

# Summer Assignment – Advanced Placement Environmental Science (APES)

## INTRODUCTION:

Welcome to Advanced Placement Environmental Science! This is a fast-paced, college-level course, where you will learn how all the science you've acquired in school thus far comes together in the natural environment, and the role that you play in this. You will also gain skills that will help you to be a better learner when you get to college (and beyond!).

One of these skills is being able to read a scientific text and to make meaning from it. You doubtless already have a skill set for this, and we will build on that now. Please complete the assignment below by the first day of school. You may email me if you are confused (alauerman@nya.org), and I will get back to you within a few days.

TEXTBOOK: (**NOTE: This is a new edition of the textbook; do NOT get a hand-me-down from last year's class!**)

Environment: [The Science Behind the Stories 7<sup>th</sup> ed](#), by Withgott & Laposata, ISBN: 978-0-13-645147-1

## INSTRUCTIONS (check off items as you complete them):

1. \_\_\_\_ Read page 2 in this document – “How to read the APES textbook”
2. \_\_\_\_ Take notes on pages 2-5 of your textbook (the first few pages of chapter 1)
3. \_\_\_\_ Compare your notes on pages 2-5 with my notes (page 2 in this document)
4. \_\_\_\_ Make any changes you need to make in your own notes, and think about how to improve your note-taking for the remainder of chapter 1
5. \_\_\_\_ Complete the reading and notes for ch 1
6. \_\_\_\_ Complete the following questions on p20-21
  - a. Seeking solutions #1-4
  - b. Calculating ecological footprints: complete the table and answer #1-3
7. \_\_\_\_ Take the chapter 1 reading quiz (open notes)
8. \_\_\_\_ check your reading quiz against the answer key. *If you got a 9 or a 10, this means your reading strategies are in good alignment with my expectations. If you got an 8 or below, look back at the questions you missed as well as your notes and my sample notes to figure out how to adjust your reading strategies for the next chapter.*
9. \_\_\_\_ Complete the reading and notes for ch 6
10. \_\_\_\_ Complete the following questions on p158
  - a. Seeking solutions #1,3,4
  - b. Calculating ecological footprints: complete the table and answer #1-2
11. \_\_\_\_ Take the chapter 6 reading quiz (open notes)
12. \_\_\_\_ check your reading quiz against the answer key. Re-assess your reading strategies once again.
13. \_\_\_\_ Complete the reading and notes for ch 7
14. \_\_\_\_ Complete the following questions on p183
  - a. Seeking solutions #3,4
  - b. Calculating ecological footprints: complete the table and answer #1-3
15. \_\_\_\_ Come to class ready with questions about any content you did not feel confident about from each of these three chapters. We will go over questions in class before taking the chapter 7 reading quiz (the first graded reading quiz in the course)

**Reading the APES textbook - AKA – 4 steps to success in this course!**

1. Organize your notes first
  - Chapter # and title at the top of the page
  - If you are typing your notes, before you even begin reading, make an outline using just the headers.  
Like this:

I. Section headers (the blue headers in your book) - roman numerals  
a. sub-headers (the green headers in your book) - a,b,c,d  
- Notes on sub-section should be bulleted and indented under the sub-header

2. Use the book's layout to your advantage
  - a. Write down the sub-headers – in this book they summarize the content in that section!
  - b. write a few bullet points below each one
    - i. Define vocab (underline vocabulary terms)
    - ii. Explain “how” or “why” or “what does that mean” for the sub-header. It is most helpful to read the whole sub-section BEFORE you do this.
3. Answer any assigned questions
  - There will be reading quizzes (open notes), and doing the questions is the best way to make sure that you are prepared for the reading quiz.
  - Come to class with questions on what you don't understand or need clarification on.
  - We will NOT re-cover all the material from the textbook. If it is in the reading you are responsible for it.

