CHILLICOTHE
HIGH SCHOOL

AP Environmental Science Syllabus
CHS Science Department

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CCSD Vision Statement: The Chillicothe City School District will provide tomorrow's leaders with a high quality education by developing high expectations and positive personal relationships among students, staff, and community members.

CCSD Mission Statement: The Chillicothe City School District empowers students to learn, to lead, and to serve.

Course Description and Prerequisite(s) from Course Handbook:
AP Environmental Science - 319
State Course #: 132350
Prerequisite: Successful completion of Physical Science and Biology with grades of 'B' or better; teacher approval.
Elective Grade: 11-12
Weighted Grade Credit: 1
Course Description:

AP Environmental Science is a full-year course designed to be equivalent to a general course in environmental science offered at a college level. General topics include interdependence of Earth systems, human population dynamics, natural resources and environmental quality. Emphasis is placed on developing scientific skills in examining environmental issues and problems. Students will be required to complete additional projects that satisfy the AP Environmental Science curriculum.

Students are expected to take and pay for the AP exam. If the student fails to take the exam, a 4.5 point grading scale will be applied to the course. The course is designed to prepare students to perform well on the examination. A student who earns a 3 or above on the exam will be granted college credit at most colleges and universities throughout the United States.

There is a $15 lab fee, plus cost of workbook.

Learning Targets: Defined below for clarity are the Unit Titles, Big Ideas of every Unit taught during this course, and the Essential Questions to be answered to better understand the Big Ideas. A student's ability to grasp and answer the Essential Questions will define

whether or not he or she adequately learns and can apply the skills found in Big Ideas. This will ultimately define whether or not a student scores well on assessments administered for this course.

- **<u>1st Quarter</u>**
  - **Unit I: Introduction to Environmental Science**
    - **NOTE: TO BE COMPLETED AS SUMMER WORK**
    - **Big Idea #1:** I can explain the geological processes that have changed Earth over time.
      - *Essential Question #1: What is the relationship between the rock cycle, minerals, and the composition of the earth?*
      - *Essential Question #2: How does the Theory of Plate Tectonics explain what structures are created on Earth's surface?*
      - *Essential Question #3: How can I use the geologic time scale to relatively and absolutely date rocks and rock structures?*
    - **Big Idea #2:** I can connect sustainability to a growing human population.
      - *Essential Question #1: What are the three principles of sustainability?*
      - *Essential Question #2: How are our ecological footprints affecting Earth?*
      - *Essential Question #3: When is the use of a resource considered to be a "Tragedy of the Commons"?*
  - **Unit II: Land Use—Forests, Rangelands, Urban Areas, and Mining**
    - **Big Idea #1:** I can explain the importance of forests and rangelands to the earth's biodiversity.
      - *Essential Question #1: How can we manage forests and range sustainably?*
      - *Essential Question #2: How can we protect and conserve public and federal lands?*
    - **Big Idea #2:** I can explain major population trends in urban areas.
      - *Essential Question #1: What are the causes and effects of urbanization?*
      - *Essential Question #2: How does transportation and infrastructure affect the urban environment?*
    - **Big Idea #3**: I can support the idea that mining is necessary, but has negative effects on the earth.
      - *Essential Question #1: Why is mining an important economical investment?*
      - *Essential Question #2: How are minerals mined and processed?*
      - *Essential Question #3: What are the disadvantages of mining?*
      - *Essential Question #4: What is land reclamation?*
  - **Unit III: Land Use--Agriculture**
    - **Big Idea #1:** I can conclude that feeding a growing population takes careful consideration toward protecting the food supply, the population, and the earth.
      - *Essential Question #1: How has agriculture progressed through time to become more sustainable?*

        - *Essential Question #2: Why is irrigation an important part of growing crops and what is its role in sustainable agriculture?*
        - *Essential Question #3: What is 'Integrated Pest Management' (IPM) and how does it help control invasive species?*
    - **Big Idea #2:** I can prove that maintaining soil quality allows farmers to produce higher quality food for consumption.
        - *Essential Question #1: How does soil form from the rock cycle, providing it with the physical and chemical properties that allow us to identify soil types and textures?*
        - *Essential Question #2: What soil nutrients are important for productive soil?*
        - *Essential Question #3: Why is soil conservation necessary?*
    - **Big Idea #3:** I can educate consumers about a safe food supply.
        - *Essential Question #1: What is the "Green Revolution"?*
        - *Essential Question #2: What are advantages and disadvantages of genetically modified organisms?*
        - *Essential Question #3: How does organic farming compare to traditional farming?*
- **Unit IV: Global Water Resources and Uses**
    - **Big Idea #1:** I can prove water is a necessity for the human population.
        - *Essential Question #1: How does the water cycle provide a continuous supply of water for Earth?*
        - *Essential Question #2: What are the major water sources in the US and the world?*
    - **Big Idea #2:** I can show how freshwater systems on Earth provide economic and environmental benefits.
        - *Essential Question #1: What are the effects of pollution on freshwater sources, locally and globally?*
        - *Essential Question #2: How can aquaculture be a sustainable farming method of providing food and economic stability to the population?*
        - *Essential Question #3: What is cultural eutrophication and how does it affect a freshwater source in a negative way?*
    - **Big Idea #3:** I can provide evidence that saltwater systems on Earth provide economic and environmental benefits.
        - *Essential Question #1: What happens when oceanic systems become polluted?*
        - *Essential Question #2: How can overfishing have a negative environmental and economic impact on the earth's ocean systems?*

