**Welcome to APES!!!**

AP Environmental Science is a lab based course that is designed to examine ecological, biological, chemical, physical and environmental concepts and interactions. A student in this course should be familiar with local, regional and global concerns within their own environment. The objective of this summer assignment is to get you thinking environmentally. Please note that this assignment will be collected for two test grades at the end of the first week of school Friday, August 26th. Please assemble all materials in a folder with dividers and table of contents. All materials should be typed. I hope that you have an enjoyable, exciting, and educational summer! I look forward to meeting you (or seeing you again) in August! ---Mrs. Butcher aka, Queen Nerdling, aka, Mama B.

**Below are the tasks you should complete this summer. All final materials should be typed, and assembled in order in a folder with a table of contents to be handed in at the end of the first week of school.**

**The summer assignment consists of 4 parts for a total of 200pts (2 test grades):**

**Part 1 (100pts) Mandatory TED Talks to watch**

Below, there are 2 lists of TED talks, which are available at (https://www.ted.com/). Each student must watch the **8** TED talks found below under the heading “**Required TED Talks**”. After watching the 8 required TED talks, each student needs to choose **4** of the TED talks in **Section 2** under the heading “**Suggested TED Talks**”**.** Therefore, over the course of the summer, each student must watch a total of **12** TED talks.

After watching each TED talk, students will be responsible for writing a Video Response (VR). All VRs must adhere to the following minimum formatting:

1. Typed

2. Times New Roman, 12 pt. font

3. Single spaced

4. Name

5. Each individual VR should be clearly numbered

6. The title of the TED talk should be identified in each VR

Each student will need to refer to the APES topic outline found below in **Section 3** to answer some of the requirements.

**Your typed 12 responses must include the following:**

1.) A list of 5 facts you learned from watching the TED talk. (These must be written in complete

sentences.)

2.) Use the **Topic Outline** section, found in **Section 3** of this assignment, for the AP Environmental Science course and exam, to make a *comprehensive* list of topics each selected TED talk relates to.

3.) One personal reflection paragraph regarding each TED talk. In this portion you must address how each TED talk relates to APES.

**Sample Response for Formatting**

TED Talk 1: Eddie Eagle *Why flame retardant bald eagles are NOT a good thing*

A. TED Talk Facts

1. Fact from the TED Talk

2. Fact from the TED Talk

3. Fact from the TED Talk

4. Fact from the TED Talk

5. Fact from the TED Talk

B. Ecosystem Structure, Energy Flow ,Ecosystem Diversity, Water pollution, Hazardous chemicals in the environment, and Loss of Biodiversity

C. No more than one paragraph personal reflection regarding the TED talk. Include in your response how you think the TED talk is related to APES.

**Required TED Talks (100pts):**

James Balog: Time-lapse proof of extreme ice loss https://www.ted.com/talks/james\_balog\_time\_lapse\_proof\_of\_extreme\_ice\_loss

Lee Hotz: Inside an Antarctic time machine https://www.ted.com/talks/lee\_hotz\_inside\_an\_antarctic\_time\_machine

Bernie Krause: The voice of the natural world https://www.ted.com/talks/bernie\_krause\_the\_voice\_of\_the\_natural\_world

Garth Lenz: The true cost of oil https://www.ted.com/talks/garth\_lenz\_images\_of\_beauty\_and\_devastation

George Monbiot: For more wonder, rewild the world https://www.ted.com/talks/george\_monbiot\_for\_more\_wonder\_rewild\_the\_world

Shimon Steinberg: Natural pest control…using bugs

https://www.ted.com/talks/shimon\_steinberg\_natural\_pest\_control\_using\_bugs

Greg Stone: Saving the ocean one island at a time https://www.ted.com/talks/greg\_stone\_saving\_the\_ocean\_one\_island\_at\_a\_time

Dennis van Engelsdorp: a plea for bees https://www.ted.com/talks/dennis\_vanengelsdorp\_a\_plea\_for\_bees

**Part II Suggested TED Talks: (100pts)**

Bilai Bomani: Plant fuels that could power a jet

https://www.ted.com/talks/bilal\_bomani\_plant\_fuels\_that\_could\_power\_a\_jet

Barbara Block: Tagging tuna in the deep ocean https://www.ted.com/talks/barbara\_block\_tagging\_tuna\_in\_the\_deep\_ocean

Stewart Brand:4 environmental ‘heresies’

https://www.ted.com/talks/stewart\_brand\_proclaims\_4\_environmental\_heresies

Stewart Brand: The Long Now https://www.ted.com/talks/stewart\_brand\_on\_the\_long\_now

