

The Living Book of Biology

Master Title Bible — 125-Lesson U.S.-Aligned High School Biology Curriculum

Revised Working Draft — August 2026

Framework note: The United States has no single national biology curriculum. This sequence is an optimized, comprehensive high-school biology framework aligned with the major content domains emphasized in the NGSS high-school life-science standards and the College Board AP Biology framework. Unit 1 retains the previously approved titles.

Unit 1 — Introduction to Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
1	What Is Life?	What Makes Something Truly Alive?	What Is Life? What Makes Something Truly Alive? High School Biology
2	Characteristics of Living Things	The Seven Signs of Life	Characteristics of Living Things The Seven Signs of Life High School Biology
3	The Scientific Method	How Do Scientists Discover the Secrets of Life?	The Scientific Method How Do Scientists Discover the Secrets of Life? High School Biology
4	Designing Biological Experiments	How Can We Design a Fair Biological Experiment?	Designing Biological Experiments How Can We Design a Fair Biological Experiment? High School Biology
5	Data Analysis and Graphing	How Do Scientists Turn Numbers into Discoveries?	Data Analysis and Graphing How Do Scientists Turn Numbers into Discoveries? High School Biology
6	Using the Microscope	Seeing the Invisible World	Using the Microscope Seeing the Invisible World High School Biology
7	Laboratory Safety	Why Every Great Discovery Begins with Safety	Laboratory Safety Why Every Great Discovery Begins with Safety High School Biology

Unit 2 — Chemistry of Life

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
8	Atoms, Elements, and Compounds	The Tiny Building Blocks of Life	Atoms, Elements, and Compounds The Tiny Building Blocks of Life High School Biology
9	Chemical Bonds and Reactions	How Atoms Build the Molecules of Life	Chemical Bonds and Reactions How Atoms Build the Molecules of Life High School Biology
10	The Properties of Water	Why Life Depends on Water	The Properties of Water Why Life Depends on Water High School Biology
11	Acids, Bases, and pH	How Living Systems Control Chemical Balance	Acids, Bases, and pH How Living Systems Control Chemical Balance High School Biology
12	Carbon and Organic Molecules	Why Carbon Is the Backbone of Life	Carbon and Organic Molecules Why Carbon Is the Backbone of Life High School Biology
13	Carbohydrates	The Sugars That Fuel and Build Life	Carbohydrates The Sugars That Fuel and Build Life High School Biology
14	Lipids	The Fats That Store Energy and Build Membranes	Lipids The Fats That Store Energy and Build Membranes High School Biology
15	Proteins and Enzymes	The Molecular Workers of Life	Proteins and Enzymes The Molecular Workers of Life High School Biology
16	Nucleic Acids and ATP	How Cells Store Information and Transfer Energy	Nucleic Acids and ATP How Cells Store Information and Transfer Energy High School Biology

Unit 3 — Cell Structure and Function

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
17	Cell Theory	How Scientists Discovered the Basic Unit of Life	Cell Theory How Scientists Discovered the Basic Unit of Life High School Biology
18	Prokaryotic and Eukaryotic Cells	Two Fundamental Designs of Cellular Life	Prokaryotic and Eukaryotic Cells Two Fundamental Designs of Cellular Life High School Biology
19	The Animal Cell	Inside the Living Factory of an Animal Cell	The Animal Cell Inside the Living Factory of an Animal Cell High School Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
20	The Plant Cell	Inside the Solar-Powered Factory of a Plant Cell	The Plant Cell Inside the Solar-Powered Factory of a Plant Cell High School Biology
21	Cell Organelles	The Specialized Machines Inside Cells	Cell Organelles The Specialized Machines Inside Cells High School Biology
22	The Cytoskeleton and Cell Movement	The Hidden Framework That Shapes and Moves Cells	The Cytoskeleton and Cell Movement The Hidden Framework That Shapes and Moves Cells High School Biology
23	The Fluid Mosaic Model	Why the Cell Membrane Is Always Moving	The Fluid Mosaic Model Why the Cell Membrane Is Always Moving High School Biology
24	Cell Membrane Structure	The Selective Boundary of Life	Cell Membrane Structure The Selective Boundary of Life High School Biology
25	Passive Transport	How Molecules Move Without Cellular Energy	Passive Transport How Molecules Move Without Cellular Energy High School Biology
26	Active Transport	How Cells Move Materials Against a Gradient	Active Transport How Cells Move Materials Against a Gradient High School Biology
27	Endocytosis and Exocytosis	How Cells Move Large Materials In and Out	Endocytosis and Exocytosis How Cells Move Large Materials In and Out High School Biology