- **<u>2nd Quarter</u>**
    - **Unit V: Energy Resources and Energy Use**
        - **Big Idea #1:** I can defend human dependence on fossil fuels.
            - *Essential Question #1: How can energy be traced through history?*
            - *Essential Question #2: What types of fossil fuels are being used today?*
            - *Essential Question #3: What is the future outlook of using fossil fuels?*

        - **Big Idea #2:** I can explain why fossil fuels are polluting, inefficient, and nonrenewable.
            - *Essential Question #1: How are fossil fuels formed, extracted, and processed?*
            - *Essential Question #2: What are the environmental advantages and disadvantages of fossil fuel use?*
        - **Big Idea #3:** I can investigate more efficient and clean, renewable alternatives that may be used in the future.
            - *Essential Question #1: What are the types of renewable alternative energies?*
            - *Essential Question #2: How can we create a more sustainable energy future?*
    - **Unit VI: Hazardous Wastes and Toxicology**
        - **Big Idea #1:** I can identify environmental hazards that can affect human health.
            - *Essential Question #1: How does a risk assessment estimate how much harm a hazard can cause to humans or the environment?*
            - *Essential Question #2: What types of biological hazards do we face?*
            - *Essential Question #3: What types of chemical hazards do we face?*
        - **Big Idea #2:** I can evaluate chemical hazards and determine toxicity levels.
            - *Essential Question #1: What is a dose-response curve?*
            - *Essential Question #2: How do we perceive, evaluate, and reduce risk?*

- **MID-TERM EXAM**

- **3rd Quarter**
    - **Unit VII: Atmospheric Dynamics and Climate Change**
        - **Big Idea #1:** I can understand the interactions of the atmosphere and Earth.
            - *Essential Question #1: Why do we have seasons?*
            - *Essential Question #2: What is the relationship between the composition/structure of the atmosphere and weather and climate?*
            - *Essential Question #3: How does the Coriolis affect Earth's wind patterns and influence weather?*
        - **Big Idea #2:** I can prove air pollution is detrimental to the health of all organisms.
            - *Essential Question #1: What are types and impacts of outdoor air pollution?*
            - *Essential Question #2: What are types and impacts of indoor air pollution?*
            - *Essential Question #3: Why were CAFE standards created?*
            - *Essential Question #4: What are heat islands and temperature inversions that contribute to air pollution?*
        - **Big Idea #3:** I can cite evidence that the Greenhouse effect is necessary for life on Earth, but also dangerous.
            - *Essential Question #1: How do I distinguish between global change, global climate change, and global warming?*

        - *Essential Question #2: What evidence can I cite for global warming and what are the consequences?*
        - *Essential Question #3: What is the Greenhouse effect and why is it important, but also detrimental, to our environment?*
        - *Essential Question #4: Why should we protect the ozone?*
        - *Essential Question #5: What laws have been established to help prevent or reduce air pollution?*
- **Unit VIII Human Population**
    - **Big Idea #1:** I can demonstrate the effects of human population changes.
        - *Essential Question #1: What factors can influence the size of a population?*
        - *Essential Question #2: How does an age structure diagram show growth or decline of a population?*
        - *Essential Question #3: How can we demonstrate the impacts of population growth?*
    - **Big Idea #2**: I can explain how the relationships among population size, economic development, and resource consumption influence the environment.
        - *Essential Question #1: How can I explain demographic transitions?*
        - *Essential Question #2: What is 'affluence'?*
- **<u>4th Quarter</u>**
- **Unit IX: Living On Our Earth (Ecosystems)**
    - **Big Idea #1:** I can document the movement of energy within ecosystems.
        - *Essential Question #1: How can I distinguish among the trophic levels that exist in food chains and food webs?*
        - *Essential Question #2: How can I explain energy transfer efficiency and trophic pyramids, along with biogeochemical cycles?*
    - **Big Idea #2**: I can explain and identify biomes.
        - *Essential Question #1: How do I interpret climatograms?*
        - *Essential Question #2: What distinguishes a terrestrial biome from an aquatic biome?*
- **Unit X: Living On Our Earth (Biodiversity)**
    - **Big Idea #1**: I can explain the biodiversity of Earth.
        - *Essential Question #1: How can I quantify biodiversity?*
        - *Essential Question #2: How can I describe patterns of relatedness among species?*
        - *Essential Question #3: How can I identify the processes that cause genetic diversity?*
        - *Essential Question #4: How can I explain how evolution can occur through natural selection, artificial selection and random processes?*
    - **Big Idea #2**: I can explain how nature exists at different levels of complexity.
        - *Essential Question #1: What are the characteristics of populations?*
        - *Essential Question #2: When is population growth based on density-dependent or density-independent factors?*

