

## **Sample Syllabus**

### **High School Fast-Paced Biology**

#### **Sample Materials:**

- Lecture Notebook
- Lab notebook
- Pencil/Pen
- Dissection Kit
- Biology by Miller & Levine (2010)
  - ISBN-13: 978-0-13-366951-0
- Active brain & Imagination

#### **Course Description:**

This intensive, fast-paced course is designed to expose students to the different concepts in an accelerated introductory biology course. This course will be approached from a micro to a macro scale (from basic atoms to the biosphere). Due to the accelerated nature of the course, multiple chapters and sometimes units of the textbook may be covered in single day. Students in this course are given the opportunity, and encouraged to be extremely creative and to leverage all unique talents in order to improve their mastery of the content.

**\*\*Note:** while this course is not designed to replace AP biology, students who successfully complete the course will have a much easier time adapting to an AP environment granted that they complete a year of chemistry first.\*\*

#### **Learning Outcomes:**

After successful completion of the course, students will be able to:

- Apply the Scientific Method and critical thinking skills to solve complex problems
- Identify and explain the characteristics for living things

- Explain how structure and function are interrelated
- Explain how evolution is the underlying theme of biology
- List and describe some of the professional careers that require thorough knowledge of biology

**Instructional Methods:**

- Lectures
- Discussions
- Short Videos
- Laboratory exercises

**Assessment:**

Students will be assessed using several methods including but not limited to the following:

- Tests
- Quizzes (announced & unannounced)
- Exit tickets
- Lab write-ups/reports
- Lab practical(s)
- Projects
- Case Studies
- Article Reviews

**Personal Technology Policy:**

Cell phones, PDAs, laptops, tablets etc... will not be permitted in the classroom except when explicit permission is obtained from instructors.

**Student Code of Ethics:**

All students must abide to policies laid out by Johns Hopkins CTY policy. In addition, all students are expected to work individually on quizzes, projects and tests, unless instructed otherwise. Plagiarism, cheating and other unacceptable behaviors will be addressed appropriately through CTY policy.

**Tentative Schedule:**

Day	Session & Topic/Objectives	Activities/ Methods & Assignments	Targeted Vocabulary
1 Sun	<b>Evening (7:00PM - 9:00PM)</b> <ul style="list-style-type: none"> <li>● Introductions</li> <li>● Pre-test</li> </ul>	<ul style="list-style-type: none"> <li>● Introduction</li> <li>● Pre-test</li> </ul>	N/A
2 Mon	<b>Morning (9:00AM - 12:00PM)</b> <ul style="list-style-type: none"> <li>● Classroom procedures discussion</li> <li>● Transition to and from class discussion</li> <li>● Course overview</li> <li>● Intro to Scientific Method</li> <li>● Introduction to Nature of Life</li> <li>● Lab procedures discussion</li> <li>● Intro to Basic Chemistry</li> <li>● Properties of Water               <ul style="list-style-type: none"> <li>○ Adhesion &amp; Cohesion</li> <li>○ Surface Tension</li> <li>○ Polarity</li> <li>○ Heat capacity</li> <li>○ Solvent</li> </ul> </li> <li>● <b>Penny Lab</b></li> </ul> <b>Afternoon (1:00PM - 3:00PM)</b> <ul style="list-style-type: none"> <li>● Chemistry of life</li> <li>● Nature of matter</li> <li>● Carbon Compounds</li> </ul>	<b>Introductions to HS Fast-Paced Biol:</b> <ul style="list-style-type: none"> <li>● Students will be given a brief overview of the course, the classroom procedures, lab safety rules and an opportunity to ask questions</li> </ul> <b>Intro to Scientific Method:</b> <ul style="list-style-type: none"> <li>● Students will be asked to list the major steps of the Scientific Method and its application to scientific inquiry</li> </ul> <b>Defining Life:</b> <ul style="list-style-type: none"> <li>● Students will be given a lecture over Scientific Method and the nature of life.</li> <li>● Students will be introduced to basic chemistry of atoms and properties of water</li> </ul> <b>Penny Lab:</b> <ul style="list-style-type: none"> <li>● Students will be conducting a lab determining a penny's ability to hold water drops</li> <li>● Students will hold a brief discussion over the different properties of water that allow a penny's surface to hold several drops of water</li> </ul> <b>Warm up Activity:</b> <ul style="list-style-type: none"> <li>● Students will be asked to answer a few questions on their understanding of the major macromolecules</li> </ul>	<ul style="list-style-type: none"> <li>● Science</li> <li>● Observation</li> <li>● Inference</li> <li>● Hypothesis</li> <li>● Controlled experiment</li> <li>● Independent variable</li> <li>● Dependent variable</li> <li>● Control group</li> <li>● Data</li> <li>● Theory</li> <li>● Bias</li>   <li>● Biology</li> <li>● DNA</li> <li>● Stimulus</li> <li>● Sexual reproduction</li> <li>● Asexual reproduction</li> <li>● Homeostasis</li> <li>● Metabolism</li>   <li>● Atom</li> <li>● Nucleus</li> </ul>

