AP Biology

"And I, God, said unto mine Only Begotten, which was with me from the beginning: Let us make man in our image, after our likeness; and it was so. And I, God, said: Let them have dominion over the fishes of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth." – Moses 2: 26

Course Description

The theme for this course comes from Moses 2:26 in which gives us purpose and perspective for studying the creations of our Heavenly Father. In this scripture, we are given the specific instruction to have "*dominion over the fishes of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth."* We have a great responsibility, and in order to fulfill that responsibility, we must be willing to understand the way in which life works. This course orients students to make informed and wise decisions regarding the impacts—both environmental impacts and social impacts—of modern biological science and related policy issues.

This course is designed to mirror the classroom experience using the Principal Approach®[1] method of Research, Reason, Relate and Record, which is the methodology of American Heritage School. The Seven Principles of American Christian Education®[2] will also be emphasized. Students are expected to be self-governed and recognize that "conscience is the most sacred of all property" as they are honest in recording the completion of their assignments and recording insights in their notebooks as well as submitting their work.

AP Biology is designed to be equivalent to a two semester college level introductory biology course with a lab component. After showing mastery on the AP Exam, some students, in their first year of college, are permitted to take upper-level courses in biology or register for courses for which introductory biology is a prerequisite. The AP Biology course is designed to give students the same type of coursework and lab experience as first year college students, as well as cover the major themes and topics studied therein. The type of work and discussion will vary greatly from a regular high school biology class with respect to the depth of topics covered, and the time and effort required of students.

Course Objectives

Students will demonstrate their mastery of the curriculum through the following tasks:

1) Demonstrate comprehension of the course material through 10 multiple choice tests, 50 points each.

2) Demonstrate concept mastery by completing 40 AP test-style free-response essays questions, each to be written in a 30 minute time frame.
3) Complete 14 online biology labs fulfilling the laboratory requirement of the course.
4) Create a "key terms" notebook wherein major themes of each topic will be defined and identified.
5) Use the 4-R methodology (research, reason, relate, and record) through two word studies.
6) Demonstrate reasoning, relating, and recording skills through short answer assignments and review questions.
7) Summarize in writing and discuss lessons learned after each topic covered.

Course Format

American Heritage School offers AP Biology in three formats: On-Campus, Independent Study (Distance Education), or Consulted (Distance Education).

On-Campus Course. Students currently enrolled at American Heritage School in American Fork, Utah experience live course interactions with teachers, students, and laboratory tasks in a traditional classroom setting and laboratory setting. Lab exercises will be conducted by students or teachers in class.

Independent Study Course. Students collaborate in online discussions with a class cohort of students and the instructor. Discussion questions will be posted and students will be required to participate and respond with insightful responses. Live tutorial sessions will be held on a periodic basis in which students will be invited to participate and be able to receive immediate feedback from the instructor as well as individual instruction. Students will also have American Heritage School's copyrighted online or print curricula (materials that are not licensed to share or re-sell) and AP Biology WebLabs®3. Assignments will include computer and instructor feedback.

Consulted Course. Students explore curricular materials and pre-recorded lectures at their own pace. Students are strongly encouraged to meet online with the instructor for 20-minute, one-on-one, individual, weekly consulting sessions to review written assignments and discuss other questions or topics relating to the curriculum. These will be encouraged, but not strictly required. Students also have access to American Heritage School's curricula (material that are not licensed to share or re-sell). Students receive teacher-graded assignments and computer-generated feedback in the course.

Independent Study and Consulted Courses are designed to be completed in a 36 week period. It is expected that students use the time frame as a general guideline in order to complete the course in the expected 36 weeks. Students planning on taking the AP Exam may have to adjust the amount of time spent on each unit in order to complete the course before the administration of the official exam. For most units, students should

be completing assignments for 2 units per week. Embedded in the schedule is 1 week for review and study before taking the final exam for each semester.

AP Biology WebLabs®3 offers a series of virtual, interactive, inquiry-based biology simulations and exercises designed for AP Biology high school students. The laboratory portion of the course is designed to give students a simulated laboratory experience which will be tested on the AP Biology test. Times to complete the labs may vary.

