

Advanced Placement Biology: 2017-2018

Instructor: E. Walsh--Room 407

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Class Website: classroom.google.com

Access Code: **vkea9r**

Join Remind: Text @APBioWalsh to 81010

Course Description

Biology is the study of living organisms and their interactions with their surroundings. Advanced Placement Biology is a college level course offered to high school students who have demonstrated a high level of motivation and an interest in the subject. Students who perform well on the AP exam in May will receive college credit for this course. This course is intended to be highly rigorous and will build on knowledge presented in previous science courses.

Course Overview

An understanding of how organisms change over time to become better suited to their environment is critical to any study of biology. Therefore, the unifying theme of this course is evolution. As we work our way through various topics, we will examine evolutionary patterns at all levels; genetic, cellular, organism, and population. This course is organized around four Big Ideas as outlined in the AP College Board Course Description:

- Big Idea 1: The process of evolution drives the diversity and unity of life
- Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis
- Big Idea 3: Living systems store, retrieve, transmit and respond to information essential to life processes
- Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties

The emphasis in Advanced Placement Biology is shifting away from the memorization of facts towards inquiry-based investigations. Students will strive to develop proficiency in the practice of science. Specifically:

- Science Practice 1: The student can use representations and models to communicate scientific phenomena and solve scientific problems
- Science Practice 2: The student can use mathematics appropriately
- Science Practice 3: The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course
- Science Practice 4: The student can plan and implement data collection strategies appropriate to a particular scientific question
- Science Practice 5: The student can perform data analysis and evaluation of evidence
- Science Practice 6: The student can work with scientific explanations and theories
- Science Practice 7: The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains

Course Requirements

The intent of this course is to provide the student with the equivalent of a college level biology course. The textbook used in this course is the 9th edition of *Biology* by Raven, Johnson, et al. There is a heavy emphasis on writing and laboratory work in this course. Students will complete a minimum of 8 laboratory investigations throughout the year, addressing each of the four Big Ideas.

To be successful in this course, it is recommended that students meet the following prerequisites:

- Completion of high school biology course with a minimum grade of B
- Completion of high school chemistry course with minimum grade of B
- At least 90% attendance during year prior to enrollment
- Rating of “proficient” or “advanced” in reading and writing on ACT Aspire

Teaching Strategies

This class meets 5 times per week for 49 minutes per session. Students will occasionally need to invest additional time before or after school or on Saturdays to complete laboratory exercises or to review material. Typically, class time will be divided as follows:

- Lecture-30% (approximately 80 minutes per week)
Lectures will be supported with PowerPoint presentations using the SMART board and internet resources. The goal of my lectures will be to help student see relationships rather than simply relaying facts.
- Lab-50% (approximately 120 minutes per week)
Students will be expected to prepare for labs outside of class. They will be provided with a protocol at least one day in advance. Following the lab, students will submit a formal lab report which must include: an abstract, materials list, procedure, data/results (including graphs when appropriate), and a conclusion that includes an analysis of the results and an examination of possible errors while posing new questions. In addition, all sources must be cited in correct format.
- Discussion-20% (approximately 50 minutes per week)
Students will engage in small group discussions about topics related to our current unit of study. To prepare for these discussions, students will be required to engage in outside reading from various sources, including scientific journals, newspapers and books.

Students will need to make a substantial investment in this course outside of class time. Students should expect to spend a minimum of **one hour of study/work time for each hour of class time**. Activities that students will be expected to complete on their own time include:

- Reading and outlining textbook chapters
- Preparing for laboratories
- Completing supplemental readings
- Working sample problems
- Completing sample essay questions in preparation for the AP exam

Your grade in the course will reflect the amount of effort you put into studying and preparing.

Computer Access

To be successful in this course, students will need regular access to a computer with Internet. In addition to maintaining a class website, the instructor will send out important reminders via email and will conduct periodic online help sessions. In addition, there are numerous online resources, including online access to the textbook. The online textbook can be accessed at:

<https://connect.mheducation.com/class/walsh-2017>

The access code is **WQE4-MWED-JYFF-TP6F-XRBC**

AP Exam

All students enrolled in this course are **EXPECTED** to take the AP Biology exam on May 14, 2018.

