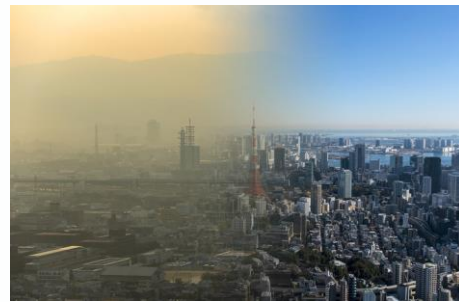


# AP/IB Sciences In MCPS

## AP Environmental Science

**Justine Lassar - Bethesda-Chevy Chase HS**



May 8th  
Wootton High School



MONTGOMERY COUNTY PUBLIC SCHOOLS

# Agenda

- Overview of the AP Environmental Science course
- Examine the pacing of the content in the course
- External Assessments
- Sample Assignments

# Overview of APES course

Equivalent to one semester introductory Environmental Science college course

## **Interdisciplinary:**

- Geology
- Biology
- Environmental Studies
- Environmental Science
- Chemistry
- Geography

# Overview of APES

Provide students with the scientific principles, concepts, and methodologies required to

- understand the interrelationships of the natural world
- identify and analyze environmental problems both natural and human-made
- evaluate the relative risks associated with these problems
- examine alternative solutions for resolving or preventing them.

# Sample APES Problems

Is the renewable energy generated by a hydroelectric dam worth the risks to local ecosystems?



How can we prevent biodiversity loss in the face of human-mediated climate change?

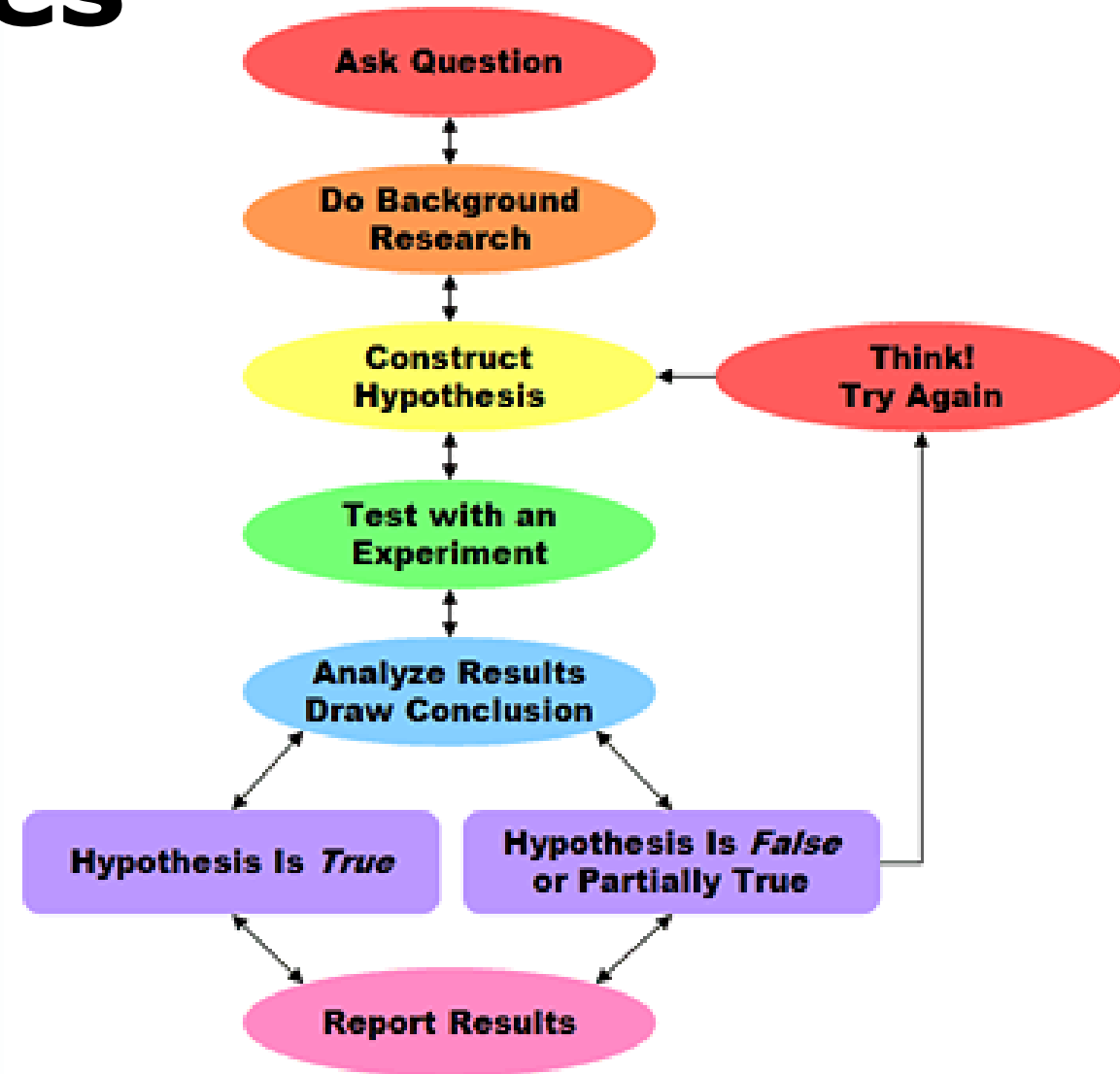
What is the best way to prevent overfishing, while still promoting economic growth?



