

The Living Book of AP Biology Master Title Bible

Curriculum • Version 1.0 • August 2026

College Board–Aligned Working Master

8 Units • 60 Lessons • AP Content + Science Practices + Exam Readiness



1. Authority and Scope

This Master Title Bible defines the proposed authoritative Unit and Lesson architecture for TLBB L2 — AP Biology. It is intentionally separate from the locked 125-Lesson L1 Biology Master Title Bible. L2 is designed specifically around the current College Board AP Biology Course and Exam Description effective Fall 2025.

- Primary academic authority: College Board AP Biology Course and Exam Description, effective Fall 2025.
- AP Biology is treated as its own curriculum, not as a more difficult rendering of L1 Biology.
- College Biology topics that are not needed for AP Biology are excluded from the L2 core and reserved for later College Biology / biomedical pathways.
- The College Board 8-Unit architecture is retained to maximize transparency, alignment, teacher usability, and student exam preparation.
- Within each Unit, TLBB may divide an official AP Topic into more than one video Lesson when needed for clarity, visualization, experimental reasoning, or quantitative practice.
- Every AP Topic is explicitly mapped so coverage can be audited.

2. Curriculum Architecture

Unit	Official AP Unit	AP Exam Weight	TLBB Lessons
1	Chemistry of Life	8–11%	8
2	Cells	10–13%	10
3	Cellular Energetics	12–16%	7
4	Cell Communication and Cell Cycle	10–15%	7
5	Heredity	8–11%	6
6	Gene Expression and Regulation	12–16%	9
7	Natural Selection	13–20%	8
8	Ecology	10–15%	5

Total proposed TLBB AP Biology lessons: 60.

3. Six Science Practices — Horizontal Requirements

Practice	Name	Production Requirement
1	Concept Explanation	Explain mechanisms and predict effects of changes in biological systems.
2	Visual Representations	Read, analyze, connect, and where appropriate construct models, diagrams, and pathways.
3	Questions and Methods	Identify testable questions, variables, controls, procedures, limitations, and follow-up investigations.
4	Representing and Describing Data	Read and construct tables/graphs; identify trends, patterns, and relationships.
5	Statistical Tests and Data Analysis	Use calculations, confidence/error information, chi-square reasoning, and hypothesis evaluation.
6	Argumentation	Make claims, use evidence, justify reasoning, and predict consequences of system disruption.

These practices are not separate optional lessons. They must recur across the entire 60-lesson curriculum and in AI-Tutor follow-up.

4. Master Lesson Sequence

Unit 1 — Chemistry of Life

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L001	Why Does Water Make Life Possible?	1.1	Structure of Water and Hydrogen Bonding
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L002	Which Elements Build Living Systems?	1.2	Elements of Life
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L003	How Do Cells Build and Break Biological Polymers?	1.3	Introduction to Macromolecules
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L004	How Does Carbohydrate Structure Determine Function?	1.4	Carbohydrates
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L005	Why Do Lipids Behave Differently from Other Macromolecules?	1.5	Lipids
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L006	How Can Nucleic Acids Store Biological Information?	1.6	Nucleic Acids
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L007	How Does Protein Structure Create Biological Function?	1.7	Proteins
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L008	How Do Molecular Structure and Interactions Shape Life?	1.1–1.7	Unit 1 Integration, Data & AP Reasoning

Unit 2 — Cells

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L009	How Does Cell Structure Reveal Cell Function?	2.1	Cell Structure and Function
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L010	Why Can't Cells Grow Without Limit?	2.2	Cell Size
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L011	How Does the Plasma Membrane Organize the Cell Boundary?	2.3	Plasma Membrane
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L012	What Determines Whether a Molecule Crosses a Membrane?	2.4	Membrane Permeability
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L013	How Do Molecules Move Across Cell Membranes?	2.5	Membrane Transport
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L014	How Do Membrane Proteins Enable Facilitated Diffusion?	2.6	Facilitated Diffusion
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L015	How Do Water Balance and Tonicity Affect Cells?	2.7	Tonicity and Osmoregulation
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L016	How Do Cells Move Substances Against Gradients or in Bulk?	2.8	Mechanisms of Transport
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L017	Why Do Eukaryotic Cells Need Compartments?	2.9	Cell Compartmentalization
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L018	How Could Internal Membranes Have Evolved?	2.10	Origins of Cell Compartmentalization

