

AP® Biology builds students' understanding of biology on both the micro and macro scales. After studying cell biology, students move on to understand how evolution drives the diversity and unity of life. Students will examine how living systems store, retrieve, transmit, and respond to information and how organisms utilize free energy. The equivalent of an introductory college-level biology course, AP® Biology prepares students for the AP® exam and for further study in science, health sciences, or engineering.

The AP® Biology course provides a learning experience focused on allowing students to develop their critical thinking skills and cognitive strategies. Frequent no- and low-stakes assessments allow students to measure their comprehension and improve their performance as they progress through each activity. Students regularly engage with primary sources, allowing them to practice the critical reading and analysis skills that they will need in order to pass the AP® exam and succeed in a college biology course. Students perform hands-on labs that give them insight into the nature of science and help them understand biological concepts, as well as how evidence can be obtained to support those concepts. Students also complete several virtual lab studies in which they form hypotheses; collect, analyze, and manipulate data; and report their findings and conclusions. During both virtual and traditional lab investigations and research opportunities, students summarize their findings and analyze others' findings in summaries, using statistical and mathematical calculations when appropriate. Summative tests are offered at the end of each unit as well as at the end of each semester, and contain objective and constructed response items. Robust scaffolding, rigorous instruction, relevant material and regular active learning opportunities ensure that students can achieve mastery of the skills necessary to excel on the AP® exam.

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Length: Two Semesters

### **Unit 1: Cell Biology**

- Cell Structure and Function
- Cell Membrane Structure and Function
- Cell Biology Wrap-up

### **Unit 2: Protein Structure and Functions and the Impact on Evolutionary Biology**

- Protein Structure; Function; and Synthesis
- Natural Selection and Speciation
- Protein Structure and Function; and the Impact on Evolutionary Biology Wrap-up

### **Unit 3: A Historical Perspective on the Evidence for Evolution**

- Earth's History
- Evolutionary Relationships
- A Historical Perspective on the Evidence for Evolution Wrap-up

**Unit 4: Mechanisms of Inheritance**

- Cell Reproduction
- Genetics and Gene Expression
- Mechanisms of Inheritance Wrap-up

**Unit 5: Semester 1 Exam****Unit 6: Homeostasis**

- Introduction to Metabolism and Homeostasis
- Adaptations, Behavior, and Learning
- Homeostasis Wrap-up

**Unit 7: Cellular Energetics**

- Understanding Photosynthesis
- Understanding Cellular Respiration
- Cellular Energetics Wrap-up

**Unit 8: Cell Communication and Body Systems**

- Integrating Cell Communication and the Immune System
- Cell Signaling in the Nervous and Endocrine Systems
- Cell Communication and Body Systems Wrap-up

**Unit 9: Ecological Principles**

- Organisms and Populations in Their Environment
- Ecological Communities
- Ecological Principles Wrap-up

**Unit 10: Semester 2 Exam**