Advanced Placement Environmental Science (APES) 2017-2018 Syllabus

Instructor: Ms. Sabrina Maxwell, rm 202
Email: sabrina.maxwell@am.dodea.edu
Textbook: Friedland, Andrew, Rick Relyea and David Courard-Hauri. *Environmental Science for AP**. W. H. Freeman and Company.

Welcome to the AP Environmental Science course!
AP Environmental Science is designed to be the equivalent of an introductory college course in environmental science. The goal of the AP Environmental Science course is to provide students with the scientific concepts, principles, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and anthropogenic, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. To achieve these goals, we will focus on the following, students will; conceive and develop experimental design; develop methods for analyzing and interpreting mathematical calculations, understand the unifying themes that integrate all biological and environmental science topics; and the apply knowledge and critical thinking to environmental and societal concerns.

Taking the AP Exam is not required but it is encouraged. College credit may be given for exam scores of three and above. Exactly what scores will be accepted and how much credit will be awarded depends on the individual college.

Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science. The following themes provide a foundation for the structure of the AP Environmental Science course.

1. **Science is a process**
   a. Science is a method of learning more about the world.
   b. Science constantly changes the way we understand the world.
2. **Energy conversions underlie all ecological processes.**
   a. Energy cannot be created; it must come from somewhere.
   b. As energy flows through systems, at each step more of it becomes unusable.
3. **The Earth itself is one interconnected system.**
   a. Natural systems change over time and space.
   b. Biogeochemical systems vary in ability to recover from disturbances.
4. **Humans alter natural systems.**
   a. Humans have had an impact on the environment for millions of years.
   b. Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.
5. **Environmental problems have a cultural and social context.**
   a. Understanding the role of cultural, social, and economic factors is vital to the development of solutions.
6. **Human survival depends on developing practices that will achieve sustainable systems.**
   a. A suitable combination of conservation and development is required.
   b. Management of common resources is essential.

About the APES exam:
The 2018 APES exam will be given in Thursday, May 10th. The exam is three hours in length and consists of two parts: a multiple– choice selection comprised of 100 questions and forming 60% of the grade, and a free-response section comprised of four questions and forming 40% of the grade. The number of multiple-choice questions taken from each major topic area is reflected in the percentage of the course as designated in the outline of topics.

The free-response section emphasizes the application of principles in greater depth; you will need to organize answers to broad questions, demonstrating reasoning and analytical skills, as well as the ability to synthesize material from several sources into cogent and coherent essays. There are three types of free-response questions; data-analysis, document-based, and synthesis and evaluation.

In addition to the required academic material we will spend a considerable amount of time discussing the exam, its format, what to expect and preparation. While you are not required to take the exam, you should be aware that I fully expect each student that completes my class successfully to be capable of passing the exam with a 3 or better.

APES Topic Outline

The following is an outline of the topics will be covered during this course. The percentages indicate the approximate emphasis that will be placed on that topic area both in this course and on the APES exam in May. The sequence of topics is approximate.

- **Earth Systems and Resources (10-15%)**
  - Earth Science concepts
  - The Atmosphere
  - Global Water Resources and Use
  - Soil and Soil dynamics
- **The Living World (10-15%)**
  - Ecosystem Structure
  - Energy Flow
  - Ecosystem Diversity
  - Natural Ecosystem Change
  - Natural Biogeochemical Cycles
- **Population (10 – 15%)**
  - Population Biology
  - Human Population
    - ❖❖ History, Birth Rate, Death Rate, Demographic Transition, age-structure diagrams
    - ❖❖ Population size and impact of population growth
- **Land and Water Use (10 – 15%)**
  - Food and Agriculture
  - Forestry
  - Rangelands
  - Other Land Use (Urban development, transportation infrastructure, Public and Federal lands, Land conservation)
  - Mining
  - Fishing
  - Global Economics
- **Energy Resources and Consumption (10-15%)**
  - Energy concepts
    - ❖❖ Laws of Thermodynamics, Conversions, Units, Energy Quality
  - Energy Consumption: Past, Present, and Future
  - Fossil Fuel Resources and use
  - Nuclear Energy
  - Hydroelectric Power
  - Energy conservation
  - Renewable Energy
- **Pollution (25-30%)**
  - Human Health and Toxicology
  - Pollution types
    - ❖❖ Air, Noise, Water, Solid and Toxic waste
  - Economic Impacts
- **Global Change (10-15%)**
  - Strospheric Ozone
  - Global Warming
  - Loss of Biodiversity

