

## AP BIOLOGY 2018-2019

UNIT	TITLE	CHAPTER(S)	EXAM
1	Biochemistry	2, 3	9/24

TOPICS: Water, atoms, chemical bonds, acids, bases, pH scale, properties of molecules, macromolecules (proteins, carbohydrates, lipids, nucleic acids), hydrolysis and dehydration synthesis reactions.

LAB:

LAB BENCH: Transpiration (9)

POGIL: Biochemistry Basics (1)

Free Energy (2)

Protein Structure (3)

Analyzing and Interpreting Scientific Data (4)

2	Cells	4, 5, 15	10/15
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TOPICS: Prokaryotic vs. eukaryotic cells, organelles, endomembranes, the cytoskeleton, the plant cell wall, membrane composition, cell recognition, passive transport, active transport, endocytosis, exocytosis, membranes as dynamic structures.

LAB: Cell to Cell Communication (Cell Signaling) – from the College Board site

Investigation 6: Cellular Respiration

LAB BENCH: Diffusion and Osmosis (1)

Cellular Respiration (5)

CASE: Osmosis is serious business!

3	Energy, Enzymes & Metabolism	6, 7, 8	11/13
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TOPICS: Energy conversions, ATP, biological catalysts, enzyme function, metabolism, enzyme regulation, energy from glucose, glycolysis, citric acid cycle, cell respiration, fermentation, contrasting energy yields, regulating energy pathways, photosynthesis, light, pigments, light reactions, making carbohydrates from carbon dioxide, the Calvin Cycle.

LAB: Investigation 5: Photosynthesis

Science Take-Out: Enzymes and Lactose Intolerance

LAB BENCH: Enzyme Catalysis (2)

POGIL: Enzymes and Cellular Regulation (6)

4	Cell Division and Mendelian Genetics	9, 10	12/14
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TOPICS: Cell reproduction, control of the cell cycle, eukaryotic chromosomes, mitosis, cytokinesis, asexual vs. sexual reproduction, meiosis, meiotic errors, cell death, Mendel's experiments, laws of inheritance, allelic interactions, gene interactions, sex determination, sex-linked inheritance

LAB:

LAB BENCH: Mitosis & Meiosis (3)

Genetics of Organisms (7)

5	Molecular Genetics	11, 12, 26	1/29
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TOPICS: The structure of DNA, DNA replication, proofreading, repair, RNA, information flow in nucleic acids, transcription, the genetic code, translation, mutations in genes, cleaving and rejoining DNA, getting new genes into cells, sources of genes for cloning, manipulating DNA, evolution of macromolecules, new protein functions, uses of molecular genomic information.

LAB: Investigation 8: Biotechnology: Bacterial Transformation

LAB BENCH: Molecular Biology (6)

POGIL: Gene Expression – Transcription (14)

Gene Expression – Translation (15)

6	Evolution	23, 24, 25	2/21
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TOPICS: Darwin's theory, genetic variations in populations, Hardy-Weinberg equilibrium, evolutionary agents and their effects, the results of natural selection, assessing the costs of adaptations, maintaining genetic variation, what is a species, how do species arise, reproductive isolation, speciation rates, evolutionary radiations, phylogenetic trees, reconstructing phylogenies, biological classifications.

LAB: Hardy-Weinberg / Rock Pocket Mouse with spreadsheet (see Making of the Fittest DVD first)

Investigation 3: Comparing DNA Sequences to Understand Evolutionary Relationships w/BLAST

LAB BENCH: Population Genetics and Evolution (8)

UNIT	TITLE	CHAPTER(S)	EXAM
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7	Organismal Physiology	18, 41, 42, 44	3/21
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TOPICS: Animal defense systems, specific and non-specific defenses, B cells, T cells, the genetic basis for antibody diversity, disorders of the immune system, homeostasis, thermoregulation, hormones, neuron functions, nerve impulses, synapses, and communication.

LAB: Science Take-Out: Medical Mystery of Epidemic Proportion

Investigation 12: Fruit Fly Behavior

LAB BENCH: Animal Behavior (11)

8	Ecology	54, 55, 56	4/11
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TOPICS: Populations, ecological interactions, population density, communities, disturbance of community structure, dispersal, extinction, biogeography, terrestrial biomes, aquatic ecosystems.

LAB: Investigation 10: Energy Dynamics

LAB BENCH: Dissolved Oxygen (12)

9	Biodiversity	57, 58	4/26
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TOPICS: Estimating current rates of extinction, preserving biodiversity, species recovery, and nutrient cycling.

LAB: Investigation 9: Biotechnology: Restriction Enzyme Analysis of DNA – “Forensic DNA Profiling”

LAB BENCH:

10	REVIEW	<i>There will be 5 class days of review.</i>	Begins 4/30
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**AP EXAM: MONDAY 5/13**