	<ul style="list-style-type: none"> <li>○ Carbohydrates <ul style="list-style-type: none"> <li>■ Monosaccharide</li> <li>■ Polysaccharide</li> </ul> </li> <li>○ Lipids</li> <li>○ Proteins <ul style="list-style-type: none"> <li>■ Amino Acid</li> </ul> </li> <li>○ Nucleic Acids <ul style="list-style-type: none"> <li>■ Nucleotides</li> </ul> </li> <li>● Chemical Reactions &amp; Enzyme <ul style="list-style-type: none"> <li>○ Catabolic &amp; Anabolic</li> <li>○ Substrates &amp; Products</li> <li>○ Optimal conditions</li> <li>○ Activation Energy <ul style="list-style-type: none"> <li>■ pH, Temp., regulatory molecules</li> </ul> </li> </ul> </li> <li>● Enzyme Lab/Demo</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Lab write up (in notebooks)</li> <li>● Review Activity (POGIL)</li> </ul>	<p><b>Introduction to Organic Compounds:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a brief lecture over the different macromolecules and their uses in cells and the human body.</li> </ul> <p><b>Enzyme lab:</b></p> <ul style="list-style-type: none"> <li>● Students complete a lab over the the different factors that affect an enzyme's reaction</li> </ul> <p><b>Lab Report Questions &amp; Lab Report:</b></p> <ul style="list-style-type: none"> <li>● Students will be completing a lab report over the labs from the day</li> <li>● They will then complete an POGIL activity over enzymatic reactions.</li> </ul>	<ul style="list-style-type: none"> <li>● Electron</li> <li>● Proton</li> <li>● Isotope</li> <li>● Neutron</li> <li>● Bonds</li> <li>● Ionic</li> <li>● Covalent</li> <li>● Hydrogen bond</li> <li>● Van der Waals</li>   <li>● Acids &amp; Bases</li> <li>● Buffer</li> <li>● Monomer</li> <li>● Polymer</li> <li>● Catalyst</li> <li>● Reactant</li> </ul>
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<p><b>3 Tue</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Cellular basis of life <ul style="list-style-type: none"> <li>○ Cell theory</li> <li>○ Prokaryote</li> <li>○ Eukaryote</li> </ul> </li> <li>● Cell structure &amp; function <ul style="list-style-type: none"> <li>○ Organelle</li> </ul> </li> <li>● Cell Transport</li> <li>● Selective Permeability</li> <li>● Active vs Passive</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Diffusion Osmosis Lab</li> <li>● Tonicity Lab/Demo</li> <li>● Lab questions</li> <li>● Lab write-up</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Review Activity (POGIL) <ul style="list-style-type: none"> <li>○ Cell Structure &amp; Functions</li> <li>○ Cell Membrane</li> <li>○ Cell Transport</li> </ul> </li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be asked to answer a few questions about their knowledge of cellular structures and functions.</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will be given an introductory lecture over cell structures and their functions</li> </ul> <p><b>Diffusion &amp; Osmosis Lab:</b></p> <ul style="list-style-type: none"> <li>● Students will answer pre-lab questions over general cell transport</li> <li>● Students will conduct a lab over Diffusion, Osmosis, and overall Tonicity</li> <li>● Students will write a full lab report over the the lab</li> </ul> <p><b>Evening Review:</b></p> <ul style="list-style-type: none"> <li>● Students will complete a POGIL activity over cell structures, and functions.</li> </ul>	<ul style="list-style-type: none"> <li>● Cell</li> <li>● Nucleus</li> <li>● Cell Membrane</li> <li>● Lipid bilayer</li> <li>● Cytoplasm</li> <li>● Vacuole</li> <li>● Lysosome</li> <li>● Centriole</li> <li>● Cytoskeleton</li> <li>● Ribosome</li> <li>● Smooth ER</li> <li>● Rough ER</li> <li>● Golgi</li> <li>● Chloroplast</li> <li>● Mitochondria</li> <li>● Cell Wall</li> <li>● Diffusion</li> <li>● Facilitated diffusion</li> <li>● Aquaporin</li> <li>● Osmosis</li> <li>● Isotonic</li> <li>● Hypertonic</li> <li>● Hypotonic</li> <li>● Osmotic Pressure</li> <li>● Endocytosis</li> <li>● Exocytosis</li> <li>● Protein Pumps</li> <li>● Vesicle</li> <li>● Homeostasis</li> <li>● Tissue</li> <li>● Organ</li> <li>● Organsystem</li> </ul>
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			<ul style="list-style-type: none"> <li>● Receptor</li> </ul>
<p><b>4</b></p> <p><b>Wed</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Photosynthesis <ul style="list-style-type: none"> <li>○ Light-dependent reactions</li> <li>○ Light-independent reactions</li> <li>○ Photosystem</li> <li>○ Electron Transport Chain</li> <li>○ Calvin Cycle</li> </ul> </li> <li>● Photosynthesis POGIL <ul style="list-style-type: none"> <li>○ What is a Leaf</li> </ul> </li> <li>● Cellular Respiration <ul style="list-style-type: none"> <li>○ Glycolysis</li> <li>○ Krebs Cycle</li> <li>○ Oxidative Phosphorylation</li> </ul> </li> <li>● Fermentation <ul style="list-style-type: none"> <li>○ Lactic Acid</li> <li>○ Alcoholic</li> </ul> </li> <li>● Cell Respiration POGIL</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● <b>Photosynthesis Lab</b> <ul style="list-style-type: none"> <li>○ Lab Questions</li> </ul> </li> <li>● <b>Cell Respiration Lab</b> <ul style="list-style-type: none"> <li>○ Lab Questions</li> </ul> </li> <li>● Respiration vs. Photosynthesis POGIL</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will write a brief paragraph summary comparing and contrasting photosynthesis and cellular respiration to the best of their knowledge</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will receive a lecture over the processes of photosynthesis and cellular respiration</li> <li>● Students will complete POGIL exercise comparing and contrasting the two processes</li> </ul> <p><b>Photosynthesis &amp; Cellular Respiration Lab:</b></p> <ul style="list-style-type: none"> <li>● Students will complete photosynthesis and cellular respiration labs</li> <li>● Students will answer questions about both labs</li> </ul>	<ul style="list-style-type: none"> <li>● ATP</li> <li>● Heterotroph</li> <li>● Autotroph</li> <li>● Pigment</li> <li>● Chlorophyll</li> <li>● Thylakoid</li> <li>● Stroma</li> <li>● ATP synthase</li> <li>● Calorie</li> <li>● Anaerobic</li> <li>● Aerobic</li> </ul>