# Underlying Principles

## #1 Science is a process.

- Science is a method of learning more about the world.
- Science constantly changes the way we understand the world.

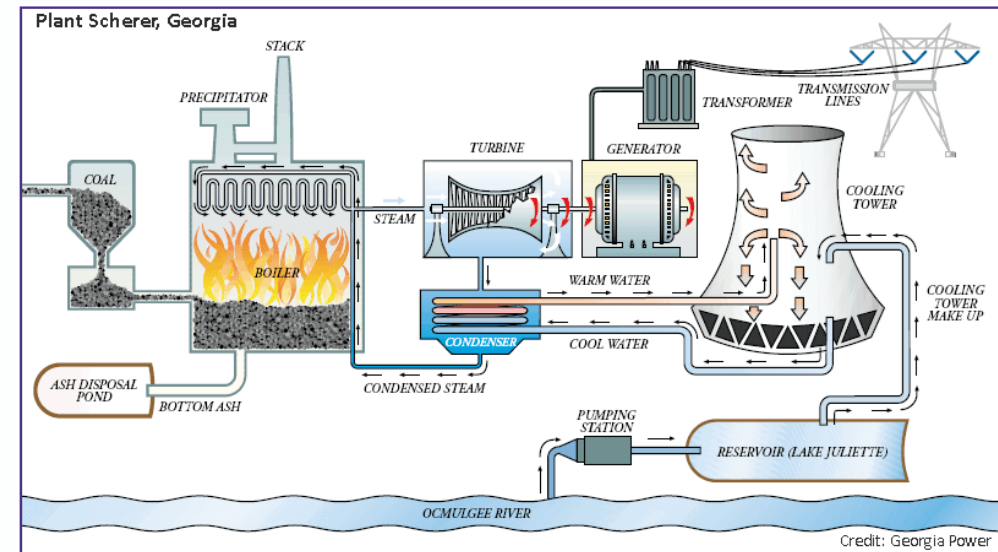
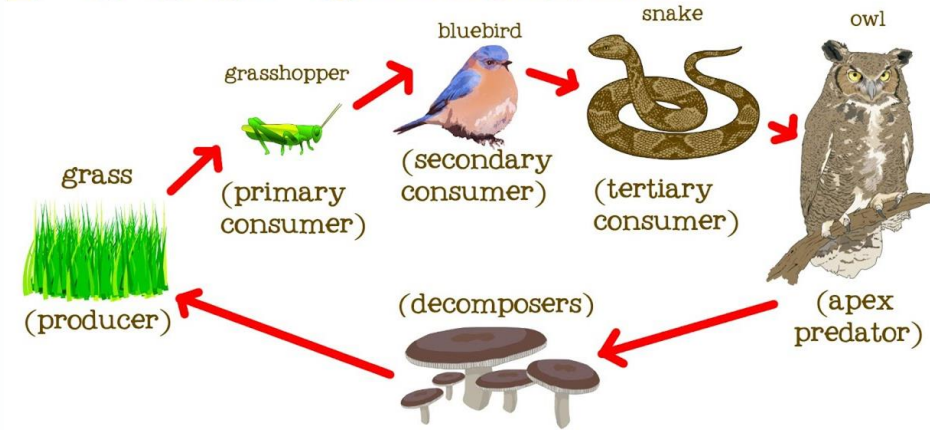


# Underlying Principles

## #2 Energy conversions underlie all ecological processes.

- Energy cannot be created; it must come from somewhere.
- As energy flows through systems, at each step more of it becomes unusable.

