

JASPER HIGH SCHOOL

AP Biology

Pacing Guide

Resource basis: College Board AP Biology Course and Exam Description, Effective Fall 2025. This guide follows the CED unit sequence, topic structure, exam weightings, science practices, AP Classroom Progress Checks, and the AP lab requirement. Pacing assumes an 18-week block semester and should be adjusted for local calendar interruptions, lab length, remediation, and AP Exam timing.

AP Course Structure	Science Practices Spiral	Laboratory Expectation	Assessment Rhythm
8 CED units: Chemistry of Life; Cells; Cellular Energetics; Cell Communication and Cell Cycle; Heredity; Gene Expression and Regulation; Natural Selection; Ecology.	Concept explanation; visual representations; questions and methods; representing/describing data; statistical tests and data analysis; argumentation.	Maintain approximately 25% of instructional time for hands-on/inquiry labs, with at least two investigations connected to each Big Idea.	Unit quizzes, AP Classroom Progress Checks after each unit, frequent data-analysis practice, FRQ practice, and cumulative review.

Week	CED Unit / Exam Weight	Priority CED Topics	Science Practice + Lab Focus	Assessment / Checkpoint
1	Unit 1: Chemistry of Life 8-11%	1.1 Structure of Water and Hydrogen Bonding; 1.2 Elements of Life; 1.3 Introduction to Macromolecules; 1.4 Carbohydrates; 1.5 Lipids; 1.6 Nucleic Acids; 1.7 Proteins	SP 1, 2, 6: explain structure-function relationships using water and macromolecule models. Lab options: water properties mini-labs; macromolecule indicator investigation; protein structure/modeling activity.	Unit 1 vocabulary and model check; short FRQ on water/macromolecule structure-function; AP Classroom Progress Check 1.
2	Unit 2: Cells 10-13%	2.1 Cell Structure and Function; 2.2 Cell Size; 2.3 Plasma Membrane; 2.4 Membrane Permeability	SP 2, 5, 6: analyze cell diagrams, surface area-to-volume data, and membrane models. Lab options: cell size diffusion lab; microscope skills; membrane model construction.	Quiz: organelles, membranes, and SA:V; data-analysis practice with rate/ratio calculations.
3	Unit 2: Cells 10-13%	2.5 Membrane Transport; 2.6 Facilitated Diffusion; 2.7 Tonicity and Osmoregulation; 2.8 Mechanisms of Transport; 2.9 Cell Compartmentalization; 2.10 Origins of Cell Compartmentalization	SP 3, 4, 5: plan and analyze osmosis/diffusion investigations. Lab options: dialysis tubing osmosis; potato core water potential; transport case-study.	Unit 2 test; osmosis graph/claim-evidence-reasoning; AP Classroom Progress Check 2.
4	Unit 3: Cellular Energetics 12-16%	3.1 Enzymes; 3.2 Environmental Impacts on Enzyme Function; 3.3 Cellular Energy	SP 3, 4, 5: design enzyme experiments and evaluate variables, controls, rates, and error bars. Lab options: catalase enzyme lab; temperature/pH/substrate concentration enzyme investigation.	Enzyme lab report or CER; quiz on enzymes and energy coupling.
5	Unit 3: Cellular Energetics 12-16%	3.4 Photosynthesis; 3.5 Cellular Respiration	SP 4, 5, 6: interpret photosynthesis/respiration graphs and support claims with data. Lab options: floating leaf disk photosynthesis; respiration with respirometers or sensors; energy flow modeling.	Unit 3 test; graphing FRQ; AP Classroom Progress Check 3.