        - *Essential Question #3: What distinguishes exponential growth from logistic growth?*
        - *Essential Question #4: How do reproductive strategies of species compare?*
    - **Big Idea #3**: I can discuss various relationships between species in ecosystems.
        - *Essential Question #1: What are symbiotic relationships?*
    - **Big idea #4**: I can explain community succession.
        - *Essential Question #1: What is the difference between primary and secondary succession?*
        - *Essential Question #2: How do I describe the factors that determine the species richness of a community?*
- **Unit XI: Global Change**
    - **Big Idea #1:** I can address global issues from a professional and personal point of view, which is imperative to accepting change.
        - *Essential Question #1: What are some of the most prominent, and current, debates over global issues?*
    - **Big Idea #2**: I can explain changes in genetic diversity changes of wild and domesticated species.
        - *Essential Question #1: What are reasons and patterns of change in species diversity?*
        - *Essential Question #2: What are the effects of overharvesting of species?*
        - *Essential Question #3: What effect does pollution and climate change have on species diversity?*
    - **Big idea #3**: I can address sustainability and economics on a global level.
        - *Essential Question #1: How do I describe how economic health depends on the availability of natural capital and basic human welfare?*
        - *Essential Question #2: How can I explain the role of agencies and regulations in efforts to protect our natural and human capital?*
        - *Essential Question #3: What are the approaches to measuring and achieving sustainability?*
- **END OF COURSE EXAM**

Course Materials:

- Google Chromebook & charger—EVERY DAY
- Pencils AND pens
- 3-ring binder (1 inch to 1 ½ inch if sufficient)
- Notebook paper—college ruled
- OPTIONAL—AP Exam Review or Test Prep Books or Flash Cards

Textbook:

- Miller, G. Tyler, and Scott E Spoolman. Living in the Environment, High School Level 4, 17th Ed. Cengage Learning, 2012.

- Friedland, Andrew, and Rick Relyea. *Enironmental Science for the AP Course*. W H Freeman, 2018.

Electronic Resources:

- Google Classroom
- Progress Book
- Other resources may be added at any time

Field Trips

Science Alliance (Piketon, Ohio at the A-plant)—October
*Others may be added as permission is granted

Course Expectations:

- Students taking any AP course are expected to behave and be treated as young adults, (i.e., accepting responsibility, working above and beyond what is asked, and staying current with assignments.).
- You will need to spend time reading and reviewing chapters independently from the textbook and other resources made available to you. We will watch various film clips/documentaries which relate to environmental concepts. Taking notes over them is a must! You will be expected to pay attention to them and be able to apply the content to formatives, summatives, and other assessments that may be appropriate.
- Late work will be accepted and graded according to the CCSD grading policies. I realize many of you are very involved with extracurricular activities that may take you out of the classroom for many days during the year. Please think about what is happening in class, to be sure your grades are current and decent. If you're doing poorly, you may need to skip the event and attend a class, or I may require you to stay in class (discuss with parent/teacher). If you're out, it is your responsibility to get the work ahead of time or as soon as you return. It will likely be posted on Classroom, in the hanging folder by the door, or you can ask a classmate. Extenuating circumstances may be discussed with me. Homework MAY be assigned over holidays, long weekends, and breaks; however, I try to keep it minimal.
- The practice APES test is a **requirement**. You MUST be here that day, as this will take the place of an actual final exam for **juniors and will be also count as a unit exam!** Please note these dates now! This is one of the larger parts of prep for the AP Exam, Monday, May 11, in the afternoon (NOTE: AP Bio is this same day, but in the morning). The AP Exam is not required, but you will be dropped down to the Honors GPA if you do not take the test. The guidance office will be registering you in March or April, and there will be a fee to take this exam.
- Students will follow all classroom rules, which include:
    - Come to class on time, begin bellringer as soon as the bell rings, and be prepared.
    - Follow all rules from the CHS Handbook, including use of CELL PHONES and CHROMEBOOKS! They should be put away unless they are being used as a classroom tool. The only purpose they serve during class is to be a distraction, and we cannot afford that in an AP class!

