STUDYWALKS · COURSE SYLLABUS

Biology — High School Course with CLEP Preparation

Biology is the science of living things, and most health and life-science study builds on it.

CREDIT LABEL	HOURS GOAL	STUDYWALKS LEARNING HOURS	SUGGESTED OFFLINE HOURS
1.0 credit	**120 h**	**40 h**	**80 h**
high school, with the study plan	the 1.0-credit convention	measured runtime plus assessment time	reading, review and writing

40 h StudyWalks (8.1 h of lessons, 26 h of lectures, 5.8 h of quizzes and exams) + **80 h** suggested offline study = **120 h**. 1,133 lessons in 14 units; prepares for the CLEP Biology exam.

High school credit is granted by the homeschool parent under the state's rules. StudyWalks supplies the record: hours, scores and this syllabus. The credit label is a suggestion; the parent makes the final call.

Course contents

Unit	Title and lecture topics	Lessons	Lecture
1	**The Study of Life and the Chemistry of Life** What biology is, and what kind of science it is · From an observation to a testable claim · Building a test that can answer · Two directions of reasoning, two kinds of study · What survives testing, and who checks · The properties every living thing shares · Evolution, and the mechanism it is not a synonym for · The ladder of structure, and the life arranged on it · Matter, atoms, and what fixes identity · Isotopes, decay, and reading elapsed time · Electrons, and the two strong bonds · Uneven sharing, and the weak attractions · Water, and one property behind all of it · The scale, and the two directions on it · What holds a pH steady · Two reactions, and every polymer · Carbohydrates · Lipids · Proteins: the monomer, the sequence, the first fold · The finished shape, and what disruption takes · Nucleic acids, and the capstone	79	1 h 47 min (4 parts)
2	**Cell Structure and the Plasma Membrane** Seeing a cell, and the theory that followed · What every cell has, and what a prokaryote adds · The size limit, and the eukaryotic answer · The boundary, and the interior it encloses · The nucleus, and the ribosomes it builds · Organelles with their own genome, and one without · Where animal and plant cells diverge · The endomembrane system, end to end · Three fibers, three jobs · What holds cells together · Three junctions, three functions · The membrane, described · The outward face, and what exploits it · What keeps it fluid · What crosses, and what drives it · Helped across, but still passive · Water, and what it answers to · Three words, and the reference point they need · Against the gradient · Pumps, and borrowed energy · Moving material in bulk · The unit on three failing cells	71	1 h 29 min (3 parts)

Unit	Title and lecture topics	Lessons	Lecture
3	**Metabolism, Respiration, and Photosynthesis** What metabolism names · Energy, and where it sits · Which reactions run, and which need help · The hill every reaction climbs · The two laws · The currency itself · What an enzyme is, and how it recognises · What breaks it · Two ways to inhibit · Helpers, and two kinds of control · Electrons, and who carries them · Making ATP directly, and the first pathway · Into the mitochondrion · The chain, and what spends it · Why the number moves · Without oxygen · Two fermentations, and a myth · Everything else that feeds in · One glucose, all the way through · Who makes their own, and from what · Where it happens, and in what order · What light is, and what absorbs it · Catching a photon · Two photosystems, in series · Fixing carbon, and the enzyme's mistake · The cycle, and what leaves it · Two ways around the same problem · Two pathways, one system · What cycles, and what does not · One carbon atom, traced	73	1 h 51 min (5 parts)
4	**Cell Communication and Cell Reproduction** Two levels, and the pair that carries a message · Four ways to send · Straight through the wall · Inside, or on the surface · Three surface receptors · Three kinds of ligand · The cascade, and its geometry · Messengers made inside · Three things a signal can do · Ending it · One ligand, all the way through · Signalling without multicellularity · The vocabulary, locked · Folding it up · The cycle before the division · Four phases, in order · Splitting the rest of the cell · One cycle, traced · Two kinds of control · Three gates, three questions · What drives the cycle forward · What holds it back · When regulation fails · A different solution entirely	75	1 h 39 min (4 parts)
5	**Meiosis and Mendelian Genetics** One replication, two divisions · Prophase I: pairing and exchange · Meiosis I completes · Meiosis II, and the whole sequence traced · What makes it different from mitosis · Three sources of variation · Why an organism does this at all · Mendel's method · What the data forced · Two probability rules · The vocabulary every later cross uses · Predicting and testing · Where strict dominance breaks · When the chromosome matters · Three laws, and what performs two of them · Two traits at once · Beyond two traits · When independence fails · The whole cross, traced · Sex chromosomes and what they carry	60	1 h 24 min (3 parts)
6	**Modern Inheritance, DNA, and Gene Expression** Putting genes on chromosomes · When separation fails · Finding the molecule · Solving the structure · What the molecule is made of · How it copies · Opening the helix · One rule, two strategies · The whole fork, traced · Two architectures · The problem at the ends · Three safeguards · Structure through repair · The code itself · Transcription in prokaryotes · Transcription in eukaryotes · Processing the transcript · The translation machinery · Translation in three stages · One gene, all the way through · Four ways a sequence changes · What mutations actually are · Regulation, and the prokaryotic case · Regulation before transcription · One-way flow, restated · Regulation at every remaining level · When regulation fails	83	2 h (4 parts)
7	**Biotechnology and Genomics** The scale, and the tools for seeing DNA · Cutting and joining DNA · Cloning, and what it does not deliver · Engineering an organism · What the toolkit is used for · Mapping a genome · Reading a sequence · Searching a sequence · Genomes and health · Genomics beyond one organism · Past the genome · Gene to function	43	1 h 1 min (2 parts)

