

WELCOME TO APES! (A.P. ENVIRONMENTAL SCIENCE)

FROM THE COLLEGE BOARD

“The AP Environmental Science course is designed to engage students with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.”

COLLEGE COURSE EQUIVALENT...“The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science.

Prerequisites Students should have completed two years of high school laboratory science—one year of life science and one year of physical science (e.g., a year of biology and a year of chemistry). Due to the quantitative analysis required in the course, students should also have taken at least one year of algebra. Also desirable (but not necessary) is a course in earth science.”

At PHUHS, we recommend that APES students have already taken chemistry and earned A or B (unless they are IB sophomores, who will take chemistry concurrently with APES).

BIG IDEAS (College Board)

- 1) Energy Transfer (ENG)
- 2) Interactions Between Earth Systems (ERT)
- 3) Interactions Between Different Species and the Environment (EIN)
- 4) Sustainability (STB)

SCIENCE PRACTICES (College Board)

PRACTICE 1: Concept Explanation	30-38% of MC	13-20% of FRQ
PRACTICE 2: Visual Representation	12-19% of MC	6-10% of FRQ
PRACTICE 3: Text Analysis	6-8% of MC	N/A
PRACTICE 4: Scientific Experiments	2-4% of MC	10-14% of FRQ
PRACTICE 5: Data Analysis	12-19% of MC	6-10% of FRQ
PRACTICE 6: Mathematical Routines	6-9% of MC	20% of FRQ
PRACTICE 7: Environmental Solutions	17-23% of MC	26-34% of FRQ

UNITS (College Board; do not have to be done in order):

- UNIT 1: The Living World: Ecosystems (6-8% of AP exam)
- UNIT 2: The Living World: Biodiversity (6-8%)
- UNIT 3: Populations (10-15%)
- UNIT 4: Earth Systems and Resources (10-15%)
- UNIT 5: Land and Water Use (10-15%)
- UNIT 6: Energy Resources and Consumption (10-15%)
- UNIT 7: Atmospheric Pollution (7-10%)
- UNIT 8: Aquatic and Terrestrial Biomes (7-10%)
- UNIT 9: Global Change (15-20%)

AP EXAM FORMAT →

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1) Objective Questions – 60% of the grade

- **80 multi-choice questions in 90 minutes**
- always 4 responses, *no* “all of the above” and “none of the above”
- text analysis, cluster questions (related to one passage or piece of information), graph/table/chart/map/model interpretation, math problems
- blanks don’t count for or against
- score is based on the number of questions answered correctly
- points are *not* deducted for incorrect answers
- approved calculators are allowed
- Try not to second-guess the MC answers. Changes usually are wrong.
- White polymer erasers are best for erasing pencil marks.

2) FRQ (Free Response Questions) – 40% of grade

- **3 FRQ’s in 70 minutes (22.5 min. per FRQ)**
 - **Question 1: Design an Investigation**
 - **Question 2: Analyze an environmental problem and propose a solution**
 - **Question 3: Analyze an environmental problem and propose a solution, with math**
- IMPORTANT TASK VERBS IN FRQs (College Board):

Calculate: Perform mathematical steps to arrive at a final answer, including algebraic expressions, properly substituted numbers, and correct labeling of units. Showing work is required.

Describe: Provide the relevant characteristics of a specified topic.

Explain: Provide information about how or why a relationship process, pattern, position, situation, or outcome occurs, using evidence and/or reasoning to support or qualify a claim. Explain “how” typically requires analyzing the relationship process, pattern, position, situation, or outcome; whereas, explain “why” typically requires analysis of motivations or reasons for the relationship process, pattern, position, situation, or outcome. Also phrased as “give one reason.”

Identify: Indicate or provide information about a specified topic, without elaboration or explanation.

Justify: Provide evidence to support, qualify, or defend a claim and/or provide reasoning to explain how that evidence supports or qualifies the claim.

Make a claim: Make an assertion that is based on evidence or knowledge.

Propose a solution: Provide a proposed solution to a problem based on evidence or knowledge.

- FRQ GENERAL TIPS...
 - Use **regular ball-point pen** with black or blue ink— no roller-balls, gel pens, or markers.
 - First, read all the FRQs through twice.
 - Write in **complete sentences** unless you are completing a chart or table.
 - Students tend to speak and write too generally. They may know the information but if they do not write it out clearly, they can’t get points.
 - The test readers are looking for **key content**. Spelling and grammar do not have to be perfect.

- If the readers can't read it, it will get a zero. Write **legibly**.
- Prose response does not mean a bulleted or numbered list.
- Drawings are acceptable only if they are accompanied by a written explanation.
- Avoid unclear and vague pronouns and information.
- Use single-line cross outs; no white-out, no huge scribbles or erasures. Anything crossed out (except units in math work) will not be read.
- **How many examples** are requested? If they ask for two pieces of info and the student gives four, the first two of which are wrong and the last two are right, they will not get any points. The reader will stop at the first two asked for.
- **Answer the questions as asked.** Do not restate the question. No introductory paragraphs are needed. Be specific. Pay attention to the **task verbs**.
- **Be careful with absolutes.** (*All the animals will die; the entire ecosystem will be harmed...*)
- Answer as many parts of a multi-point question as you can.
- Do the hardest FRQ first. Leave the easiest one for last. You can do the questions out of order as long as everything is labeled.
- Neatly **organize and label** essay answers like the questions are set up: a), b), c)...
- **Actual math setup, with all units, must be shown** in the answer section.
- **Do not box in or circle math answers.** You may highlight the wrong thing or contradict yourself.
- Always write something. Don't ever leave essays blank.
- Pacing is important.
- If a question asks for lab design, include the following:

- 1) Your **hypothesis** and/or predictions/expected results
- 2) The **independent variable** - what treatments will you apply
- 3) The **dependent variable** - what will you measure as a result of manipulating the independent variable
- 4) The variables to be controlled.(kept constant).
- 5) What is the **control group**—the group without the experimental change?
- 6) The **organism/materials/apparatus** to be used
- 7) Describe what you will **actually do**
- 8) Describe how you will actually **take and record data**
- 9) Describe how the data will be **graphed and/or analyzed**
- 10) State how you will draw a **conclusion** (compare results to hypothesis and predictions)

Note: Your experimental design needs to be at least theoretically possible and it is very important that your conclusions/predictions be consistent with the principles involved and with the way you set up the experiment.