I. Introduction to Diversity

What is diversity

Is life on earth diverse?

Where do we find life?

Why is our planet so hospitable for life?

How many species are there?

Known species

Probably species

Centers of Greatest Diversity

Kingdoms of Life

II. Extinction and the Fossil Record

What is extinction?

How many species have ever existed

Rate of Extinctions

Normal rate

Mass Extinctions
III. Loss of biodiversity

Conditions today favor diversity

Rate of Extinctions today

Current Mass Extinction

Causes of Extinction

Natural

Human Causes

Why should we Care?

Major Human Causes of Extinctions

Hunting/Harvesting

Bioinvasions

Air (other than climate change), Water & Land Pollution

Climate Change

Habitat Destruction

III. What is Science?

Science compared to other ways of obtaining knowledge
Assumptions of Science

- Follows Natural Laws
- Must be Falsifiable
- Self Correcting

Definitions:

- Hypothesis vs Theory

- Prove vs Disprove

IV. Taxonomy & Classification

- Common vs Scientific name

- History of Classification

- Linnaeus’ system of classification

  - binomial name

  - hierarchical categories

  - what is a species

V. What is Life/Defining Life

- Properties of Life

  - hierarchical complexity
unique & complex chemical structure

compartments/boundaries

prokaryote vs eukaryote cells

genetic program of DNA & RNA

metabolism

matter

energy

autotrophs vs heterotrophs

reproduction

asexual vs sexual

development & growth

environmental interactions
adaptation & evolution

VI. Introduction to Ecology

biosphere vs ecosystem

ecosystem structure

abiotic portion

biotic portion

examples of ecosystem functions

biogeochemical cycles

food chains & food webs

productivity

symbioses

diversity & stability

kinds of ecosystems
marine ecosystems

freshwater ecosystems

terrestrial ecosystems

VII. Introduction to Evolution & Natural Selection

history of the idea of change through time

Darwin and Evolution by Natural Selection

struggle for survival

natural variations within a population

“struggle for existence”/”survival of the fittest”

major lines of evidence

fossil record

intermediate forms
VIII. The Origin of Life

Probability: what are the chances?

Major “steps” for the origin of life

suitable environment

formation of basic building blocks

metabolism and formation of large polymers

compartmentalization/ cells

operating instructions

Characteristics of the first cells
Where did life begin?

IX. History of Life on Earth – Major Events

Photosynthesis

Aerobic Respiration

Origin of Eukaryotes

Origin of Multicellular Life

Timespans

What is life?