Unit	Title and lecture topics	Lessons	Lecture
8	**Evolutionary Processes** What evolution is, and what selection is · The word "theory" · Adaptation and two directions of change · Reading structures · Four lines of evidence · Where variation comes from · Two misconception pairs · Species, and how new ones form · Speciation without separation · Barriers before fertilization · Barriers after fertilization · Where two species still meet · One event, traced · Joining two fields · The baseline, and what it measures · Variation, and what selection can reach · Chance · Three more forces · Fitness, and three modes of selection · Two cases where the rules bend · What selection cannot do · One mutation, followed to fixation · What a phylogeny is · Reading a tree · Naming and classifying · What a tree can be built from · Clades, groups, and the simplest tree · Genes that cross lineages · Where the tree model strains · The case, and the beginning	97	2 h 9 min (4 parts)
9	**Microbial and Fungal Diversity** What a virion is · Sorting viruses by how they make mRNA · Two things the field has not settled · Replication, and two routes through it · Getting in and out of a host · Consequences and countermeasures · Neither virus nor cell, and the capstone · The prokaryotic cell · Walls, and what they reveal · Naming them, and how they multiply · How they make a living · Where they live · When they cause harm · What they do for everything else · Sorting an unknown · A group defined by exclusion · Endosymbiosis, once and twice · How protists live · The supergroups, and three of them · SAR, and its three subgroups · Excavata · What protists do, and two closers · What a fungus is · How fungi reproduce · The phyla, and what sorts them · Growth form is not ancestry · What fungi do for everything else · When fungi cause harm · What we get from fungi · One symbiosis, traced	86	2 h 2 min (4 parts)
10	**Plant and Animal Diversity** Where land plants came from · What counts as a plant · Bryophytes · Seedless vascular plants · The seed · Gymnosperms · Angiosperms · What plants do, and two closers · What an animal is · Four criteria that sort the kingdom · Complexity has no ranking · A tree that keeps moving · Sponges · Cnidarians · Lophotrochozoa · Molluscs and annelids · Ecdysozoa · Arthropods · The deuterostome branch · Sorting, and the branch point · What a chordate is · Fishes · Onto land · Birds · Mammals and primates · The human lineage, and no ranking · Fish to amniote	78	1 h 50 min (4 parts)
11	**Plant Structure and Function** Two systems, and where cells still divide · Three tissue types · Growing longer · Growing thicker · Stems and roots · Leaves · Water potential, and the pull upward · Sugar, and the other direction · Responding to the world · Auxin, and how it was found · Four more hormones · Apical dominance, resolved · What a plant needs · Soil · Where the mass comes from · Partnerships underground · Living on or off other organisms · Sorting a strategy · Building the gametophytes · How flowers and species are arranged · Who pollinates whom · From fertilization to seed · Fruits, and reproduction without sex · What each strategy costs · One flower, all the way through	68	1 h 42 min (4 parts)

