STRATFORD PUBLIC SCHOOLS
Stratford, Connecticut

"Tantum eruditi sunt liberi"
Only the Educated Are Free

Advanced Placement Biology
Syllabus 2012-2013

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Stratford Public Schools
AP Biology

Mission Statement

The mission of the Stratford Public Schools is to provide the opportunity and support for all students to acquire the skills and knowledge necessary to become responsible, contributing citizens. This is based on the belief that:

- All people can learn.
- All people are entitled to respect and dignity.
- Individuals are accountable for their actions.
- All students have the right to learn in an environment free from fear and prejudice.
- Education includes developing skills for life-long learning.
- Education is the shared responsibility of the student, family, faculty, school and community.
- Family support is the key to a child's success.
- A healthy society recognizes commonalities and respects diversity.
- People learn in different ways and at different rates.
- Education empowers people to expand options throughout life.
- Effort is commendable and should be acknowledged.
- Progress requires that people be open to change.
- Performance is directly related to expectations.
- Students and staff should have access to and be able to use current technology.

ACADEMIC

1. Read effectively
2. Write effectively
3. Speak effectively
4. Listen effectively
5. View effectively
6. Read and understand a variety of multicultural literary works
7. Apply a variety of mathematical skills and methods to analyze and solve problems
8. Observe, locate, and evaluate information in order to solve problems, present ideas, and make informed decisions
9. Understand the benefits and limitations of science and technology to measure and explore the natural world
10. Demonstrate an awareness of the cultural and aesthetic aspects of various visual and performing art forms
11. Demonstrate the appropriate use of technology as a learning tool in all subject areas
12. Research various employment opportunities and develop skills necessary for a potential career path
13. Analyze problems from both a national and a global perspective

CIVIC

14. Acknowledge the values, rights and responsibilities of a democratic society
15. Demonstrate productive work habits and a positive work ethic

SOCIAL

16. Demonstrate an understanding of concepts in order to make healthy lifestyle choices that will enhance their well being; Demonstrate respect for themselves and others by exhibiting the six pillars of character.

Safety In The Science Laboratory

Students and teachers must be aware of the potential for safety problems in the science classrooms and laboratories. Schools should review available safety resources and develop safety training for their teachers and students as well as safety rules for the classroom.

Teachers must choose safe labs that cover important concepts. Thought must be given to the chemicals purchased by schools. Which chemicals are the safest for the proposed labs, how much is needed, where will the chemicals be stored and in what arrangement? Are the storage areas locked and well ventilated?

General Lab Safety Recommendations

1. Always perform an experiment or demonstration prior to allowing students to replicate the activity. Look for possible hazards. Alert students to potential dangers.
2. Safety instructions should be given orally and be posted each time an experiment is begun.
3. Constant surveillance and supervision of student activities are essential.
4. Never eat or drink in the laboratory or from laboratory equipment. Keep personal items off the lab tables.
5. Never use mouth suction in filling pipettes with chemical reagents. Use a suction bulb.

General Science Safety Checklist

The following is a suggested checklist of safety concerns in K-12 science laboratories.

1. Appropriate protective equipment for the science laboratory
2. Enforcement of safety procedures
3. All students and teachers know the location of all protective equipment
4. All students read and sign a lab safety contract.
5. Sufficient, accessible lab stations per number of students in each laboratory
6. All students must wear proper safety goggles whenever chemicals, glassware, or heat are used

No food products should be consumed by staff or students as part of a lesson, unit or related course work.

ADVANCED PLACEMENT BIOLOGY SYLLABUS 2012-2013

Balancing Breadth of Content with Depth of Understanding; Focusing on Enduring, Conceptual Ideas Using Supporting Knowledge by: Developing Advanced Inquiry and Reasoning Skills through Science Practices…

PHILOSOPHY:

Biology is the gateway to the world… Through our desire to understand life on this planet we have delved into all aspects, physical and metaphysical, of our universe. It is my belief that human kind's quest to discern our place in the cosmos began with a comparison of ourselves to others. From the moments we attained self-consciousness, we were aware of the differences and eventually the similarities we had with other creatures on Earth. Our curiosities grew as our knowledge and technologies expanded the horizons. We at first thought of ourselves as unique, sitting on top of the highest mountain and looking down at all the other life forms in the valley below. We no longer have that centric view, realizing that all organisms on this sphere reside on the same plain. Scientists, great and small, past and present, well known and hardly heard of, have helped us get to where we are now, with an enlightened vantage point. From here, and with the science of Biology, we can take what we know and look even deeper into our pasts to guide us even farther into our futures.

INTRODUCTION:

"Given the speed with which scientific discoveries and research continuously expand scientific knowledge, many educators are faced with the challenge of balancing breadth of content coverage with depth of understanding. This revised **Advanced Placement (AP) Biology** course addresses this challenge by shifting from a traditional "content coverage" model of instruction to one that focuses on enduring, conceptual understandings and the content that supports them. This approach will enable students to spend less time on factual recall and more time on inquiry-based learning of essential concepts, and will help them develop the reasoning skills necessary to engage in the science practices used throughout their study of AP Biology. To foster this deeper level of learning, the breadth of content coverage in AP Biology is defined in a way that distinguishes content essential to support the enduring understandings from the many examples or applications that can overburden the course. Illustrative examples are provided that offer teachers a variety of optional instructional contexts to help their students achieve deeper understanding. Additionally, content that is outside the scope of the course and exam is also identified. Students who take an AP Biology course designed using this curriculum framework as its foundation will also develop advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts in and across domains. The result will be readiness for the study of advanced topics in subsequent college courses — a goal of every AP course. The revised AP Biology course is equivalent to a

two-semester college introductory biology course and has been endorsed enthusiastically by higher education officials." (1)

COURSE OVERVIEW:

AP Biology is a rigorous course only offered to hard working, high achieving students who meet the qualifications for enrollment. These standards are set by the School Administration and the Science Department. The course is open to students who meet the following **prerequisites**: "B" or better in Honors Physics, Honors Chemistry, & Honors Biology; or an "A" in Physics Level 1, Chemistry Level 1, & Biology Level 1; a 50 or better on the PSAT; and a recommendation by the previous science teacher and the Science Department Chairperson.

AP Biology differs from other high school courses in the range and detail of topics covered, the kind of laboratory work done by students, and the time and effort required of students. The course is a direct parallel to Freshman Biology courses being offered at many colleges, and therefore maintains quite stringent academic guidelines. The **class meets every day** of the week, with Tuesdays and Thursdays being single periods, 48 minutes long. Mondays, Wednesdays, and Fridays are double periods, totaling 95 minutes of instruction and/or laboratory time. Overall, the students spend 381 minutes a week between the classroom and the laboratory. Students are also advised that, for every hour they spend in school, they should be setting aside one to two hours at home for course work. This is similar to, but not quite, the two to three hours recommended for every hour of class while in college.

