BASIS Charter Schools

COURSE SYLLABUS 2021/2022

AP ENVIRONMENTAL SCIENCE

School: BASIS Chandler

Instructor: Theresa Gburek

Email: theresa.gburek@basised.com

Course Description

"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 Board, 2019)

Grading Policy

Evaluation Breakdown:

- Tests & Quizzes: 60%

- Homework: 20%

- Labs and Field Trips: 20%

All **exams** will be announced no later than 5 days prior.

All **quizzes** are intended to check the students current understanding of the material. Students can expect a 10 - 20 point quiz every Friday.

Grades can be rounded up at the end of the year based exclusively on effort, participation, and classroom behavior.

For more information regarding exams, quizzes, and assignments, please see the classroom policy section of this document. The grade for the course is calculated according to the rules established in the Parent-Student Handbook.

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

Class Policy

Bell Work and Notes:

Class will begin each day with bell work. Bell work is a series of questionsor problems designed to reinforce concepts from the previous day's material. Bell work is to be recorded in the composition notebook dedicated exclusively to science class. Every Friday bell work completion for the week will be checked for completion and will be recorded as a homework grade. Taking notes is NOT optional. Notes will be checked with bell work every Friday for a homework grade as well. In certain cases students may be given paper copies of the power point lectures to ammend with their own interpretation of the content. Notes will be checked with bell work every Friday for a homework grade as well.

Homework/Current Events:

Homework will be assigned on a regular basis and will normally involve selected readings, handouts, and/or current events. The completion of homework will be checked and assesed in class. Every Friday a different student will be selected to give a 10 minute presentation a current event of their choice, in whatever format they prefer, and on any topic falling under the dicipline of Environmental Science. Topics may include, but are not lisimted too, climate change, deforestation, water saftey, enviornmental policies, food saftey, etc. Following the presentation the student will then be expected to guide the class in a brief discussion on the topic. Class participation in the discussion will also count towards the student's current events score.

Homework is an essential tool for learning and should be completed regularly if the student wishes to succeed in this course. SUCCESS DEPENDS ON YOU!

Assesments:

As keeping with BASIS philosophy, tests and quizzes will comprise the bulk of the student's grade. Regular and rigorous testing often results in better learnig and higher course grades for students. As a result, the students will be provided with ample opportunity to demonstrate their knowledge through the use of assesments. There will be 2 - 3 exams during each trimester and weekly Friday quizzes. This will ensure that the student has reson to stay up to date with material and does not lag too far behind.

Exams will be given in multiple-choice format with a section at the end for free responce to a set of selected promptsthat involveenvironmental quandaries or processes discussed in class. Examples of this could be an in-depth explaination of the water cycle or the process of nitrogen fixation in decompsers. Students will be notified of upcoming examsa minimum of 5 school days in advance. The multiple choice portion of the exam will be worth 60 points and the free responce section of the test will be worth 40 points (total of 100%). The exams are formated this way to familiarize studetns with the format of the official AP Envirnmental Science exam.

Test Corrections:

Students may attend tutoring hours to do test corrections and earn partial credit back on their score. Students can also improve their scores by participating in optional extra credit opportunities throughout the school year.

Extra Credit:

Extra credit assignemnts will be offered consistently throughout the year. These assignments are optional. Should the student complete the extra credit they will recieve an extra credit ticket. They may then attach that ticket to any exam, quiz, or assignment for the current trimester to add the points to their original score. Tickets cannot be re-issued if they are lost and tickets cannot be applied to asssignments from previous trimesters.

Laboratories and Field Investigations:

This course will include a strong laboratory and field investigation component. The goal of this component is to compliment the classroom portion of the course by allowing students to learn about the environment through first hand observations. Students will spend a minimum of one class per every 2 weeks engaged in laboratory or field work. Laboratory investigations listed below will be completed or substituted with appropriate examinations or field work. Some examples of laboratory activities include:

- Quality of Natural Waters: Biological Factors (1 class period)

- Quality of Natural Waters: Physical and Chemical Factors (1 class period)

- Soil Productivity (1 class period)

- Population Growth (4 week period - observations, data collection)

- Primary Consumer Energy Flow (2 - 3week period - observations, data collection)

- Soil Formation and Properties (2 class periods)