Unit	Title and lecture topics	Lessons	Lecture
12	**Animal Form, Nutrition, and Control Systems** The shape of a body, and the words for describing it · Why an animal cannot be any size it likes · What it costs to run a body · Four tissues, and every organ built from them · Holding a value steady · Heat, in and out · What an animal eats, and the gut that suits it · The tract, mouth to elimination · What food has to supply · Three macromolecules, three routes · What controls the timing · Energy balance, and a meal traced end to end · The cell, and the cells around it · How a signal happens · Crossing the gap · Connections that change · The brain · The cord, and the wiring beyond it · When the system is altered, and one reflex traced · What a sense is, mechanically · Touch, temperature, and pain · The chemical senses · How many senses there are · Hearing, and balance · Vision, and a sound traced · What a hormone is, chemically · Hormone, or neurotransmitter · The axis that runs it · Opposing pairs, and the glands behind them · What governs release · Two loops traced	121	2 h 37 min (5 parts)
13	**Animal Support, Transport, Defense, and Reproduction** Three ways to hold a body up · The vertebrate skeleton · The tissue between bones · Three kinds of joint · Inside a muscle · Pull, pairs, and one cycle traced · What a gas-exchange surface has to be · Four ways animals solve it · Moving air in and out · Carrying the gases · What drives a breath, and one loop traced · Two circulatory plans · What blood is made of · The pump · The vessels, and what defines them · Regulation, drainage, and the circuit traced · Water balance, and the nephron · The first lines · Innate defence beyond the wound · Adaptive immunity · Antibodies, and memory · Two things people get wrong · When the system errs, and one wound traced · Two ways to reproduce · Anatomy, and making gametes · Hormonal control, and fertilisation · Pregnancy and birth · From a ball of cells to organs · Twins, and one development traced · What decides a cell's fate, and the unit closed	119	2 h 34 min (5 parts)
14	**Ecology, Ecosystems, and Conservation** What ecology studies · Two abiotic constraints · Biomes · Measuring a changing climate · Counting and describing a population · How populations grow, and one traced · Three ways species interact · What classifies a symbiosis · Sharing a niche · Succession, causation, and a decline read · Behaviour, innate and learned · Behaviour in a social world · Feeding positions, and what energy does · What cycles, and what does not · The four cycles · Species with outsized effects · Productivity, and what disrupts it · Measuring diversity, and measuring risk · Four threats · Two conservation approaches · What de-extinction cannot restore · A status that moves, and two cases worked	80	1 h 56 min (4 parts)

Assessment and grading

- **Unit quizzes.** 14 quizzes, 10 questions each, checked as the student goes, each answer with the lesson to review. Untimed; retakes are unlimited.
- **Mid exam.** 50 questions on units 1–7, drawn fresh each time and scored at the end with a breakdown by content area. Untimed; retakes are unlimited.
- **Final exam.** 115 questions, 90 minutes, on the whole course. Scored 20–80; 50 passes (76 of 115 correct, about 66%). Retakes are unlimited with a 24-hour wait, each a fresh draw.

Suggested composite grade

Part	Weight
Unit quizzes (average of best scores)	20%
Mid exam (best score)	20%
Final exam (percent correct)	60%

Suggested letter scale

Letter	Composite
A	90–100
B	80–89
C	70–79
D	60–69
F	below 60

Suggested; the parent sets the grade. A passing final is the completion standard for the course record.

Study plan

The 80 offline hours are spread over the units in proportion to each unit's StudyWalks time. For each unit: read the matching sections of *Biology 2e (OpenStax); General Biology*, review the unit quiz misses, and write a one-page unit summary. Log the time as you go.

Unit	Title	StudyWalks	Offline, suggested	Unit total
1	The Study of Life and the Chemistry of Life	2 h 20 min	5 h 30 min	7 h 50 min
2	Cell Structure and the Plasma Membrane	1 h 59 min	4 h 40 min	6 h 39 min
3	Metabolism, Respiration, and Photosynthesis	2 h 22 min	5 h 35 min	7 h 57 min
4	Cell Communication and Cell Reproduction	2 h 11 min	5 h 10 min	7 h 21 min
5	Meiosis and Mendelian Genetics	1 h 50 min	4 h 20 min	6 h 10 min
6	Modern Inheritance, DNA, and Gene Expression	2 h 35 min	6 h 5 min	8 h 40 min
7	Biotechnology and Genomics	1 h 19 min	3 h 5 min	4 h 24 min
8	Evolutionary Processes	2 h 51 min	6 h 40 min	9 h 31 min
9	Microbial and Fungal Diversity	2 h 39 min	6 h 15 min	8 h 54 min
10	Plant and Animal Diversity	2 h 23 min	5 h 35 min	7 h 58 min
Lessons and lectures		**34 h 3 min**	**80 h**	**114 h 3 min**
Quizzes, mid exam and final (stated time)		**5 h 48 min**	**—**	**5 h 48 min**

Unit	Title	StudyWalks	Offline, suggested	Unit total
11	Plant Structure and Function	2 h 11 min	5 h 5 min	7 h 16 min
12	Animal Form, Nutrition, and Control Systems	3 h 28 min	8 h 10 min	11 h 38 min
13	Animal Support, Transport, Defense, and Reproduction	3 h 25 min	8 h	11 h 25 min
14	Ecology, Ecosystems, and Conservation	2 h 30 min	5 h 50 min	8 h 20 min
Lessons and lectures		**34 h 3 min**	**80 h**	**114 h 3 min**
Quizzes, mid exam and final (stated time)		**5 h 48 min**	**—**	**5 h 48 min**

Unit times are the unit's lecture runtime plus its lessons at the course's measured average lesson length; totals can differ from the learning hours by rounding.

Sources

- **Anchor:** OpenStax, *Biology 2e* (Clark, Douglas & Choi). Pinned to the live web edition revised July 22, 2026. Eight units, 47 chapters. CC BY-NC-SA 4.0
- **Secondary witness:** *General Biology*, Boundless / Lumen Learning, hosted on LibreTexts. Independently authored and not derived from OpenStax. CC BY-SA 4.0

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