In this AP Biology course, there are effectively **over one hundred and fifty school days** from the start of the school year up until the AP Biology Exam, to work with the students. Not included in this total is the time spent completing their summer assignments. These are given to all students, who have qualified and enrolled in the course, at the end of the previous school year. Students are also made aware that assignments are given over the breaks during the school year. This allows the instructor to have ample time to fully cover and prepare the students on contents and applications, inquiry and science practices, and concepts and connections from the AP Biology curriculum. Students will have many opportunities during the course of the year to nurture and develop their understanding of the topics covered in AP Biology. Plenty of opportunities will be made available throughout the year for **extra help**. These include time before and after school in preparation of this exam, both on the material being learned and test taking strategies.

All students taking AP Biology are required to have, and to keep available, a copy of this course **syllabus** with them for reference. The assignments listed herein are each student's responsibility. On occasion, there will be adjustments and/or corrections made to the syllabus. All dates, lecture topics, readings, labs, assignments, & exams are subject to change. Yet, only in those cases will there be deviation from the following: a **summer assignment** due the first day of the school year, a timely adherence to the **course schedule**, and work on **independent assignments**, which may be done at the student's leisure, though completed by the set date.

"The key concepts and related content that define the revised AP Biology course and exam are organized around a few underlying principles called the **Big Ideas**, which encompass the

core scientific principles, theories and processes governing living organisms and biological systems. For each of the big ideas, enduring understandings, which incorporate the core concepts that students should retain from the learning experience, are also identified." (1)

CONCEPT OUTLINE: BIG IDEAS [CR2]

BI1: The process of evolution drives the diversity and unity of life.

"Evolution is a change in the genetic makeup of a population over time, with natural selection its major driving mechanism. Darwin's theory, which is supported by evidence from many scientific disciplines, states that inheritable variations occur in individuals in a population. Due to competition for limited resources, individuals with more favorable variations or phenotypes are more likely to survive and produce more offspring, thus passing traits to future generations." (1)

BI2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

"Living systems require free energy and matter to maintain order, grow and reproduce. Organisms employ various strategies to capture, use and store free energy and other vital resources. Energy deficiencies are not only detrimental to individual organisms; they also can cause disruptions at the population and ecosystem levels." (1)

BI3: Living systems store, retrieve, transmit and respond to information essential to life processes.

"Genetic information provides for continuity of life and, in most cases, this information is passed from parent to offspring via DNA. The double-stranded structure of DNA provides a simple and elegant solution for the transmission of heritable information to the next generation; by using each strand as a template, existing information can be preserved and duplicated with high fidelity within the replication process. However, the process of replication is imperfect, and errors occur through chemical instability and environmental impacts. Random changes in DNA nucleotide sequences lead to heritable mutations if they are not repaired. To protect against changes in the original sequence, cells have multiple mechanisms to correct errors. Despite the action of repair enzymes, some mutations are not corrected and are passed to subsequent generations. Changes in a nucleotide sequence, if present in a protein-coding region, can change the amino acid sequence of the polypeptide. In other cases, mutations can alter levels of gene expression or simply be silent. In order for information in DNA to direct cellular processes, information must be transcribed (DNA→RNA) and, in many cases, translated (RNA→protein). The products of transcription and translation play an important role in determining metabolism, i.e., cellular activities and phenotypes. Biotechnology makes it possible to directly engineer heritable changes in cells to yield novel protein products." (1)

BI4: Biological systems interact, and these systems and their interactions possess complex properties.

"All biological systems are composed of parts that interact with each other. These interactions result in characteristics not found in the individual parts alone. In other words, "the whole is greater than the sum of its parts." All biological systems from the molecular level to the ecosystem level exhibit properties of bio-complexity and diversity. Together, these two

properties provide robustness to biological systems, enabling greater resiliency and flexibility to tolerate and respond to changes in the environment. Biological systems with greater complexity and diversity often exhibit an increased capacity to respond to changes in the environment." (1)

SCIENCE PRACTICES: [CR6]

"The revised Advanced Placement Biology course shifts from a traditional teacher-directed "content coverage" model of instruction to one that focuses on helping students gain **enduring understandings** of biological concepts and the scientific evidence that supports them. This approach enables students to spend more time understanding biological concepts while developing reasoning skills essential to the science practices used throughout their study of biology. A *practice* is a way to coordinate knowledge and skills in order to accomplish a goal or task. The science practices, as noted in the AP Biology Curriculum Framework, enable students to establish lines of evidence, and use them to develop and refine testable explanations and predictions of natural phenomena. Because content, inquiry, and reasoning are equally important in AP Biology, each **learning objective (LO)** combines content with inquiry and reasoning skills described in the science practices." (1)

SP1: The student can use representations and models to communicate scientific phenomena and solve scientific problems.

SP2: The student can use mathematics appropriately.

SP3: The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

SP4: The student can plan and implement data collection strategies appropriate to a particular scientific question.

SP5: The student can perform data analysis and evaluation of evidence.

SP6: The student can work with scientific explanations and theories.

SP7: The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains.

"In **student-directed, inquiry-based laboratory investigations**, students model the behavior of scientists by discovering knowledge for themselves as they observe and explore. Beginning with observations, students employ a variety of methods to answer questions that they have posed. These include conducting laboratory and field investigations; manipulating software simulations, models, and data sets; and exploring meaningful online research. By designing experiments to test hypotheses, analyze data, and communicate results and conclusions, students learn that a scientific method of investigation is cyclic, not linear; each observation or experimental result raises new questions about how the world works, thus leading to open-ended

investigations. Students also appreciate that inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations." (2)

COURSE RESOURCES:

Text: Biology, 9th Edition, by Jane B. Reece, Lisa A. Urry, Michael L. Cain, et al. Pearson: Benjamin Cummings Pub., San Francisco. ISBN number: 0-13-137504-0 [CR1]

Supplemental Text: Biology, Concepts & Connections, 5th Edition, by Neil Campbell, Jane Reece, Martha Taylor and Eric Simon. Pearson: Benjamin Cummings Pub., San Francisco. ISBN number: 0-13-193480-5 (BHS)

Lab Manual: Advanced Placement Biology Investigative Labs: An Inquiry-Based Approach. The College Board, 2012, Printed in the U.S.A.