- Air Pollution and Vehicle Emissions (2 - 3 class periods)

- Acid Deposition (1 class period)

- Agriculture and Feeding Growing Human Populations (1 class periods)

- Wastewater Treatment (1 class period)

- Cultural Eutrophication (1 - 2 class periods)

- Wet Scrubbers and Air Pollution (2 class periods)

- Coriolis Effect and Atmospheric Circulation (1 class period)

- Primary productivity and Energy Flow (3 week period - observations, data collections)

- Ocean Acidification (3 - 4 class periods)

- Biomass to Biofuel (3 - 4 class periods)

We will be working with glassware, fire, and certain toxic chemicals in certain labs. Students are expected to follow all laboratory directions (written or otherwise). Failure to comply with lab instructions and/or inappropriate behavior during labs will result in a zero for the assignment and immediate refferal to the deans office.

Field Trips:

There will be up to 3 mandatory field trips. Test questions could and usually do arise from things we experience or learn while on the field trips. Attendance on the field trips becomes part of your overall Field Trips and Lab grade.

Field trips will be announced no later than one month prior to the field trip. This will give you ample time to rearrange schedulesif needed to ensure that you attend the field trip. In the accordance with BASIS policy, field trips will occur on nonschool days so as not to disrupt other classes. We will rely heavily on parent volunteers to provide transportation for students to and from field trips. Some examples of laboratory activities include:

- Sunset Crater

- Kartchner Caverns

- Cinder Lake Landfill

- Wildcat Hill Wastewater Treatment Facility

- Cholla Power Plant

- Glen Canyon Dam

- Southwest Wildlife Conservation Center

- Gilbert Riperian Preserve

AP Exam Dates:

Mock AP Exam: Saturday, April 2, 2022, 12:30pm

Formal AP Exam: Tuesday, May 3, 2022, 8:00am

Alternate AP Exam: Tuesday May 17, 2022, 8:00am

The mock exam will count as 2 exam scores ONLY if it improves a students overall grade.

If the student chooses to opt out of the formal AP exam they will be required to take a comprehensive final exam written by the instructor.

Communication Journal (CJ):

Students are required to bring their CJ to class and record the CJ notes daily. CJ completion will count as a homework score and CJs will be checked at random thoughout the school year. Parents are encouraged to check their student's CJ frequently.

Organization:

Assignments are to be turned into the teacher nice and neat (neat handwriting, no frills, rips, etc.). Unreadable assignments will not be accepted and must be re-submitted for a late score. All notes, handouts, write-ups, and old labs should be saved to review for the formal AP exam. Because this course is comprehensive, ALL MATERIALS are importantand should be maintained throughout the duration of this course.

Absences:

Students have the number of days they were absent to complete and submit their work. For example, Johnny was absent for 3 days. This means Johnny has 3 days upon his return to school to submit his missing work and schedule to re-take any missed quizzes or exams. Work submitted after this time frame would be considered late and cannot recieve higher than 50% credit. Make-up quizzes and exams will NOT be the same assesments that the other students have taken and may not be in the same format. Most often it will be expected that the student will take the make up assesment during tutoring hours. Most often, the student can expect to take the make-up assesment before or after school. If the student knows they will be out of town they may opt to take the make-up assesment early.

Student Responsibilities Regarding Assignments and Late Submission Policy:

It is the responsibility of the student to keep track of the assignemnts and assesments in their CJ. Assignments and exam dates will be posted daily and should always be recorded in the CJ. On the day the assignment is due it must be presented for inspection in the BEGININNG of class. All homework will be assesed for completion and effort showing the students attempts to complete the assigned problems. All mathematical problems must be presented clearly and in logical format in order to recieve a homework score for that asignment. Students cannot re-do exams, quizzes, or assignment. Although exam corrections and quiz and exam make-ups will be allowed for improved absences.

Students can only earn 50% credit on assignments turned in late. This includes assignments that were submitted on the due date but submitted after class. There are no exceptions.