	<p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Cell Metaphor Poster</li> </ul>	<p><b>Cell Posters:</b></p> <ul style="list-style-type: none"> <li>● Students will be asked to create a poster of a metaphorical cell outlining all the different organelles and their functions.</li> </ul>	
<p><b>5</b> <b>Thu</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Cell Poster Presentation</li> <li>● Mendelian Genetics <ul style="list-style-type: none"> <li>○ Principles of Dominance</li> <li>○ Fertilization</li> </ul> </li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Punnett Squares Practice</li> <li>● Mendelian Creation Posters</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Mendelian Poster Presentations</li> </ul>	<p><b>Cell Poster Presentations:</b></p> <ul style="list-style-type: none"> <li>● Students will be given the opportunity to present their posters in front of the entire class</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a lecture over the principles of Mendelian Genetics</li> <li>● Students will be given an opportunity to practice punnett squares.</li> </ul> <p><b>Mendelian Principles in Action:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a set of problems using punnett squares to learn the different principles that apply</li> <li>● Students will be asked to create offspring from different combinations of genes with different dominance patterns</li> </ul> <p><b>Presentations:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a few minutes to finalize their posters</li> <li>● Students will then present their posters to the whole class</li> </ul>	<ul style="list-style-type: none"> <li>● Trait</li> <li>● Hybrid</li> <li>● Gene</li> <li>● Allele</li> <li>● Gametes</li> <li>● Meiosis</li> <li>● Segregation</li> <li>● Independent Assortment</li> <li>● Phenotype</li> <li>● Genotype</li> <li>● Probability</li> <li>● Dominant</li> <li>● Recessive</li> <li>● Homozygous</li> <li>● Heterozygous</li> <li>● Incomplete Dominance</li> <li>● Codominance</li> <li>● Polygenic inheritance</li> <li>● Multiple alleles</li> <li>● Homologous</li> <li>● Haploid</li> <li>● Diploid</li> <li>● Tetrad</li> <li>● Zygote</li> <li>● Crossing-over</li> </ul>

