UNIVERSITY OF GEORGIA
Center for Continuing Education & Hotel

This AP Summer Institute has been endorsed by CollegeBoard AP

2023 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
2: Cell Structure and Function
3: Cellular Energetics
4: Cell Cycle
5: Heredity
6: Gene Expression and Regulation
7: Natural Selection
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 2023 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 year-long Pacing Guide, 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 10-13 (In-Person APSI)

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

Goals, College Board Materials, Consultant's Notebook (CN)

The Course Framework:

Understanding the Big Ideas (Course Themes)

Understanding the Enduring Understandings (Course Concepts)

Understanding the Essential Knowledge (Course Content)

Understanding the Learning Objectives (What Students have to do in the Course)

Understanding the Sciences Practices (the Skills the Students will master)

Lunch

Textbooks

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* ** *SP 1, 2, 4 - BI 4

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

Homework Assignment: *Previewing the Science Practices - Teaching for Transfer*
Begin work on *Creating* a Pacing Guide (Year-long or Semester-long) for the Course
Due at the beginning of Day 4 of the APSI

Day 2: Tuesday: **Importance of the INVESTIGATIVE LABS?**

Previewing and Understanding the Science Practices - Teaching for Transfer

Equity and Access and Diversity of Learners

AP Course Audit and Curricular Requirements

***Practicing the Practices:* Results from Investigation 4: Diffusion and Osmosis**

Lunch

Scaffolding and Spiraling the SP's

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

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

Homework Assignment: *Create an Instructional Lesson Plan from one Topic from a Unit in the CED*
Due at beginning of Day 3.

Day 3: Wednesday: Let's Work on Those SKILLS = *SCIENCE PRACTICES*

Planning Your Course: Share Instructional Lesson Plans

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

Gallery Walk to View Lab Mini-posters/CER Mini-posters: *Argumentation*
The 2023 Exam: New format began in 2021: CED p. 193 – Remember UBD

Lunch

AP Biology Exam Structure: Appling LO's from the CED to the FRQ's
A close look at the 2023 AP Biology Exam FRQs (Scoring Guidelines and Sample Responses)

Practicing the Practices: Investigation 5: Photosynthesis ** SP 4 -BI 2
Practicing the Practices: Investigation 2: Hardy-Weinberg** SP 2,5 - BI 1

Homework Assignment: Complete the Pacing Guide (Year-long or Semester) for the Course
Due at beginning of Day 4.

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

Discuss *Scaffolding and Spiraling the SP's*: Share Pacing Guides

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

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

Lunch

Statistical Tests and Data Analysis: Chi Square Analysis

Practicing the Practices: Wooly Worm Lab – *What is a Null Hypothesis?* SP 3 - BI 1
Practicing the Practices: Investigation 11: Transpiration ** SP 1. 2, 4, 5 - BI 4
Calculating Results/Observing Stomata

Making Time to Review for the AP Biology Exam
Reflections on Goals and Activities for the week

Science Practice 1: Concept Explanation
Science practice 2: Visual Representations
Science Practice 3: Questions and Methods
Science Practice 4: Representing and Describing Data
Science Practice 5: Statistical Tests and Data Analysis
Science Practice 6: Argumentation

What to bring to the APSI:
Items you should have access to during the week include:

- A laptop computer/ tablet
- A favorite lesson, lab, 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)
- A jacket, sweat shirt, or sweater: it can get "chilly" in the lab room

College Board Consultant for this APSI

Patricia Mote taught biology at the high school level for over thirty years serving as department chair for many of these 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 also helps develop Multiple-Choice and Free Response questions for the AP Biology Exams. She currently is serving as 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 has served 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.

She began teaching at the College level as an adjunct instructor in 1992 at Georgia Perimeter Community College and in 2001 at the Georgia Institute of Technology where she taught a Molecular Biology Program for 17 years during the summers. After she retired from high-school teaching, she began fulltime work at the college-level in 2008. She is currently a Senior Lecturer and Lab Instructor for Human Anatomy and Physiology, Majors Biology, and Non-majors Biology courses at Georgia State University in Atlanta, GA.