## Ms. Lauerman's Notes on pages 2-5

### Chapter 1 – Science and Sustainability

- I. Our Island, Earth – we need to learn to live sustainably on our planet
  - a. Our environment surrounds us
    - i. Environment – all living and non-living things around us.
    - ii. We are part of the environment and must be aware of our role and interactions
  - b. Environmental science explore our interactions with the world
    - i. We depend on nature for air, water, food, shelter etc.
    - ii. Modifying the natural environment has allowed us to have a better quality of life, but has also degraded natural systems, threatening our own well-being
    - iii. Environmental science – the scientific study of how the natural world works, how our environment affects us, and how we affect our environment
  - c. We rely on natural resources
    - i. Natural resources – the substances and energy sources that we take from our environment and that we rely on to survive
    - ii. Renewable natural resources – resources that are replenished over short periods (sunlight, wind, wave energy are perpetually renewed, and timber, water, animals, and soil renew themselves on certain time scales and are only renewable if we use them more slowly than they replenish)
    - iii. Nonrenewable natural resources – in finite supply, not replenished
  - d. We rely on ecosystem services
    - i. Ecosystem services – functions of the natural environment from which we benefit (clean air, water, pollination, etc.)
  - e. Population growth amplifies our impact
    - i. more people = more impact
    - ii. Agricultural revolution – transition from hunter-gathering to agriculture about 10,000 y.a. allowed more food to be produced and more babies to be born
    - iii. Industrial revolution – shift from rural agrarian life to urban life with factory made goods. Brought advances in technology that allowed the population to grow
    - iv. Fossil fuels – non-renewable energy sources (coal, oil, natural gas)
  - f. Resource consumption exerts social and environmental pressures
    - i. Ecological footprint – estimates the land and water needed to provide a person or population with the resources they consume and dispose of
    - ii. ...

## Chapter 1 Reading Quiz (open notes)

- 1) \_\_\_\_ The scientific method \_\_\_\_\_.  
A) results in conclusions based on speculation      B) cannot prove a hypothesis to be true  
C) results in the proving of a theory      E) involves testing observations to derive a working hypothesis  
D) now has been replaced by a widely accepted shortcut that is less time-consuming and less expensive
- 2) \_\_\_\_ Roberto lives near a wind farm and is wondering about the environmental effects of the wind turbines. He \_\_\_\_\_ that the turbines make a sound like faint airplane engines and also that there are far fewer meadowlarks living near the windfarm than lived there before the windfarm was built.  
A) hypothesizes      B) predicts      C) observes      D) theorizes      E) guesses
- 3) \_\_\_\_ Roberto lives near a wind farm and is wondering about the environmental effects of the wind turbines. He \_\_\_\_\_ that the turbines, which sound like faint airplane engines, are scaring off meadowlarks that used to nest in the area.  
A) hypothesizes      B) predicts      C) observes      D) theorizes      E) hopes
- 4) \_\_\_\_ In a manipulative experiment \_\_\_\_\_.  
A) researchers manipulate the independent variable  
B) researchers manipulate as many variables as possible  
C) replication of the experiment is not necessary  
D) a scientist has been caught manipulating the data for economic gain  
E) the peer review process is bypassed
- 5) \_\_\_\_ All of the following are examples of quantitative data EXCEPT \_\_\_\_\_.  
A) the number of siblings that students have      B) the gender of the students in a class  
C) the cholesterol levels of the students in a class      E) the exam scores for the students in a class  
D) the amount of sleep normally gotten by the students in a class
- 6) \_\_\_\_ A study's results are deemed worthy of acceptance into the body of scientific knowledge if they are published in journals which \_\_\_\_\_.  
A) use the peer review process      B) charge a high fee for acceptance  
C) are funded by corporations financing the research      E) conform to current political and religious views  
D) meet guidelines advocated by environmentalists or consumer groups
- 7) \_\_\_\_ An environmental scientist is least likely to be involved with which of the following?  
A) determining the best fuel to generate electricity for a growing city in Arizona  
B) helping a rancher determine the best ways to rotate herds of cattle to reduce erosion  
C) studying X-ray emissions for evidence of black holes  
D) launching NASA satellites that monitor changes in carbon dioxide production on Earth  
E) studying the relationship between soil fungi and aspen trees in areas that are being restored after oil sand mining
- 8) \_\_\_\_ Solutions to environmental problems \_\_\_\_\_.  
A) can be implemented only by scientists  
B) should be designed with the goal of sustaining Earth's natural capital  
C) must work on a global scale  
D) must focus on short-term fixes because long-term solutions are generally unattainable  
E) must always be designed and discussed in the political arena before implementation

- 9) \_\_\_\_ What is a key "take-home message" about Easter Island?
- A) Making and placing large stone statues is a waste of time.
  - B) Tropical soils are insufficient for growing enough crops for a population to be self-sustaining.
  - C) An island population must live as responsible stewards of its resources.
  - D) Humans that live in tropical areas will not die of exposure to extremely low temperatures.
  - E) The invasive brown tree snake can wipe out an entire population of humans in a short amount of time.
- 10) \_\_\_\_ You have read about the mistakes made on Easter Island. On Tikopia, a small island in the Solomon Islands, the people acted in other ways. When they realized that the pigs they had imported were damaging the environment, they killed them all. They had to have permission from a chief to fish, which prevented overfishing. They also practiced contraception. These actions all indicate that \_\_\_\_.
- A) they believed in full resource utilization
  - B) they felt that everything was a nonrenewable resource
  - C) they felt that everything was a renewable resource
  - D) they were concerned with only one year at a time
  - E) they were attempting to enact sustainability