<p><b>6</b> <b>Fri</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Central Dogma <ul style="list-style-type: none"> <li>○ DNA - RNA - Protein</li> </ul> </li> <li>● Mutations <ul style="list-style-type: none"> <li>○ Large scale vs. Small scale</li> </ul> </li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Central Dogma POGIL</li> <li>● Central Dogma Kit</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a scenario to allow them to share creativity: <ul style="list-style-type: none"> <li>○ They will be asked to imagine themselves are thieves attempting to break into a vault to steal a secret recipe. They will be given a few tools at their disposals and will be told that they have to use all of them</li> </ul> </li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a lecture over the major concepts of the central dogma, and general mutations that can occur as well as their potential consequences</li> </ul> <p><b>Central Dogma Kit:</b></p> <ul style="list-style-type: none"> <li>● Students will complete a pre-lab exercise over the central dogma (DNA-RNA-Proteins)</li> <li>● Students will work collaboratively to simulate the central dogma using the provided kit</li> </ul>	<ul style="list-style-type: none"> <li>● Replication</li> <li>● Transcription</li> <li>● Translation</li> <li>● Primer</li> <li>● mRNA</li> <li>● tRNA</li> <li>● DNA Polymerase</li> <li>● RNA Polymerase</li>   <li>● Deletions</li> <li>● Insertion</li> <li>● Silent</li> <li>● Missense</li> <li>● Nonsense</li> </ul>
<p><b>7</b> <b>Sun</b></p>	<p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Exam 1</li> </ul>	<p><b>Cumulative Exam 1:</b></p> <ul style="list-style-type: none"> <li>● Students have an opportunity to review the information on their own</li> <li>● Students Complete a cumulative exam over the content they have learned so far.</li> </ul>	<p>N/A</p>
<p><b>8</b> <b>Mon</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Cell Growth &amp; Division</li> <li>● Cell Cycle</li> <li>● Sexual Reproduction</li> <li>● Asexual Reproduction</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be asked to answer a few questions regarding sexual and asexual reproduction, and the advantages/disadvantages they pose</li> </ul>	<ul style="list-style-type: none"> <li>● Chromosome</li> <li>● Chromatin</li> <li>● Interphase</li> <li>● Mitosis</li> <li>● Meiosis</li> </ul>



	<p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Mitosis/Meiosis Lab</li> <li>● Cell cycle regulation <ul style="list-style-type: none"> <li>○ Cancers</li> </ul> </li> <li>● Cell Differentiation <ul style="list-style-type: none"> <li>○ Stem Cells</li> </ul> </li> <li>● Review Activity POGIL</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Cancer Case Studies</li> </ul>	<p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a lecture over the Cell Cycle and the roles it plays in cell division (sexual and asexual)</li> </ul> <p><b>Mitosis/Meiosis Lab:</b></p> <ul style="list-style-type: none"> <li>● Students will complete pre-lab questions over the mitosis/meiosis lab</li> <li>● Students will collaboratively complete the mitosis/meiosis lab</li> <li>● Students will later be introduced to cancer and stem cells</li> </ul> <p><b>Cancer Case Studies:</b></p> <ul style="list-style-type: none"> <li>● Students will complete case studies on Stem Cell Research as well as Case Studies.</li> </ul>	<ul style="list-style-type: none"> <li>● Prophase</li> <li>● Metaphase</li> <li>● Anaphase</li> <li>● Telophase</li> <li>● Centromere</li> <li>● Chromatid</li> <li>● Centriole</li> <li>● Cytokinesis</li>   <li>● Tumors</li> <li>● Apoptosis</li> <li>● Totipotent</li> <li>● Multipotent</li> <li>● Pluripotent</li> </ul>
<p><b>9</b> <b>Tue</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Intro to Evolution</li> <li>● Darwin vs. Lamarck</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Evolution of populations</li> <li>● Natural Selection</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be asked to write a brief paragraph summary about their general understanding of evolution or make a list of the concepts they are familiar with.</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will be given an introductory lecture on evolution and the different theories that contributed to its development</li> </ul> <p><b>Population Evolution:</b></p> <ul style="list-style-type: none"> <li>● Students will be given a brief introduction on the methods by which populations evolve.</li> <li>● Students will be carrying out an activity over the different types of Natural Selection that occur.</li> </ul>	<ul style="list-style-type: none"> <li>● Fossil</li> <li>● Artificial Selection</li> <li>● Adaptation</li> <li>● Fitness</li> <li>● Natural Selection</li> <li>● Directional selection</li> <li>● Disruptive selection</li> <li>● Stabilizing selection</li> <li>● Biogeography</li> </ul>

