

Introduction to Ecology

Cedar International School

7th Grade Science

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What is Ecology?

- The scientific study of distribution, abundance and relationships of organisms and their interactions with their environments.



How will we study Ecology?

- We will do field work to gather data for analysis.
- We will use numerous Case Studies to highlight our curriculum.
- We will study Ecology by **doing** Ecology.

Vocabulary

- We must speak the language of science when conducting science.



- A comprehensive vocabulary list will be found on the website.

The Breakdown.

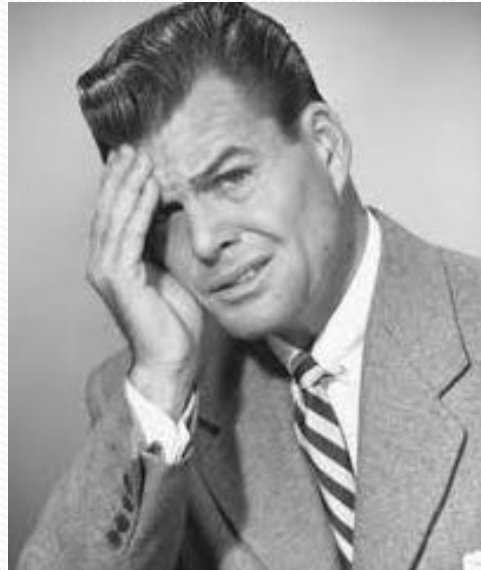
- Our studies of Ecology will be broken down into two main topics.
- **Introduction to Ecology:** Relationships between organisms.
- **Biogeography:** The distribution of organisms and their relationships to their environments.

Introduction to Ecology

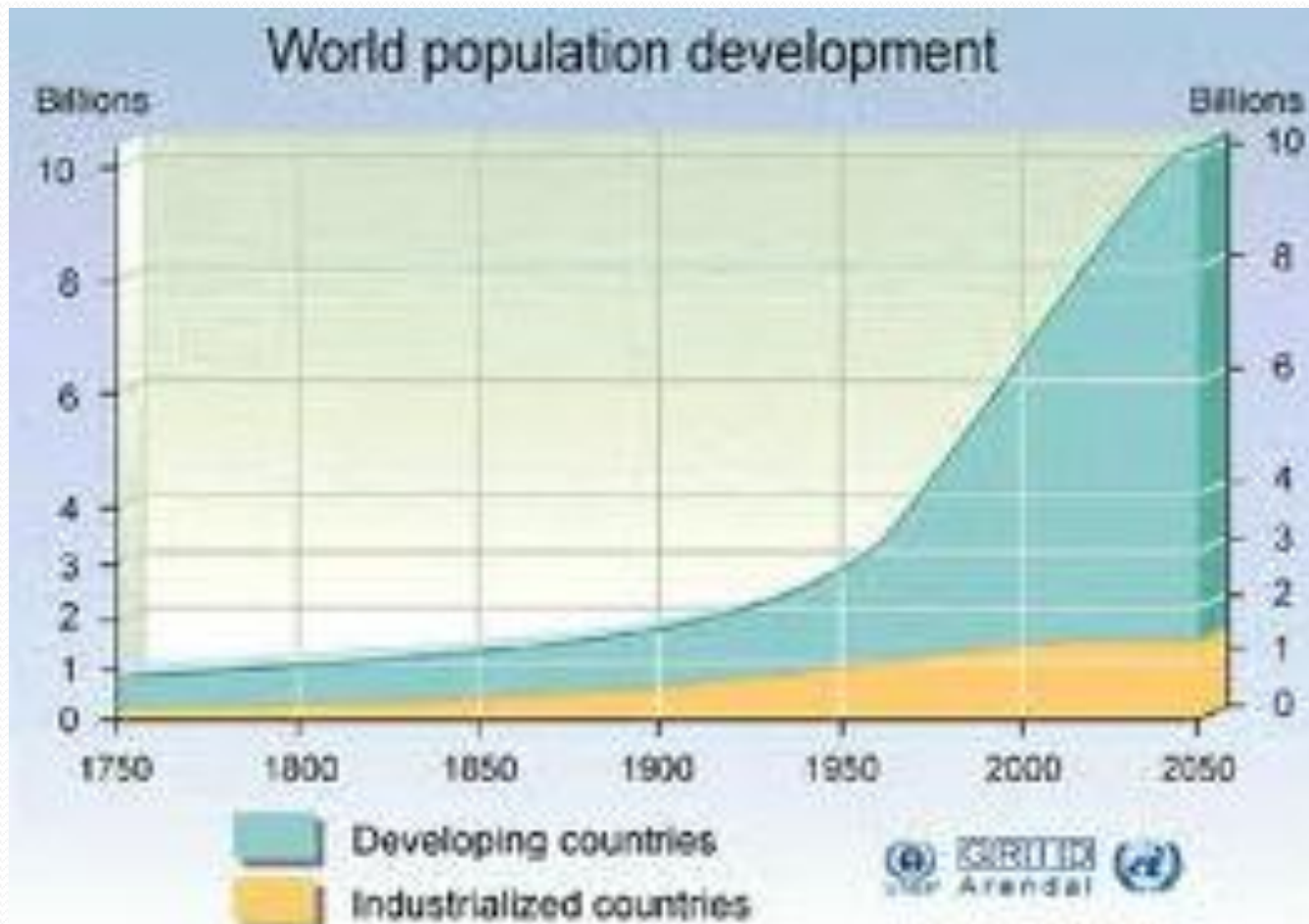
- The John Eli Miller Family
- When John Eli Miller died in the 1950s, he was survived by 7 children, 61 grandchildren, 338 great-grandchildren, and 6 great-great-grandchildren.
- This is the largest recorded family in the U.S.