Week	CED Unit/ Exam Weight	Priority CED Topics	Science Practice + Lab Focus	Assessment / Checkpoint
6	Unit 4: Cell Communication and Cell Cycle 10-15%	4.1 Cell Communication; 4.2 Introduction to Signal Transduction; 4.3 Signal Transduction Pathways; 4.4 Feedback	SP 1, 2, 6: model signal transduction and feedback loops. Lab/activity options: cell signaling simulation; homeostasis feedback case studies; hormone or quorum sensing scenario analysis.	Quiz: signal transduction and feedback; model-based FRQ practice.
7	Unit 4 / Unit 5 Bridge Cell Cycle 10-15%; Heredity 8-11%	4.5 Cell Cycle; 4.6 Regulation of Cell Cycle; 5.1 Meiosis; 5.2 Meiosis and Genetic Diversity	SP 1, 2, 5: compare mitosis/meiosis models and connect chromosome behavior to variation. Lab options: mitosis slide analysis; cancer/cell cycle data; meiosis modeling with crossing over.	Unit 4 test; AP Classroom Progress Check 4; meiosis checkpoint quiz.
8	Unit 5: Heredity 8-11%	5.3 Mendelian Genetics; 5.4 Non-Mendelian Genetics; 5.5 Environmental Effects on Phenotype	SP 3, 5, 6: solve inheritance problems, analyze pedigrees, and justify probability rules. Lab/activity options: corn genetics or Fast Plants; pedigree analysis; chi-square genetics practice.	Unit 5 test; genetics FRQ; AP Classroom Progress Check 5.
9	Unit 6: Gene Expression and Regulation 12-16%	6.1 DNA and RNA Structure; 6.2 DNA Replication; 6.3 Transcription and RNA Processing	SP 1, 2, 6: model information flow from DNA to RNA and predict effects of molecular changes. Lab/activity options: DNA extraction; replication/transcription modeling; primary source or mutation case analysis.	Quiz: DNA/RNA structure, replication, transcription; model explanation writing.
10	Unit 6: Gene Expression and Regulation 12-16%	6.4 Translation; 6.5 Regulation of Gene Expression; 6.6 Gene Expression and Cell Specialization	SP 1, 2, 6: connect gene regulation to cell specialization and phenotype. Lab/activity options: operon simulation; gene expression case study; translation modeling with mutation prediction.	FRQ practice: regulation of gene expression; quiz on translation/operons/cell specialization.
11	Unit 6: Gene Expression and Regulation 12-16%	6.7 Mutations; 6.8 Biotechnology	SP 3, 4, 5: interpret biotechnology data and mutation effects. Lab options: gel electrophoresis; bacterial transformation; PCR simulation or virtual PCR; restriction enzyme analysis.	Unit 6 test; biotechnology data FRQ; AP Classroom Progress Check 6.
12	Unit 7: Natural Selection 13-20%	7.1 Introduction to Natural Selection; 7.2 Natural Selection; 7.3 Artificial Selection; 7.6 Evidence of Evolution; 7.7 Common Ancestry	SP 1, 2, 4, 6: use evidence from data, fossils, homology, and models to explain evolutionary change. Lab/activity options: selection simulation; rock pocket mice; BLAST/common ancestry activity.	Quiz: mechanisms and evidence of evolution; short argumentation FRQ.
13	Unit 7: Natural Selection 13-20%	7.4 Population Genetics; 7.5 Hardy-Weinberg Equilibrium; 7.8 Continuing Evolution; 7.9 Phylogeny; 7.10 Speciation; 7.11 Variations in Populations; 7.12 Origins of Life on Earth	SP 2, 5, 6: calculate allele frequencies, test Hardy-Weinberg assumptions, and justify phylogenetic relationships. Lab/activity options: Hardy-Weinberg bead/bean simulation; cladogram construction; chi-square practice.	Unit 7 test; Hardy-Weinberg and phylogeny FRQ; AP Classroom Progress Check 7.
14	Unit 8: Ecology 10-15%	8.1 Responses to the Environment; 8.2 Energy Flow Through Ecosystems; 8.3 Population Ecology; 8.4 Effect of Density on Populations	SP 3, 4, 5: model population growth, energy transfer, and density-dependent factors. Lab/activity options: ecosystem energy model; logistic growth simulation; population growth data analysis.	Quiz: population ecology and energy flow; graph interpretation practice.
15	Unit 8: Ecology 10-15%	8.5 Community Ecology; 8.6 Biodiversity; 8.7 Disruptions in Ecosystems	SP 4, 5, 6: analyze community interaction data, biodiversity indices, and ecosystem disruption scenarios. Lab options: Simpson's diversity index; field quadrat/transect sampling; succession or invasive species case study.	Unit 8 test; biodiversity/data FRQ; AP Classroom Progress Check 8.
16	Cumulative Integration + Required Lab Time	Spiral Big Ideas across all 8 units: evolution, energetics, information storage/transmission, and systems interactions. Revisit high-priority cross-unit concepts: structure-function, regulation, energy/matter flow, information flow, and natural selection.	SP 3-6 emphasis: student-designed inquiry, data collection, statistical analysis, graphing, uncertainty, and evidence-based argumentation. Use this week to complete lab portfolio requirements and revise lab notebooks.	Cumulative lab practical or portfolio check; mixed-topic MCQ; FRQ set with experimental design and data analysis.

Week	CED Unit / Exam Weight	Priority CED Topics	Science Practice + Lab Focus	Assessment / Checkpoint
17	AP Exam Review	Targeted review based on Progress Check data and unit test trends. Prioritize high-weight units: Natural Selection, Gene Expression and Regulation, Cellular Energetics, Ecology, Cell Communication/Cell Cycle, and Cells.	Daily mixed practice: models, data tables, graphs, chi-square/H-W, experimental design, and CER writing. Include timed FRQ routines and error analysis.	Full or half-length mock exam; individual review plan; timed FRQ scoring with rubrics.
18	Final Proficiency / Post-Exam Extension	Final synthesis, remediation, and post-exam enrichment. Options: biotechnology ethics, disease modeling, ecology field investigation, evolution research project, or systems biology capstone.	Students present evidence-based explanations using AP science practices. Final product should require data, a model, and a written or oral argument from evidence.	Final assessment, project presentation, or post-exam capstone. *Tentative schedule; faculty may alter pacing based on student needs.*