	<p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Review Activity</li> </ul>	<p><b>Evening Review:</b></p> <ul style="list-style-type: none"> <li>● Students will be completing a POGIL handout over evolution of and the different types of evidence for evolution.</li> </ul>	
<p><b>10</b> <b>Wed</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Speciation <ul style="list-style-type: none"> <li>○ Reproductive Isolation</li> </ul> </li> <li>● Review POGIL <ul style="list-style-type: none"> <li>○ Evidence of Evolution</li> <li>○ Evolution &amp; Selection</li> </ul> </li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Natural Selection Lab</li> <li>● Animal Behavior Lab</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Evolution Case Study</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students are given a group of species on a handout to organize and trace back to common ancestors using their known characteristics.</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students receive a lecture over the formation of new species and the different methods by which it occurs.</li> </ul> <p><b>Pre-lab:</b></p> <ul style="list-style-type: none"> <li>● Students will complete the pre-lab questions over animal behaviors that may result in speciation</li> </ul> <p><b>Natural Selection &amp; Animal Behavior Lab:</b></p> <ul style="list-style-type: none"> <li>● Students will conduct laboratory exercises over natural selection and animal behaviors.</li> </ul> <p><b>Evolution Case Study:</b></p> <ul style="list-style-type: none"> <li>● Students will complete a case study over speciation through allopatric and sympatric methods.</li> </ul>	<ul style="list-style-type: none"> <li>● Genetic drift</li> <li>● Bottleneck effect</li> <li>● Founder effect</li> <li>● Hardy-Weinberg</li> <li>● Sexual Selection</li> <li>● Homologous structures</li> <li>● Analogous structures</li> <li>● Vestigial structure</li> <li>● Species</li> <li>● Behavioral isolation</li> <li>● Temporal isolation</li> <li>● Geographic isolation</li> </ul>
<p><b>11</b> <b>Thu</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Classification <ul style="list-style-type: none"> <li>○ DKPCOFGS</li> </ul> </li> <li>● Phylogeny</li> <li>● Tree of Life</li> <li>● Biological Classification POGIL</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be presented with an envelope addressed to a specific individual at a specific location and be asked to write a paragraph about the steps they would take to deliver it.</li> </ul>	<ul style="list-style-type: none"> <li>● Taxonomy</li> <li>● Systematics</li> <li>● Domain</li> <li>● Kingdom</li> <li>● Phylum</li> <li>● Class</li> <li>● Order</li> </ul>

