

2021 Advanced Placement® Biology

About the AP® Biology Summer Institute

Over the course of this workshop, new and experienced teachers alike will become familiar with the *Course and Exam Description (CED)* in AP Biology. The CED organizes the course into eight commonly taught units:

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|--------------------------------|-----------------------------------|
| 1: Chemistry of Life | 5: Heredity |
| 2: Cell Structure and Function | 6: Gene Expression and Regulation |
| 3: Cellular Energetics | 7: Natural Selection |
| 4: Cell Cycle | 8: Ecology |

The major focus of this online APSI will be on the CED, lab investigations, and the resources available to teachers to help them as they create and present an AP Biology course. The course framework clearly connects *each learning objective* to specific *essential knowledge* and includes *biology-specific science practices* that build skills to help students learn to think and act like biologists. Particularly important with the CED is the time and skill set necessary to support teachers in implementing more inquiry-based investigations. Participants will be given tools and strategies for modifying traditional experiments into inquiry-based models. **Participants will become familiar with both hands-on and virtual investigations** from the lab manual: *AP Biology Lab Investigations: An Inquiry-Based Approach* (2019). Participants will also explore creative alternatives to the investigations. We will examine the new AP Biology Exam design, essay writing, and essay grading. There will be time for teachers to begin working on their AP Biology syllabus specific to their school's daily schedule and calendar and the AP Course Audit process.

There will also be time for AP teachers to share their best practices with one another. To learn more about AP Biology, please go to AP Central AP Biology: <https://apcentral.collegeboard.org/courses/ap-biology/course/updates-2019-20?course=ap-biology>

Online Learning Requirements: Participants must have a laptop or computer, a gmail address, a WiFi/internet for access to Google Drive and Zoom as well as a willingness to exchange effective teaching practices with peers in an online platform. **The APSI will run for 6 hours daily with the Participants having synchronous instruction 2/3rds of the time and asynchronous instruction 1/3rd of the time for each of the 5 days.** This time frame will meet the **College Board's 30-hour requirement** to become a **certified AP Biology teacher**. The synchronous and asynchronous times are as follows: **9:00-11:00 am EDT (synchronous)** will be spent viewing presentations and demonstrations by the instructor, **11:00 am-2:00 pm EDT: (asynchronous)** will be spent independently or with other participants working on assignments and activities which includes an hour for lunch, **2:00-4:00 pm EDT: (synchronous)** will be spent on allowing time to observe the consultant model laboratory investigations and to give the participants time to discuss the CED and ask questions about the AP Biology course framework, lab investigations, and APSI assignments. There will also be time in this part of the APSI for invited presentations for some of the more difficult lab investigations.

Participants will:

- Learn how to use existing resources most effectively in implementing the Course Framework
- Discuss teaching strategies for the 13 AP Biology labs from the Investigative Lab Manual
- Select a minimum of one or two lab investigations to do for each of the eight Units
- Share alternative and supplemental class and lab activities
- Share Lab Mini-poster and CER (Claim, Evidence, and Reasoning) activities
- Work on preparing two specific lesson plans and a Course Audit (as needed)
- Visit the AP Central website, AP Classroom, the Course Audit portal with a sample syllabus

Key Takeaways for Participants during the Week: Participants will complete a Daily Takeaway Survey.

- **Understanding the Course and Exam Description (CED)**
- **Planning the Course**
- **Teaching the Course**
- **Learning how to assess Student Progress and Understanding**
- **Becoming a part of the AP Community**

Abbreviations that will be Used During the Week:

CER: Course and Exam Description

CBH: College Board Handbook

CN: Consultant's Notebook

LM: AP Biology Investigative Lab Manual

SSRs: AP Biology 2021 Sample Student Responses

UbD: Understanding by Design

KTA: Key Takeaway

**Tentative Schedule for the 5-Day APSI
Pat Mote - AP Biology Consultant**

9:00-11:00 am EDT synchronous instruction

11:00 am-2:00 pm EDT asynchronous instruction and lunch break

2:00-4:00 pm EDT synchronous instruction

**Day 1: Key Takeaway: Understanding the Course and Exam Description (CED)
(Complete Key Takeaway Survey at the end of the day)**

- The Course Framework
- Building conceptual understandings by linking testable Learning Objectives (what student's should be able to do) to
- Essential Knowledge (Content) for each Big Idea and
- Using the Science Practices (Skills) and the Essential Knowledges (Content) to apply content in new, relevant, and unfamiliar contexts.

You are responsible for completing designated Lessons from the College Board Handbook during the asynchronous times for the APSI: Directions will be given during synchronous times.

- Discuss Lessons ... **QUESTIONS?** Treasure Hunt Activity
- Textbook Information
- Lab Equipment/Materials – Ward's, Carolina, Flinn, Bio-RAD, Probeware
- Lab Manual: *AP Biology Investigative Labs: An Inquiry-Based Approach*
Practicing the Practices: Investigation 11 Transpiration - BI 4 (Set-up)

You are responsible for completing designated Lessons from the College Board Handbook during asynchronous times for the APSI: Directions will be given during synchronous times.

**Day 2: Key Takeaway: Planning the Course
(Complete Key Takeaway Survey at the end of the day)**

- Equity and Access and Diversity of Learners
- Instructional Resources: AP Classroom and AP Central

You are responsible for completing designated Lessons from the College Board Handbook during the asynchronous times for the APSI: Directions will be given during synchronous times.