Unit 3 — Cellular Energetics

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L019	How Do Enzymes Control the Rate of Life's Reactions?	3.1	Enzymes

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L020	How Does the Environment Change Enzyme Function?	3.2	Environmental Impacts on Enzyme Function
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L021	How Do Cells Couple Energy-Releasing and Energy-Requiring Processes?	3.3	Cellular Energy
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L022	How Do Photosynthetic Organisms Capture Light Energy?	3.4	Photosynthesis: Light Capture and Electron Flow
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L023	How Is Carbon Fixed into Biological Molecules?	3.4	Photosynthesis: Carbon Fixation and Integration
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L024	How Do Cells Harvest Energy from Fuel Molecules?	3.5	Cellular Respiration
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L025	How Can Data Reveal Changes in Cellular Energetics?	3.1–3.5	Unit 3 Experimental & Quantitative Reasoning

Unit 4 — Cell Communication and Cell Cycle

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L026	How Do Cells Send and Receive Information?	4.1	Cell Communication
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L027	How Does a Signal Cross a Cell Membrane Without Entering the Cell?	4.2	Introduction to Signal Transduction
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L028	How Do Signaling Pathways Amplify and Integrate Information?	4.3	Signal Transduction
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L029	How Do Feedback Mechanisms Maintain or Change Biological Systems?	4.4	Feedback
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L030	How Does the Cell Cycle Produce New Cells?	4.5	Cell Cycle
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L031	How Is the Cell Cycle Regulated?	4.6	Regulation of Cell Cycle
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L032	What Happens When Communication and Cell-Cycle Control Are Disrupted?	4.1–4.6	Unit 4 Integration & AP Reasoning

Unit 5 — Heredity

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L033	How Does Meiosis Reduce Chromosome Number?	5.1	Meiosis
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L034	How Does Meiosis Generate Genetic Diversity?	5.2	Meiosis and Genetic Diversity
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L035	How Can Mendelian Patterns Predict Inheritance?	5.3	Mendelian Genetics
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L036	Why Do Many Traits Not Follow Simple Mendelian Ratios?	5.4	Non-Mendelian Genetics
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L037	How Can Environment Influence Phenotype?	5.5	Environmental Effects on Phenotype
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L038	How Can Probability and Data Test Genetic Predictions?	5.1–5.5	Unit 5 Quantitative Genetics & AP Reasoning

Unit 6 — Gene Expression and Regulation

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L039	How Do DNA and RNA Structures Support Information Storage and Transfer?	6.1	DNA and RNA Structure
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L040	How Is DNA Copied with High Fidelity?	6.2	DNA Replication
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L041	How Is Genetic Information Transcribed into RNA?	6.3	Transcription
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L042	How Is RNA Processed Before It Is Used?	6.3	RNA Processing
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L043	How Does a Ribosome Translate Information into Protein?	6.4	Translation
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L044	How Do Cells Turn Genes On and Off?	6.5	Regulation of Gene Expression
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L045	How Does Gene Regulation Create Specialized Cells?	6.6	Gene Expression and Cell Specialization
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L046	How Do Mutations Change Biological Information and Phenotype?	6.7	Mutations
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L047	How Can Biotechnology Read, Compare, and Alter Biological Information?	6.8	Biotechnology

Unit 7 — Natural Selection

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L048	Why Does Natural Selection Change Populations?	7.1–7.2	Introduction to Natural Selection + Natural Selection
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L049	How Does Artificial Selection Reveal the Power of Selection?	7.3	Artificial Selection
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L050	How Do Allele Frequencies Change in Populations?	7.4	Population Genetics
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L051	When Would a Population Remain in Hardy–Weinberg Equilibrium?	7.5	Hardy–Weinberg Equilibrium
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L052	What Evidence Shows That Evolution Has Occurred?	7.6–7.7	Evidence of Evolution + Common Ancestry
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L053	Why Is Evolution Still Happening?	7.8 + 7.11	Continuing Evolution + Variations in Populations
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L054	How Do Phylogenies Reconstruct Evolutionary Relationships?	7.9	Phylogeny
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L055	How Do New Species Arise—and How Did Life Begin?	7.10 + 7.12	Speciation + Origins of Life on Earth