For a full description of the AP environmental Science visit:
http://apcentral.collegeboard.com/apc/public/repository/05832apcoursdescenvsc_4317.pdf

Goal:
The goal of this AP Environmental Science course is to provide students with the scientific skills needed to understand the interrelationships of the natural world, to identify and analyze causes for and risks associated with natural and human-made environmental problems, and to examine the alternative solutions for resolving or preventing them.

Through the intense creek studies students will practice techniques for ecosystem monitoring in the local environment, take steps to ensure a more pristine watershed while ensuring the survival of common and threatened biotic species. Students will use a variety of methods including professional presentations and electronic dissemination to communicate accurately and meaningfully about observations and conclusions

Schedule:
This course meets for 90 minutes every other school day. Two out of every five days will consist of lecture, presentations, and discussion of textbook and primary source document information. Students are expected to take or expand notes during these activities. The remaining three days will be used for hands-on laboratory procedures, independent projects and field experiences that allow students to supplement the information presented during lectures/presentation days.

Laboratory and Field Work
AP Environmental Science will contain laboratory experiences from lab manuals, data sets, fieldwork and student-designed experiments. Emphasis is placed on in-depth investigation and experimental design regarding environmental science concepts. These lab activities emphasize development and testing of hypotheses; collection, analysis, and presentation of data; and clear discussions of results. Formal reports are required and must include the previously mentioned elements, as well as proper labeling of tables and graphs. In many cases, software and Internet simulations will be conducted in support of the lab being undertaken. With the addition of computers to our labs, we will be using Pasco scientific probes and software as part of the lab procedure. Examples of AP Environmental Science laboratories include but are not limited to: *1) Ecosystem Ecology, 2) Plate Tectonics, Volcanism, Earthquakes, 3) Soil Structure & the Rock Cycle, 4) Geotechnical Science, 5) Environmental Factors & Organism Distribution, 6) Calculating Population Data ,7) Sampling Techniques, 8) Human Demographics, 9) Calculating Consumption, 10) Atmospheric Science, 11) Toxicology, 12) Aquatic Ecology, 13) Environmental Engineering, 14) Greenhouse Effect, 15) Acid Deposition, 16) Radiation & Growth Factor, 17) Environmental Impact Summary. 18) The Quantico creek study is a long-term investigation that will occur throughout the year. Students will be required to write formal lab reports for their experiences in this study.*

Each lab will require:
- The formation of an hypothesis or hypotheses, based on in-class discussion of the presented problem or focus of each experiment
- Design of (an) experiment(s), also based on in-class discussion, to test the hypothesis or hypotheses
- Collection of data and observations
- Calculations using the collected data
- Conclusions about how well the hypothesis or hypotheses held up based on the experiment
- Class discussion of variance and error analysis
- Written report

TECHNICAL WRITING REVIEWS:
Students will be given technical articles to read. The Students will do various writing and reading comprehension activities throughout the year to enhance their skills. This will happen about once a week.

TESTS:
All tests are given at the end of each unit. They may be multiple choice, essay, performance or any combination of these.

PROJECTS:
Projects are assigned according to topic, with descriptions and guidelines provided at time of assignment. Projects may be completed individually or in groups depending on the particular assignment and instructor discretion.

