

Honors Biology Syllabus – Combined Lecture & Lab

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School Year: 2025–2026

Course Location: Torah High School

Course Description

Honors Biology is a rigorous, fast-paced high school course designed to thoroughly prepare students for college-level biology. It integrates lecture content and laboratory experiences to build a strong foundation in key biological concepts, including biochemistry, cell biology, molecular biology, genetics, evolution, ecology, plant biology. Students will gain a deep understanding of the scientific process, develop critical thinking skills, and confidently approach complex biological topics. By the end of this course, students will feel well-prepared to succeed in advanced high school science and college-level biology courses.

Major Units of Study

- Unit 1 – Chemistry of Life
- Unit 2 – Cell Structure and Function
- Unit 3 – Energy and Cellular Respiration
- Unit 4 – Cell Division and DNA
- Unit 5 – Genetics and Inheritance
- Unit 6 – Molecular Biology and Protein Synthesis
- Unit 7 – Photosynthesis and Plant Biology
- Unit 8 – Evolution and Natural Selection
- Unit 9 – Diversity of Life and Classification
- Unit 10 – Ecology and Environmental Science

Grading Policy & Breakdown

Category	Weight
Exams	25%
Homework	15%
Group Work	10%
Discussion/Participation	15%
Lab Work (Biology Lab Portion)	35%

Exams will assess understanding of lecture material and scientific reasoning through multiple choice, true/false, and short-answer questions.

Homework will include chapter notes, review questions, and application-based exercises tied to health and real-world biological scenarios.

Group work includes collaborative activities, presentations, and lab-based assignments.

Participation includes attendance, active involvement in class discussions, and consistent engagement with activities and peers.

Lab work makes up a significant portion of the grade and includes pre-labs, post-lab analysis, lab notebook entries, and experimental reporting.

Required Texts & Materials

- Concepts of Biology (OpenStax, free online textbook)
- 3-ring binder with lined paper
- Colored pens or pencils for diagrams and annotations
- Scientific calculator
- Laptop or tablet

Biology Schedule

Subject to change

Unit 1 – Chemistry of Life (Aug 2025)

- **Lecture Topics:** Atoms, molecules, water properties, macromolecules (carbs, lipids, proteins, nucleic acids)
- **Lab:** Food Test Lab using iodine (starch), Biuret or vinegar (protein), and brown paper bag (lipids)

Unit 2 – Cell Structure and Function (September 2025)

- **Lecture Topics:** Prokaryotic vs. eukaryotic cells, organelles, membrane function, osmosis
- **Lab:** Microscopy Lab using onion skin and cheek cells stained with methylene blue

Unit 3 – Energy and Cellular Respiration (October 2025)

- **Lecture Topics:** ATP, anaerobic vs. aerobic respiration, mitochondria

- **Lab:** Yeast Fermentation Lab with sugar and balloons to observe carbon dioxide production
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Unit 4 – Cell Division and DNA (November 2025)

- **Lecture Topics:** Mitosis, meiosis, DNA structure and replication
 - **Lab:** Chromosome Simulation and DNA modeling using pipe cleaners or paper cutouts
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Unit 5 – Genetics and Inheritance (December 2025)

- **Lecture Topics:** Mendelian genetics, Punnett squares, phenotypes/genotypes
 - **Lab:** Inheritance Activity using dice or cards to simulate traits in fictional offspring
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Unit 6 – Molecular Biology and Protein Synthesis (January 2026)

- **Lecture Topics:** DNA → RNA → Protein, codons, transcription and translation
 - **Lab:** Protein Synthesis Simulation using beads or paper codons to model translation
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Unit 7 – Photosynthesis and Plant Biology (February 2026)

- **Lecture Topics:** Chloroplasts, light reactions, Calvin cycle, leaf structure
 - **Lab:** Photosynthesis and Transpiration Activity using plastic bags over leaves
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Unit 8 – Evolution and Natural Selection (March 2026)

- **Lecture Topics:** Natural selection, adaptation, genetic variation
 - **Lab:** Beak Adaptation Simulation using different tools to mimic feeding behaviors
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Unit 9 – Diversity of Life and Classification (April 2026)

- **Lecture Topics:** Domains, kingdoms, classification systems, taxonomy

- **Lab:** Classification Activity using mystery items and a dichotomous key
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Unit 10 – Ecology and Environmental Science (May 2026)

- **Lecture Topics:** Ecosystems, energy flow, nutrient cycles, human impact
 - **Lab:** Food Web Design or Bottle Ecosystem Construction
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Email Etiquette & Communication Guidelines

To help me respond to your emails in a timely and organized manner, please follow the guidelines below:

- Subject Line: Always include “Torah High School – Biology” in the subject line so I can quickly identify your message.

Example: Subject: Torah High School – Biology: Question about Lab Report Format

- Email Content:

- Start with a proper greeting (e.g., 'Dear Dr. Rodriguez,' or 'Hi Dr. Rodriguez,').

- Be clear and specific about your question or concern.

- Use complete sentences and maintain a respectful tone—this is a professional communication space.

- Response Time:

- I will do my best to respond within 48 hours (2 business days). Please plan ahead and avoid last-minute questions.

The best way to ask questions is during class time. Please try to meet with me often—I welcome your curiosity and want to support your learning in real time.

Lab Expectations and Safety

Laboratory activities are an essential part of the Honors Biology course. Labs provide opportunities to engage in hands-on learning, reinforce lecture content, and develop critical scientific skills such as observation, data collection, analysis, and communication.

Students will complete labs individually and in small groups. Each lab will include a set of procedures, guided questions, and space for data analysis and conclusions. Students are expected to come prepared with their materials (e.g., binder, pen/pencil, calculator) and to follow all instructions carefully.

Lab Safety Rules

All students must adhere to the following safety expectations:

- Follow all safety instructions and listen carefully during lab briefings.
- Wear goggles and gloves when instructed to do so.
- Never taste or directly inhale chemicals or lab materials.
- Report any accidents, spills, or broken equipment to the instructor immediately.
- Clean your workspace and return materials at the end of the lab.
- Do not engage in horseplay or distracting behavior during lab time.

Failure to follow lab safety guidelines may result in removal from the lab activity, loss of credit for the assignment, and communication with parents/guardians.

If a student misses a lab due to an excused absence, they will be given a comparable make-up assignment or may be allowed to use shared data to demonstrate mastery of the lab objectives.