Supplemental Lab Manual: Biology in the Laboratory, 3rd Edition, by Doris Helms, Carl Helms, Robert Kosinski and John Cummings. W. H. Freeman and Company, New York. ISBN number: 0-7167-3146-0 (BHS)

Study Guide: Study Guide for Campbell Biology, 9th Edition, by Martha R. Taylor. Pearson: Benjamin Cummings Pub., San Francisco. ISBN number: 0-321-62992-2

Supplemental Study Guide: Student Study Guide: Biology Concepts & Connections, 3rd Edition, by Richard Liebaert. Addison Wesley Longman, Inc., Pub., San Francisco. ISBN number: 0-8053-6587-7 (BHS)

Workbook: Practicing Biology: A Student Workbook, 4th Edition, by Jean Heitz & Cynthia Giffen. Pearson: Benjamin Cummings Pub., San Francisco. ISBN number: 0-321-68328-5

Advanced Placement Biology: Equations and Formulas Handout; The College Board.

SYLLABUS REFERENCES:

(1) Advanced Placement Biology: Course and Exam Description; Effective Fall 2012. The College Board, 2012, Printed in the U.S.A.

(2) Advanced Placement Biology Investigative Labs: An Inquiry-Based Approach; Teacher Manual. The College Board, 2012, Printed in the U.S.A.

(3) Advanced Placement Biology: An Overview of Course Revisions. The College Board, 2012, Printed in the U.S.A.

(4) Advanced Placement Biology: Syllabus Development Guide. The College Board, 2012, Printed in the U.S.A.

COURSE REQUIREMENTS:

SUMMER ASSIGNMENT: Each student will be given a textbook at the end of June of the previous school year. Please refer to the **"Course Assignments"**, chapters & correlations in the syllabus for what is expected to be done over the summer vacation. The first day back in the fall, the assignment is due, and will then be discussed that first week. An assessment in the form of an exam with multiple-choice questions and an essay will soon follow, so be prepared. Keeping up with the assignments given will guarantee your greatest chance of success in this course.

ATTENDANCE: Typically, there is a strong correlation between low attendance and low grades. Make every effort to attend all classes. Excessive absences may affect course credit. As per school/district policy, more than 10 absences in any semester (20 for the whole year) may institute academic review. Students will also only be given a three-minute tardy lenience, after which time a detention will be issued. Three detentions will initiate an office referral.

UNEXCUSED ABSENCE: Any student who misses class due to an unexcused absence for any reason (coming late to school, being involved in school activities without a pass, cutting class, etc.) will not be given the opportunity to make up work done during that class, lab, test or quiz. A grade of zero will be entered for the uncompleted assignment.

LABS: There are a number of labs assigned from the "Advanced Placement Biology Investigative Labs: An Inquiry-Based Approach" manual, and a number of supplemental labs assigned from other sources for this course; all of which must be conducted in their entirety, and if missed must be made up. The lab portion of the course constitutes **at least 25% of the total instructional time**, is related to the learning objectives, and as such demands an equal commitment of energy and focus. Each of these labs are student-directed investigations, are dispersed throughout the course, and all have some written components to them. **[CR7]**

INDEPENDENT ASSIGNMENTS: Students must complete these requirements on their own, preferably during down time and study hall. They are given these assignments well in advance, and may choose to do them at their discretion, but definitely before their due date. Students will be given the chance to "connect their biological and scientific knowledge to major ethical and social issues" by doing quarterly reports of news-worthy significance. Their ability to show that they are **"scientifically literate citizens"** will be based on review, discussion and debate of such concerns, technological advances, and innovations as, but not limited to, human causation of climate change, sequencing the human genome, and genetically modifying organisms. **[CR5]**

CHEATING/PLAGIARISM: These are both serious offenses and neither will be tolerated. Any student caught in a questionable situation will lose credit for the assignment without opportunity to make it up, and will be subject to academic review, with potential consequences.

COMMUNICATION: Whenever in doubt, it is always best to communicate any questions, comments or concerns before or as a situation arises. If you know you will not be able to be in

class or personal matters preclude you from completing an assignment, let the instructor know. Do not wait until the assignment is late to explain why it is late, it will receive deductions regardless of the circumstances.

COURSE ASSESSMENT:

Class work: 10% - Includes student participation, preparedness, and anything extra that the student brings to class; especially the "Scientifically Literate Citizens" independent assignments (see information about this above). Excessive lateness, absences, or disruptive behavior may affect this grade. This also includes a ***Class Notebook:*** 2-3" binder which is required, must be maintained throughout the course, and is reflective of the work being done in class, will be checked on a regular basis, and therefore must be brought to class daily.

Home work: 10 % - Includes student assignments, such as; chapter outline summaries, chapter study guide packets, completion of in-class unfinished work, research requested for topic coverage, preparedness for next day's activities, and anything else unable to be done in school.

Lab work: 25% - There are a number of mandatory labs assigned from the AP Biology Lab curriculum, and a number of supplemental labs assigned to this course, all of which are done throughout the year, and must be conducted and completed in a timely manner. This includes a ***Lab Notebook:*** 2-3" binder which is required, must be maintained throughout the course, and is reflective of the work being done in lab, documenting everything done individually and/or in group, will be checked on a regular basis, and therefore must be kept in class daily. **[CR8]**

Quizzes: 10% - There will be a variable number and type of quizzes dispersed throughout the course of the year, dependent on a range of factors; including time and necessity.

Tests: 20% - There will be a fixed number of tests during the course of the year; refer to the course schedule for approximate dates and content/labs covered.

Essays: 10% - Essays are given throughout, related to the topic being covered at the time, often at the same time as a test, but not necessarily so.

Projects: 15% - Include one year-long project working in the class-room with animals, and one semester-long project working in the greenhouse with plants; done in groups, though with year-end individual presentations for the projects (details to follow). This also requires maintaining a ***Project Journal*** (provided): to make entries, record data and have available for the group partner(s) and/or the instructor to see at any time. (BHS)

Semester Exams: Will be given at the end of each semester and will be cumulative for that semester's course content. These are exclusive of and in addition to the AP Biology Exam.

AP Bio Exam: Further details about the date, time and location can be found either in the course calendar or will be announced when made available. Questions and concerns about taking this exam, or paying for it if unable to, should be made well in advance of this date.

Extra-credit is NOT given. There is enough coursework given to fairly asses a student's grade without the need for any additional work.

Grading Scale: Is consistent with school/district parameters (see handbook for details).
Grading Deductions: ***Exams must be taken, labs must be attended, and assignments must be submitted when scheduled or due. There will be a 10% deduction per day late, up until a 50% reduction, after which the grade entered will be a zero.*** This holds true under any circumstances where the exam, lab or assignment was prearranged, whether the student was present or not, with no exception. All students must be in contact with either the instructor or another student when not in attendance for any reason. Each student is responsible for getting and knowing what is required of them and when it is due. In an emergency, student contact by e-mail, telephone or fax is acceptable. Otherwise, only prior permission having been granted or documented excuse from a doctor or other professional will negate any deductions.

