



Parkrose High School

Course Syllabus 2021-2022

Course Title: Advanced Placement Biology (1.0 PHS Credits)
MHCC Aligned Courses: Principles of Biology I, II, and III (15 MHCC credits, recommended)
Teacher Name: Kerryn Henderson
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Google Classroom Code: x75q5n7 (Period 2); 63vr2s2 (Period 4); uik77iu (Period 6)
Study Club: Thursdays 3:30-4:30

Course Description:

This course is designed to be the equivalent of a two-semester college introductory course for Biology majors. It will allow students who have already learned the basics of biology to further their conceptual understanding of living systems. This course is structured around the four big ideas (see below), the enduring understandings within the big ideas, and the essential knowledge as identified by the College Board. AP Biology is aligned with MHCC's Principles of Biology course sequence; students will learn how structure defines function in organisms and explore the pathways and transformations of energy in living systems (**BI 211**), how genetics can be used as a model system to understand information flow in living organisms (**BI212**); and how the interactions of living systems contribute to the ecology and evolution of biodiversity (**BI213**). Class and laboratory activities focus on developing the six science practices (see below). Students are given the opportunity to engage in student-directed laboratory investigations that account for a minimum of 25% of instructional time. Throughout the AP Biology course, students will have the opportunity to engage in higher level thinking as they learn about complex interactions, the scientific method, bioethics, and the techniques of research.

The Four Big Ideas:

Big Idea 1: The process of evolution drives the diversity and unity of life.

Big Idea 2: Biological systems use 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 exhibit complex properties.

The Six AP Science Practices:

- ★ **Science Practice 1: Explain biological concepts, processes, and models presented in written format.** The ability to use verbal and/or written explanations that describe biological processes is an important learning outcome of the AP Biology course. Students will not just be memorizing details but rather demonstrating an integrated understanding of how a concept or process relates to the overall function of the biological system.
- ★ **Science Practice 2: Analyze visual representations of biological concepts and processes.** Visual representations are indispensable tools for learning and exploring scientific concepts and ideas. Students will create and use representations to illustrate biological processes and concepts, communicate information, make predictions, address scientific questions, and describe systems to demonstrate their understanding.
- ★ **Science Practice 3: Determine scientific questions and methods.** To provide deeper understanding of the concepts, students will pose, refine, and evaluate scientific questions about natural phenomena and investigate answers through experimentation, research, and discussion.
- ★ **Science Practice 4: Represent and describe data.** The analysis of different types of graphs is a skill that will help students to succeed in the course and on the AP Exam. Students will refine their graphing skills. In addition, students will master the skill of describing and analyzing the data they collect during their investigations.
- ★ **Science Practice 5: Perform statistical tests and mathematical calculations to analyze and interpret data.** Students should be able to routinely use mathematics to solve problems, analyze experimental data, describe natural phenomena, make predictions, and describe processes symbolically. Students should also justify the selection of a particular mathematical routine and apply the routine to describe natural phenomena.
- ★ **Science Practice 6: Develop and justify scientific arguments using evidence.** Students should be able to write and evaluate scientific descriptions, explanations, and theories that describe biological phenomena and processes. Students should be able to call upon current knowledge and historical experiments and draw inferences from their explorations to justify claims with evidence.

Schedule of Topics

1st Semester

UNIT 1: Chemistry of Life

UNIT 2: Molecules and Cells

UNIT 3: Cellular Energetics

UNIT 4: Cell Communication and the Cell Cycle

2nd Semester

UNIT 5: Heredity

UNIT 6: Gene Expression and Regulation

UNIT 7: Natural Selection

UNIT 8: Ecology

*The AP Biology Exam is May 11th, 2022, at 12-3pm

Assessment and Grading

This course uses a skills-based approach to grading. Each semester, students will have multiple opportunities to demonstrate their skill level in each of the six AP Biology Science Practices. After each opportunity, students will reflect on feedback provided to identify next steps to take as they build their science skills and understanding. For each skill area, the top three attempts will determine the student’s grade in the course, based on the table below.

Skill Level	Grade	Points	Description of the skill level
COMMANDING	A	95	Student has become <i>an expert</i> in the science practice
EXPANDING	B	85	Student can <i>demonstrate proficiency</i> in the science practice
TRANSITIONING	C	75	Student is able to <i>independently engage</i> in the science practice
EMERGING	D	65	Student is able to engage in the science practice with <i>support of the teacher</i>
ENTERING	NG	50	There is <i>not enough evidence</i> to assess the student’s level in this science practice

AP Science Practice	Number	Points Possible	Total Points	Power UP*	Total Points
Concept Explanation	3 x	95 =	285	+15	300
Visual Representation	3 x	95 =	285	+15	300
Questions & Methods	3 x	95 =	285	+15	300
Representing & Describing Data	3 x	95 =	285	+15	300
Statistical Tests & Data Analysis	3 x	95 =	285	+15	300
Argumentation	3 x	95 =	285	+15	300
TOTAL POINTS POSSIBLE			1710	90	1800
Percentage of Grade			95%	5%	100%

YOUR GRADE: This class is a game, your grade is your score! As you take opportunities to demonstrate your science skills, your points will quickly accumulate. As you earn points, you will “level up.” You will have more opportunities than you need - so keep pushing yourself to improve! Earn power-ups points for the skills you are already commanding. Be sure to keep track of your progress (on your game sheet and as a percentage in Student Vue) to make sure you are on track to earn the grade you want!

Absence and Make-Up Work

This year, absences are expected. It is my goal to make it as easy as possible for you to stay caught up and on top of your grade. If you are going to miss more than a few days, check Google Classroom to access alternative materials (videos, notes, and projects) for the modules you miss.

Academic Integrity Policy

Your grade should represent genuine learning. Although you are encouraged to collaborate, your work must be your own. Do not copy from another student's homework, notebook, or quiz/test; cite others' ideas in papers and projects.

Suggested Materials for Success

- **AP Biology Interactive Notebook (INB)** → will be provided by the teacher each semester
- **Pencils, pens, colored pencils, highlighters, and scientific calculator (can be on cell phone)**

Behavioral Expectations

1. Be on time and prepared for class when the bell rings.
2. Respect the rights, ideas and property of others.
3. Do your own work to the best of your ability; ask for help when you need it! NEVER GIVE UP!
4. Use electronic devices in class for academic purposes only.
5. Wear safety goggles when instructed, follow directions to use proper techniques and procedures, discard waste properly, and be alert, serious, and responsible at all times during lab activities.