There is a fee to take the exam. The exam consists of two sections:

- 63 multiple choice questions plus 6 grid-in questions
 - 90 minutes
 - 50% of score
- 2 long response questions plus 6 short response questions
 - 80 minutes plus 10 minute reading period
 - 50% of score

Standards and Grading

Students will be given several opportunities to demonstrate their mastery of the content in this course. A student's semester grade in the course is determined by examining the evidence of their growth toward meeting each of the following standards:

- Evolution is the driver of diversity and unity of life
- Biological system utilization of energy/molecular building blocks
- Living systems store/retrieve/transmit/respond to information
- Interactions of biological systems and their properties
- Scientific practices

Student learning activities will fall into two categories: **Preparation** and **Performance**. Preparation activities are those done in and out of the classroom to prepare the student to show mastery of objectives. It is important to complete practice activities because the feedback will help the student progress toward mastery. Performance activities are those intended to show student mastery of objectives.

Evidence submitted by students will be evaluated against the standards and given a rating of

Advanced-Exhibits exceptional mastery of the course objectives

Proficient-Displays good mastery of the course objectives

Basic- Provides evidence of beginning mastery of course objectives

Minimal-Provides no evidence of mastery of course objectives

These ratings will be converted to a numeric value and translated into the traditional A, B, C, D, U grades for progress reports.

| Standard Level | GPA Point Scale | % Represented in ESIS | Traditional Letter Grade |
|-----------------|-----------------|-----------------------|--------------------------|
| AD (Advanced) | 4 | 100 (90-100) | A |
| PR (Proficient) | 3 | 85 (70-89) | 80-89=B 70-79=C |
| BA (Basic) | 2 | 65 (51-69) | D |
| MI (Minimal) | 1 | 50 (1-50) | U |
| 0 (No evidence) | 0 | 0 | U |

Students will have the opportunity to make revisions to evidence or attempt a replacement evidence piece to improve their achievement levels. The steps involved in this process include:

1. Examining the feedback given on the original work.
2. Incorporating the feedback into an improved product.
3. Conferencing with the teacher regarding the progressing work.

**Lab reports must be resubmitted within 5 days of the original work being returned.

**The deadline for all other retakes and resubmits is one week prior to the close of grades.

Lab Component

Science knowledge is gained best through hands-on, inquiry-based activity. As previously stated, there is a heavy emphasis on laboratory work in this course. Students will complete a minimum of eight formal labs during this course, each addressing one of the four Big Ideas. Each of labs will require a detailed lab report to be described later. Additional hands-on activities will be incorporated as appropriate. These may include modeling activities, computer simulations, or group demonstrations. In addition, each student will design and implement an investigation related to a topic of personal interest. This research will span a period of several weeks and will be presented in lieu of a second semester final exam.

Classroom Expectations

Students are expected to be seated, working on the daily warm-up before the bell rings to begin class.

Students who are late to class are expected to have a legitimate pass.

Students are strongly encouraged to be in class every day. The interactive nature of a science class makes it difficult to make up after an absence.

Students are responsible for making up any work missed during an excused absence. Work missed during an unexcused absence cannot be made up.

Students will not be given permission to leave the classroom once class has begun. All personal business, including using the restroom and going to lockers should be taken care of prior to class.

For safety reasons, **students are not permitted to chew gum, eat or drink in science classrooms.**

Clear, plastic water bottles are permitted.

Students are expected to abide by all laboratory safety rules. Failure to do so will result in removal from the lab. Student will not be permitted to make up the lab.

Failure to meet these expectations will be reflected in the student's Citizenship grade and may result in disciplinary action.

Cell Phone Policy

Electronic devices may not be used during class. Electronics should be turned off and put away upon entering class. Due to the unfortunate rise in electronics-facilitated cheating, cell phones are forbidden while students are taking a test. All students must surrender their cell phones upon entering the classroom for a test. Phones will be kept secure and returned after the test. Any student found in possession of a cell phone during a test will receive an automatic zero on the test.

