

AP Environmental Science Summer Assignment



Welcome to our class!

Would you like text reminders for this project/class?

If so, join our class Remind text group! Text the message @e3h9g to 81010.

With a human population of 7.5 billion, the Earth is constantly affected by its relationship with people. The amount of environmental impact by humans is difficult to comprehend. The purpose of this assignment is for students to become more locally and globally informed.

You have two options for your AP Summer Assignment! The first option is completion of an environmental science field study project, and the second option is creation of a summer science journal.

OPTION 1: Summer Research Opportunity

In an effort to become more aware of environmental impacts, both locally and globally, students will complete a field research study. Completion of this research project will take place as part of the Juvenile Tarpon Habitat Conservation Summer Research Opportunity Camp, which will take place June 5 through June 16 at Lemon Bay High School and Wildflower Preserve. Students will choose a topic of interest, research the topic, and perform a scientific field and/or laboratory project based on research. Option 1 will require students to work individually or with a partner to complete a project and present findings at a reception that will take place on Friday, June 16, 2017. Students will keep a logbook, prepare a scientific presentation poster, and have the option to compete in the school science fair. **If you are interested in Option 1, please see Mrs. Green in Room 02-111 AS SOON AS POSSIBLE for a camp information and sign up form.** One of the fantastic benefits of choosing Option 1 is that your Summer Assignment will be completed after the first two weeks of summer (and it will be fun to work with a friend)! 😊 😊 😊

A list of possible topics is as follows:

Oysters as Bioremediators in Estuary Habitats (Chemistry Focus)

Study the effects of pollutant runoff and the role of oysters in the bioremediation of estuarine habitats. Test for presence of fertilizer, oil, organic pollutants (wastewater) and inorganic pollutants (heavy metals, etc.), and dissolved oxygen levels (VOD and CBOD). In addition, students will determine how oysters are able to remediate pollutants in water (chemical reactions and processes). Includes possible field trip to Englewood Water District's Water Chemistry Lab.

Survey of Terrestrial Non-Native and Invasive Plant Species (Botany Focus)

Students will survey non-native and invasive plant species in Wildflower Preserve. Students will then determine levels of impact of these species on native species, and what ecological roles non-native species are playing in the various habitats at Wildflower Preserve.

Effects of Salinity Levels on Mosquito Populations and Species (Environmental Management Focus)

Students will survey mosquito populations and species at various water bodies in Wildflower Preserve. Students will collect larvae and monitor development and effects of salinity levels. Students will identify species that are detrimental to human health and make recommendations about mosquito control. Possible field trip to Charlotte County Mosquito Control Lab.

Engineering Artificial Coral Reef Infrastructure to Encourage Polyp Growth (Environmental Engineering Focus)

Students will use engineering to solve an environmental problem. Coral bleaching due to climate change is having devastating effects of the world's coral reef ecosystems. Students will use 3D printing to design and construct artificial reef infrastructure to encourage regrowth of coral in areas damaged by ocean acidification. Students will test reef effectiveness through controlled scientific experiments in Lemon Bay High School's marine science laboratory. Possible field trip to Mote Marine Laboratory.

Effects of Environmental Variables on Juvenile Tarpon Populations in Wildflower Preserve (Math and Statistics Focus)

The February Net Pull for Juvenile Tarpon Conservation Program yielded the highest numbers in the history of the monitoring program. The question everyone wants an answer to is, "Why was this pull so successful?" Students analyze data to determine trends in weather, water quality, etc. in order to answer the question of tarpon prevalence in Wildflower Preserve. Students will determine which variables cause numbers to increase or decrease, and make recommendations about how to preserve high population numbers.

Survey of Predator/Prey Populations in Order to Monitor Health of Ecosystem (Animal Behavior Focus)

How temperature affects metamorphosis rate of moths and butterflies. Can relate to global warming leading to these prey species emerging earlier than they used to, resulting in the birds that feed on them having less food for when their babies hatch. Students will survey butterfly (prey) species and bird (predator) species present in Wildflower's butterfly garden habitat.

Natural Remediation of Contributors to Red Tide Blooms in Coastal Waters (Environmental Management Focus)

Red tide is a pervasive problem for coastal communities. Students will study effects of urban/residential runoff on red tide blooms. The focus will be on fertilizer concentrations as well as effectiveness of bioremediation, presence of riparian vegetation, and rainwater catchment systems.

OPTION 2: Summer Science Journal

Introduction/Purpose

In an effort to become more aware of environmental issues, students will keep a summer science journal. The science journal will be a combination of current event research and field observations. The journal should be a continuous work-in-progress throughout the ten-week summer break.

Setting Up the Science Journal

A composition book should be used (not a spiral notebook). **Stop by room 02-111 to pick up your composition book!**

Write your name and phone number on the inside front cover of the composition book (in case it is misplaced, it can be returned).

Create a Title Page with your name, the name of this class, and the school year (2017-2018).

Leave two pages (after Title Page) blank for a Table of Contents.

After the Table of Contents pages, begin numbering pages in the top right corner. Number only the front of each page. You will NOT write on the backs of each page.

When writing in your journal, you may make a mistake. Use only single line strike throughs (Ex: ~~MISTAKE~~)...no white out, no erasing, no tearing pages out! As a scientist, something you think is a mistake now, may be valuable information later!