Course Texts

Students are required to obtain the following study material for use throughout the course:

Required Texts:
Biology, 8th Edition, Campbell & Reece (ISBN-13: 978-0-8053-6777-5), $119.00
AP Biology Weblabs: http://www.ucopenaccess.org
LabBench Activities (Pearson): http://phschool.com/science/biology_place/labbench/
LDS Scriptures (King James Version Bible, Book of Mormon, Doctrine & Covenants, and Pearl of Great Price)

Recommended Text:
Cracking the AP Biology Exam 2011 – Princeton Review (ISBN13: 9780375429965)

Course Assignments

There are eight major themes of biology which include Science as a Process, Evolution, Energy Transfer, Continuity and Change, Relationship of Structure to Function, Regulation, Interdependence in Nature and Science, Technology and Society. These themes have been identified as the overarching features that recur, connect, and unify our understanding of the topics. Each of the major themes of biology will be covered throughout this course. Units are composed of Chapters which will correlate with your text book. You will find files within the chapters labeled “Assignments”, “PowerPoint Presentation”, and “Key Terms”. Students are expected to work through each chapter and complete the assignments and quiz embedded in each of the respective files.

During the course, students are to complete 15 in-class or online laboratory exercises before taking the final exam. The lab exercises will correspond with chapter topics throughout the course, and students will be directed to complete the lab along with the appropriate chapter. Each laboratory activity requires approximately 3 hours in class or online to complete. Students will be expected to complete the assessments for each lab in order to receive credit for completing the lab. Lab time totals approximately 45 hours, or approximately 25% of the course.

There will be a total of 10 faith-based discussion questions wherein students will be required to respond throughout the course. The purpose of the discussion questions is for students to have a forum in which to discuss the connection of the subject matter to the scriptures and to demonstrate the relevance the topic has in their lives. All things learned in this course will be related back to the gospel of Christ, and the discussion questions will allow students to share their feelings and thoughts of the topics we will be exploring.

Students will submit chapter assignments including Key Terms and Concept Check Questions. These assignments correspond with the text, and definitions and answers can be found in the appropriate chapters. Each of these assignments will be worth 10 points. A 20 point chapter quiz will be administered at the completion of each chapter as preparation for the unit test. The chapter quiz is intended to serve as a review of the major concepts, and relate to the major themes of biology.

At the completion of each Unit, students will be required to complete the online multiple choice test and 4 free-response essay questions. There will be a 90 minute time limit for the multiple choice section of the test, and a 120 minute time limit for the free-response section. The purpose of the timed tests is to prepare students for the actual timed AP Biology test. The free-response essay questions will assess the student's knowledge of the major themes throughout the biology course. A final will be administered at the conclusion of each semester wherein students will be able to show mastery of the concepts relating to the eight major themes of biology.

Unit Descriptions and Detailed Assignments

Part 1: 18 weeks

Unit 1: The Chemistry of Life (3 weeks)

Read Chapters 1 - 5
Complete Key Terms Chapters 1 - 5
Discussion questions
- #1: Introduce Yourself
- #2: Elements
- #3: Water

Quiz: Chapter 2, Chapter 3, Chapter 4 and Chapter 5
Unit Test: Multiple Choice
Free Response Test

Unit 2: The Cell – Part 1 (5 weeks)

Read Chapters 6, 7, 11 & 12
Complete Key Terms Chapters 6, 7, 11 & 12
Complete Chapter Concept Check Questions (Ch. 6, 7, 11 & 12)
Discussion Questions

#4: The Magnificence of Man
AP Biology WebLabs
#1: Diffusion and Osmosis
#2: Enzyme Catalysts
#3: Mitosis
Chapter Quizzes (Ch. 6, 7, 11 & 12)
Unit Test: Multiple Choice
Free Response Test

Unit 3: The Cell – Part 2: Cellular Energies (3 weeks)

Read Chapters 8, 9 & 10
Complete Key Terms Chapters 8, 9 & 10
Complete Chapter Concept Check Questions (Ch. 8, 9 & 10)
AP Biology WebLabs
#7: Cellular Respiration
#6: Photosynthesis
Chapter Quizzes (Ch. 9 & 10)
Unit Test: Multiple Choice
Free Response Test

