



Teaching Learning Succeeding

Subject: AP Biology

Grade Level: High School

DI Strategy: Learning Choices

### AP Biology End of the Year Learning Choices Lesson

This is the End of the Year Project for my AP Biology classes. I wanted to give them the opportunity to complete a project that would allow them to focus on an area of Biology that is of interest to them. I wanted them to be able to delve deeper into their topic of interest and present their learning in a way that best suited their needs and interests. The response from the students was very positive. Students were excited to pick their projects and topics. They mentioned how much they liked the ability to choose their own project and kept coming up with more ways to enhance their project.

Students were allowed to choose between the projects listed below and were able to complete any combination they wanted, as long as the total number of points added up to 50 points. Based on their performance throughout the school year, I did direct some students to projects I thought would benefit them more than others. I also used this knowledge when helping student pick their science book or topic.



## AP Biology End of the Year Project

***Congratulations, you have conquered the AP Exam***, and now it is time to get started on your final project. You will choose from the list of projects below to complete an “End of the Year” project that adds up to 50 points.

You may choose to complete the 50 point option, two of the 25 point options, or a 25, 15, and two 5 point options. All projects will be completed individually.

### **Due Date:**

### **50 point option:**

- Science book review and trailer
  - You will choose a nonfiction science book to read (see possible books on last page)
  - Create a list of guided reading questions (minimum 10 questions per chapter) to go along with each chapter (include an answer key)
  - Write a book summary/review.
    - Summary of the book
    - Whether or not this is a book you would recommend having future AP Biology students read and why/why not.
    - How does this book connect to the content we learned in class this year (at least 3 connections)? Be sure to explain the connections thoroughly.
    - Minimum 1 page
  - Create a book trailer/online poster to sell the book to future readers.
    - Use iMovie, Photostory, Prezi, MovieMaker, WeVideo, YouTube Photo Slideshow, or other tools
    - The trailer should include an explanation of what the book is about and its connections to the biology curriculum.
    - Make sure anyone looking at/watching the trailer will learn what the book is about without giving away the entire story.
    - Make sure the trailer will excite readers about the book.

### **25 point options:**

- Multimedia Review Resource
  - Create a video-based review resource for future AP students to use
  - Pick one chapter/topic to focus on
  - Make sure all content provided is accurate and detailed enough to be used by future students
    - Suggestion: have someone else look over your content to make sure it is correct
  - Make sure you have no spelling errors if text is used



- o Format options:
  - Whiteboard (ASAP science model)
  - Talk show format
  - Hank Green (Crash Course) style
  - Bozeman Science style
  - Skit
  - Music video
- o This is the only option that may be done as a group. No more than 3 AP Biology students may earn credit for your video, but more may make an appearance.
- Children's Book
  - o Choose a science topic that would be appropriate for elementary aged students and create a children's book
    - It can also be a scientist's biography
    - Include the grade level(s) of your target audience on the front or back cover of the book
  - o Come up with a creative title
  - o Your book needs to include both words and illustrations
    - Illustrations may include drawings, paint, crayons, computer generated, etc. You may not cut and paste graphics from other sources. They must be your own creation.
    - Make sure that all text is large enough for the reader to see easily
    - All hand-written text must be legible
  - o Make sure that all humor and vocabulary is appropriate for the age group you select
  - o Minimum 15 pages and 400 words
  - o Make sure you have no spelling errors
- AP Biology or Anatomy Manipulative Activity
  - o Create an activity that can be used in AP Biology, Anatomy, or both that will allow students to learn the process using a hands-on approach
    - Remember the Cell Signaling Play-doh models you made or the Muscle Contraction or Action Potential activities if you take/took Anatomy?
  - o You will need to make enough pieces (made out of cardstock, construction paper, or foam) to be used by 8 lab groups
  - o Topic ideas: Mitosis & Meiosis, Photosynthesis, Cellular Respiration, Immune System, Blood Typing, Signal Transduction, or any other you can think of
  - o In addition to the pieces, any instructions on using the activity should also be included



- Course Overview to Future Students
  - Create a multimedia presentation for future AP Biology students (can use PowerPoint, Prezi, or create a video).
  - Topics to include:
    - Topics covered in the course (this should be the most detailed section of your project)
      - Big Ideas, Science Practices
      - For each Big Idea, include the topics/chapters covered and the most important information to learn for each section
      - Provide essential questions for each section to help student determine if they have mastered the content
        - Example Question: Can you describe several sources of evidence from multiple scientific disciplines that support biological evolution?
    - Guide to studying for class tests and the AP exam
    - Tips for managing their time
    - Tips for taking the AP exam
    - What have you learned about yourself while taking this course
    - Skills you have developed from taking this course
    - What you wish you had known before taking the course
    - Advice to future students
    - Things to know about your teacher (how to get/stay on her good side; pet peeves)
- Research Proposal
  - Title: This should provide a specific summary of the proposed work
  - Abstract (one paragraph): This is a brief description of the hypothesis and the goals of the experiment. It should indicate what questions you, as a researcher, will be seeking to answer. An abstract provides a summary that allows readers to quickly assess the basic premise of your proposal.
  - Introduction and Literature Review: This will be the longest part of your assignment. Explain the basics of your research topic and then go into more detail about your specific question. Provide background knowledge for your reader on the topic you have chosen. What is currently known about your research question? How will your research be different from what has already been done? Make sure you cite all sources that you use to create this section.
  - Research Hypothesis: What is the hypothesis that you are testing? What are the questions that you seek to answer? Based on what is known in this field, explain what you expect to see and hope to show through your results. This is where you share your thoughts.