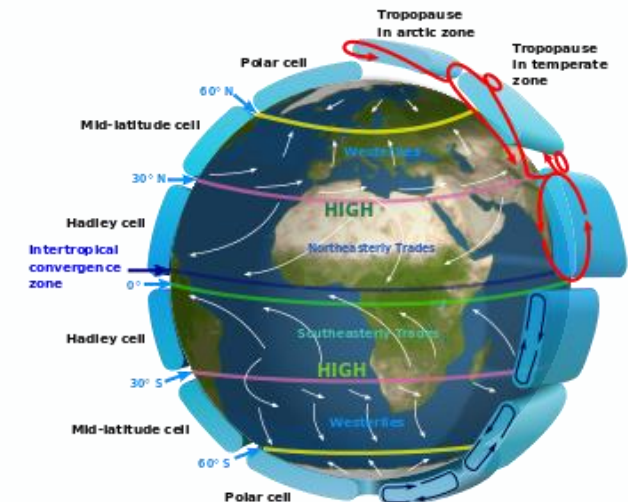
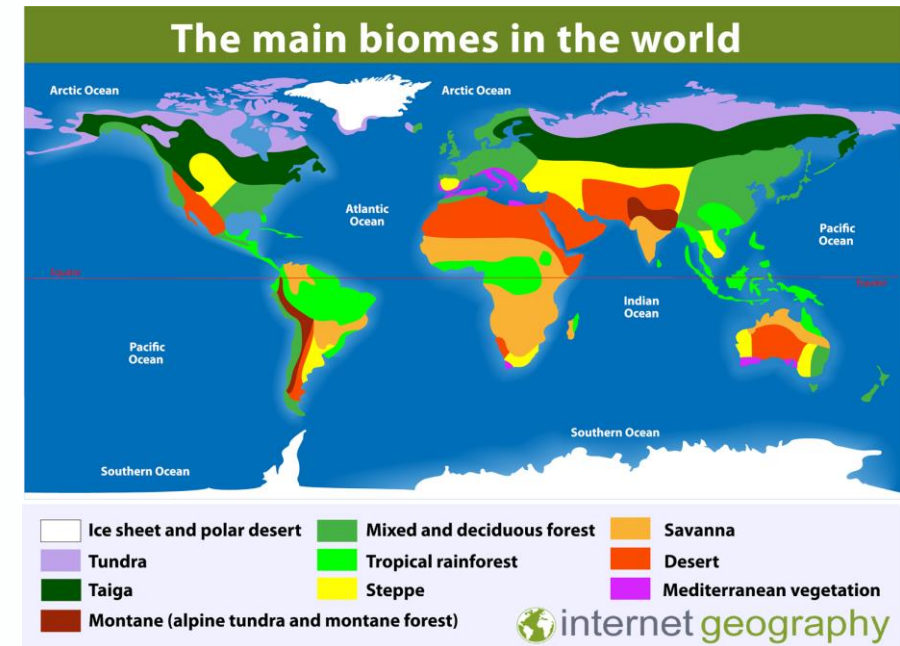
## Food Chains



# Underlying Principles

## #3 The Earth itself is one interconnected system.

- Natural systems change over time and space.
- Biogeochemical systems vary in ability to recover from disturbances.





# Underlying Principles

## #4 Humans alter natural systems.

- Humans have had an impact on the environment for millions of years.
- Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.