	<ul style="list-style-type: none"> <li>● History of Life</li> <li>● Patterns and Process of Evolution</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Clade Review</li> <li>● Evolution of an idea, entity(poster)</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Finalization of Posters</li> <li>● Poster Presentations</li> </ul>	<p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will receive a lecture over the classification of life</li> <li>● Students will perform a group activity to classify different living organisms</li> <li>● Students will build a timeline of the evolution of life.</li> </ul> <p><b>Review &amp; Evolution Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be completing an activity over building and classifying cladograms.</li> <li>● Students will be tasked with creating a poster over the evolution of an idea, technology, or idea in order to trace it back from its past and predicting its future.</li> </ul> <p><b>Presentation:</b></p> <ul style="list-style-type: none"> <li>● Students will finish their presentations</li> <li>● Students will present their posters to the whole class</li> </ul>	<ul style="list-style-type: none"> <li>● Family</li> <li>● Genus</li> <li>● Species</li> <li>● Monophyletic</li> <li>● Paraphyletic</li> <li>● Clade</li> <li>● Derived character</li> <li>● Cladogram</li> <li>● Domain</li> <li>● Bacteria</li> <li>● Archaea</li> <li>● Eukarya</li> <li>● Radiometric Dating</li> <li>● Half-life</li> <li>● Relative dating</li> <li>● Strata</li> <li>● Era</li> <li>● Epoch</li> <li>● Period</li> <li>● Plate Tectonics</li> <li>● Gradualism</li> <li>● Punctuated equilibrium</li> <li>● Mass extinction</li> <li>● Coevolution</li> <li>● Convergent evolution</li> <li>● Adaptive radiation</li> <li>● Endosymbiotic theory</li> </ul>
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<p><b>12</b> <b>Fri</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Viruses &amp; Prokaryotes</li> <li>● Viruses &amp; Bacteria Case Studies</li> <li>● Protists &amp; Fungi</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Case Studies</li> <li>● Classification POGIL</li> <li>● Virus &amp; Bacteria POGIL</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students will be answering questions about classifying different types of prokaryotes</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students will take notes on a lecture over prokaryotes (bacteria and archaea), and viruses.</li> <li>● Students will read and complete a chart over fungi and the different types of protists.</li> </ul> <p><b>Review &amp; Case Studies:</b></p> <ul style="list-style-type: none"> <li>● Students will complete a POGIL exercise over viruses and bacteria</li> <li>● Students will complete a case study of prokaryotes, viruses, fungi, and protists.</li> </ul>	<ul style="list-style-type: none"> <li>● Virus</li> <li>● Capsid</li> <li>● Bacteriophage</li> <li>● Lytic</li> <li>● Lysogenic</li> <li>● Retrovirus</li> <li>● Provirus</li> <li>● Prokaryote</li> <li>● Conjugation</li> <li>● Endospore</li> <li>● Binary Fission</li> <li>● Spirillum</li> <li>● Coccus</li> <li>● Bacillus</li> <li>● Gram +/-</li> <li>● Antibiotics</li> <li>● Pathogen</li> <li>● Vaccine</li> <li>● Prion</li> <li>● Plant-like protist</li> <li>● Animal-like protists</li> <li>● Fungus-like protist</li> <li>● Chitin</li> <li>● Hyphae</li> <li>● Mycelium</li> <li>● Mycorrhizae</li> <li>● Lichen</li> <li>● Fruiting body</li> </ul>
<p><b>13</b> <b>Sun</b></p>	<p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Review</li> <li>● EXAM 2</li> </ul>	<p><b>Exam Review:</b></p> <ul style="list-style-type: none"> <li>● Students review independently or in groups (based on student choice) in order to take the exam</li> </ul>	<p><b>N/A</b></p>

		<b>Test:</b> <ul style="list-style-type: none"> <li>Students are given an exam over the content they have learned in part 2 of the course.</li> </ul>	
<b>14</b> <b>Mon</b>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>Intro to Plants</li> <li>Plant Structure &amp; Function <ul style="list-style-type: none"> <li>Vascular Tissue</li> <li>Seed vs. Seedless</li> </ul> </li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>Plant Evolution</li> <li>Plant Reproduction &amp; Response</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>Case Studies <ul style="list-style-type: none"> <li>Plant &amp; Animal Co-evolution</li> <li>Plant &amp; Fungi Co-evolution</li> </ul> </li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>Students are asked to label the different parts of a plant and identify their functions</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>Students receive a lecture over the structures and functions of plant and their overall role in the environment in sustaining life</li> <li>Students complete an activity comparing and contrasting vascular and nonvascular plants, and seed and seedless plants.</li> </ul> <p><b>Plant Evolution Activity:</b></p> <ul style="list-style-type: none"> <li>Students read a source and construct a timeline of plant evolution over time</li> <li>Students present a timeline of adaptations that allowed plants to conquer land (as well as advantages and disadvantages)</li> </ul> <p><b>Case Study Activity:</b></p> <ul style="list-style-type: none"> <li>Students complete a case study over the coevolution of plants and pollinators as well as symbiotic relationships between plants and other species.</li> </ul>	<ul style="list-style-type: none"> <li>Alternation of Generation</li> <li>Sporophyte</li> <li>Gametophyte</li> <li>Xylem</li> <li>Phloem</li> <li>Angiosperm</li> <li>Gymnosperm</li> <li>Seed coat</li> <li>Monocot vs Dicot</li> <li>Leaves</li> <li>Roots</li> <li>Stems</li> <li>Flowers</li> </ul>
<b>15</b> <b>Tue</b>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>What is an animal</li> <li>Animal body plans &amp;</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>Students are asked to organize animals from simplest to most complex</li> </ul>	<ul style="list-style-type: none"> <li>Invertebrate</li> <li>Vertebrate</li> <li>Notochord</li> </ul>