- o Material and Methods: Describe your proposed experiment in depth. What processes are you going to use? What will the steps of your experiment be? What kind of equipment and supplies will be necessary for the project? What will you use for a control, and what will be your experimental group?
- o Conclusion and Justification: Your literature review will have already helped to lead the reader to an understanding of why your topic is of importance. This is where you will explicitly state how your proposed research will advance knowledge. What are the far-reaching effects? Will your study potentially change practices or policies? Why is it that your research deserves funding?
- o Bibliography

**15 point options:**

- Science Career Research
  - o Choose a science career (be as specific as possible) that you are considering
  - o Create a detailed inventory of the requirements for that career:
    - College degree options
    - Courses you need to take in college
    - Does it require graduate level schooling? If so, how much and what types of classes?
    - Do you have to take any tests/exams to be qualified for this career?
  - o Salary
  - o Can you find a job in this field anywhere in the country? Or only certain areas?
  - o What would a normal day look like for this career?
  - o All work should be in your own words. Do NOT simply copy and paste from your resources.
- Edpuzzle Review Videos
  - o Choose 3 AP Biology related videos and add review questions using Edpuzzle.
  - o Any videos that are not Bozeman Science or Crashcourse must be preapproved by me.
  - o You must include a minimum of 8 questions in your video and you must have at least one multiple choice and one free response question.
  - o Also include a typed answer key for all of your questions.



### 5 point options:

- Science Article Review
  - Find a minimum 1 page science article
  - Write a minimum 1 page review of the article and connect it to topics we learned in class this year.
  - Write at least 5 guiding questions (these should be higher-level questions) for students to answer. (Include an answer key)
  - Include a link to the article if found online. Include a copy of the article if it is in print.
  
- TED Talk Review
  - Find a TED Talk related to science and watch it (must be at least 10 minutes)
  - Write a 1 page review of the Talk and how it connects to topics we learned in class this year.
  - Write at least 5 guiding questions (these should be higher-level questions) for students to answer. (Include an answer key)
  - Include the name of your TED Talk and a link
  
- You-Tube Videos
  - Find 5 school appropriate YouTube videos that could be used in class or as out-of-class review for students.
    - Please look at my video links on Fusion before choosing a video. You may not use a video that I already have posted on Fusion, Google Classroom, or Edpuzzle
  - Supply a link to the video and which chapter/topic it would be shown with
  - Include a brief summary of the video and how it connects to the topic(s) covered in class.

You may propose another project idea. You must provide a list of project requirements and a proposed point value for your proposed project. I have the final say on all project proposals.

**Book List** (if there is a book you are interested in reading that is not on the list, let me know):

(\*\*\*) denotes books you may borrow from me – first comes, first serve

*Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body* – Neil Shubin  
(\*\*\*)

*Survival of the Sickest* – Sharon Moalem (\*\*\*)



*Inheritance: How Our Genes Change Our Lives and Our Lives Change Our Genes* – Sharon Moalem

*The Emperor of All Maladies* – Siddhartha Mukherjee

*The Immortal Life of Henrietta Lacks* – Rebecca Skloot (\*\*\*)

*The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution* – Sean Carroll

*Remarkable Creatures: Epic Adventures in the Search for the Origins of Species* – Sean Carroll

*When a Gene Makes You Smell Like a Fish and Other Amazing Tales about the Genes in Your Body* – Lisa Seachrist Chiu

*At the Water's Edge: Fish with Fingers, Whales with Legs, and How Life Came Ashore by Then Went Back to the Sea* – Carl Zimmer

*The Ghost Map* – Steven Johnson

*The Great Influenza* – John M. Barry

*Microbe Hunters* – Paul de Kruif

*The World Without Us* – Alan Weisman

*Brilliant Blunders: From Darwin to Einstein* – Mario Livio

*Zoobiquity: The Astonishing Connection Between Human and Animal Health* – Barbara Natterson-Horowitz, M.D. and Kathryn Bowers (\*\*\*)

*The Sixth Extinction: Patterns of Life and the Future of Mankind* – Richard Leakey and Roger Lewin (\*\*\*)

*Stiff: The Curious Lives of Human Cadavers* – Mary Roach (\*\*\*)

*Gulp: Adventures of the Alimentary Canal* – Mary Roach (\*\*\*)

*Time, Love, Memory: A Great Biologist and His Quest for the Origins of Behavior* – Jonathan Weiner (\*\*\*)

*Microcosm: E. coli and the New Science of Life* – Carl Zimmer (\*\*\*)

*Why We Get Sick: The New Science of Darwinian Medicine* – Randolph M. Nesse M.D. and George C. Williams Ph.D. (\*\*\*)

*The Beak of the Finch* – Jonathan Weiner (\*\*\*)

*Smoke Gets in Your Eyes: And Other Lessons from the Crematory* – Caitlin Doughty (\*\*\*)

*The Universe Within: The Deep History of the Human Body* – Neil Shubin (\*\*\*)



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*Life: A Natural History of the First Four Billion Years of Life on Earth* – Richard Fortey (\*\*\*)

*Science Matters: Achieving Scientific Literacy: From Plate Tectonics to Leptons to the First Living Cell, Now You Can Understand the Simple Science Behind Our Complex World* – Robert M. Hazen and James Trefil (\*\*\*)

*The Language of Genes: Solving the Mysteries of Our Genetic Past, Present, and Future* – Steve Jones (\*\*\*)

*The Story of the Human Body: Evolution, Health, and Disease* – Daniel E. Lieberman (\*\*\*)