### Chapter 6 Reading Quiz (open notes)

- 1) \_\_\_\_ All of the following scenarios EXCEPT ONE would cause the price of the product to change. Which of the following could result in the price of the product remaining the same?
- A) an increase in demand for the product
  - B) a decrease in supply of the product
  - C) a decrease in supply of the product combined with an increase in demand for the product
  - D) an increase in the supply of a product combined with a decrease in demand for the product
  - E) a decrease in supply of the product combined with a decrease in demand for the product
- 2) \_\_\_\_ Which of the following best illustrates the intrinsic value of an ecosystem?
- A) A wetland filters runoff and detoxifies water before it percolates into drinking water aquifers.
  - B) My professor's prairie provides flowers for her colony of honeybees to harvest pollen.
  - C) Chippewa National Forest in Minnesota provides jobs for loggers.
  - D) An estuary is often a stopover location for millions of migrating shorebirds that need to stop and fuel up on the invertebrates living in the mudflats.
  - E) Woodpeckers in the Black Hills eat mountain pine beetles that have been killing millions of acres of pine forests in the western U.S., costing millions of dollars in lost timber sales and creating an extreme fire hazard.
- 3) \_\_\_\_ Which of the following includes volunteer work and damage from pollution in a country's goods and services?
- A) GDP      B) GNP      C) GAP      D) GPI      E) ATP
- 4) \_\_\_\_ Which of the following is the most accurate definition of economics?
- A) the study of conversion of monetary units between nations
  - B) the study of making money, goods, and services
  - C) the study of how humans use potentially scarce resources to meet demand
  - D) the study of tax laws, banking, and monetary policy
  - E) the study of environmental systems and their monetary value

- 5) \_\_\_\_ You spend the night at a hotel and notice a sign in the bathroom asking you to place dirty towels on the floor and to hang up towels that you wish to reuse. By doing so, the hotel chain can help "save the planet" by conserving water and detergent. You recognize that the hotel chain would also save a lot of money by not having to launder so many towels, and you begin to wonder cynically whether the hotel isn't just practicing \_\_\_\_.
- A) ecolabeling                      B) environmental justice                      C) greenwashing  
D) the externalizing of costs                      E) discounting
- 6) \_\_\_\_\_ is best defined as the knowledge, beliefs, values, and learned ways of life shared by a group of people.
- A) Niche              B) Economics              C) Worldview              D) Habitat              E) Culture
- 7) \_\_\_\_ Who is best known as the founder of the Sierra Club?
- A) Ralph Waldo Emerson      B) Aldo Leopold              C) John Ruskin  
D) Walter Sierra                      E) John Muir
- 8) \_\_\_\_ Leaders striving for sustainable development aim to satisfy a triple bottom line, which involves what three goals?
- A) economic development, making money, and depleting resources slowly  
B) making money, lowering taxes, and protecting the environment  
C) protecting animals, protecting ecosystems, and protecting the biosphere  
D) racial equality, social equality, and political equality  
E) economic advancement, environmental protection, and social equity
- 9) \_\_\_\_ Robert Costanza's research on ecosystem services found that \_\_\_\_\_.
- A) ecosystem services provided by Earth's biosphere are worth more than goods and services created and provided by people  
B) most ecosystem services can be replicated by humans, but materials like wood cannot be manufactured  
C) wetlands detoxify and purify water  
D) the value of ecosystem services has been overstated in the literature and should be valued at only 1/10 of the value generally accepted by economists  
E) actions taken from a conservation viewpoint actually serve ecosystems more efficiently than those from a preservation viewpoint
- 10) \_\_\_\_ Which of the following is an assumption of neoclassical economics?
- A) Economic growth is a means toward greater human well-being.  
B) Resources are finite and should be conserved for the greater good of society.  
C) Long-term effects and planning are important.  
D) External costs and benefits are valuable.  
E) All citizens deserve just and equal economic and sociopolitical treatment.

**Chapter 1 Reading Quiz Answers**

1. B    2. C    3. A    4. A    5. B    6. A    7. C    8. B    9. C    10. E

**Chapter 6 Reading Quiz Answers**

1. E    2. D    3. D    4. C    5. C    6. E    7. E    8. E    9. A    10. A