

2022 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* (2019). The CED organizes the course into eight commonly taught units:

- | | |
|--------------------------------|-----------------------------------|
| 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 APSI will be on the CED and the resources available to teachers. The course framework clearly connects *each learning objective* to specific *essential knowledge*. It includes *biology-specific science practices* that build skills to help students learn to think and act like biologists.

Particularly important will be 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 hands-on and virtual investigations** in the lab manual: *AP Biology Lab Investigations: An Inquiry-Based Approach* (2019). They will also explore creative alternatives to these investigations. We will examine the 2019 AP Biology Course and Exam Description (CED) and essay writing and grading. There will be time for teachers to begin working on their AP Biology course syllabus specific to their school's daily schedule and calendar and the AP Course Audit process. To learn more about AP Biology, please go to: <https://apcentral.collegeboard.org/courses/ap-biology/course/updates-2019-20?course=ap-biology> or www.apcentral.collegeboard.org/Biology

Topics for the Week:

- Course and Exam Description and Course Planning
- Diversity and Inclusion & Equity and Access
- Strategies and Pedagogical Tools
- AP Classroom, AP Daily, and how to become part of the AP Community
- Summative Assessments: AP Biology 2022 Exam
- Reflection on the APSI Material

Goals for the Week:

- Learn how to use resources most effectively in implementing the Course and Exam Framework
- Discuss teaching strategies for the 13 AP Biology labs from the Investigative Lab Manual
- Share alternative and supplemental class and lab activities (CER mini-posters and Lab mini-posters)
- Work on preparing a specific Lesson Plan and a Course Audit (if needed)
- Explore the AP Central website, AP Classroom, AP Daily, Course Audit Portal, AP Community
- Learn how the AP Biology Exam is constructed and scored (MCQs and FRQs)

Tentative Schedule for the Week of July 11-14 (In-Person)

Day 1: Monday: **The Course Framework and Exam Description (CED)**

Goals, College Board Handbook (CBH), Consultant's Notebook (CN), Textbooks

The Course Framework: *Lesson 3: Understanding the Course Content* - CBH p. 29-34

Lesson 4: Understanding the Big Ideas – CBH p.35-39

Lesson 5: Exploring the 8 Unit Guides – CBH p. 41-42

Lunch

Lab Equipment/Materials – Ward’s, Carolina, Flinn, Bio-RAD, Probeware

Lab Manual: *AP Biology Investigative Labs: An Inquiry-Based Approach*

Investigation 11: Transpiration ** SP 1, 2, 4 - BI 4 (will take measurements each day)

Chi Square Analysis: **Wooly Worm Lab – What is a Null Hypothesis?** SP 3 - BI 1

Homework Assignment: Lesson 1: Previewing the Science Practices - Teaching for Transfer – CBH p. 7-14

Day 2: Tuesday: Importance of the INVESTIGATIVE LABS?

Discuss Lesson 1: *Previewing the Science Practices - Teaching for Transfer – CBH p. 7-14*

Investigation 4: Diffusion and Osmosis ** SP 5 - BI 2

Equity and Access and Diversity of Learners

Lesson 27: AP Course Audit and Curricular Requirements – CBH p. 213-218

Lunch

Lesson 9: Scaffolding and Spiraling the SP’s – CBH p. 65-70

Investigation 12: Animal Behavior ** SP 3, 4, 5 - BI 4

Lab Notebooks, Lab Reports, Mini-posters for Lab and CER Activities

Homework Assignment: Lesson 10: Planning Your Course- CBH p. 81-88: Create an Instructional Plan

Day 3: Wednesday: Let’s Work on Those SKILLS = The SCIENCE PRACTICES

Discuss Lesson 10: *Planning Your Course–CBH p. 81-88: Share Instructional Plans*

Investigation 4: Water Potential ** SP 2, 5 - BI 2

Gallery Walk to View Mini-posters/CER posters *Lesson 18: Argumentation CBH p. 129*

Scoring of the 2020 Exam *Lesson 22: Exam Structure – CBH - p. 167*

Lunch

The 2020 Exam, continued (Applying LO’s from the Course Framework to the FRQ’s)

Investigation 5: Photosynthesis ** SP 4 -BI 2 and Other Activities Using Plants

Investigation 2: Hardy-Weinberg** SP 2, 5 - BI 1

Homework Assignment: Create an Instructional Plan for a Second Unit from the Course Framework

Day 4: Thursday: MATHEMATICS and STATISTICS: Biology’s Next Microscope

Discuss Lesson 9:*Scaffolding and Spiraling the SP’s–CBH p. 65-70: Share Instructional Plans*

MiniOne Systems: Student-Centered Activities for Gel Electrophoresis and PCR

Investigation 9: Biotechnology - Restriction Enzyme Analysis of DNA ** SP 2, 4 - BI 3

Lunch

Lesson 17: Statistical Tests and Data Analysis CBH – p. 123-127

Investigation 11: Transpiration ** SP 1, 2, 4, 5 - BI 4 Results and Observing Stomata

Making Time to Review for the AP Biology Exam

Reflections on Goals for the week and USB drives

Science Practice 1: Lesson 19 – Concept Explanation - CBH p. 137

Science practice 2: Lesson 14 – Visual Representations – CBH p. 107

Science Practice 3: Lesson 15 – Questions and Methods – CBH p. 113

Science Practice 4: Lesson 16 – Representing and Describing Data – CBH p. 117

Science Practice 5: Lesson 17 – Statistical Tests and Data Analysis – CBH p. 123

Science Practice 6: Lesson 18 – Argumentation - CBH p. 129

What to bring:

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)

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 a 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 the College Board's National Science Advisory Committee.

As a high school teacher, she received numerous awards, including being named high school Teacher of the Year many times and 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. Her students have also selected her as their STAR Teacher numerous times.

She has developed Test Banks for Human Anatomy and Physiology textbooks and 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.