- Discuss Lessons ... **QUESTIONS?**
- Lab Notebooks, Lab Reports, Mini-posters, CER mini-posters

Practicing the Practices: Investigation 4 Diffusion and Osmosis - BI 2

Practicing the Practices: Investigation 12: Animal Behavior - BI 4

Practicing the Practices: Transpiration 11 Data Collection Day

Day 3: Key Takeaway: Teaching the Course

(Complete Key Takeaway Survey at the end of the day)

- Discuss Activity: Lesson 10: Planning Your Course - CBH p. 81: Share Plans
- Using effective instructional strategies to help develop course skills and content
- Practice makes perfect
- Teachers need a deep understanding of content and applications

You are responsible for completing designated Lessons from the College Board Handbook during asynchronous times for the APSI: Directions will be given during synchronous times.

- Discuss Lessons ...**QUESTIONS?**
- Mini-posters and CER - Gallery Walk to view samples of Mini-posters and CER posters
- **Practicing the Practices: Transpiration 11 Data Collection Day 3**
Practicing the Practices: Investigation 4: Water Potential - BI 2
Practicing the Practices: Investigation 5: Photosynthesis - BI 2

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Day 4: Key Takeaway: Assessing Student Progress and Understanding

(Complete Key Takeaway Survey at the end of the day)

- Aligning assessments and instruction to learning goals and performance standards
- Challenging students to apply their knowledge and skills in different contexts for a deeper understanding of the content
- Time, practice and feedback
- **Understanding** is earned over time

Practicing the Practices: Investigation 2: Hardy-Weinberg - BI 1
Practicing the Practices: Chi Square Analysis: Woolly Worm Lab - BI 1

You are responsible for completing designated Lessons from the College Board Handbook during the asynchronous times for the APSI: Directions will be given during synchronous times.

- Guest Speaker: Student-centered Electrophoresis Activities – miniPCR 1:30-3:00 pm EDT

Practicing the Practices: Investigation 9: Biotechnology - BI 3 (Handout)
Practicing the Practices: Transpiration 11 Data Collection Day 4

Day 5: Key Takeaway: Course Audit, AP Biology Exam

(Complete Key Takeaway Survey at the end of the day)

- Announcements: College Board Survey, Day 5 Key Takeaway Survey
- Activity: AP Course Audit, AP Facebook, MyAP, AP Community
- Formative vs Summative Assessments
- AP Biology Exam Structure
- Activity: Analysis of the 2019 Exam

You are responsible for completing designated Lessons from the College Board Handbook during the asynchronous times for the APSI: Directions will be given during synchronous times.

- **Discuss Lessons ... Questions?**
- **Activity: Scoring of the 2021 Exam**
- **Activity: Making Time to Review for the AP Biology Exam**
- **Activity: Sharing Favorite Activities or Labs**
- **Reflection on the activities of the week and APSI Event Survey**

Practicing the Practices: Transpiration 11 - Data Collection Day 5-Results, Graph

What to bring:

Supplies you might need for the week:

- Highlighter
- Notebook/ paper
- Ruler
- Graph paper
- Sticky notes
- Pen and Pencil
- Calculator
- Marker

Items you should have access to during the week include:

- A laptop computer/ tablet
- A favorite lesson or practice to share
- A copy of your school's academic calendar
- A copy of the textbook you will be using next year (if you have access to one)
- **AP Biology Workshop Handbook**
- **AP Biology Course and Exam Description**
- **AP Biology Investigative Lab Manual**
- **AP Biology Free-Response Questions 2021**
- **AP Biology Consultant Notebook by Pat Mote**

Instructor:

Patricia Mote taught biology at the high school level for over thirty years serving as department chair for many of these years. She has been an instructor and lecturer at the college level for 29 years. She holds degrees in Microbiology, Genetics, and Science Education from the University of Georgia. While serving as a consultant for the College Board since 1991, she has conducted one-day workshops and summer institutes at various schools and universities all over the country. She has been involved with the AP Reading to score the free response questions from the AP Biology Exam since 1992, serving as reader, table leader, question leader, and exam leader. She helps develop Multiple-Choice and Free Response questions for the AP Biology Exams. She currently serves as the chair of CLEP (the College-Level Examination Program) for the Educational Testing Service and is a member of College Board's National Science Advisory Committee.

During her career as a high school teacher she received numerous awards including being named high school Teacher of the Year many times as well as Teacher of the Year for her school district. She was named the Biology Teacher of the Year for Georgia and a Tandy Technology Scholar. In 2003, she received the Siemens Award in Biology for her work with minority students in the AP program at her school. Her students have also selected her as their STAR Teacher numerous times.

She has developed Test Banks for Human Anatomy and Physiology textbooks and for several AP Biology textbooks and has had items published in The College Board's Materials for Professional Workshops. She serves as an editor for articles for The American Biology Teacher. She has edited numerous editions of Human Anatomy and Physiology textbooks. Other publications include articles for several microbiology journals from research conducted at the Centers for Disease Control in Atlanta and three instructors' guides for AP Biology. For 17 years during the summer months she taught a Molecular Biology Program at the Georgia Institute of Technology in Atlanta.

Patricia resides in Atlanta, Georgia. She is currently a Lecturer and Lab Instructor for Human Anatomy and Physiology, Majors Biology, and Non-majors Biology courses at Georgia State University-Perimeter College.