Tutoring Hours:

Tutoring hours are held every Tuesday after school from 3:50 - 4:50pm in room 130. Students have the opportunity to come to me for additional instruction during tutoring hours. Tutoring hours are not only designed to aid those students who are struggling with a particular topic, but also those students who simply want to reinforce what they feel comfortable with. Tutoring hours are not meant to "re-teach" a lesson. Students are encouraged to attend but MUST come prepared with specific questions and/or assignments they need assistance with. Stduents are expected to take respnsibility for their own education. If in the event that students are no able to make my tutoring hours they may choose to attend Dr. Fought's tutoring hours on Thursdays from 3:45 - 4:45pm in room 124.

Parent hours:

Parent hours are held Wednesdays from 1:00 - 1:50pm. Appointments must be made 24 hours in advance. Alternative times may be scheduled upon request.

Instructional Materials

Textbook: These textbooks are supplied by the school and are available for the student to check out if they wish to take it home.

Type of Instructional Material: Required Instructional Material	
ISBN	9781319113292
Author	Andrew Friedland; Rick Relyea
Title	Environmental Science for the AP course
Publisher	W.H. Freemand and Company
Strategy	School provides for students

Review Book: This review book is an optional (but highly recomended) student purchase.

Type of Instructional Material: Suggested Instructional Material	
ISBN	9780764145711
Author	Thorpe, Gary
Title	AP Environmental Science, 4th Edition
Publisher	Barron's Educational Series, Inc.
Strategy	Student Purchase

Other Information

Required supplies:

Students will be expected to bring the following supplies to class:

- Pens, pencils, dry erase markers, highlighters

- 2 composition notebook dedicated to AP Envirnmental Science only

- Folder for storing handouts dedicated to AP Environmental Science only

- Graph paper for labs

- Students may be asked to bring items from home on occasion for laboratory activites

Requested supplies:

AP Environmental Science students will be performing lots of labs and hands-on activities. To assist with these labs and with clean-up it would be greatly appreciated if each student could bringin one or more of the following items:

- Tissue boxes

- Paper towels

- Clorox wipes

- Disposable cups

- Disposable bowls

- Dosposable spoons

- Hand sanitizer

- Ziploc bags (multiple sizes)

All topics and material covered in the course are aligned with the expectionals outlined by the AP college board (https://www.collegeboard.org/). The insturtor reserves the right to alter the order and/or selected laboratory investigations during the course.

The following is an outline of major topics that describes the scope of the AP Environmental Science course and exam. The order of topics in the outline holds no special significance, since there are many different sequences in which the topics can be appropriately addressed in the course. The percentage after each major topic heading shows the approximate proportion of multiple-choice questions on the exam that pertain to that heading; thus, the percentage also indicates the relative emphasis that should be placed on the topics.

I. Earth Systems and Resources (10 -15%)

A. Earth Science Concepts (geologic time scale; palte tectonics; earthquakes; volcanism; seasons; solar intensity; latitude)

B. The Atmosphere (composition; structure; weather and climate; atmospheric circulation and the Coriolis Effect; atmosphere - ocean interactions; El Nino & La Nina; seasons; solar radiation)

C. Global Water Resources and Use (freshwater/saltwater; ocean circulation; agricultural, industrial, and domestic use; surface and groundwater issues; global problems; conservation)

D. Soil and Soil Dynamics (rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation)

II. The Living World: Ecosystems and Biodiversity (12 - 16%)

A. Ecosystem structure (biological populations and communities; ecological niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes)

B. Energy Flow (photosynthesis and cellular respiration; food chains and food webs and trophic levels; ecological pyramids; 10% rule; primary productivity)

C. Ecosystem Diversity (biodiversity; natural selection; evolution; ecosystem services)

D. Natural Ecosystem Change (climate shifts; species movement; ecological succession; adaptations; ecological succession; tolerance; biogeography)

E. Natural Biogeochemical Cycles (carbon; nitroge; phophorus; sulfur; water; conservation of matter)

F. Ecosystem Services (services and benefits rendered from surrounding services)

III. Population (10 -15%)

A. Population Biology Concepts (population ecology; carrying capacity; reproductive strategies; survivorship; r-selected and k-selected; generalist and specialist species)

B. Human Population:

1. Human population dynamics (historical population sizes; distribution; fertility rates; growth rates and doubling times; demographic transition; age-structure diagrtams)

