APES Exam Review Summative Assignment

Overview

Below is a list of exam review options. Read each option carefully, then chose how you will earn the grade that you want to earn. Remember, the exam is cumulative, so you will benefit from choosing a variety of assignments and topics. Refer to the course outline in the next few pages for the unit breakdown. **Every assignment must be completed correctly, thoroughly, IN YOUR OWN HANDWRITING, and turned in on time.** Assignments are DUE on their specific due dates. This review assignment is worth 1 summative grade for the last grading period.

Option 1: Study Card –**EVERYONE MUST DO THIS** (NOT AN OPTION)

For 20 points, create a quick study card that includes all of the environmental laws that we have learned about this year. The study card should be in a chart or table form. You must include the name of the law, the year of the law, a summary of the law, provisions of the law, and mitigation issues (if any). The important environmental laws and policies are:

Endangered Species Act
CITES
FIRFA
General Mining Law of 1872
Surface Mining Control and Reclamation Act of 1977 (SMCRA)
Wilderness Act
National Environmental Policy Act
Clean Water Act
Safe Drinking Water Act
Clean Air Act
Kyoto Protocol
Montreal Protocol

YOU MUST CHOOSE OPTION 2 OR OPTION 3 You Will NOT Earn Credit for Both

Option 2: APES Alphabet Review Book

For 40 points, create an APES Alphabet Review Book. Your book should have a title page with at least 5 diagrams that summarize APES and then twenty-six pages, one for each letter of the alphabet. For each page, choose a topic (from the list provided) that begins with the appropriate letter and include an explanation of the topic and an illustration for the concept. Keep your writing simple, but scientific. All pages must be hand written and IN YOUR OWN WORDS. Color must be use appropriately (5 pts of the assignment). Bind the pages together before you turn it in. You should cover 26 different topics from all of the different units. You must use **UNLINED** paper (printer paper). You may get paper from your teacher.

Option 3: Review-At-A Glance

For 40 points, create a review-at-a-glance using the APES Topic Outline. The APES Review-At-A-Glance should be 4 double sided sheets of white card stock. Color, Graphs, Diagrams, and Tables, must be included in each section. The review-at-a-glance should include **everything** listed in the APES Topics Outline. Neatness and the use of rulers is a requirement to fit everything in to the required guidelines.

Option 4: FRQs/ FRQ Peer Review **(may be done up to 2 times**)

For **20 points**, both parts must be completed by each person. This assignment must be completed with a classmate and completed in class or in after school tutorials.

Part 1: Complete 4 released FRQs (of your teacher's choosing) covering 4 different units. All four FRQs must be written in complete sentences (except for math). On all math FRQs, you must show all of your work, including units (at every step) and box your final answer. You may not use a calculator.

Part 2: Once your FRQs are completed, you will come in to tutoring and peer grade each other's FRQs. You will give positive comments and constructive criticism.

Option 5: Bozeman Science and EdPuzzles

For 10 points, watch all of the Bozeman Science Videos and complete each Edpuzzle. This assignment does not require any handwritten work. EdPuzzles will be available beginning the week of April 10th.

Option 6: Documentaries **(may be done up to 2 times**)

For 10 points, watch two documentaries (at home) and take notes over the documentaries. Attend tutorials and handwrite a 1 page summary about what you learned. The summary and the notes must be turned in for credit. Documentaries include: Gaslands, Strange Days on Planet Earth – Trouble Waters, Racing Extinction, Food, Inc., Before the Flood, the Population Paradox, How the Earth was Made

Option 7: Create an Infographic (**may be done up to 2 times**)

For 10 points, create an infographic for a specific topic. The Info graphic must be completed on a poster and large enough for students to read. Neatness, color, accuracy are all important. You must use rulers to draw lines and the final work MUST be in marker (though original work may be in pencil and pencil marks removed after the marker has dried). Infographic topics include the following:

Ocean Acidification
Hydraulic Fracturing
Ozone Depletion in the Stratosphere
Pacific Garbage Patch
GMOs
Organic Agriculture
Integrated Pest Management
Biofuels - Algae

Non AP Testers Summative Assignment

Overview

If you have chosen to not take the AP Environmental Science Exam, you will still be required to complete a set of options from the list below. Read each option carefully, then chose how you will earn the grade that you want to earn. **Every assignment must be completed correctly, thoroughly, IN YOUR OWN HANDWRITING (where applicable), and turned in on time.** Assignments are DUE on their specific due dates. This summative assignment is worth 1 summative grade for the last grading period.