COURSE RESPONSIBILITIES:

- Students are responsible for ***keeping this syllabus in their class notebook***, and being aware of all assignments, due dates and other matters of concern for this course.
- Students can also ***access this syllabus*** on the instructor's school website, the course's *Wikispaces* website, or by asking for an e-mailed copy from the instructor.
- Students should ***direct any questions, comments or concerns*** personally to the instructor about any issues or clarifications of the assignments or due dates as soon as possible.
- Students are required to ***read and outline the highlighted chapters/sections*** as listed in the course schedule, before the lectures pertaining to those chapters are given.
- Students are required to ***complete the chapter study guides*** after the content has been gone over in class, and be prepared to go over the answers in review for the exams.
- Students should use the ***additional chapters/sections listed as reference*** and/or in support of furthering their understanding of the topics/content being discussed.
- Students ***should also use*** the supplemental resources, in-class textbooks, library media center, reliable on-line resources, journals and newspapers to help facilitate learning.
- Students are responsible for ***reading and being prepared for all labs***, having asked for clarifications beforehand and attentive to proper lab attire.
- Students are required to ***choose alternating lab partners***, so as to work with a different person for each of the subsequent labs.
- Students will have the ***same project partners***, to be determined at the beginning of the year, for both their year-long and semester-long projects.
- Students will have the opportunity at the beginning of each project to pick the ***animal(s) or plant(s)***, on an alternating basis, their group will be working with for the assignment.
- Students will be ***presenting individually***, on either the animals or plants, which they and their group worked with throughout their projects.
- Students will choose their ***independent assignments*** on a first come, first serve basis by listing their choice of topic with the instructor.
- Students will ***review, discuss and debate*** their topics for the independent assignments according to the same order in which they signed up for them.

- Students are required to ***complete all components of this syllabus*** to achieve credit for this course.
- Students ***are encouraged to*** ask for help from the instructor, other students (both present and past), and other valuable resources (i.e. Librarian, etc.) when needed.

ENDURING UNDERSTANDINGS: [CR2]
As they relate to each of the big ideas, the following enduring understandings incorporate the core concepts that students should retain from the learning experience. These aspects of the curriculum framework will be referred to in the course assignments under the correlations column, next to the assignments they align with.

EU1.A: Change in the genetic makeup of a population over time is evolution.
EU 1.B: Organisms are linked by lines of descent from common ancestry.
EU 1.C: Life continues to evolve within a changing environment.
EU 1.D: The origin of living systems is explained by natural processes.

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

EU 3.A: Heritable information provides for continuity of life.
EU 3.B: Expression of genetic information involves cellular and molecular mechanisms.
EU 3.C: The processing of genetic information is imperfect and is a source of genetic variation.
EU 3.D: Cells communicate by generating, transmitting and receiving chemical signals.
EU 3.E: Transmission of information results in changes within and between biological systems.

EU 4.A: Interactions within biological systems lead to complex properties.
EU 4.B: Competition and cooperation are important aspects of biological systems.
EU 4.C: Naturally occurring diversity among and between components within biological systems affects interactions with the environment.

COURSE ASSIGNMENTS: (CALENDAR SCHEDULE)

PLEASE NOTE: For the course assignment listings on the following pages;

- **<u>Text that is highlighted (regular/ italicized print)</u> is for essential assignments and form the basis for the fundamental concepts being discussed in lecture, investigated in lab, and used for assessment, and must be completed in their entirety.**

- Text that is not highlighted (regular print) is for supplemental and referential purposes, relating course assignments to the big ideas, enduring understandings, and/or science practices that are being supported by their implementation.
- *Text that is not highlighted (italicized print) is for independent assignments, supplemental readings, and/or alternate activities that will be done on an as-time-permit, as-needed, and as-availability-of-resources allows basis.*

WEEKS	**COURSE ASSIGNMENTS**	**CORRELATIONS**
Summer 2012	**SUMMER ASSIGNMENT:**	

For all assigned chapters: Read and outline (hand written) the major points of each chapter. Make sure you put headings for each chapter and section, so you can follow along during lecture. Also, leave enough space so you can add information, write down any questions you have, etc. At the end of each section there are concept check questions. Please number and answer these briefly in your notes as you go through the chapters. Attention to detail and getting an overall view of the material is sometimes hard to accomplish at the same time. So, try to look at the chapter summaries first, read the chapter, go back and outline the important concepts, answer the concept check questions as you do, and then look over what you have done when completed. This will give you the best grasp of what you have covered… (Please note: the units in this course do not directly align with the units in the textbook.)

UNIT 1 **MOLECULAR ASPECTS (Chapters 1-5)…**

Themes in the Study of Life (Chapter 1):
Connections across areas of Biology (1.1)
Evolution accounts for Unity & Diversity (1.2)
Studying Nature: observations & hypotheses (1.3)
Cooperative Approach & Diverse Viewpoints (1.4)

Chemical Context of Life (Chapter 2):
Matter: elements & compounds (2.1)
Properties depend on structure (2.2)
Form & function depends on bonding (2.3)
Chemical reactions make & break bonds (2.4)

Water & Life (Chapter 3):

Hydrogen bonding & water polarity (3.1)	**EU 2.a.3**
4 Emergent properties of water for life (3.2)	**EU 2.a.3**
Acidic & Basic conditions affect life (3.3)	**EU 2.a.3**

Carbon & Molecular Diversity (Chapter 4):

Organic Chemistry: Study of Carbon (4.1)	**EU 1.d.1, 2.a.3**
Carbon bonding & molecular diversity (4.2)	**EU 2.a.3**
Key Chemical Groups & biological functioning (4.3)	

Structure & Function: Biological Molecules (Chapter 5):

Polymers: built from monomers (5.1)	**EU 4.a.1, 4.c.1**
Carbohydrates: fuel & building materials (5.2)	**EU 4.a.1, 4.c.1**
Lipids: diverse hydrophobic molecules (5.3)	**EU 4.a.1, 4.c.1**
Proteins: diversity of structure & function (5.4)	**EU 4.a.1, 4.b.1, 4.c.1**
Nucleic Acids: store, transmit & express heredity (5.5)	**EU 3.a.1, 4.a.1**

Fall Semester 2012

Begins with… **COURSE INTRODUCTION:**

2-3 weeks

Classroom policies & procedures
Laboratory safety & guidelines

Summer Assignment (Chapters 1-5):
Check for completion of assignment
Review of content
Concept reinforcement activities:

Scientific Method Basics: Testing Hypotheses (Chapter1);	
1-2 periods	**SP 3, SP 4, & SP5**
Properties of Water: Nature's Challenge (Chapter 3);	
1-2 periods **[CR3d]**	
Pattern Matching: Molecules of Life (Chapter 5);	
1-2 periods **[CR3b] [CR4b]**	**LO 4.1**