Unit 8 — Ecology

Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L056	How Do Organisms Respond to Environmental Change?	8.1	Responses to the Environment
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L057	How Does Energy Move Through	8.2	Energy Flow Through Ecosystems

	Ecosystems?		
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L058	What Controls Population Growth and Density?	8.3–8.4	Population Ecology + Effect of Density on Populations
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L059	How Do Species Interactions Shape Communities and Biodiversity?	8.5–8.6	Community Ecology + Biodiversity
Lesson	Official TLBB Curriculum Title	AP Topic Coverage	Role
L060	How Do Disruptions Reshape Ecosystems?	8.7	Disruptions in Ecosystems + Cumulative AP Synthesis

5. Unit-to-Unit Driving Question Bridges

Bridge	Exact Conceptual Question
U1 → U2	If life's molecules depend on their structure, how are those molecules organized into a functioning cell?
U2 → U3	Once a cell has organized structures and controlled membranes, where does it get the energy to keep all of those processes running?
U3 → U4	If cells can capture and use energy, how do they coordinate when, where, and how cellular processes occur?
U4 → U5	When cells divide, how is biological information passed to the next generation—and why are offspring genetically different?
U5 → U6	If traits are inherited through genes, how does the information in a gene actually produce a biological trait?
U6 → U7	If mutations create new genetic variation, what determines which variants become more or less common over generations?
U7 → U8	If evolution changes populations over time, how do those populations interact with one another and with their environment?

6. AP Exam and Assessment Architecture

- All six Science Practices must appear repeatedly in both lesson content and AI-Tutor assessment.
- Each Unit should include AP-style multiple-choice sets based on models, experiments, graphs, or data—not only stand-alone recall questions.
- Free-response practice should progressively train experimental design, data analysis, calculation, evidence-based reasoning, and scientific argumentation.
- Quantitative practice must include the calculations and statistical reasoning required by the current AP framework, including confidence/error interpretation and chi-square hypothesis testing where applicable.
- Unit exam weighting should guide assessment emphasis, but lesson count is determined by conceptual and instructional needs rather than exam percentages alone.
- AP Classroom remains a complementary official resource; TLBB should not reproduce proprietary AP questions.

7. Laboratory and Inquiry Standard

AP Biology requires substantial inquiry-based laboratory work. TLBB video lessons can prepare students conceptually and analytically for laboratory investigations, but video cannot substitute for required hands-on laboratory experience in an authorized AP course.

- Embed experimental scenarios across all Units.
- Require students to identify independent/dependent variables, controls, constants, confounding factors, and appropriate measurements.
- Use authentic-looking datasets for graphing, trend analysis, error analysis, hypothesis testing, and experimental redesign.

- Where a lesson connects naturally to a hands-on investigation, include an 'AP Lab Connection' section for teacher/student use.

8. Content Boundary Rule

L2 AP Biology must remain focused. College-level topics that are interesting but not necessary for AP mastery should not expand the core lesson sequence unless they directly improve understanding of required AP content or Science Practices.

- Do not turn L2 into College Biology.
- Do not add biomedical specialization merely because it is scientifically interesting.
- Optional enrichment should be visibly labeled and removable without damaging AP coverage.
- Future College Biology and Biomedical Sciences curricula should inherit AP foundations rather than forcing AP students to learn later-stage content prematurely.

9. Master Bible Lock Rule

After user approval, this Unit/Lesson order becomes the authoritative L2 AP Biology Master Title Bible. Production logic, video continuity, or a desired transition must not reorder the locked Master Bible. Continuity must be solved through the final-question/next-opening-question bridge.

10. Source and Alignment Note

Primary source: College Board, AP Biology Course and Exam Description, Effective Fall 2025. The College Board framework contains eight Units and a defined set of required Topics and six Science Practices. College Board states that its published unit sequence is optional, but the content and skills are the course framework. TLBB retains the official eight-Unit structure for clarity and market alignment while creating its own lesson-level instructional sequence.

PROPOSED MASTER — REVIEW BEFORE FINAL LOCK