Option 1: Study Card –**EVERYONE MUST DO THIS** (NOT AN OPTION)

For 20 points, create a quick study card that includes all of the environmental laws that we have learned about this year. The study card should be in a chart or table form. You must include the name of the law, the year of the law, a summary of the law, provisions of the law, and mitigation issues (if any). The important environmental laws and policies are:

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CITES
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National Environmental Policy Act
Clean Water Act
Safe Drinking Water Act
Clean Air Act
Kyoto Protocol
Montreal Protocol

YOU MUST CHOOSE OPTION 2 or OPTION 3

Option 2: Build a Model –**NOT from a Kit**

For 40 points, conduct Internet research and build a model to demonstrate a concept. Models must be homemade and **MAY NOT** be built from a commercial kit. For the model that you choose to build, you must include a material list, cost of each individual material, and a direction sheet for building the model. If you chose to make the solar oven, you must supply a food that can be eaten (cookies) that was made with your oven.

- Make a windmill (school project size):
- Make a homemade solar oven (school project size)
- Make a homemade water wheel (school project size)
- Make a hydroponic tower garden (school project size)

Option 3: Create a Review Game Based on One Unit of Instruction

For 40 points, create a review game based on one of the 7 big ideas on the APES Topic Outline. You may make a game board or a card game with a minimum of 40 questions based on terms and concepts for the unit. You will need to include the directions for playing the game, a game board (if you create a board game), "markers" for advancing through the game. Your game must be handmade and homemade (nothing can be computer generated nor a commercial game.) The Big Topics are:

Earth Systems and Resources
The Living World
Populations
Land and Water Use
Energy Resources and Consumption
Pollution
Global Change

Option 4: Create an Infographic (**may be done up to 2 times**)

For 10 points, create an infographic for a specific topic. The Info graphic must be completed on a poster and large enough for students to read. Neatness, color, accuracy are all important. You must use rulers to draw lines and the final work MUST be in marker (though original work may be in pencil and pencil marks removed after the marker has dried). If you choose this option, be sure to pick up a rubric. Infographic topics include the following:

Deep Water Horizon (BP Oil Spill)
Mountaintop Removal
The Bottled Water Dilemma
Fukushima Disaster
Chernoby Disaster
Zone of Hypoxia in the Gulf of Mexico
Colony Collapse Disorder
White Nose Syndrome
Endocrine Disruptors
Nox, Vocs, and Ground Level Ozone
Causes and Effects of Global Warming
E-Waste
Water footprint (How much do we use & how to reduce)
Carbon footprint and how to reduce it
Dakota / Keystone pipeline
Food Waste and Imperfect Food

Option 5: Make an Earth Day Public Service Announcement Poster

For 10 points, create a colorful, informative Earth Day Public Service Announcement Poster to educate others about reducing environmental impact on the Earth. The poster should include a major theme (water conservation, water pollution, air pollution, energy conservation, endangered species, or invasive species). A poster with the Earth and Save the Planet – Earth – Water – simply will not do the job to earn the points.

Option 6: Upcycling (**may be done up to 2 times**)

For 10 points, create an item that is completely made of used materials. The only new items may be glue or marker. The item could be a greeting card, an ornament, an object with a real purpose. Make a creative yet useful item. You must include a materials list and the directions for creating the project. There are many web sites available for ideas for upcycling.