Digging Deeper

- What may have contributed to Mr. Miller's ability to achieve this record?
- What kinds of ecological topics can we relate to the Miller Family?



Population Growth



Resource Use



Carrying Capacity



- We could use the Miller Family as an example that illustrates many of the concepts we will be studying throughout this unit.



- Instead, we are going to start someplace simpler...

SYSTEMS



- What is a System?
 - System: a set of components that function together as a whole.
- What is an example of a system that you have encountered?



Types of Systems

- Open System: A system in which energy or material flows into and out of the system.
 - Examples: Your body
- Closed System: A system that is essentially sealed off.
 - Examples: Planet Earth (for practical purposes)

Inputs and Outputs

- Your body is a complex system. Read the story about Backpacking on the next slide.
- What is an example of an INPUT in this story?
- What might be examples of OUTPUTS for this story?

One day...

- You were backpacking through Yellowstone National Park with your sweetheart. You hike around a turn in the trail and, standing right in front of you, is a Grizzly Bear and her three small cubs!
- What is\are the systems?
- What are the Inputs?
- What are the Outputs?



- INPUTS

- The Bear

- OUTPUTS

- Increased adrenaline levels
- Increased heart rate
- Playing Dead
- Requiring a change of underpants.



Try It!

- You're driving your car and a bicycle swerves into your path.
 - INPUTS:
 - OUTPUTS
- You're eating a sandwich and you bite into something unexpectedly crunchy...
 - INPUTS:
 - OUTPUTS:

Systems Behave

- Feedback
 - Feedback occurs when the output of the system becomes an input, leading to further changes.
 - Feedback allows systems to approach equilibrium.
- Joe pushes a button on the wall and gets a \$100.
- William gets sick every time he eats a burrito.
 - Can you think of any other examples?

Positive Feedback

- “Vicious Cycle”
- A small forest fire dries the wood around it and begins to grow. The larger the fire becomes, the more adjacent wood it dries. The more wood it dries, the larger the fire becomes.
- Positive Feedback is DESTABILIZING. (out of whack)

How?



If Polar Ice is melting...

- Positive Feedback
 - As ice melts, less sunlight is REFLECTED (more is absorbed by the ocean water), resulting in increased water temperatures and more melting ice.



Negative Feedback

- Staying out in the mid-day sun results in a severe sunburn. Next time, you limit your exposure to the mid-day sun.
- Negative Feedback is STABILIZING.
- How?