TEST #1: Chapters 1-5
ESSAY #1: Properties of Water

Independent Assignments #1-4:
Sign-up begins for "Scientifically Literate Citizens" presentations.
Each student must present on a topic not already discussed, sign-up for the date they are going to do so on the class calendar, and complete one independent assignment per quarter. **[CR5]**

Year-long Project Set-up:
Choosing & planning of Biomes for vivariums, with selection of animals, & consideration of habitats; with start of weekly Journal entries, by groups. (BHS)
[CR3d] [CR 4d] **LO 2.24**

Winogradsky Columns Lab: Part I
Discussion of investigation, set-up of inquiry columns, field trip to pond to obtain samples, and initiation of weekly recording of data based on observations. (BHS)
[CR3a] [CR4d] **LO 2.22**

UNIT 2 **THE CELL (Chapters 6-9)…**

2-3 weeks

Tour of the Cell (Chapter 6):

Microscopes & the tools of biochemistry (6.1)	
Eukaryotic cell internal membranes (6.2)	**EU 2.a.3, 2.b.3, 4.a.2**
Eukaryotic cell genetic instructions (6.3)	**EU 2.b.3, 4.a.2**
Endomembrane system regulation & function (6.4)	**EU 2.b.3, 4.a.2, 4.b.2**
Mitochondria & Chloroplasts change energy (6.5)	**EU 2.b.3, 4.a.2**
Cytoskeleton network roles (6.6)	
Extra-cellular & Inter-cellular component roles (6.7)	
Membrane Structure & Function (Chapter 7):	
Fluid mosaic model (7.1)	**EU 2.b.1**
Selective Permeability (7.2)	**EU 2.b.1**
Passive transport: diffusion & osmosis (7.3)	**EU 2.b.2**
Active transport & membrane potential (7.4)	**EU 2.b.2**
Exocytosis & endocytosis (7.5)	**EU 2.b.2**
AP Bio Investigation #4: Diffusion and Osmosis	
4-5 Lab periods… **[CR6]**	**BI 2; SP 2, 4 & 5**
Metabolism Introduction (Chapter 8):	
Transformation of matter & energy (8.1)	**EU 2.a.1**
Reactions free-energy change (8.2)	**EU 2.a.1**
ATP powering cellular work (8.3)	**EU 2.a.1**
Enzymes & energy barriers (8.4)	
Enzyme activity regulation (8.5)	
AP Bio Investigation #13: Enzyme Activity	
3-4 Lab periods… **[CR6]**	**BI 4; SP 5, 6 & 7**
Cellular Respiration & Fermentation (Chapter 9):	
Catabolic pathways oxidize (9.1)	**EU 2.a.1, 2.a.2**
Glycolysis (9.2)	**EU 2.a.1, 2.a.2**
Citric Acid Cycle (9.3)	**EU 2.a.1, 2.a.2**
Oxidative Phosphorylation (9.4)	**EU 2.a.1, 2.a.2**
Fermentation & anaerobic respiration (9.5)	**EU 2.a.1, 2.a.2**
Connection to other pathways (9.6)	
Concept reinforcement activity: *Cell Respiration: Modeling the Pathways;*	
1-2 periods **[CR3b] [CR4b]**	**LO 2.4**
AP Bio Investigation #6: Cell Respiration	
4 Lab periods… **[CR6]**	**BI 2; SP 1, 2, 3, 6 & 7**
TEST #2: Chapters 6-9; Investigations #4, 13 & 6	
ESSAY #2: Enzyme Catalysis	

UNIT 3 **CELL TO CELL (Chapters 11-13)…**
1-2 weeks

Cell Communication (Chapter 11):
External signal conversion (11.1) **EU 2.e.2, 3.b.2, 3.d.1**
Reception (11.2) **EU 3.d.2**
Transduction (11.3) **EU 3.d.3**
Response (11.4) **EU 3.b.2, 3.d.4**
Apoptosis (11.5)

Concept reinforcement activity: *Signal Transduction: "Means to an End"; 1-2 periods* **[CR3d] [CR4d]** **LO 3.33**

The Cell Cycle (Chapter 12):
Cell division (12.1) **EU 3.a.2**
Phases of the Cell Cycle (12.2) **EU 3.a.2**
Eukaryotic cell cycle regulation (12.3) **EU 3.a.2**

Concept reinforcement activity: *Cell Cycle: Simulation of the Phases; 1 period* **[CR3c] [CR4c]** **LO 3.9**

Meiosis & Sexual Life Cycles (Chapter 13):
Chromosomal inheritance (13.1) **EU 3.a.2**
Alternation of fertilization & meiosis (13.2) **EU 3.a.2**
Diploid vs. haploid number (13.3) **EU 3.a.2**
Genetic variation & evolution (13.4) **EU 3.c.2**

AP Bio Investigation #7: Cell Division: Mitosis and Meiosis
5-6 Lab periods… **[CR6]** **BI 3, SP 1, 5, 6 & 7**

TEST #3: Chapters 11-13; Investigation #7
ESSAY #3: Cellular Respiration

UNIT 4
1-2 weeks

FLOW OF GENETIC MATERIAL (Chapters 16-19)…

Molecular Basis of Inheritance (Chapter 16):
DNA, the genetic material (16.1) **EU 3.a.1**
DNA replication & repair (16.2) **EU 3.a.1, 3.c.1**
Chromosome composition (16.3)

Concept reinforcement activity: *DNA Modeling: Construction of the Molecule of Life; 1-2 periods* **[CR3c] [CR4c]** **LO 3.3**

From Gene to Protein (Chapter 17):
Genes specify proteins (17.1) **EU 3.a.1**
Transcription (17.2) **EU 3.a.1**
Post-transcription modification (17.3) **EU 3.a.1**
Directed synthesis of polypeptides (17.4) **EU 3.a.1**
Mutations effects (17.5) **EU 3.c.1**

Universal Concept of a Gene (17.6)

Concept reinforcement activity: *Protein Synthesis: From DNA to RNA to Polypeptides; 1-2 periods* **[CR3b] [CR4b]** **LO 3.4**

Regulation of Gene Expression (Chapter 18):
Bacterial regulation of transcription (18.1) **EU 3.b.1, 3.b.2**
Eukaryotic regulation of genes (18.2) **EU 3.b.1, 3.b.2**
Noncoding RNAs roles (18.3) **EU 3.b.1, 3.b.2**
Differential genes/cell types (18.4) **EU 3.b.2, 4.a.3**
Cancer: cell cycle control irregularities (18.5)

Viruses (Chapter 19):
Virus structure (19.1) **EU 3.c.3**
Virus replication in host cells (19.2) **EU 3.a.1, 3.c.3**
Viruses, Viroids, & Prions (19.3)