Unit 4 — Cellular Energetics

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
28	Energy and Metabolism	How Living Systems Manage Energy	Energy and Metabolism How Living Systems Manage Energy High School Biology
29	Enzyme Activity and Regulation	How Cells Control the Speed of Reactions	Enzyme Activity and Regulation How Cells Control the Speed of Reactions High School Biology
30	Photosynthesis: Capturing Light Energy	How Life Turns Sunlight into Chemical Energy	Photosynthesis: Capturing Light Energy How Life Turns Sunlight into Chemical Energy High School Biology
31	The Light-Dependent Reactions	How Chloroplasts Capture the Energy of Light	The Light-Dependent Reactions How Chloroplasts Capture the Energy of Light High School Biology
32	The Calvin Cycle	How Cells Build Sugar from Carbon Dioxide	The Calvin Cycle How Cells Build Sugar from Carbon Dioxide High School Biology
33	Cellular Respiration	How Cells Release Energy from Food	Cellular Respiration How Cells Release Energy from Food High School Biology
34	Fermentation and Anaerobic Pathways	How Cells Make Energy Without Oxygen	Fermentation and Anaerobic Pathways How Cells Make Energy Without Oxygen High School Biology

Unit 5 — Cell Communication and Division

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
35	Cell Communication	How Cells Send and Receive Messages	Cell Communication How Cells Send and Receive Messages High School Biology
36	Signal Transduction	How a Message Travels Through a Cell	Signal Transduction How a Message Travels Through a Cell High School Biology
37	Feedback Regulation and Homeostasis	How Living Systems Maintain Internal Balance	Feedback Regulation and Homeostasis How Living Systems Maintain Internal Balance High School Biology
38	The Cell Cycle	How Cells Prepare to Divide	The Cell Cycle How Cells Prepare to Divide High School Biology
39	Mitosis and Cytokinesis	How One Cell Becomes Two	Mitosis and Cytokinesis How One Cell Becomes Two High School Biology
40	Cancer and Cell-Cycle Control	What Happens When Cell Division Loses Control	Cancer and Cell-Cycle Control What Happens When Cell Division Loses Control High School Biology
41	Meiosis and Gamete Formation	How Cells Create Genetic Diversity	Meiosis and Gamete Formation How Cells Create Genetic Diversity High School Biology

Unit 6 — Heredity

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
42	Mendel and the Foundations of Genetics	How Pea Plants Revealed the Rules of Heredity	Mendel and the Foundations of Genetics How Pea Plants Revealed the Rules of Heredity High School Biology
43	Genes, Alleles, and Traits	How Inherited Information Shapes Traits	Genes, Alleles, and Traits How Inherited Information Shapes Traits High School Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
44	The Laws of Segregation and Independent Assortment	How Alleles Separate and Recombine	The Laws of Segregation and Independent Assortment How Alleles Separate and Recombine High School Biology
45	Probability and Punnett Squares	How Genetics Predicts Inheritance	Probability and Punnett Squares How Genetics Predicts Inheritance High School Biology
46	Monohybrid Crosses	Tracking One Trait Across Generations	Monohybrid Crosses Tracking One Trait Across Generations High School Biology
47	Dihybrid Crosses	Tracking Two Traits at the Same Time	Dihybrid Crosses Tracking Two Traits at the Same Time High School Biology
48	Incomplete Dominance and Codominance	When Inheritance Is Not Simply Dominant or Recessive	Incomplete Dominance and Codominance When Inheritance Is Not Simply Dominant or Recessive High School Biology
49	Multiple Alleles and Polygenic Traits	Why Many Traits Show Complex Variation	Multiple Alleles and Polygenic Traits Why Many Traits Show Complex Variation High School Biology
50	Sex-Linked Inheritance	Why Some Traits Follow the Sex Chromosomes	Sex-Linked Inheritance Why Some Traits Follow the Sex Chromosomes High School Biology
51	Pedigrees, Environment, and Phenotype	How Families and Environments Reveal Inheritance	Pedigrees, Environment, and Phenotype How Families and Environments Reveal Inheritance High School Biology