- You may order from the café, if open.
- RESPECT! You gotta give it to get it!
- PLAGIARISM WILL NOT BE TOLERATED! You will be working in groups frequently, and you are expected to discuss, but your work should be individual. YOU are taking the AP exam all by yourself, not your friend. You will be punished according to the CHS discipline rules, as well as take a zero on the assignment.

- Recommendation for Students Considering Honors Level and AP Classes
  - Students who take honors level classes should fit the following profile in order to assure success in these classes:
    - PERFORMANCE
      - These students should:
        - Consistently strive to meet high academic standards.
        - Respect deadlines
        - Put forth their 'best effort', not just 'good enough' effort
        - Demonstrate probing curiosity
        - Act with maturity in the classroom
        - Participate actively in class discussion
        - Demonstrate pride in work submitted
        - May be expected to participate in extracurricular academic activities
    - ATTITUDE
      - These students should:
        - Assume responsibility for their own learning
        - Possess a strong work ethic
        - Expect at least one hour of nightly homework in the honors class
        - Comes to class prepared to work
        - Seeks opportunities for enrichment
        - Welcomes creative and challenging assignments
        - And, where applicable, suggests own assignments
    - BEHAVIOR
      - These students should:
        - Use class time wisely
        - Respect classmates and teacher
        - Demonstrate personal integrity
    - ATTENDNACE
      - These students should:
        - Seldom miss class
        - Arrive punctually
        - Complete make-up34 work immediately

AP Classes

The Advanced Placement Program (AP)

The AP program is an offering of college level courses and exams for ambitious secondary school students. It is a special learning experience that takes a full year. AP Courses are typically more challenging and require more work that other high school courses. At the end

of the yare students must take and AP exam. Over 90% of the colleges that most AP candidates have attended give credit and/or advanced placement to students whose AP exam grades are considered acceptable. The exam fee is set by the College Board and must be paid for each exam selected. In order to receive AP credit with a 5 point on 5.0 scale, the student must take and pay for the AP exam. If the student fails to take the exam, an honors GPA will be applied to the course.

AP tests are given in May. The tests are scored from a 1 (low) to a 5 (high), and many colleges will grant college credit for the scores of 3 or better. A students should always check with the specific college in question to see if credit is granted. All tests are standardized and printed by the College Board.

NOTE: The EOC juniors will be the practice APES exam, as seniors are exempt from exams (unless in danger of failing the class).

Grading:

Unit Exams	50%
Assessments (Including: Quizzes, Essays, Labs, and Projects)	30%
Class work/Homework	20%

- Each nine week's grade comprises 20% of a student's final grade.
- The Mid-Term Exam and End of Course Exam each comprise 10% of a student's final grade.

Grading Scale:
The grading scale for Chillicothe High School can be found in the student handbook or online at http://www.chillicothe.k12.oh.us/1/Content2/studenthandboook.

Late Work: Late work will be subject to the Board-adopted policy on assignments that are submitted late (to be reviewed in class).

- Regardless of the absence type (excused, unexcused, OSS, etc.), students are expected to make up work and be held accountable for learning all material they missed.
- Any student who is absent from school will receive one (1) additional day for every day he/she missed to make up his/her work for full credit (100%).
- Any student who exceeds the allotted time to turn in an assignment for full credit may still submit work late for partial credit.
    - Any student who turns in work up to 1 week late must at least be given the opportunity to earn 75% on that assignment.
    - Any student who turns in work between 1 and 2 weeks late must at least be given the opportunity to earn 60% on that assignment.
- The end of the 9 weeks is the cut off point for teachers to accept late work from students for full or partial credit unless the teacher decides to give the student an incomplete for the 9 weeks due to extenuating circumstances.

Performance Based Section: Writing Assignments/Exams/Presentations/Technology

One or more of the End of Unit Exams may be Performance Based. According to the Ohio Department of Education, "Performance Based Assessments (PBA) provides authentic ways for students to demonstrate and apply their understanding of the content and skills within the standards. The performance based assessments will provide formative and summative information to inform instructional decision-making and help students move forward on their trajectory of learning." Some examples of Performance Based Assessments include but are not limited to portfolios, experiments, group projects, demonstrations, essays, and presentations.

CHS AP Environmental Science Course Syllabus

After you have reviewed the preceding packet of information with your parent(s) or guardian(s), please sign this sheet and return it to me so that I can verify you understand what I expect out of each and every one of my students.

Student Name (please print): _____

Student Signature: _____

Parent/Guardian Name (please print): _____

Parent/Guardian Signature: _____

Date: _____