

Rebecca Brewer

AP Biology Course Outline

Michigan

Dates	Unit Topics and Labs	Chapters in Campbell Biology
Sept.5-21 1	Environmental Biology Topics: Behavior; Biosphere; Populations; Communities; Ecosystems Environmental Biology Labs / Activities: <ul style="list-style-type: none">• AP Lab 11- Animal Behavior• Termite Trail Marking Behavior Lab (students design experiments using different writing instruments to determine termite preferences)• Biome Dioramas (students are assigned a biome to create a diorama of that they then present to the class)• Internal Symbionts Lab (students remove the gut of a termite to view the protozoa living within them)• Mark-Recapture Activity (uses 2 different colored bb's that students "tag" and release)• Succession Activity (uses the woodlot and meadow behind the school to identify characteristic species)• AP Lab 12- Dissolved Oxygen and Aquatic Primary Productivity• Remote Sensing with Aeropod Cameras and Kites *• Student Glacier Study http://nsidc.org/data/g00472.html *• "Carbon Cycle Dice Activity" to understand the carbon cycle (http://coseenow.net/blog/2011/04/the-carbon-cycle-game/) *• Analyze Tree Ring Data (http://mynasadata.larc.nasa.gov/preview_lesson.php?&passid=95) *• Coral Bleaching in the Ocean (http://mynasadata.larc.nasa.gov/preview_lesson.php?&passid=51) *	50, 51, 52, 53, 54
Sept.22- 2 Oct.4	Biochemistry Topics: Basic Chemistry; Water; Carbon and Functional	2, 3, 4, 5, 6

Groups; Macromolecules-Carbohydrates, Lipids, Proteins, and Nucleic Acids; Enzymes

Biochemistry Labs:

- Properties of Water Lab (uses pennies, eye droppers, and capillary tubes to exhibit water's characteristics)
- Carbohydrates Activity (students taste different sugars and rank them according to sweetness)
- Protein Activity (uses pipe cleaners to model the different levels to protein folding)
- Toothpickase Lab (uses toothpicks to model competitive inhibitors and factors that affect enzymatic rates)
- AP Lab 2- Enzyme Catalysis
- McMush Lab (students perform labs to determine the amount of proteins, lipids, and carbohydrates in a typical McDonald's meal)

Biochemistry Video: Super Size Me

Oct. 5- Oct. 18	3	Cellular Biology Topics: Cell Structure; Cell Membranes; Cell Division	7, 8, 12
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Cellular Biology Labs:

- Elodea Lab (uses elodea plants to view structures + plasmolysis + cytoplasmic streaming)
- AP Lab 1- Diffusion and Osmosis
- AP Lab 3- Part A Mitosis

Oct. 19- Nov. 2	4	Physiology I Topics: Internal Environment; Circulation; Respiration; Immunity	44, 42, 43
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Physiology I Labs:

- Kidney Dialysis Activity (uses simulated urine to show the effects of dialysis)
- Sheep Heart Dissection
- AP Lab 10- Physiology of the Circulatory System

Physiology I Videos: Body Stories

Nov. 3- Nov. 30	5	Physiology II Topics: Digestion; Hormones; Nervous System; Muscles	41, 45, 48, 49
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Physiology II Labs:

- Sheep Brain Dissection
- Brain Cap Activity (students draw the regions of the brain on swim caps)
- Percussion Hammer Activity (students use rubber mallets to test each other's reflexes)
- Muscle Cell Contraction Lab (chemicals applied to a rabbit's muscle causes it to contract)

Physiology II Videos: Lorenzo's Oil

Dec.1- 6 Genetics and Reproduction Topics: 13, 46, 14, 15
Dec.22 Meiosis; Reproduction; Mendel; Chromosomes

Genetics and Reproduction Labs:

- AP Lab 3- Part B Meiosis
- Flower Dissection
- AP Lab 7- Genetics of Organisms
- Blood Typing Activity (uses simulated blood types)
- M & M Statistics Activity (uses M & M's to understand ChiSquare)

Jan.2- 7 Molecular Biology Topics: 16, 17, 18,
Feb.1 DNA Replication; Protein Synthesis; Viruses and Bacteria; 19, 20, 21
DNA Technology; Genetics of Development

Molecular Biology Labs:

- Paper Plasmids Activity (students cut out DNA and a plasmid then create a piece of recombinant DNA)
- AP Lab 6- Molecular Biology
- PCR Lab With Transgenic Food (students use a thermocycler to determine if transgenic foods are found in grocery store items)

Feb2-16 8 Evolution Topics: 22, 23, 24, 25
Darwin; Evolving Populations; Origin of Species; Tracing Phylogeny

Evolution Labs:

- Cladogram Activity (uses nails to construct evolutionary relationships based on shared characteristics)
- AP Lab 8- Population Genetics and Evolution

Feb26- 9 Classification I Topics: 26, 27, 28,
Mar.7 Early Earth and Prokaryotes; Protista; Plant Diversity; Fungi 29, 30, 31

Classification I Labs:

- Protozoa Lab (students view live protists under the microscope)
- Fungus Lab (students analyze and draw fungal structures under the microscope)

Mar.8-19 10 Classification II Topics: 32, 33, 34
Animal Kingdom Overview; Invertebrates; Vertebrates

Classification II Labs:

- On-Line Animal Kingdom Survey
- Invertebrates Lab (students group animal samples according to characteristics)
- Planaria Regeneration Lab (students make incisions to planaria and observe which structures regenerate each day over the course of a week)

Mar.20- 11 Cellular Respiration Topics: 9
28 Steps to Cellular Respiration; Fermentation

Cellular Respiration Labs:

- AP Lab 5- Cell Respiration
- Root Beer and Yogurt Lab (students make these to better understand fermentation)

Mar.29- 12 Photosynthesis Topics: 10
Apr.18 Steps to Photosynthesis; C3, C4 and CAM Photosynthesis

Photosynthesis Labs:

- AP Lab 4- Plant Pigments and Photosynthesis
- Photosynthesis Cake Activity (students decorate cakes with the equations of photosynthesis)

April19- 13 Plant Topics: 35, 36,37, 38,
May4 Plant Structures; Transport in Plants; Plant Hormones 39

Plant Labs:

- Plant Cross-Section Activity (students create models of plant stems and roots for monocots and dicots)
- Seed Dissection
- AP Lab 9- Transpiration
- Plant Hormones Lab (students design experiments to test)

the effects of different plant hormones)

Plant Video:
Sexual Encounters of the Floral Kind

May 7-11 Review Students take practice AP exams from former years.
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May 15- After Additional Labs:
June 15 the A

- PEXAM
- Zebrafish Development (students hatch Zebrafish and monitor the stages of development)
 - Fetal Pig Dissection
 - Metagenomic Soil DNA PCR (students will collect soil samples, perform PCR, and ID the microbes found in the soil- a lab sponsored by Princeton University)

Additional Videos: Outbreak and GATTACA

Research Projects:

- Students select a topic from the year of interest, investigate the topic as it relates to themselves, then develop a flyer + lesson to teach the topics to the general public. The theme involves “How to make wise decisions in life based upon what I learned in biology class”. Topics range from health, to the environment, to ethics.
- Students do a biology photo scavenger hunt of concepts they learned throughout the year.