Unit 7 — Molecular Genetics

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
52	The Structure of DNA	The Double Helix That Stores Biological Information	The Structure of DNA The Double Helix That Stores Biological Information High School Biology
53	DNA Replication	How Cells Copy Their Genetic Information	DNA Replication How Cells Copy Their Genetic Information High School Biology
54	RNA	The Working Partner of DNA	RNA The Working Partner of DNA High School Biology
55	Transcription	How Cells Copy DNA Instructions into RNA	Transcription How Cells Copy DNA Instructions into RNA High School Biology
56	Translation	How Ribosomes Build Proteins	Translation How Ribosomes Build Proteins High School Biology
57	Gene Expression	How Genetic Information Becomes a Trait	Gene Expression How Genetic Information Becomes a Trait High School Biology
58	Gene Regulation	How Cells Turn Genes On and Off	Gene Regulation How Cells Turn Genes On and Off High School Biology
59	Mutations	How Changes in DNA Create Variation	Mutations How Changes in DNA Create Variation High School Biology
60	Epigenetics	How Cells Control Genes Without Changing DNA	Epigenetics How Cells Control Genes Without Changing DNA High School Biology

Unit 8 — Biotechnology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
61	Polymerase Chain Reaction	How Scientists Copy DNA Millions of Times	Polymerase Chain Reaction How Scientists Copy DNA Millions of Times High School Biology
62	Gel Electrophoresis	How DNA Fragments Are Separated and Compared	Gel Electrophoresis How DNA Fragments Are Separated and Compared High School Biology
63	DNA Sequencing and Bioinformatics	How Scientists Read and Analyze Genomes	DNA Sequencing and Bioinformatics How Scientists Read and Analyze Genomes High School Biology
64	DNA Fingerprinting	How DNA Can Identify an Individual	DNA Fingerprinting How DNA Can Identify an Individual High School Biology
65	Recombinant DNA and Genetic Engineering	How Scientists Move Genes Between Organisms	Recombinant DNA and Genetic Engineering How Scientists Move Genes Between Organisms High School Biology
66	CRISPR Gene Editing	How Scientists Rewrite DNA	CRISPR Gene Editing How Scientists Rewrite DNA High School Biology
67	Biotechnology, Personalized Medicine, and Ethics	How Genetic Technology Is Changing Medicine and Society	Biotechnology, Personalized Medicine, and Ethics How Genetic Technology Is Changing Medicine and Society High School Biology

Unit 9 — Evolution

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
68	Darwin and the Theory of Evolution	How a Revolutionary Idea Changed Biology	Darwin and the Theory of Evolution How a Revolutionary Idea Changed Biology High School Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
69	Natural Selection	How Environments Shape Populations	Natural Selection How Environments Shape Populations High School Biology
70	Adaptation	How Traits Improve Survival and Reproduction	Adaptation How Traits Improve Survival and Reproduction High School Biology
71	Artificial Selection	How Humans Direct Evolution	Artificial Selection How Humans Direct Evolution High School Biology
72	Evolution of Antibiotic Resistance	How Bacteria Evolve Against Medicine	Evolution of Antibiotic Resistance How Bacteria Evolve Against Medicine High School Biology
73	Evidence from Fossils and Biogeography	How Earth's History Records Evolution	Evidence from Fossils and Biogeography How Earth's History Records Evolution High School Biology
74	Comparative Anatomy and Embryology	How Body Structures Reveal Common Ancestry	Comparative Anatomy and Embryology How Body Structures Reveal Common Ancestry High School Biology
75	Molecular Evidence for Evolution	How DNA Reveals the Tree of Life	Molecular Evidence for Evolution How DNA Reveals the Tree of Life High School Biology
76	Population Genetics and Evolution	How Allele Frequencies Change Over Time	Population Genetics and Evolution How Allele Frequencies Change Over Time High School Biology
77	Speciation	How New Species Form	Speciation How New Species Form High School Biology
78	Phylogenetic Trees and Biological Classification	How Scientists Reconstruct and Organize the Tree of Life	Phylogenetic Trees and Biological Classification How Scientists Reconstruct and Organize the Tree of Life High School Biology