TEST #4: Chapters 16-19
ESSAY #4: DNA and Gene Expression

UNIT 5 **DNA TECHNOLOGY (Chapters 20-21)…**
2-3 weeks

Biotechnology (Chapter 20):
DNA Cloning (20.1) **EU 3.a.1**
DNA Technology possibilities (20.2) **EU 3.a.1**
Cloning organisms: Stem Cells (20.3)
Practical applications of DNA Technology (20.4)

Concept reinforcement activity: "*Case of the Crown Jewels": Biotechnology applications; 1-2 periods* **[CR3c] [CR4c]**

AP Bio Investigation #8: Biotechnology: Bacterial Transformation
4-5 Lab periods… **[CR6]** **BI 3; SP 1, 3, 5, 6 & 7**

Concept reinforcement activity: *Supplemental Lab: Polymerase Chain Reaction (Virtual – Learn.Genetics.Utah.edu); 1-2 periods* **[CR3c]**

AP Bio Investigation #9: Biotechnology: Restriction Enzyme Analysis of DNA
3-4 Lab periods… **[CR6]** **BI 3; SP 3 &6**

Genomes & their Evolution (Chapter 21):
Genome sequencing approaches (21.1)
Bioinformatics genome analysis (21.2)
Genome variation (21.3)
Noncoding DNA & Multigene Families (21.4)
DNA variation & genome evolution (21.5) **EU 4.c.1**

Genome sequence comparisons (21.6)

Concept reinforcement activity: *"Ghost in Your Genes": Affects of Epigenetics; 2-3 periods* **[CR3c] [CR4c]** **LO 3.6**

TEST #5: Chapters 20-21; Investigations #8 & 9
ESSAY #5: Biotechnology

UNIT 6 **ANIMAL STRUCTURES & FUNCTION (Chapters 40-50)…**
3-4 weeks

Animal Form & Function Basics (Chapter 40):
Organizational correlation of form & function (40.1) **EU 2.a.1, 4.b.2**
Feedback Control (40.2) **EU 2.a.1, 2.c.1, 2.d.2, 2.d.3**
Homeostatic processes (40.3) **EU 2.a.1, 2.c.1, 2.c.2, 2.d.2, 2.d.3**
Energy requirements (40.4) **EU 2.a.1**

Animal Nutrition (Chapter 41):
Animal Diet Essentials (41.1)
Stages of food processing (41.2)
Mammalian Digestive System organs (41.3)
Vertebrate Digestive Systems adaptations (41.4)
Feedback Circuit regulation (41.5)

Animal Dissection Lab (Part I): *Animal form & integumentary system; 2 Lab periods* **[CR3a] [CR4a]** **LO 1.16**

Circulation & Gas Exchange (Chapter 42):
Circulatory systems links (42.1)
Mammalian heart: double circulation (42.2)
Blood circulation principles (42.3)
Blood components functions (42.4)
Gas exchange: respiratory surfaces (42.5)
Breathing: ventilating lungs (42.6)
Respiratory pigments: gas exchange (42.7)

Supplemental Lab: Physiology of the Circulatory system (AP biology Lab #10); 2 Lab periods **LO 2.21**

The Immune System (Chapter 43):
Innate immunity (43.1) **EU 2.d.4**
Adaptive immunity (43.2) **EU 2.d.4**
Defense against infection (43.3) **EU 2.d.4**
Immune System disruptions (43.4) **EU 2.d.4**

Osmoregulation & Excretion (Chapter 44):
Osmoregulation (44.1)

Nitrogenous wastes (44.2)
Diverse excretory systems (44.3)
Nephron organization (44.4)
Hormonal circuit links (44.5)

Animal Dissection Lab (Part II): *Animal muscle & skeletal systems; 2 Lab periods* **[CR3a] [CR4a]** **LO 1.16**

TEST #6A: Chapters 40-44
ESSAY #6A: Structure vs. Function

Hormones & the Endocrine System (Chapter 45):
Hormones & other signaling molecules (45.1)
Feedback regulation & Antagonistic Hormone pairs (45.2)
Hypothalamus & Pituitary: Endocrine regulation (45.3)
Endocrine Glands responses to stimuli (45.4)

Animal Reproduction (Chapter 46):
Asexual vs. sexual reproduction (46.1)
Fertilization (46.2)
Reproductive organs (46.3)
Interplay of hormones (46.4)
Placental Mammals: embryo development (46.5)

Animal Dissection Lab (Part III): *Animal digestive & cardiovascular systems; 2 Lab periods* **[CR3a] [CR4a]** **LO 1.16**

Animal Development (Chapter 47):
Embryonic development (47.1)
Morphogenesis (47.2)
Cytoplasmic determinants & Inductive signals (47.3)

Neurons, Synapses & Signaling (Chapter 48):
Neuron organization & structure (48.1) **EU 3.e.2**
Establishing resting potential (48.2) **EU 3.e.2**
Conducting action potentials (48.3) **EU 3.e.2**
Synaptic communication (48.4) **EU 3.e.2, 4.a.4**

Animal Dissection Lab Practical Exam
Assessment of all systems explored; 2 Lab periods

Nervous Systems (Chapter 49):
Nervous Systems constituents (49.1)
Regional specialization of vertebrate brain (49.2) **EU 3.e.2**
Cerebral cortex control (49.3)
Synaptic Connection changes (49.4)

Nervous System disorders explained (49.5)

Sensory & Motor Mechanisms (Chapter 50):
Transduction & Transmittance (50.1)
Hearing & Equilibrium (50.2)
Visual Receptors (50.3)
Taste & smell (50.4)
Muscle function requirements (50.5)
Muscle contraction & locomotion (50.6)

TEST #6: Chapters 45-50
ESSAY #6: Nervous vs. Endocrine Control/Communication

Fall Semester Exam Review:
Extra time will be made available before & after school as necessary.

Semester Exam Period
1 week — **FALL SEMESTER EXAM**
Includes ALL material (text, lab, & otherwise) covered since the beginning of the year. Multiple-choice, grid-in, and short and long essay question formats will be included. Date & time of the exam will be announced.

Spring Semester 2013
Begins with… — **Semester-long Project Set-up**
Choosing & planning of Gardens, with selection of plants, both flowering & vegetable; with start of weekly discussions & Journal entries, by groups. (BHS)

Winogradsky Columns Lab: Part I (cont…)
Formal write-up of analysis of Part I due before investigation in Part II begins.