	<p>Evolution</p> <ul style="list-style-type: none"> <li>● Symmetry</li> </ul> <p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Comparative Anatomy Lab <ul style="list-style-type: none"> <li>○ Dissections</li> </ul> </li> <li>● Lab Reflection Questions</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Human Body Systems Overview</li> <li>● Pathogen Infection Case Study</li> </ul>	<p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students take notes over a lecture on animal evolution and development</li> <li>● Students complete a group activity on classification of animals based on physical characteristics</li> <li>● Students complete pre-lab exercises over dissection of different animal species</li> </ul> <p><b>Comparative Anatomy Dissection Lab:</b></p> <ul style="list-style-type: none"> <li>● Students are broken into pairs to carry out dissection of several animals from simple to complex.</li> <li>● Students complete reflection questions over the dissection lab.</li> </ul> <p><b>Human Body Systems overview:</b></p> <ul style="list-style-type: none"> <li>● Students receive a brief lecture explaining the purpose of each organ system of the human body and some of the major organs in it.</li> <li>● Students complete a case study exercise over pathogen infections in the human body</li> <li>● Students complete case study over primate evolution</li> </ul>	<ul style="list-style-type: none"> <li>● Feedback inhibition</li> <li>● Pharyngeal pouch</li> <li>● Radial</li> <li>● Bilateral</li> <li>● Endoderm</li> <li>● Ectoderm</li> <li>● Mesoderm</li> <li>● Coelom</li> <li>● Asceolom</li> <li>● Pseudocoelom</li> <li>● Cephalization</li> <li>● Evolution of Invertebrate</li> <li>● Chordate/Vertebrate Evolution</li> <li>● Primate Evolution</li> </ul>
<p><b>16</b> <b>Wed</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Ecology</li> <li>● The biosphere</li> <li>● Ecosystems &amp; Communities</li> <li>● Populations</li> </ul>	<p><b>Warm up Activity:</b></p> <ul style="list-style-type: none"> <li>● Students are asked to organize different levels of ecology in order from largest to smallest</li> <li>● Students are asked to identify niches within a food chain</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students receive a lecture on introduction to Ecology</li> <li>● Students participate in whole class discussion on</li> </ul>	<ul style="list-style-type: none"> <li>● Energy</li> <li>● Population</li> <li>● Community</li> <li>● Abiotic factor</li> <li>● Biotic factor</li> <li>● Ecosystem</li> <li>● Biome</li> <li>● Producer</li> <li>● Consumer</li> <li>● Autotroph</li> </ul>