Unit 10 — Ecology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
79	Levels of Ecological Organization	From Organisms to the Biosphere	Levels of Ecological Organization From Organisms to the Biosphere High School Biology
80	Population Ecology	How Populations Change Over Time	Population Ecology How Populations Change Over Time High School Biology
81	Carrying Capacity and Limiting Factors	What Controls Population Growth	Carrying Capacity and Limiting Factors What Controls Population Growth High School Biology
82	Communities and Ecological Niches	How Species Share an Environment	Communities and Ecological Niches How Species Share an Environment High School Biology
83	Competition and Predation	How Organisms Compete and Hunt	Competition and Predation How Organisms Compete and Hunt High School Biology
84	Symbiosis	How Different Species Live Together	Symbiosis How Different Species Live Together High School Biology
85	Food Chains and Food Webs	How Energy Connects Living Communities	Food Chains and Food Webs How Energy Connects Living Communities High School Biology
86	Ecological Pyramids and Energy Flow	Why Energy Decreases at Higher Trophic Levels	Ecological Pyramids and Energy Flow Why Energy Decreases at Higher Trophic Levels High School Biology
87	Cycles of Matter in Ecosystems	How Matter Moves Through the Living World	Cycles of Matter in Ecosystems How Matter Moves Through the Living World High School Biology
88	The Water Cycle	How Water Circulates Through Earth and Life	The Water Cycle How Water Circulates Through Earth and Life High School Biology
89	The Carbon Cycle	How Carbon Moves Through Atmosphere, Life, and Earth	The Carbon Cycle How Carbon Moves Through Atmosphere, Life, and Earth High School Biology
90	The Nitrogen Cycle	How Nitrogen Becomes Available to Living Things	The Nitrogen Cycle How Nitrogen Becomes Available to Living Things High School Biology
91	Ecological Succession	How Ecosystems Recover and Change	Ecological Succession How Ecosystems Recover and Change High School Biology
92	Biodiversity and Ecosystem Stability	Why Variety Strengthens the Living World	Biodiversity and Ecosystem Stability Why Variety Strengthens the Living World High School Biology
93	Human Impacts and Conservation	Can Humans Protect Earth's Living Systems?	Human Impacts and Conservation Can Humans Protect Earth's Living Systems? High School Biology

Unit 11 — Plant Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
94	Plant Evolution and Diversity	How Plants Transformed Life on Land	Plant Evolution and Diversity How Plants Transformed Life on Land High School Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
95	Plant Structure and Function	How Roots, Stems, and Leaves Work Together	Plant Structure and Function How Roots, Stems, and Leaves Work Together High School Biology
96	Transport in Plants	How Water and Sugar Travel Through a Plant	Transport in Plants How Water and Sugar Travel Through a Plant High School Biology
97	Plant Responses and Hormones	How Plants Sense and Respond to Their World	Plant Responses and Hormones How Plants Sense and Respond to Their World High School Biology
98	Plant Reproduction	How Plants Produce the Next Generation	Plant Reproduction How Plants Produce the Next Generation High School Biology
99	Plant Adaptations	How Plants Survive Extreme Environments	Plant Adaptations How Plants Survive Extreme Environments High School Biology