Stewart Brand: The dawn of de-extinction. Are you ready?

https://www.ted.com/talks/stewart\_brand\_the\_dawn\_of\_de\_extinction\_are\_you\_ready

Stewart Brand and Mark Z. Jacobson: Does the world need nuclear energy? (Debate)

http://www.ted.com/talks/debate\_does\_the\_world\_need\_nuclear\_energy

Marcus Byrne: The dance of the dung beetle https://www.ted.com/talks/marcus\_byrne\_the\_dance\_of\_the\_dung\_beetle

Arthur Potts Dawson: A vision for sustainable restaurants https://www.ted.com/talks/arthur\_potts\_dawson\_a\_vision\_for\_sustainable\_restaurants

Rob Dunbar: Discovering ancient climates in oceans and ice https://www.ted.com/talks/rob\_dunbar

Jonathan Foley: The other inconvenient truth https://www.ted.com/talks/jonathan\_foley\_the\_other\_inconvenient\_truth

Rose George: Let’s talk crap. Seriously https://www.ted.com/talks/rose\_george\_let\_s\_talk\_crap\_seriously

Al Gore: What comes after An Inconvenient Truth?

https://www.ted.com/talks/al\_gore\_warns\_on\_latest\_climate\_trends

Tyrone Hayes + Penelope Jagessar Chaffer: The toxic baby https://www.ted.com/talks/tyrone\_hayes\_penelope\_jagessar\_chaffer\_the\_toxic\_baby

James Howard Kunstler: The ghastly tragedy of the suburbs https://www.ted.com/talks/james\_howard\_kunstler\_dissects\_suburbia

Michael Laberge: How synchronized hammer strikes could generate nuclear fusion https://www.ted.com/talks/michel\_laberge\_how\_synchronized\_hammer\_strikes\_could\_generate\_nuclear\_fusion

Anupam Mishra: The ancient ingenuity of water-harvesting https://www.ted.com/talks/anupam\_mishra\_the\_ancient\_ingenuity\_of\_water\_harvesting

Paul Nicklen: Tales of ice-bound wonderlands https://www.ted.com/talks/paul\_nicklen\_tales\_of\_ice\_bound\_wonderlands

Hadyn Parry: Re-engineering mosquitoes to fight disease https://www.ted.com/talks/hadyn\_parry\_re\_engineering\_mosquitos\_to\_fight\_disease

Michael Prichard: Turning filthy water drinkable http://blog.ted.com/pritchard\_water/

Hans Roling: Global population growth, box by box https://www.ted.com/talks/hans\_rosling\_on\_global\_population\_growth

Hans Roling: Religion and babies https://www.ted.com/talks/hans\_rosling\_religions\_and\_babies

Hans Roling: The good news of the decade?

https://www.ted.com/talks/hans\_rosling\_the\_good\_news\_of\_the\_decade

Carl Safina: The oil spill’s unseen culprits, victims https://www.ted.com/talks/carl\_safina\_the\_oil\_spill\_s\_unseen\_culprits\_victims

Allan Savory: How to fight desertification and reverse climate change https://www.ted.com/talks/allan\_savory\_how\_to\_green\_the\_world\_s\_deserts\_and\_reverse\_climate\_change

Gavin Schmidt: The emergent patterns of climate change https://www.ted.com/talks/gavin\_schmidt\_the\_emergent\_patterns\_of\_climate\_change

Laura Snyder: The Philosophical Breakfast Club https://www.ted.com/talks/laura\_snyder\_the\_philosophical\_breakfast\_club

Jonathan Trent: Energy from floating algae ponds https://www.ted.com/talks/jonathan\_trent\_energy\_from\_floating\_algae\_pods

Peter Ward: A theory of the Earth’s mass extinctions

https://www.ted.com/talks/peter\_ward\_on\_mass\_extinctions

**Part III Topic Outline for use on TED talk analysis**

The following outline of major topics serves to describe 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 in the course.