	<p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Human impacts on Biosphere</li> <li>● Climate</li> <li>● Niche &amp; Community interactions</li> <li>● Succession</li> <li>● Biomes</li> <li>● Aquatic Ecosystems</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● Threats to Biodiversity Case Study</li> </ul>	<p>ecology</p> <ul style="list-style-type: none"> <li>● Students answer exit questions on the new content</li> </ul> <p><b>Lecture/Notes:</b></p> <ul style="list-style-type: none"> <li>● Students receive a lecture over population, community, biome, and biosphere level ecology</li> <li>● Students complete activity over different biomes and their locations in the world</li> <li>● Students present on their assigned biomes to the whole class</li> </ul> <p><b>Case Study:</b></p> <ul style="list-style-type: none"> <li>● Students work in groups using internet resources, and books to complete case study over different threats to biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>● Heterotroph</li> <li>● Photosynthesis</li> <li>● Chemosynthesis</li> <li>● Herbivore</li> <li>● Carnivore</li> <li>● Omnivore</li> <li>● Decomposer</li> <li>● Scavenger</li> <li>● Detrivore</li> <li>● Energy flow</li> <li>● Food chain</li> <li>● Food web</li> <li>● Trophic level</li> <li>● Biomass</li> <li>● Ecological pyramid</li> <li>● Cycles of Matter</li> <li>● Nutrient</li> <li>● Nitrogen fixation</li> <li>● Carbon Cycle</li> <li>● Nitrogen Cycle</li> <li>● Phosphorus Cycle</li> <li>● Water Cycle</li> <li>● Climate</li> <li>● Weather</li> <li>● Greenhouse effect</li> <li>● Microclimate</li> <li>● Habitat</li> <li>● Competition</li> <li>● Predation</li> </ul>
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			<ul style="list-style-type: none"> <li>● Herbivory</li> <li>● Keystone species</li> <li>● Symbiosis</li> <li>● Parasitism</li> <li>● Commensalism</li> <li>● Mutualism</li> <li>● Niche</li> <li>● Carrying Capacity</li> <li>● Ecological Succession</li> <li>● Pioneer Species</li> <li>● Primary succession</li> <li>● Secondary succession</li> <li>● Canopy</li> <li>● Taiga</li> <li>● Deciduous</li> <li>● Coniferous</li> <li>● Wetland</li> <li>● Benthos</li> <li>● Marine</li> <li>● Freshwater</li> <li>● Population Density</li> <li>● Age structure</li> <li>● Exponential growth</li> <li>● Carrying capacity</li> <li>● Logistical growth</li> </ul>
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			<ul style="list-style-type: none"> <li>● Immigration</li> <li>● Emmigration</li> <li>● Limiting factor</li> <li>● Density dependent factor</li> <li>● Density independent factor</li> <li>● Desertification</li> <li>● Deforestation</li> <li>● Pollutant</li> <li>● Biological Magnification</li> <li>● Acid rain</li> <li>● Smog</li> <li>● Biodiversity</li> <li>● Ecosystem Diversity</li> <li>● Species diversity</li> <li>● Genetic Diversity</li> <li>● Ecological footprint</li> <li>● Ozone layer</li> <li>● Global warming</li> </ul>
17 Thu	<b>Morning (9:00AM - 12:00PM)</b> <ul style="list-style-type: none"> <li>● Review Activity</li> </ul>	<b>Morning Review Activity Warm up:</b> <ul style="list-style-type: none"> <li>● Students individually make a list of all the vocabulary words that they remember learning throughout the entire course without using their notes. Students then partner up to make a more comprehensive list based on what their group members remembered.</li> </ul>	N/A

	<p><b>Afternoon (1:00PM - 3:00PM)</b></p> <ul style="list-style-type: none"> <li>● Jeopardy Competition</li> </ul> <p><b>Evening (7:00PM - 9:00PM)</b></p> <ul style="list-style-type: none"> <li>● End of Course Test</li> <li>● End of Course Survey</li> </ul>	<p><b>Group Review Activity:</b></p> <ul style="list-style-type: none"> <li>● Together students go through their notes and find other vocabulary words then obtain the definitions.</li> <li>● Students take turns quizzing each other.</li> <li>● Students come up with a list of questions that can be potentially asked on the cumulative exam(with answers)</li> </ul> <p><b>Jeopardy Competition:</b></p> <ul style="list-style-type: none"> <li>● Students use the first hour of the afternoon session to study on their own.</li> <li>● Students challenge the other Fast-Paced Biology Class to a Jeopardy Game.</li> <li>● Students use the final hour of the session to review their owns either independently or with a group member.</li> </ul> <p><b>End of Course Exam:</b></p> <ul style="list-style-type: none"> <li>● Students get an opportunity to ask their final questions (if any)</li> <li>● Students complete Fast-Paced Biology End of Course Exam</li> <li>● Students complete End of Course Survey</li> </ul>	
<p><b>18</b></p> <p><b>Fri</b></p>	<p><b>Morning (9:00AM - 12:00PM)</b></p> <ul style="list-style-type: none"> <li>● Botany of Desire Screening</li> <li>● Final Goodbyes</li> </ul>	<ul style="list-style-type: none"> <li>● Students view a documentary on Botany of Desire to explain the evolutionary relationship between plants and animals.</li> <li>● Students get an opportunity to sign each other's t-shirts and yearbooks.</li> </ul>	<p><b>N/A</b></p>