UNIT 7 — **ORGANIZING LIFE (Chapters 25-28 & 31)…**
1-2 weeks

History of Life on Earth (Chapter 25):

Early Earth conditions (25.1)	**EU 1.b.1, 1.d.1**
Fossil Record documentation (25.2)	**EU 1.a.4**
Life's Key events (25.3)	**EU 1.b.1, 1.d.1**
Rise and fall of organisms (25.4)	**EU 1.c.1, 4.b.4**

Cause of body form changes (25.5)
Evolution is not goal oriented (25.6)

Concept reinforcement activity: *Understanding Cladistics; 1-2 periods* **[CR3a] [CR4a]** — **LO 1.19**

AP Bio Investigative Lab #3: BLAST: Comparing DNA Sequences
3 Lab Periods… **[CR6]** — **BI 1; SP 1 & 5**

Phylogeny and the Tree of Life (Chapter 26):
Phylogenies show evolutionary relationships (26.1) **EU 1.b.2**
Inferences for Phylogenies (26.2) **EU 1.b.2**
Use of shared characters (26.3) **EU 1.b.2**
Genomic documentation of history (26.4)
Molecular Clock tracking (26.5)
Tree of Life revisions (26.6) **EU 1.d.2**

Concept reinforcement activity: *Classification Mania; 1-2 periods* **[CR3a]**

Bacteria & Archaea (Chapter 27):
Structural & functional adaptations (27.1) **EU 3.a.1**
Genetic diversity in Prokaryotes (27.2) **EU 3.c.2**
Nutritional & Metabolic adaptations (27.3)
Molecular systematic illumination ((27.4)
Prokaryotic roles in the Biosphere (27.5)
Harmful & beneficial impacts (27.6)

Protists (Chapter 28):
Single-celled organisms (28.1)
Excavates (28.2)
Chromalveolates (28.3)
Rhizarians (28.4)
Red & Green Algae (28.5)
Unikonts (28.6)
Protists roles in ecological communities (28.7)

Fungi (Chapter 31):
Fungi are heterotrophs (31.1)
Fungal reproduction (31.2)
Fungal descent (31.3)
Fungal diversity (31.4)
Fungal impact on ecosystems & humans (31.5)

Winogradsky Columns Lab: Part II
Investigation begins with opening up of columns, obtaining samples from within, & then researching the most likely identities & justifications for these organisms; a formal write-up will then be due. (BHS) **[CR3a] [CR4d] LO 2.22**

TEST #7: Chapters 25-28 & 31; Investigation #3
ESSAY #7: Diversity of Life

UNIT 8 **PLANT BIOLOGY (Chapters 35-37, 10, 29-30, & 38-39)…**
2-3 weeks

Plant Biology (Chapter 35):

Plant organs, tissues, & cells (35.1)
Meristems (35.2)
Primary growth (35.3)
Secondary growth (35.4)
Plant body formation (35.5)

Transport in Vascular Plants (Chapter 36):
Adaptations for acquiring resources (36.1)
Short or long distance transport (36.2)
Transpiration via the Xylem (36.3)
Stomata regulation (36.4)
Translocation via the Phloem (36.5)
Highly dynamic symplast (36.6)

AP Bio Investigation #11: Transpiration
4 Lab periods… **[CR6]** **BI 4; SP 1, 2, 4, 6 & 7**

Soil & Plant Nutrition (Chapter 37):
Soil complexity (37.1)
Required essential elements (37.2)
Nutritional relationships (37.3)

TEST #8A: Chapters 35-37; Investigation #11
ESSAY #8A: Transpiration

Photosynthesis (Chapter 10):
Light energy to chemical energy (10.1) **EU 2.a.1, 2.a.2**
Light Reaction: ATP & NADPH (10.2) **EU 2.a.1, 2.a.2**
The Calvin Cycle: CO2 & sugar (10.3) **EU 2.a.1, 2.a.2**
Carbon fixation alternatives (10.4)

AP Bio Investigative Lab #5: Photosynthesis
4 Lab periods… **[CR6]** **BI 2; SP 1, 2, 3, 4, 6 & 7**

Plant Diversity I (Chapter 29): Land plants
Land Plants from Green Algae (29.1)
Mosses & Non-vascular plants (29.2)
Ferns & Seedless vascular plants (29.3)

Plant Diversity II (Chapter 30): Seed plants
Seed & Pollen Grain adaptations (30.1)
Gymnosperms: "naked" seeds (30.2)
Angiosperms: flowers & fruits (30.3)
Human reliance on seed plants (30.4)

Angiosperm Reproduction & Biotechnology (Chapter 38):

	Angiosperm life cycle uniqueness (38.1)	**EU 2.e.1, 2.e.2**
	Flowering Plant reproduction (38.2)	
	Human crop modification (38.3)	
	Plant signal Responses (Chapter 39):	
	Signal reception to response (39.1)	
	Plant hormones (39.2)	**EU 2.e.2, 2.e.3**
	Response to light (39.3)	**EU 2.e.2, 2.e.3**
	Response to other stimuli (39.4)	
	Plant defenses (39.5)	
	TEST #8B: Chapters 10, 29, 30, 38 &39; Investigation #5	
	ESSAY #8B: Photosynthesis	
UNIT 9 1-2 weeks	**GENETICS (Chapters 14 & 15)…**	
	Mendel & the Gene Idea (Chapter 14):	
	Mendel's scientific approach (14.1)	**EU 3.a.3**
	Laws & Mendelian inheritance (14.2)	**EU 3.a.3**
	Non-Mendelian inheritance (14.3)	**EU 3.a.3, 4.c.2, 4.c.4**
	Human trait patterns (14.4)	**EU 3.a.3**
	Concept reinforcement activity: *Genetics Problems; 1-2 periods* **[CR3c]**	**SP 2.1**
	Chromosomal Basis of Inheritance (Chapter 15):	
	Chromosome behavior & inheritance (15.1)	**EU 3.a.4**
	Sex-linked genes (15.2)	**EU 3.a.4**
	Linked genes (15.3)	**EU 3.a.4**
	Genetic disorders (15.4)	**EU 3.c.1**
	Exceptions to inheritance patterns (15.5)	**EU 3.a.4**
	Concept reinforcement activity: *Chi-Square Analysis; 1-2 periods* **[CR3c]**	**SP 2.2**
	AP Bio Investigative Lab #1: Artificial Selection *7 weeks, including a 10-day growing period…* **[CR6]** *(See investigation for lab breakdown.)*	**BI 1; SP 1, 2, 5 & 7**
	TEST #9: Chapters 14 & 15; Investigation #1	
	ESSAY #9: Genetic Inheritance	
UNIT 10 1-2 weeks	**MECHANISMS OF EVOLUTION (Chapters 22-24)…**	
	Descent with Modification (Chapter 22):	
	Darwin's revolutionary theory (22.1)	

"The Origin of Species" (22.2) **EU 1.a.1**
Scientific Evidence for Evolution (22.3) **EU 1.a.4**

Concept reinforcement activity: *Embryological Comparisons; 1-2 periods* **[CR3a] [CR4a]** **LO 1.13**