Unit 4: Heredity (3 weeks)

Read Chapters 13 – 16
Complete Key Terms Chapters 13 -16
Complete Chapter Concept Check Questions (Ch. 13 – 16)
AP Biology WebLabs
#4: Meiosis
#8: Genetics of Organisms
Chapter Quizzes (Ch. 13, 14, 15 & 16)
Unit Test: Multiple Choice
Free Response Test

Unit 5: Molecular Genetics (3 weeks)

Read Chapters 17 – 20
Complete Key Terms Chapters 17 – 20
Complete Chapter Concept Check Questions (Ch. 17 – 20)
Chapter Quizzes (Ch. 17 – 20)
Unit Test: Multiple Choice
Free Response Test

Final: Review/Study for semester final Part 1 (1 week)

Part 2: 18 weeks

Unit 6: Evolutionary Biology (2 weeks)

Read Chapters 22 – 25
Complete Key Terms Chapters 22 – 25
Complete Concept Check Questions (Ch 22 – 25)
AP Biology WebLab
#10: Population Genetics and Evolution
Chapter Quizzes (Ch 22-25)
Unit Test: Multiple Choice
Free Response Test

Unit 7: Diversity of Organisms (4.5 weeks)

Read Chapters 26 - 34
Complete Key Terms Chapters 26 - 34
Complete Chapter Concept Check Questions (Ch. 26-34)
AP Biology WebLab
#8: Molecular Biology
Chapter Quizzes (Ch. 26-34)
Unit Test: Multiple Choice
Free Response Test

Unit 8: Plant Form and Function (3.5 weeks)

Read Chapters 35-39
Complete Key Terms Chapter 35-39
Complete Chapter Concept Check Questions (Ch. 35-39)
AP Biology WebLab
#5: Plant Pigments
#11: Transpiration
Chapter Quizzes (Ch. 35-39)
Unit Test: Multiple Choice
Free Response Test

Unit 9: Structure and Function of Animals (5 weeks)

Read Chapters 40 - 51
Complete Key Terms Chapters 40- 51
Complete Chapter Concept Check Questions (Ch. 40-51)
AP Biology WebLab
#12: Animal Behavior
#15: Physiology of the Circulatory System
Chapter Quizzes (Ch. 40-51)
Unit Test: Multiple Choice
Free Response Test

Unit 10: Ecology (2 weeks)