Extra Help

It is essential that students study daily in order to perform well in this class. It is important to get clarification of difficult concepts as we go along, rather than waiting until right before a test. Do not wait until you are struggling to ask for help. Student Support is available in Science

Tuesdays 2:55-3:25

Thursdays 2:55-3:45

RUHS Citizenship Rubric

To earn a RESPECT CITIZENSHIP grade you must meet 3 or more criteria in one number band.

| | Be Responsible | Be Respectful | Honor Academic S | Be Safe |
|----------|---|--|--|---|
| 4 | Always <ul style="list-style-type: none"> on time to class phones, electronics are off and unseen food and drinks are not present during class (except water) | Always <ul style="list-style-type: none"> respectful of staff, students and school property uses appropriate language demonstrates appropriate school behavior | Always <ul style="list-style-type: none"> prepared for class participates on task works to potential demonstrates academic integrity | Always <ul style="list-style-type: none"> follows school and classroom rules follows staff directives secures personal belongings follows dress code |
| 3 | Consistently <ul style="list-style-type: none"> on time to class phones, electronics are off and unseen food and drinks are not present during class (except water) | Consistently <ul style="list-style-type: none"> respectful of staff, students and school property uses appropriate language demonstrates appropriate school behavior | Consistently <ul style="list-style-type: none"> prepared for class participates on task works to potential demonstrates academic integrity | Consistently <ul style="list-style-type: none"> follows school and classroom rules follows staff directives secures personal belongings follows dress code |
| 2 | Occasionally <ul style="list-style-type: none"> on time to class phones, electronics are off and unseen food and drinks are not present during class (except water) | Occasionally <ul style="list-style-type: none"> respectful of staff, students and school property uses appropriate language demonstrates appropriate school behavior | Occasionally <ul style="list-style-type: none"> prepared for class participates on task works to potential demonstrates academic integrity | Occasionally <ul style="list-style-type: none"> follows school and classroom rules follows staff directives secures personal belongings follows dress code |
| 1 | Rarely <ul style="list-style-type: none"> on time to class phones, electronics are off and unseen food and drinks are not present during class (except water) | Rarely <ul style="list-style-type: none"> respectful of staff, students and school property uses appropriate language demonstrates appropriate school behavior | Rarely <ul style="list-style-type: none"> prepared for class participates on task works to potential demonstrates academic integrity | Rarely <ul style="list-style-type: none"> follows school and classroom rules follows staff directives secures personal belongings follows dress code |

Discipline Policy

Students are expected to follow the school and class rules at all times. Chronic or serious infractions will result in referral to an administrator and a parent contact. Minor infractions will result in:

1. A verbal warning
2. A written warning
3. A 15 minute detention to be served within the week (before or after school)
4. A 30 minute detention to be served after school

What to Do if You've Been Absent

YOU ARE RESPONSIBLE FOR FINDING OUT WHAT YOU MISSED WHEN ABSENT!!!

1. Check the class website for notes and assignments that were given while you were gone.
2. You will have two days from the day you return to get assignments completed.
3. Turn in any assignments that were due while you were absent.
4. Check the "Out Box" to see what papers were returned while you were gone.
5. Check the file folders for any handouts that were given in your absence.
6. If there is a quiz on the day you return, you must take it, but you may write "absent" on the top of your paper, and it will be graded accordingly.
7. Since ample notice is given of upcoming tests, you will be expected to take any test you missed on the day you return unless the absence has been extended.
8. Make an appointment to see Ms. Walsh if you have any questions or need clarification on an assignment.

Final Assessments

A cumulative final assessment will be given at the end of each semester. All students are expected to participate in this assessment.

1. No exemptions are granted for the first semester.
2. In the second semester, all students will take the AP Biology Exam.

School Wide Literacy Focus

Riverside will be using a universal strategy to improve reading and writing for all students this year. We will use close reading with annotation and using evidence to support arguments in writing. In addition, we will implement the use of Achieve 3000 in science classes to further improve reading skills.

Supplies

The following supplies are required for this course:

- Laboratory notebook (pages must not be removable!)
- Composition book or spiral notebook (for taking notes and daily warm-ups)
- Flash drive
- Calculator
- Computer access

How to Contact Ms. Walsh

1. Join REMIND. I send out reminders and announcements via this service. To join, send this text message: @APBioWalsh to the number **81010**. You can also text me privately through this service.
2. Email: walshek@milwaukee.k12.wi.us I check email often so it is very efficient to get in touch with me this way. If you are emailing from a non-MPS email, please be sure to identify yourself.
3. Phone: I can also be reached by leaving a voicemail at **906-5175**. I will answer all voicemail messages within 24 hours.