Name: _____

AP Tester **Non-Tester**

Points Sheet			
Due Date	Option Number and Name	Points Available	Points Earned
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
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	_____ _____		
TOTAL Score			

Name: _____

AP Tester **Non-Tester**

Points Sheet			
Due Date	Option Number and Name	Points Available	Points Earned
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
	_____ _____		
TOTAL Score			

APES Units of Study

Unit 1 --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

Unit 2 -- 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

Unit 3 -- 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

Unit 4 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

T*ree 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

Unit 5 -- 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

Unit 6 -- 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 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

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

Unit 7 -- 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

ABC's of Environmental Science

A

Agricultural Practices
- Contour plowing
- No-till
- Industrialized Agriculture
- Crop rotation
- Hydroponics
- Human Nutritional requirements

B

Biology, Population
- Population ecology
- Carrying capacity
- Reproductive strategies
- Survivorship strategies

C

Climate Change
- Greenhouse gases
- Greenhouse effect
- Impacts and consequences
- Reducing climate change
- Relevant laws and treaties

D

Diversity
- Biodiversity
- Ecosystem diversity
- Genetic diversity
- Natural selection
- Species diversity

E

Earth System Concepts
- Geologic timeline
- Plate tectonics
- Earthquakes
- Volcanism
- Seasons
- Solar intensity & latitude

G

Global Water Resources & Use
- Freshwater / saltwater
- Ocean circulation
- Agricultural, industrial, & domestic use
- Surface vs groundwater issues
- Global problems
- Conservation

H

Hazardous Chemicals in the Environment
- Types of hazardous waste
- Treatment / disposal of hazardous waste
- Cleanup of contaminated sites
- Biomagnification
- Relevant laws

I

Impacts of population growth
- Hunger
- Disease
- Economic effects
- Resource Use
- Habitat destruction

J

Just Biogeochemical Cycles
- Carbon
- Nitrogen
- Phosphorus
- Sulfur
- Water
- Conservation of Matter

K

Kilowatts of Energy
- Energy forms
- Power
- Units
- Conversions
- Laws of Thermodynamics

L

Loss of Biodivesity
- habitat loss
- Overuse
- Pollution
- Introduced species
- Endangered species
- Extinct species
- Relevant laws & treaties

M

Mining
- Mineral formation
- Types of mining
- Relevant laws and treaties

N

Nuclear Energy
- Nuclear fission process
- Nuclear fuel
- Electricity production
- Nuclear reactor
- Environmental advantages & disadvantages
- Safety issues
- Radioactive wastes
- Nuclear fusion

O

Oh Atmosphere
- Composition
- Weather and Climate
- Atmospheric circulation
- The Coriolis Effect
- Atmosphere – Ocean interactions
- ENSO (El Nino)

P

Pollution of Air
- Sources of Primary vs secondary
- Major air pollutants
- Acid deposition
- Indoor Air Pollution
- Clean Air Act & relevant laws

Q

Quality Forest Management
- Tree Plantations
- Old growth forests
- Forest fires
- Forest Management
- Forest Harvesting techniques
- National Forests

R

Renewable Energy
- Solar energy
- Hydrogen fuel cells
- Biomass
- Wind energy
- Small scale hydroelectric
- Ocean waves & tidal energy
- Geothermal
- Environmental advantages & disadvantages

S

Stratospheric Ozone

- Formation of Stratospheric ozone
- Ultraviolet radiation
- Causes of ozone depletion
- Effects of ozone depletion
- Strategies for reducting ozone depletion
- Relevant treaties

T

The Soil and Soil Dynamics

- Rock cycle
- Formation
- Composition
- Physical & chemical properties
- Main soil types
- Erosion and other soil problems
- Soil conservation

U

Urban Land Use

- Urban land development
- Urbanization
- Urban sprawl
- Urban Heat Island Effect

V

Vast Human Population

- Historic human population sizes
- Distribution
- Fertility rates
- Growth rates and doubling times
- Demographic transitions (and the graph)
- age-structure diagrams
- National policies

W

Water Pollution

- Types
- Sources
- Causes and effects
- Cultural eutrophication
- Groundwater pollution
- Maintaining water quality
- Water purification
- Sewage treatment / septic systems
- Clean Water Act
-

X

Xeriscaping

- And other water conservation practices

Y

Your land (Public and Federal)

- Management
- Wilderness areas
- National parks
- Wildlife refuges
- Tragedy of the Commons
- Ecosystem impacts

Z

Zoonotic Diseases

- Occurrence with Global change
- SARS
- Zika
- Malaria
- Dengue
- West Nile Virus
- Bird Flu
- H1N1