2. Population size (stratigies for sustainability; case studies; national polocoes)

3. Impacts of poulation growth (hunger; disease; economic effects; resource use; habitat destruction)

IV. Land and Water Use (10 -15%)

A. Agriculture:

1. Feeding a growing population (human nutritional requirements; types of agriculture;Green Revolution; genetic engineering and crop production; deforestation; irrigation; sustainable agriculture; meat production)

2. Controlling pests (types of pesticides; costs and benefits of pesticide use; integrated pest management; relevant laws)

B. Forestry (tree plantations; old growth forests; forest fires; forest management; national forests; clearcutting; sustainable forestry)

C. Rangelands (overgrazing; deforestation; rangeland management; federal rangelands)

D. Other Land Use:

1. Urban land development (planned development; suburban sprawl; urbanization; reducing urban runoff)

2. Transporation infrastructure (federal highway system; canals and channels; roadless areas; ecosystem impacts)

3. Public and Federal lands (managment; wilderness areas; national parks; wildlife refuges; forests; wetlands)

4. Land conservation options (preservation; remediation; mitigation; restoration)

5. Sustainable land-use strategies

6. Tragedy of the Commons

E. Mining (mineral formation; extraction; global reserves; relevant laws and treaties)

F. Fishing (fishing techniques; overfishing; aquaculture; relevant laws and treaties)

G. Global economics (globalization; world bank; Tragedy of the Commons; relevant laws and treaties)

V. Energy Resources and Consumption (10 -15%)

A. Energy Concepts (energy forms; power; units; conversions; Laws of Thermodynamics)

B. Energy Consumption:

1. History (industrial revolution; exponential growth; energy crisis)

2. Present global energy use

3. Future energy needs

4. Conservation

C. Fossil Fuel Resources and Use (formation of coal, oil, and natural gas; extraction/purification methods; world reserves and global demand; synfuels; envirnmental advantages/disadvantages of sources

D. Nuclear Energy (nuclear fission process; nuclear fuel; electricity production; nuclear reactor types; environmental advantages/disadvantages; saftey issues; radiation and human health; radioactive wastes; nuclear fusion)

E. Hydroelectric Power (dams; flood control; salmon; silting; other impacts)

F. Energy Conservation (energy efficiency; CAFE standards; hybrid electric vehicles; mass transit)

G. Renewable Energy (solar energy; solar electricity; hydrogen fuel cells; biomass; wind energy; small scale hydroelectric; ocen waves and tidal energy; geothermal; environmental advantages/disadvantages)

VI. Pollution: Atmospheric, Aquatic, & Terrestrial (14 - 20%)

A. Pollution Types:

1. Air Pollution (sources - primary and secondary; major air pollutants; measurement units; smog; acid deposition - causes and efffects; heat islands and temperature inversions; indoor air pollution; remediation and reduction stratigies; Clean Air Act and other relevant laws)

2. Noise pollution (sources; effects; control measures)

3. Water Pollution (types; sources; causes and effects; cultural eutrophication; groundwater pollution; maintaining water quality; water purification; sewage treatment/septic systems; Clean Water Act and other relevant laws; effects on wetlands and mangroves; endocrine production; thermal pollution; POPs; bioaccumulation and biomagnification; LD50; dose responce curves)

4. Solid Waste (types; disposal; reduction)

B. Impacts on Environment and Human Health:

1. Hazards to human health (environmental risk analysis; acute and chronic effects; dose-responce relationships; air pollutants; smoking and other risks; pathogens and infectious disease)

2. Hazardous chemicals in the environment (types of hazardous waste; treatment/disposal of hazardous waste; cleanup of contaminated sites; relevant laws)

C. Economic Impacts (cost-benefit analysis; externalities; marginal costs; sustainabiity)

VII. Global Change (15 - 20%)

A. Startospheric Ozone (formation of statospheric ozone; ultraviolet radiation; causes of ozone depletion; effects of ozone depletion; strategies for reducing ozone depletion; relevant laws and treaties)

B. Global Climate Change (greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change; relevant laws and treaties)

C. Ocean Warming (acidification and warming trends)

D. Loss of Biodiversity:

1. Habitat loss; overuse; pollution; invasive species; endangered and extinct species

2. Maintenance through conservation

3. Relevant laws and treaties

Syllabus Outline Lesson Units