AP Biology

Course Overview:
Would you believe that all of life - from the tiniest single-celled organism to the most advanced primates (us!) - can be understood through just “Four Big Ideas?” AP Biology is a course organized according to those ideas; below I have listed them and my vision for how they will be folded into units this school year.

FOUR BIG IDEAS OF AP BIOLOGY

1. EVOLUTION
The process of evolution drives the diversity and unity of life.

2. FREE ENERGY AND MOLECULAR BUILDING BLOCKS
Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

3. STORAGE, RETRIEVAL, TRANSMISSION, AND RESPONSE TO INFORMATION
Living systems store, retrieve, transmit, and respond to information essential to life processes.

4. COMPLEX INTERACTIONS OF BIOLOGICAL SYSTEMS
Biological systems interact, and these systems and their interactions possess complex properties.

Units and Activities: What will we be learning about and doing in this course?

<table>
<thead>
<tr>
<th>Unit</th>
<th>Main Ideas of the unit</th>
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<tr>
<td>Natural Selection and Evolution</td>
<td>The central, organizing principle of biology is the idea of Evolution. It is expressed at every scale - from population studies to microbiology - and at all times. As such, it is an important starting point for our studies.</td>
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<tr>
<td>Cell Structure and Functions</td>
<td>The “Tree of Life” has its roots in the structure and sub-structures of the cell. All forms of life share important cellular structures and functions.</td>
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<td>Chemistry of Life</td>
<td>What separates a rock from a frog? How are molecules like salt and sugar both different from living organisms yet vital to them?</td>
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<tr>
<td>Cellular Energy</td>
<td>How does an organism exchange energy with its surroundings? How does a cell get enough energy to perform the functions of life?</td>
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Gene Expression and Regulation

How do the physical qualities of an organism get expressed? How can we link the “genes” of an individual to its physical properties?

Heredity

How do parents - not just Mom & Dad but, say, adult trees - pass along traits to their offspring? What cellular-level processes must occur for traits to be passed on from generation to generation?

Cell Communication and Cell Cycle

How do cells communicate with one another and their surroundings? How does a cell “know” when to divide … or die?

Standards: What knowledge and skills will I gain by the end of this course?

Anchor Standards: This course will assess the knowledge and skills students build in key Anchor Standards. A student will have multiple opportunities to show their proficiency in each Anchor Standard. Below, each Anchor Standard for this course is named and described.

Communicating - Students will evaluate scientific information, often in the form of complex diagrams, extract main messages, and reconstruct that information in their own words and images. By so doing, students will develop their ability to deeply understand scientific information.

Investigating - Students will explore the natural world through the manipulation of real-world materials and via computer simulations (for those cases that warrant such explorations).

Computational Thinking - Students will move back and forth from the concrete experiences of the classroom to the abstract realm of mathematics and computational thinking. Mapping reality into symbolic language is a key science skill.

Explaining - Many of the other Anchor Standards will inform a student’s ability to explain the natural world. Our efforts will be to develop our understanding from simplistic to sophisticated.

Course Standards: This course builds student knowledge using the AP Biology standards. The learning outcomes for the AP Biology course can be found here.
Assessment of Learning:
For information about assessment types, scoring, and overall grade calculation: click here.

Communication:

How Do I Access Work from Home, and What Should I Expect?
- All work will be posted in Google Classroom.
- The work will be explained during our in-person meetings and/or by video posted to Google Classroom.
- The work will also be explained in our Class Planner posted to Google Classroom.
- If you have any questions, email your teacher.

How Do I Know What My Grades Are?
- On Summative Assessments, teachers will provide both a 4-point grade and a letter grade.
- You can monitor your progress in the following ways:
  - By reading feedback and scoring returned to students on summative assessments.
  - By monitoring the scores and Overall Course Mastery Grade in the Parent/Student portal on JumpRope. Reminders to check grades will be sent from the school.
  - Communicating with your teacher if you are unclear.

Where Can I Find This Syllabus during the School Year?
- This syllabus will be available on the school website in each subject’s department tab once the school year is up and running. It will also be available in our Google Classroom.

How Do I See What’s Due?
- Assignment and summative assessment due dates with handouts are posted in Google Classroom, with connection to Google Calendar, for student access.

How Do I See What’s Past Due?
- If a student is missing a grade on an assessment, it will be listed in the red “Missing Assessment” section of the JumpRope Parent/Student Portal along with any attachments. Please contact your teacher if you have any questions.

Materials:

We will be using this textbook in this class. We will frequently need to access digital materials on Google Classroom and elsewhere. Please ensure that you bring your laptop/tablet/netbook to class for full participation.

Schoolwide Procedures:

Please see the Student Handbook for Procedures and Policies related to: Due dates and deadlines, extra credit, retaking assessments, and turnaround time for grade entry.

Personal Mobile Devices: This class will follow the procedures outlined in the student handbook.
Class Expectations:

Four norms I will seek to establish with my you:

1) **Equity** - We each have a voice. We each have the right to be heard. We each have an obligation to contribute our thoughts.

2) **Respect** - We each deserve to be heard and understood. We owe one another the basic decency of attention and consideration. We can disagree without being disagreeable.

3) **Reason** - We need to focus on evidence and logic. We should expect to provide a rationale for our thoughts. We should expect to be asked for such.

4) **Stewardship** - We each have a role to play in establishing a positive classroom culture. We each have a role to play in our own learning.