Science Journal Requirements

The following requirements may be completed in any order (this is why you have a Table of Contents).

Part 1

Current Event Summaries: There will be 10 current events required. Do some research! Find a newspaper article, magazine article, journal article, blog, website, or podcast that deals with each of the 10 assigned topics. The articles, etc. must be from reputable sources. Five of the 10 can be video sources (TED Talks, National Geographic, etc.). You will write a summary (1-2 pages) of each article/podcast/video. The summary will include:

- WHAT event or issue is the article about?
- WHERE (city, state, country) does/did the event/issue take place?
- WHEN (month, year) does/did the event/issue in the article occur?
- WHO is involved in the event/issue? Who are the major participants/stakeholders?
- HOW did the actions or beliefs of the participants/stakeholders affect the event/issue?
- WHY is the event/issue important? Why should we care about it?
- CITE the article (MLA style) at the conclusion of your summary.

Frequently Asked Questions

1. What does “current” mean?

Articles must not be older than 1 year. For example, if you are writing a current event on June 1, 2016, the article you are using cannot be older than June 1, 2015.

2. What types of sources should be used?

Reputable newspaper articles, magazine articles, journal articles, academic blogs, websites, or podcasts are acceptable. Wikipedia is not a reputable source. While encyclopedias are informative and useful, an encyclopedia entry describing the topic is not an acceptable “article.” The purpose is for students to explore these topics, learn more about these topics, and understand the latest findings in each subject area.

See this website for details:

<http://writingcenter.appstate.edu/sites/writingcenter.appstate.edu/files/Credible%20v%20Non-Credible%20Sources13.pdf>

3. What does a properly completed current event look like? Do you have an example?

Yes! Please see the properly completed sample attached to this instruction sheet. 😊

Required Current Event Topics (One Current Event is required for each of the following topics.)

1. Mining/Non-Renewable Energy: Research a topic related to the environmental impacts of surface mining, subsurface mining, oil extraction or use, coal extraction or use, natural gas extraction or use, or mountain top removal.
2. Population Ecology: Research a study that examines a population characteristic such as population size, population density, population distribution, sex ratio, age structure, or birth/death rates.
3. Biomes: Research a study that details how humans are affecting a particular biome. This summary should include a description of the biome and how humans are altering it.
4. Population Growth: Research a study or article that details the implications of human population growth on natural resources, climate change, food production, and other species.
5. Agriculture: Research an article about agriculture. Topics may include but are not limited to agricultural pollution, pesticide use, herbicide use, use of genetically modified organisms, or integrated pest management.

6. Invasive Species: Research an article about an introduced or invasive species that is having an economic and/or ecological impact in its new range.
7. Toxicology/Epidemiology: Research some aspect of the risk of harm from toxins in the environment or infection from an infectious or transmittable disease.
8. Water Pollution: Research a current event related to water pollution. Focus on prevention of, management of, remediation of, or legislation pertaining to water pollution.
9. Global Climate Change: Research some aspect of global climate change and its impact on natural systems (aquatic environments or biomes), its effect on people, technologies designed to mitigate climate change, etc.
10. Energy Efficiency: Research some technology that is designed to improve energy efficiency in the home, office, or industry. Evaluate the life cycle of this technology from production to disposal. Explain the pros and cons to this particular technology.

Part 2

Field Observations: There will be a minimum of 5 required field observations. Each of the 5 observations must take place in a different ecosystem. That's right....get outside!! ☺

Local ecosystem examples are: coastal, marine, river/stream, forested upland, wetland, fresh water marsh, fresh water swamp, estuary, mangrove estuary, slough, pine flatwoods, cypress swamp, fresh water pond or lake, fresh water spring, etc. Ecosystems that are not local are acceptable and encouraged (if possible).

Field Observation Requirements include the following:

- Location Description
- Date & Time of Day
- Weather Conditions/Temperature
- Description of Ecosystem
- List of major biotic and abiotic factors
- Observation notes should include BOTH quantitative and qualitative observations. Those observations should include topics such as: producers, consumers (primary, secondary, tertiary), decomposers, plant types (monocot, dicot, etc.), tree types, is vegetative growth mature or new growth, is there evidence of human impacts, food chains, food webs, predator/prey relationships, mutualism, parasitism, commensalism, competition, evidence of invasive species, etc.
- Sketches and/or photos should be included in each field observation.
- How is this ecosystem unique? What did you find interesting about this observation?
- **Field observations MUST be supervised...NEVER complete an observation alone!!!!**

Upon conclusion of your summer science journal project, complete the Table of Contents. Be sure to list topics sequentially (by page number).

Once again, this journal should be a **continuous work-in-progress throughout the ten-week summer break**.

It is my hope that you enjoy this project, find an area of interest, and make new discoveries! Please do not wait until August to begin...there is so much to observe and learn! Start your environmental adventure today!

Questions? Email Mrs. Green at andrea.green@yourcharlotteschools.net

P.S. I am thrilled you have decided to take this class! ☺ Also, it is absolutely acceptable for your journal to get a dirty, wet, torn, or worn! The very best science journals are stained, torn, worn, and well-traveled! Enjoy!

SUMMER ASSIGNMENTS ARE DUE August 10, 2017.