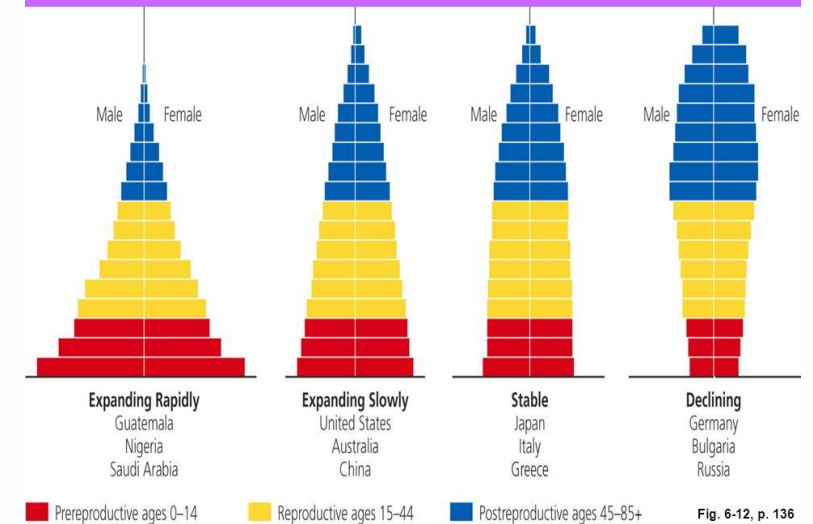
# Underlying Principles

## #5 Environmental problems have a cultural and social context.

- Understanding the role of cultural, social, and economic factors is vital to the development of solutions.



Generalized Population Age-Structure Diagrams



# Underlying Principles

## #6 Human survival depends on developing practices that will achieve sustainable systems.

- A suitable combination of conservation and development is required.
- Management of common resources is essential.



# Pre- / Co- requisites

**AP recommendation:** Taken after 2 years of high school science

## **MCPS requirements:**

Prerequisite: Biology

Recommended corequisite: Chemistry

# External Assessments: APES Exam

3 hr exam taken in May

- **Multiple choice:** 100 questions, 90 minutes
- **Free response:** 4 questions, 90 minutes

Assesses content knowledge, critical thinking skills, and experimental design skills

# External Assessments: APES Exam

## AP Scores

5 - Extremely well qualified

4 - Well qualified

3 - Qualified

2 - Possibly qualified

1 - No recommendation

Passing  
scores\*

\*Colleges individually set which score they will accept for course credit.

# Examine the pacing of the content in the course

Earth Systems and Resources (10–15%)

The Living World (10–15%)

Population (10–15%)

Land and Water Use (10–15%)

Energy Resources and Consumption (10–15%)

Pollution (25–30%)

Global Change (10–15%)

# Typical Unit Plan\*

1. The Living World: Ecosystems
2. The Living World: Biodiversity
3. Populations
4. Earth Systems and Resources
5. Land and Water Use
6. Energy Resources and Consumption
7. Atmospheric Pollution
8. Aquatic and Terrestrial Pollution
9. Global Change

\*Pacing and unit plans will differ between schools



# Sample Assignments: Labs

Productivity of a lake lab



Stream water analysis



Soil quality analysis



Seed mortality lab

# Sample Assignments: Assessments

The dangers of disposing of toxic chemicals underground came to public attention in which of the following locations?

- (A) Bhopal, India
- (B) Chernobyl, Ukraine
- (C) Love Canal, New York
- (D) Minamata, Japan
- (E) Three Mile Island, Pennsylvania

# Sample Assignments: Assessments

Most of the Earth's deserts are at approximately  $30^\circ$  latitude, north and south, because these latitudes are characterized by

- (A) generally warm ocean currents
- (B) predominantly low atmospheric pressure
- (C) descending dry air currents
- (D) slow-moving jet streams
- (E) enhanced solar radiation

# Sample Assignments: Assessments

Which of the following is LEAST likely to be an effect of global warming?

- (A) Loss of fertile delta regions for agriculture
- (B) Change in global patterns of precipitation
- (C) Extinction of some species that have narrow temperature requirements
- (D) Decreased rate of photosynthesis in vegetation
- (E) Increased frequency of hurricanes

# Sample Assignments: Assessments

- (a) Describe one environmental benefit and one environmental cost of photovoltaic systems.
- (b) From the two types of solar systems described on the government website, select the system (either stand-alone or grid-connected) that you think best meets the needs of the homeowners. Write an argument to persuade them to purchase the system you selected. Include the pros and cons of each system in your argument.
- (c) Describe TWO ways that government or industry could promote the use of photovoltaic power systems for homeowners in the future.
- (d) Describe TWO ways that homeowners could use passive solar designs and/or systems and, for each way, explain how it would reduce the homeowners' energy costs.

# Questions?

## Online form:

Type the link in your browser  
or scan the QR code

For more information on enrolling your student in this course, please contact the Counselor and/or the Science Department Resource Teacher at your high school.

**[bit.ly/SciNight19](https://bit.ly/SciNight19)**



# Questions?

## **Index Card:**

please include your contact info

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