Create an account (register)
 - enter the group code: **16a982**
 - click on "Groups". You'll see our group icon "AP Biology". You can click on it to enter our page.
- On the Sophia site you'll see your assignments listed in the order you should complete them. Watch the first video that is listed titled "The Flipped Classroom".
- We also have a 'Google Classroom' that you'll need to register for. I don't use this as often but it is a good way to post documents that you can use and share. To join the class download the "Google Classroom" app and click on 'join class'. our code is **jmm01tv**
- You may also check out the class website at <http://croteaubio.wordpress.com> I use this as a back-up to the SOPHIA site because it has all my course lectures organized. It's free for you to use it but after you graduate you'll have to pay just like all the others.

I'll need ways to communicate better. Here's what I need you to do.

- If you have a cell phone and can text you'll want to sign up for my occasional text messages from REMIND, and app that allows me to send group texts. If you don't do texting then don't worry. Enter this Number **81010**
Type this message: **@apbiology**

To give us a head start you have summer assignments. I've worked hard to make them as interactive and interesting as possible. I'm a firm believer in using vacation time to relax and do what you want and I hope you have plenty of time to do that. But all my students need to have specific knowledge when they

start AP Biology this Fall. The assignments are mandatory and you will get credit for this work. Follow the steps below

Summer Assignments: Your first test on the material covered in A - E material will be on the 4th day of classes.

A. The 4 "Big Ideas" of Biology. Understand what you're expected to know and be able to do.

- A. On the Sophia site, listed under Group Content is the item "Big Ideas in AP Biology"
- B. Scroll down and watch the video "AP Biology"
- C. Take the Quiz. You get 5 points for each right answer the first time you get it right. You must get at least 3 correct for a total of 15 pts. The pts go on your **permanent record***
- D. On the same site scroll down and read through the 12 Concepts of the Nature of Science.
- E. Choose one concept that *speaks* to you and discuss where you have experienced it in real life, write it in the "Question and Answers"

B. Scientific Literacy. What does it mean to be "Scientifically Literate"

- A. Log into Sophia (see instructions on page one)
- B. Click on "Groups" and choose "AP Biology"
- C. Listed under Group Content is the first item. Click on "Scientific Literacy"
- D. Scroll down and watch the video "AP Biology"
- E. Take the Quiz. You get points for right answers and you must get at least 3 correct. 5 points for getting the answer right the first time. Max points 15.

C. The Making of a Theory. What is a "Scientific Theory Worth?"

- A. Log into Sophia (see instructions on page one)
- B. Click on "Groups" and choose "AP Biology"
- C. Listed under Group Content is the first item. Click on "The Making of a Theory"
- D. A PDF document is on this page. Click on the icon of a page with a down arrow. Then print this page. A copy is also available in our Google Classroom where you can type on to the document without printing it. Read the background and use it to take notes on the video "The Making of a Theory"
- E. Back on the web page scroll down and watch the video "The Making of a Theory" and take notes on the page you printed
- F. Take the Quiz on that web page after watching the video

D. The Chemical Context of Life

- A. This should be a review of some of the most basic chemistry you've taken in the past so I hope it seems easy.
- B. Read chapter 2 and 3 of the Text. Ch 2 The Chemical Context of Life and Ch 3 Water and Life. Pages 30-56
- C. Complete the Activity Worksheets 2.1 and 3.1. Due on the first day of class.

Your first test on the material covered in A - E material will be on the 4th day of classes.

Recommended/Optional to help with the exams:

CliffsNotes AP Biology, Fourth Edition (Cliffs Ap Biology) [Paperback] by **Phillip E Pack**
Available from Amazon for

* Just kidding about the permanent record thing.

D. OPTIONAL Read "Your Inner Fish" by Neil Shubin.

You can read it this Summer or during the school year.

You'll find the question sheet attached to this page. If you want an electronic version you can also join our 'Google Classroom'. A pdf can be found on the Sophia site.

AP Biology Summer Reading Assignment



AP Biology Summer Assignment: Your Inner Fish

DIRECTIONS

1. Read *Your Inner Fish* by Neil Shubin, Vintage Books, Random House, New York, 2009 (ISBN 978-0-307-27745-9)
2. **All students** will answer the Overview questions. Please site specific information in the book in answering each statement. I expect that each answer will require about a page, single-spaced, typed. This will be worth 100 points (test grade) and is due the first day of class.
3. The discussion questions for the chapters listed below may be answered for an **optional** grade equivalent to 10 point Lab assignment.
4. **Each student** will be assigned at least one chapter. The student will lead a discussion of the chapter using the questions below or other questions that the student finds relevant to the material. The student needs to have 4-6 PowerPoint slides prepared to enhance their discussion points. These should be original and focused on diagrams and pictures with minimal bullet points. At www.neilshubin.com you will find PowerPoint slides that can help you construct your original slides. Please use proper citations. This is due the first day of classes. 5% per class day for an assignment that is late. Discussions will be a maximum of 10 minutes per chapter.

Rubric for Discussion:

category	5pt excellent	4pt Very good	3 pts fair	0-2 Poor/missing
PP slides- information				
PP slides- visual				
PP slides – added to discussion				
PP slides - citations				
Quality of questions				
Preparedness and timing				
Engaging other students				
Participating in all presentations				
total				

DISCUSSION QUESTIONS

Overview questions (Keep these in mind as you are reading the book) Be complete with your answers and use examples. Write in full sentences and your answers should be about ½ a page double spaced.