PARTICIPATION:
Participation consists of class participation, daily warm-ups, preparedness for class (book, paper, writing utensil, etc.), and notes. Professional behavior is always expected. Each day, students will be presented with a question and will be expected to work in small groups to answer that question. New topics will be introduced in this manner, but questions will also address topics already covered to enhance conceptual understanding. Students will have access to books, the Internet, lab equipment, computer simulations, etc. The teacher will act as a facilitator assisting and guiding students, at all times encouraging carefully articulated responses based on principles of environmental science.

DAILY WORK:
Daily work is broken into 2 categories, class work and homework. CLASS WORK consists of work assigned in class - it may be bookwork, laboratories, research, a worksheet, and/or vocabulary. It is due at a specific time during class. HOMEWORK is assigned at the end of each class period, and DUE at the beginning of class, PRIOR TO warm-ups, notes, etc. Getting missed work due to ANY KIND of absence is the student's responsibility.

LATE WORK:
Late work is accepted for EXCUSED absences only. Arrangements must be made with the instructor for lab time if necessary.

Textbook and Supplemental Materials:
Although the textbook will remain the central source of information, the class will also use supplemental resources such as additional textbooks, lab manuals, periodicals, case studies and Internet resources when deemed appropriate.

Required Course Materials:
Writing utensil, calculator, coloring pencils, index cards, a 3-ring notebook with 5 dividers: Section Dividers should be labeled as follows: 1) notes and handouts 2) Assignments 3) labs 4) tests and quizzes 5) AP test prep material.

APES in the News:
Environmental science is frequently changing and evolving field of study. To promote well-read and informed students, each one is required to participate in the "APES in the News!" assignment. Once every grading period, each student must find a newspaper or magazine article relating to environmental science, read through the article, and write a one-page (double-spaced) reflection. Additionally each student will be required to develop a discussion for class participation around the topic in the article they analyzed.

AP Environmental Grading Policy:
QMHS 2017-2018
Ms Maxwell

Your grades will be based upon the following categories: Classwork & Homework 25%, Labs 25%, Tests 50%. If you are in danger of failing - or if your grades fall below passing, I will contact your parents. Grades are updated every Friday and on days following an exam. Please check your grades so there are no surprises. If you are struggling in class you should consider coming in for additional help.

Students are to place their name and date on all assignments. Maintaining a notebook is mandatory and essential to the class and your grade. You are required to keep a binder to keep daily notes, handouts and all returned assignments. You are also required to record all homework, project, quiz or exam dates in your agenda book. Papers to be turned in should be placed in the appropriate folder in the front of the room at the beginning of class. All work must be turned in on time to receive full credit. You may turn work in early if you wish. To be fair to those who have done their work on time, assignments late by one day will be counted 50 percent and no assignments will be accepted after 2 days. Individuals with extenuating circumstances should see me outside of class.

Attendance Policy: Students have an equivalent number of days to makeup missing work as the length of the excused absence. Work may be made up before or after school and must be scheduled with the course instructor. Any work not made-up within the allowed time period or missed due to an unexcused absence will be assigned a zero. Individuals with extenuating circumstances need to see me regarding extensions.

Plagiarism / Academic Dishonesty Policy: Plagiarism and academic dishonesty are serious offenses. The academic work of a student is expected to be his/her own effort. Students must give the author(s) credit for any source material used. To represent ideas or interpretations taken from a source without giving credit is a flagrant act. To present a borrowed passage after having changed a few words, even if the source is cited, is also plagiarism. Students who commit any act of academic dishonesty will receive a failing grade in that portion of the course work. Acts of academic dishonesty will be reported to the administration.

I have read the course syllabus for _____ and I understand the expectations and requirements for this course.

Parent Signature: _____

Student Signature: _____

Syllabus has been signed, returned and recorded. It is to be placed in the student's notebook and will be a part of each unit check until the end of the course.

Teacher Signature: _____