Read Chapters 52-56
Complete Key Terms Chapters 52-56

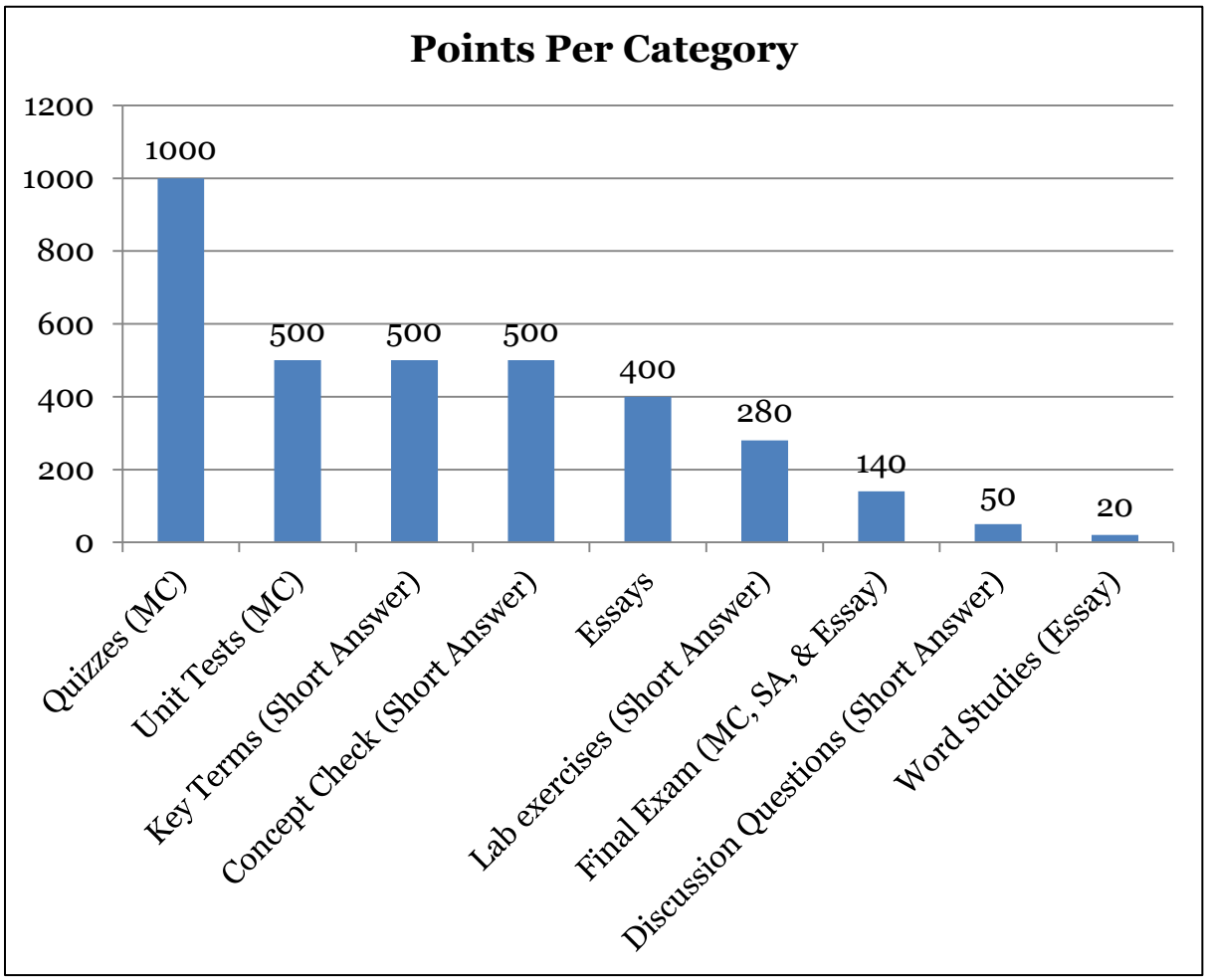
Complete Chapter Concept Check Questions (Ch. 52-56)
AP Biology WebLab
#13: Dissolved Oxygen
#14 Aquatic Population
Chapter Quizzes (Ch. 52-56)
Unit Test: Multiple Choice
Free Response Test

Final: Review/Study for semester final Part 2 (1 week)

Grading: Point Breakdown

As shown in the graph and list below, there are a total of **3390** points possible for this entire course.

50 Chapter Quizzes: 20 points each = 1000
10 Multiple Choice Unit Tests: 50 points each = 500 points
50 Chapter Key Terms Definitions: 10 points each = 500 points
50 Concept Check Chapter Questions: 10 points each = 500 points
40 Essays: 10 points each = 400 points
14 online lab exercises: 20 points each = 280 points
Final Exam = 140 points
10 Discussion questions: 5 pts each = 50 points
2 Word studies: 10 points each = 20 points



Grading: Scale

A = 100% - 94%	C = 76% - 74%
A- = 93% - 90%	C- = 73% - 70%
B+ = 89% - 87%	D+ = 69% - 67%
B = 86% - 84%	D = 66% - 64 %
B- = 83% - 80%	D - = 63% - 60%
C+ = 79% - 77%	F = 59% - 0%

Strategies for Success

◊ View all PowerPoint presentations, read the assigned text and keep a notebook of key terms, important concepts and insights.

◊ Complete each assignment and assessment soon after finishing the required readings and online instruction. Don't begin the next topic until you have completed the previous one.

◊ Respond to discussion questions with insightful and meaningful responses.

◊ Make goals with definite dates for when you would like complete each assignment. Adjust these goals if you find you are unable to meet them.

Instructor Contact Information

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[1] *The Principle Approach*® is a registered trademark of the Foundation for American Christian Education. [2] *The Seven Principles of American Christian Education*® is a registered trademark of the Foundation for American Christian Education.[3] *AP Biology WebLabs* is a registered trademark of The Regents of California.