Tentative Course Outline (Subject to Change)**Semester 1, Quarter 1 (45 days)**

| # of Days | Lecture Topics | Lab Activities | Readings |
|------------------|---|--|---|
| 5 | Themes of Biology Scientific Method/Inquiry | Lab: Animal Behavior | Raven, Chap. 1 Raven, Chap. 55 |
| 15 | Evolutionary Theory -Evolution of Populations -Origin of Species -Macroevolution -fossils, natural selection, gene pool, Hardy-Weinberg, genetic drift, mutation, reproductive barriers Early Earth and the Origin of Life | Lab: Population Genetics and Evolution | Raven, Chap. 20 Raven, Chap. 21 Raven, Chap. 22 Raven, Chap. 23 Raven, Chap. 24 |
| 15 | Ecology -population ecology -community ecology -ecosystems -conservation | Lab: Dissolved Oxygen and Primary Productivity | Raven, Chap. 56 Raven, Chap. 57 Raven, Chap. 58 Raven, Chap. 59 Raven, Chap. 60 |
| 10 | Biochemistry Water Carbon Chemistry Macromolecules | Lab: Properties of Water | Raven, Chap. 2 Raven, Chap. 3 |

Semester 1, Quarter 2 (45 days)

| # of Days | Lecture Topics | Lab Activities and Tests | Readings |
|------------------|--|---|--|
| 6 | Tour of the Cell -prokaryote/eukaryote -organelles -cell processes -cell theory Cell Membrane Structure Membrane Transport | Lab: Diffusion and Osmosis | Raven, Chap. 4 Raven, Chap. 5 Raven, Chap. 51 |
| 8 | Enzymes | Lab: Enzymes and Catalysts | Raven, Chap. 6 |
| 16 | Metabolism -laws of thermodynamics -Free energy -ATP Cellular Respiration | Lab: Cellular Respiration | Raven, Chap. 7 |
| 15 | Applications of Making Energy -digestion -circulation and gas exchange -excretion -immune response -nervous/endocrine responses | Lab: Physiology of the Circulatory System | Raven, Chap. 43 Raven, Chap. 44 Raven, Chap. 45 Raven, Chap. 46 Raven, Chap. 48 Raven, Chap. 49 Raven, Chap. 50 Raven, Chap. 52 |

Semester 2, Quarter 1 (45 days)

| # of Days | Lecture Topics | Lab Activities and Tests | Readings |
|-----------|--|--|--|
| 7 | Photosynthesis -chloroplast structure -light dependent reactions -Calvin cycle | Lab: Plant Pigments and Photosynthesis | Raven, Chap. 8 |
| 10 | Plant Structure and Growth -nutrition -transport | Lab: Transpiration | Raven, Chap. 36 Raven, Chap. 38 Raven, Chap. 40 Raven, Chap. 42 |
| 8 | Mitosis -asexual reproduction -phases of cell cycle -cancer | | Raven, Chap. 10 |
| 5 | Meiosis -haploid/diploid -sexual reproduction -gametogenesis | Lab: Mitosis and Meiosis | Raven, Chap. 11 |
| 15 | Chromosomal Basis of Inheritance -sex linkage -chromosome mapping Molecular Basis of Heredity -Griffith -Hershey and Chase -Chargaff laws -Meselson and Stahl experiments -DNA replication | Lab: Genetics of <i>Brassica rapa</i> | Raven, Chap. 12 Raven, Chap. 13 |

Semester 2, Quarter 2 (45 days)

| # of Days | Lecture Topics | Lab Activities and Tests | Readings |
|-----------|---|---|---|
| 20 | Genetics -law of segregation -law of independent assortment -sex-linkage -genetic disorders | | Raven, Chap. 14 Raven, Chap. 15 |
| 20 | Protein synthesis -gene to protein -gene regulation -viruses -biotechnology | Lab: Molecular Biology and Transformation | Raven, Chap. 16 Raven, Chap. 17 Raven, Chap. 54 |
| 5 | Review of AP Content | AP Exam, Monday, May 14, 2018 | |

AP BIOLOGY SYLLABUS AGREEMENT

Notice to Students

You are expected to keep this syllabus in your class notebook and refer to it as needed. Ignorance of the contents of this syllabus is not an acceptable excuse. These are the policies and procedures by which this class will operate. It is important that you are knowledgeable about what I will expect of you. Please sign below indicating your agreement to be held to these expectations.

Student Name (Print!)

Student Signature

Date

Notice to Parents

Your role as a partner in the education of your child is very important. Please sign below indicating that you will assist in holding your student to the expectations detailed in this syllabus.

Parent Name (Print!)

Parent Signature

Date

Phone Number

Email (Please PRINT carefully!)