**I. Earth Systems and Resources (10–15%)**

A. Earth Science Concepts

Geologic time scale; plate tectonics, earthquakes, volcanism; seasons; solar intensity and latitude

B. The Atmosphere

Composition; structure; weather and climate; atmospheric circulation and the Coriolis

Effect; atmosphere–ocean interactions; ENSO 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 (10–15%)**

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 webs and trophic levels;

ecological pyramids

C. Ecosystem Diversity

Biodiversity; natural selection; evolution; ecosystem services

D. Natural Ecosystem Change

Climate shifts; species movement; ecological succession

E. Natural Biogeochemical Cycles

Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter

**III. Population (10–15%)**

A. Population Biology Concepts

Population ecology; carrying capacity; reproductive strategies; survivorship

B. Human Population

1. Human population dynamics

Historical population sizes; distribution; fertility rates; growth rates and doubling times; demographic transition; age-structure diagrams

2. Population size

Strategies for sustainability; case studies; national policies

3. Impacts of population 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

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

C. Rangelands

Overgrazing; deforestation; desertification; rangeland management; federal rangelands

D. Other Land Use

1. Urban land development

Planned development; suburban sprawl; urbanization

2. Transportation infrastructure

Federal highway system; canals and channels; roadless areas; ecosystem impacts

3. Public and federal lands

Management; wilderness areas; national parks; wildlife refuges; forests;

wetlands

4. Land conservation options

Preservation; remediation; mitigation; restoration

5. Sustainable land-use strategies

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

C. Fossil Fuel Resources and Use

Formation of coal, oil, and natural gas; extraction/purification methods; world reserves and global demand; synfuels; environmental advantages/disadvantages of sources

D. Nuclear Energy

Nuclear fission process; nuclear fuel; electricity production; nuclear reactor

types; environmental advantages/disadvantages; safety 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; ocean waves and tidal energy; geothermal; environmental advantages/disadvantages

**VI. Pollution (25–30%)**

A. Pollution Types

1. Air pollution

Sources — primary and secondary; major air pollutants; measurement units; smog; acid deposition — causes and effects; heat islands and temperature inversions; indoor air pollution; remediation and reduction strategies; Clean Air Act and other relevant law

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

4. Solid waste

Types; disposal; reduction

B. Impacts on the Environment and Human Health

1. Hazards to human health

Environmental risk analysis; acute and chronic effects; dose-response relationships; air pollutants; smoking and other risks

2. Hazardous chemicals in the environment

Types of hazardous waste; treatment/disposal of hazardous waste;

cleanup of contaminated sites; biomagnification; relevant laws

C. Economic Impacts

Cost-benefit analysis; externalities; marginal costs; sustainability

**VII. Global Change (10–15%)**

A. Stratospheric Ozone

Formation of stratospheric ozone; ultraviolet radiation; causes of ozone depletion; effects of ozone depletion; strategies for reducing ozone depletion; relevant laws and treaties

B. Global Warming

Greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change; relevant laws and treaties

C. Loss of Biodiversity

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

2. Maintenance through conservation

3. Relevant laws and treaties

**Part 4: Buy Barron’s AP Environmental Science Review Book (latest edition)**

1. You can purchase this book at a Barnes and Nobel or find it online at amazon.com
2. We will be using this book throughout the year so you will need to secure a copy before the first day of school
3. Cost of the book is approximately $20 if you get the book without the extra tests on CD or $30 if you get the book with the extra test CD’s. Most times you can find it for even less if you order with a parents credit card (with their permission of course) on [www.amazon.com](http://www.amazon.com)
4. You need to bring your Barron’s review book to the **first day of school**.

**HOW DO I REACH YOU IF I HAVE QUESTIONS OVER ASSIGNMENTS THIS SUMMER or…I LOST MY ASSIGNMENT?**

1. You can email me: my school email is [hbutcher@pasadenaisd.org](mailto:hbutcher@pasadenaisd.org) and my personal email is [mrs\_butcher@yahoo.com](mailto:mrs_butcher@yahoo.com)
2. **PLEASE MAKE SURE TO JOIN MY APES REMIND 101 CLASS**
3. Send the following text message: @nerdling to this phone number: **81010**
4. You will receive a message back asking who you are. Please text back your first and last name.
5. I will periodically send you reminders of due dates and important info for APES. If you lose your assignment or have questions you can send me a message to this number and I will get back with you as soon as I can.

**ARE THERE ANY OTHER WEBSITES I SHOULD JOIN OR SOCIAL MEDIA AFFILIATED WITH YOU OR YOUR COURSE?**

1. Yes!
2. My website that will have summer assignments and links to videos. [www.nerdlingscience.com](http://www.nerdlingscience.com)
3. My Twitter and Instagram usernames are both: @Queen\_Nerdling or you can search Heidi Butcher
4. My Youtube channel is: queen nerdling You can find my channel by typing in “Queen Nerdling” in the search field or by following this link: https://www.youtube.com/channel/UCO7OfGz2T5UNcAbIFiBDD\_g . This is where all my videos are posted but they are not arranged like they are on my webpage, my youtube station also includes all of my AP biology videos.