1. Why should we care about evolution? Why is it important?
2. What does it mean to be human? Did your concept change after reading the book?
3. In what way do scientific explanations differ from other ways of knowing? What makes evolutionary biology a science?
4. What insights do we gain when we integrate molecular and fossil data?
5. Can we look to examples in the natural world to inform our conceptions of what is "normal" or ethical human behavior?

OPTIONAL QUESTIONS: Write your answers in complete sentences. These do not have to be long answers and most can be answered in just a couple of sentences.

A Microsoft Word version of this document is available on our web page at <http://croteaubio.wordpress.com/ap-bio-tutorials/your-inner-fish-book-questions/>

DIRECTIONS

- Read *Your Inner Fish* by Neil Shubin, Vintage Books, Random House, New York, 2009 (ISBN 978-0-307-27745-9).

DISCUSSION QUESTIONS

Chapter 1 - Finding Your Inner Fish

1. Explain why the author and his colleagues chose to focus on 375 million year old rocks in their search for fossils. Be sure to include the types of rocks and their location during their paleontology work in 2004.
2. Describe the fossil Tiktaalik. Why does this fossil confirm a major prediction of paleontology?
3. Explain why Neil Shubin thinks Tiktaalik says something about our own bodies? (in other words – why the Inner Fish title for the book?)

Chapter 2 - Getting a Grip

1. Describe the “pattern” to the skeleton of the human arm that was discovered by Sir Richard Owen in the mid-1800s. Relate this pattern to his idea of exceptional similarities.
2. How did Charles Darwin’s theory explain these similarities that were observed by Owen?
3. What did further examination of Tiktaalik’s fins reveal about the creature and its’ lifestyle?

Chapter 3 - Handy Genes

1. Many experiments were conducted during the 1950s and 1960s with chick embryos and they showed that two patches of tissue essentially controlled the development of the pattern of bones inside limbs. Describe at least one of these experiments and explain the significance of the findings.
2. Describe the hedgehog gene using several animal examples. Be sure to explain its’ function and its’ region of activity in the body.

Chapter 4 - Teeth Everywhere

1. Teeth make great fossils - why are they “as hard as rocks?” What are conodonts?
2. Shubin writes that “we would never have scales, feathers, and breasts if we didn’t have teeth in the first place.” (p. 79) Explain what he means by this statement.

Chapter 5 - Getting Ahead

1. Why are the trigeminal and facial cranial nerves both complicated and strange in the human body?
2. List the structures that are formed from the four embryonic arches (gill arches) during human development.
3. What are Hox genes and why are they so important?
4. Amphioxus is a small invertebrate yet is an important specimen for study – why? Be sure to include characteristics that you share with this critter!

Chapter 6 - The Best Laid (Body) Plans

1. Early embryonic experiments in the 1800s led to the discovery of three germ layers. List their names and the organs that form from each.
2. Describe the blastocyst stage in embryonic development.
3. What is meant by “ontogeny recapitulates phylogeny?”
4. What type of gene is Noggin and what is its function in bodies?
5. Sea anemones have radial symmetry while humans have bilateral symmetry but they still have “similar” body plans – explain...

Chapter 7 - Adventures in Bodybuilding

1. Refer to the timeline on p.121 in Your Inner Fish – what is most surprising to you about the timescale? Explain your choice.
2. What is the most common protein found in the human body? Name it and describe it.
3. Explain how cells “stick” to one another; give at least one example.
4. How do cells (generally) communicate with one another?
5. What are choanoflagellates and why have they been studied by biologists?
6. What are some of the reasons that “bodies” might have developed in the first place? Include any environmental conditions that might have favored their evolution.

Chapter 8 - Making Scents

1. Briefly explain how we perceive a smell.
2. Jawless fish have a very few number of odor genes while mammals have a much larger number. Why does this make sense and how is it possible?

Chapter 9 - Vision

1. Humans and Old World monkeys have similar vision – explain the similarity and reasons for it.
2. What do eyeless and Pax 6 genes do and where can they be found?

Chapter 10 - Ears

1. List the three parts of the ear; what part of the ear is unique to mammals?
2. An early anatomist proposed the hypothesis that parts of the ears of mammals are the same thing as parts of the jaws of reptiles. Explain any fossil evidence that supports this idea.
3. What is the function of the Pax 2 gene?

Chapter 11 - The Meaning of It All

1. What is Shubin’s biological “law of everything” and why is it so important?
2. What is the author trying to show with his “Bozo” example?
3. This chapter includes many examples of disease that show how humans are products of a lengthy and convoluted evolutionary history. Choose three (3) of the problems listed below and briefly explain how ancient ancestors’ traits still “haunt” us:
 - Obesity
 - Heart disease
 - Hemorrhoids
 - Sleep apnea
 - Hiccups
 - Hernias
 - Mitochondrial diseases

Afterward (new findings re: Tiktaalik)

1. Tiktaalik was a fish that lacked an operculum – what does this tell us about the animal?
2. Tiktaalik had a true neck – what did this allow the animal to do (advantages?)
3. How was Tiktaalik able to survive in the cold Arctic environment?