Unit 12 — Animal Diversity

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
100	Animal Evolution and Classification	How the Animal Kingdom Diversified	Animal Evolution and Classification How the Animal Kingdom Diversified High School Biology
101	Invertebrate Diversity	The Animals Without Backbones	Invertebrate Diversity The Animals Without Backbones High School Biology
102	Vertebrate Diversity	The Evolution of Animals with Backbones	Vertebrate Diversity The Evolution of Animals with Backbones High School Biology
103	Comparative Animal Anatomy	How Animal Body Plans Solve Life's Challenges	Comparative Animal Anatomy How Animal Body Plans Solve Life's Challenges High School Biology
104	Animal Behavior	Why Animals Behave the Way They Do	Animal Behavior Why Animals Behave the Way They Do High School Biology

Unit 13 — Human Body Systems

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
105	Human Tissues and Organ Systems	How Specialized Cells Build the Human Body	Human Tissues and Organ Systems How Specialized Cells Build the Human Body High School Biology
106	The Skeletal System	The Living Framework That Supports the Body	The Skeletal System The Living Framework That Supports the Body High School Biology
107	The Muscular System	How Muscles Create Movement	The Muscular System How Muscles Create Movement High School Biology
108	The Digestive System	How the Body Breaks Down and Absorbs Food	The Digestive System How the Body Breaks Down and Absorbs Food High School Biology
109	The Respiratory System	How the Body Exchanges Oxygen and Carbon Dioxide	The Respiratory System How the Body Exchanges Oxygen and Carbon Dioxide High School Biology
110	The Circulatory System	How Blood Connects Every Cell in the Body	The Circulatory System How Blood Connects Every Cell in the Body High School Biology
111	The Urinary System	How the Body Filters Blood and Balances Water	The Urinary System How the Body Filters Blood and Balances Water High School Biology
112	The Nervous System	How Electrical Signals Control the Body	The Nervous System How Electrical Signals Control the Body High School Biology
113	The Endocrine System	How Hormones Coordinate Long-Term Control	The Endocrine System How Hormones Coordinate Long-Term Control High School Biology
114	The Reproductive System	How the Human Body Produces New Life	The Reproductive System How the Human Body Produces New Life High School Biology
115	The Immune System	How the Body Recognizes and Defends Itself	The Immune System How the Body Recognizes and Defends Itself High School Biology

Unit 14 — Microbiology and Disease

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
116	Bacteria and Archaea	The Invisible Cells That Shape the Biosphere	Bacteria and Archaea The Invisible Cells That Shape the Biosphere High School Biology
117	Viruses	Life at the Edge of the Living World	Viruses Life at the Edge of the Living World High School Biology

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
118	Fungi and Protists	The Diverse Eukaryotes Beyond Plants and Animals	Fungi and Protists The Diverse Eukaryotes Beyond Plants and Animals High School Biology
119	The Human Microbiome	The Microbial Community Living Within Us	The Human Microbiome The Microbial Community Living Within Us High School Biology
120	Infectious Disease and Immunity	How Pathogens Spread and the Body Fights Back	Infectious Disease and Immunity How Pathogens Spread and the Body Fights Back High School Biology

Unit 15 — Biology and Society

Lesson	Official Curriculum Title	Documentary Video Title	YouTube Title
121	Vaccines and Public Health	How Immunization Protects Individuals and Communities	Vaccines and Public Health How Immunization Protects Individuals and Communities High School Biology
122	Antibiotics and Antimicrobial Resistance	Can Medicine Keep Up with Microbial Evolution?	Antibiotics and Antimicrobial Resistance Can Medicine Keep Up with Microbial Evolution? High School Biology
123	Bioethics	How Should Society Use the Power of Biology?	Bioethics How Should Society Use the Power of Biology? High School Biology
124	Global Health	Why Human Health Is Connected Across the Planet	Global Health Why Human Health Is Connected Across the Planet High School Biology
125	Environmental Conservation and a Sustainable Future	How Biology Can Help Protect Life on Earth	Environmental Conservation and a Sustainable Future How Biology Can Help Protect Life on Earth High School Biology

Alignment References

- U.S. Department of Education: Curriculum and standards are state and local responsibilities; the Department does not establish a national curriculum.
- Next Generation Science Standards: High School Life Science performance expectations (HS-LS1 through HS-LS4).
- College Board: AP Biology Course and Exam Description, eight-unit course framework.

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