Evolution of Populations (Chapter 23):
Evolution via Genetic Variation (23.1) **EU 1.a.2, 4.c.3**
Hardy-Weinberg equation (23.2) **EU 1.a.1, 4.c.3, 4.c.4**
Allele frequency alteration (23.3) **EU 1.a.3, 4.c.3**
Adaptive Evolution via Natural Selection (23.4) **EU 1.a.2, 3.c.1**

Concept reinforcement activity: *Hardy-Weinberg Problems: Effects of Selection; 1-2 periods* **[CR3c] [CR4a]** **LO 1.6**

AP Bio Investigative Lab #2: Mathematical Modeling
3 Lab periods… **[CR6]** **BI 1; SP 1, 2 & 5**

The Origin of Species (Chapter 24):
Biological species concept (24.1) **EU 1.c.2, 2.e.2**
Speciation (24.2) **EU 1.c.3**
Hybrid zones (24.3) **EU 1.c.1**
Speciation: rapid or slow (24.4) **EU 1.c.1**

TEST #10: Chapters 22-24; Investigation #2
ESSAY #10: Natural Selection

UNIT 11 **ANIMAL DIVERSITY & BEHAVIOR (Chapters 32-34 & 51)…**
1-2 weeks

Overview of Animal Diversity (Chapter 32):
Animals: multicellular heterotrophic eukaryotes (32.1)
History of animals (32.2)
Animal "body plans" (32.3)
Emerging animal phylogeny (32.4)

Concept reinforcement activity: *Comparing & Contrasting Animal Phyla; 1-2 periods* **[CR3a]**

Introduction to Invertebrates (Chapter 33):
Sponges (33.1)
Cnidarians (33.2)
Lophotrochozoans (33.3)
Ecdysozoans (33.4)
Deuterostomes: Echinoderms & Chordates (33.5)

Origin & Evolution of Vertebrates (Chapter 34):

Chordates (34.1)
Craniates (34.2)
Vertebrates (34.3)
Gnathostomes (34.4)
Tetrapods (34.5)
Amniotes (34.6)
Mammals (34.7)
Humans (34.8)

Animal Behavior (Chapter 51):
Discrete Sensory Input stimulation (51.1) **EU 2.e.3**
Learning: experience & behavior (51.2) **EU 2.e.3**
Explanation of most behaviors (51.3) **EU 2.a.1**
Inclusive fitness: accounting for behavior (51.4)

AP Bio Investigative Lab #12: Fruit Fly Behavior
4 Lab periods… **[CR6]** **BI 4; SP 1, 3, 4, 5, 6 & 7**

TEST #11: Chapters 32-34 & 51; Investigation #12
ESSAY #11: Animal Diversity

UNIT 12 **ECOLOGIES (Chapters 52-56)…**
2-3 weeks

Ecology & the Biosphere (Chapter 52):
Earth's climate variations (52.1)
Terrestrial Biomes: structure & distribution (52.2) **EU 2.d.1**
Aquatic Biomes: diverse & dynamic (52.3)
Organisms & Environment interactions (52.4)

Population Ecology (Chapter 53):
Dynamic biological processes (53.1) **EU 2.d.1, 4.a.5**
Exponential Model: Population growth (53.2) **EU 2.d.1, 4.a.5**
Logistic Model: Population growth (53.3) **EU 2.a.1, 2.d.1, 4.a.5**
Life History Traits (53.4) **EU 2.a.1, 2.d.1**
Population regulation factors (53.5) **EU 2.d.1, 4.a.5**
Human population growth (53.6) **EU 4.a.5**

Community Ecology (Chapter 54):
Community's interactions (54.1) **EU 2.d.1, 2.e.3, 4.a.5, 4.b.3**
Diversity & Trophic structure (54.2) **EU 2.d.1, 4.a.5, 4.a.6, 4.c.4**
Species influencing disturbances (54.3) **EU 2.d.1**
Biogeographic factor affects (54.4) **EU 2.d.1**
Pathogens alter communities (54.5) **EU 2.d.1**

Ecosystems & Restoration Ecology (Chapter 55):
Energy flow & chemical cycling (55.1) **EU 2.d.1, 4.a.6**

Limiting factors for primary production (55.2) **EU 2.a.1, 2.d.1**
Trophic level energy transfer (55.3) **EU 2.a.1, 2.d.1, 4.a.6**
Nutrient & water cycling (55.4) **EU 2.d.1, 4.a.6**
Returning degraded ecosystems to natural state (55.5) **EU 4.a.6**

AP Bio Investigative Lab #10: Energy Dynamics
4-5 Lab periods… **[CR6]** **BI 1; SP 1, 2, 3, 4, 5, 6, & 7**

Conservation Biology & Global Change (Chapter 56):
Human Activities: threaten biodiversity (56.1) **EU 2.d.2, 2.d.3, 4.b.4, 4.c.4**
Population conservation (56.2)
Landscape & Regional conservation (56.3)
Human Actions: changing Earth (56.4) **EU 4.b.4**
Sustainable development (56.5)

TEST #12: Chapters 52-5; Investigation #10
ESSAY #12: Energy Dynamics

1-2 weeks **Advanced Placement Exam Review:**
Students should begin reviewing course materials & be ready to discuss all concepts & topics covered throughout the year.
Includes ALL material (text, lab, & otherwise) covered since the beginning of the year.
Practice exams, including multiple choice & essay parts will be given, with time limitations.
Extra time will be made available before & after school as necessary.

Advanced Placement Exam:
Monday, May 13, 2013, 8 AM.
See Guidance for specifics and details on location.

1-2 weeks **Year & Semester-long Project Preparations:**
Students will begin work on their individual presentations. Each student will research and prepare a twenty-minute power point, Prezi, or other similar type presentation. Alternate formats will be considered only if discussed and approved beforehand. Each student will prepare material related to their year & semester-long projects. Topics that students may consider, though in no way should be limited to, include the animals and/or plants associated with their group's work. Library research and class preparation time will be made available. Final journal entries of plants and/or animals are to be made by groups at this time. (BHS)

Year & Semester-long Project Presentations:
Presentations order will be determined beforehand, and will continue until all individuals have presented. (BHS)

Spring Semester Exam Review:

Extra time will be made available before & after school as necessary.

Final Exam Period

1 week

SPRING SEMESTER EXAM

Includes ALL material (text, lab, & otherwise) covered since the fall semester exam. Multiple-choice, grid-in, and short and long essay question formats will be included. Date & time of the exam will be announced.

Last day of school scheduled for Tuesday, June 17, 2013.

Please note: Instructors will be available the week after final exams for:
Discussion of grades
Letters of recommendation
Exit interviews

CONGRATULATIONS! YOU'VE MADE IT! GOOD LUCK & BEST WISHES TO YOU! DON'T FORGET TO KEEP IN TOUCH…

Syllabus prepared by: **Dr. Benjamin Wrubel; 2012**