AP BIOLOGY

FALL 2016 - SPRING 2017

DOWNEY VIKINGS
HIGH SCHOOL SINCE 1903

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Course Overview-

Welcome to AP Biology, each of you are scientists and we are going to foster your observational and critical thinking skills in this course. This may be challenging but if you put in the hard work and dedication you will be successful this year. This course is aligned to the College Board standards as are all AP courses, and the AP Biology class is newly redesigned.

The main goal of AP Biology is to learn about the core scientific principles, theories, and processes governing living organisms, biological systems, and natural phenomena.

Understand key science practices you can use to develop explanations and predictions of natural phenomena, which you will test and refine through laboratory investigations.
Develop advanced reasoning and inquiry skills as you design experiments, collect and analyze data using mathematics and other methods, and interpret that data to draw conclusions.
Organized around Big Ideas: 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.

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

Big Idea 2: Cellular Processes: Energy and Communication
Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

Big Idea 3: Genetics and Information Transfer
Living systems store, retrieve, transmit, and respond to information essential to life processes.

Big Idea 4: Interactions
Biological systems interact, and these systems and their interactions possess complex properties.

Important Web Pages for AP Biology
https://apstudent.collegeboard.org/apcourse/ap-biology/course-details
https://apstudent.collegeboard.org/apcourse/ap-biology/about-the-exam
https://apstudent.collegeboard.org/apcourse/ap-biology/exam-practice

The College Board

Grading

Tests/Exams- 40%

As many as 12 comprehensive unit tests will be administered throughout the year. These will always follow the AP format (however, they will be shortened to be administered during 1-2 periods). This includes a full length practice exam.

Labs- 25%

We will complete approximately 10 major labs throughout the year. Due to the large amount of time required for laboratory set-up, it is essential that you are always present on lab days. You will be given advance notice for those days.

Quizzes -15%

There may be 5 question quizzes every M, W, F on the assigned readings and class lectures. These are designed to assess your preparedness for the day's activities as well as offer practice for MC question test strategies. You must keep up with the daily and weekly reading schedule.

Assignments - 20%

Completion of class assignments is required and make up work will be considered for valid reasons only.

OLD MAJOR THEMES VS. NEW THEMES IN AP BIOLOGY

- Science as a Process
- Evolution
- Energy Transfer
- Continuity of Change
- Relationship of Structure and Function
- Regulation
- Interdependence in Nature
- Science, Technology, and Society

Big Idea 1: Evolution

Big Idea 2: Cellular Processes: Energy and Communication

Big Idea 3: Genetics and Information Transfer

Big Idea 4: Interactions

1. Scientific Method: 1 WEEK

2. Biological Interactions: 6-7 WEEKS

a. Ecology (Chapters 50-55)

Skills: Animal behavior, ecosystems, conservation, behavioral/population/community ecology
Themes: Interdependence, evolution, continuity and change, biotech
Big Idea(s): #2, #3, #4
Lab(s): Dissolved oxygen, Pill bugs

b. Evolution (Chapters 22-25)

Skills: Evidence, natural selection, mechanisms of evolution, population genetics, micro/macro evolution, speciation, patterns of evolution
Themes: Structure and function, evolution, continuity and change, biotech
Big Idea(s): #1, #3

c. Classification/Diversity (Chapters 25-31)

Skills: classification system, cladistics, kingdoms, systematics
Themes: Evolution, interdependence, science technology
Big Idea(s): #1, #3, #4

3. Cell Processes and Structure: 4 WEEKS

a. Biochemistry (Chapters 1-5)

Skills: Chemical bonding, properties of water, functional groups, macromolecules, enzymes
Themes: Structure and function
Big Idea(s): #2, #4

Lab(s): Enzymes

b. Cell Structure (Chapters 6-7)

Skills: cell theory, cell types, organelles structure and function, membrane structure, cell transport

Themes: Structure and function, Evolution, Regulation

Big Idea(s): #1, #2, #4

Lab(s): Diffusion/Osmosis

4. Cell Processes and Energy: 6 WEEKS

a. Respiration (Chapters 8-9)

Skills: organelle structure, aerobic vs. anaerobic respiration, fermentation ATP

Themes: Structure and function, energy transfer, evolution, regulation

Big Idea(s): #1, #2, #4

Lab(s): Cellular Respiration

b. Photosynthesis (Chapters 8 and 10)

Skills: organelle structure, aerobic vs. anaerobic respiration, fermentation ATP

Themes: Structure and function, energy transfer, evolution, regulation

Big Idea(s): #1, #2, #4

Lab(s): Cellular Respiration

c. Plant Physiology (Chapters 35-39)

Skills: land plant, evolution, growth, reproduction, anatomy, revisit classification

Themes: Structure and function, energy transfer, evolution, regulation

Big Idea(s): #1, #2, #3, #4

Lab(s): Transpiration, Monocot/Dicot comparison

5. Making Cells and Organisms: 5 WEEKS

a. Mitosis and Meiosis (Chapters 11-13)

Skills: cell communication, cell cycle, cancer

Themes: Structure and function, energy transfer, evolution, regulation, biotech

Big Idea(s): #1, #2, #3, #4

Lab(s): Mitosis and meiosis microscope

b. Genetics (Chapters 14-16)

Skills: Mendel, Punnett squares, sex-linkage, DNA replication, DNA technology

Themes: Structure and function, energy transfer, evolution, regulation

Big Idea(s): #1, #2, #3

Lab(s): Family tree

6. Proteins: 3 WEEKS

a. Protein Synthesis, Gene Regulation , Biotechnology (Chapters 16-20)

Skills: protein synthesis, RNA structure, viral/bacterial genetics, and regulation of gene expression

Themes: Structure and function, energy transfer, evolution, regulation

Big Idea(s): #1, #2, #3, #4

Lab(s): stem cell/gene therapy research

7. Animals: 4 WEEKS

a. Diversity and Physiology (Chapters 40-49)

Skills: body systems, movement, digestion, circulation, immunity, nervous system, endocrine, excretion, gas exchange, fertilization and embryonic development

Themes: Structure and function, energy transfer, evolution

Big Idea(s): #1, #2, #3, #4

Lab(s): Circulatory System

8. Course Review: 5-6 WEEKS

AP Biology Resources:

www.phschool.com/science/biology_place/labbench/ - Dry Labs of each AP Biology Lab

biologycorner.com/AP_biology_labs.html

www.bozemanscience.com/ap-biology/ - Videos Lessons for every AP Biology Topic

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