Study Guide

Introduction to AP Biology: The 4 Big Ideas

Campbell Biology in Focus: Chapters 1.1-1.3

**Chapter Main Ideas:**

All living things inherit DNA, which produce cellular products

Ecosystems involve the interaction of energy and different species

All living things require energy

All current species on Earth were derived from ancestral species

Natural Selection is the process in which species evolve

Science is based on inquiry, data collection, and forming conclusions

**Key Vocabulary:** Define or state within your Cornell notes (citing examples or pages from the textbook, or finding examples outside of the text).

-Evolution (broadly)

-Biosphere

-Ecosystem

-Communities

-Populations

-Organism

-Organs/Organ Systems

-Tissues

-Cells/Organelles

-Eukaryotic and Prokaryotic Cells

-DNA

-Genes and inheritance in humans

-Gene expression (find an example)

-Genomes

-Consumers and producers

-Energy transformations (i.e. thermal-chemical)

-Organism Interactions (see page 7 and consider examples)

-Bacteria/Archaea/Eukarya

*-Origin of Species* and its 2 main points

-Process of radiation and specialization

-Qualitative and Quantitative Data

-Inductive reasoning

-Hypothesis

-Deductive Reasoning

-Controlled Experiment

**Important Figures** (Explain and link to learning targets in Cornell Notes)

**Figure 1.3** (concisely link the different levels of organization together)

**Figure 1.4** (find another biological example to further your understanding, consider evolution)

**Figure 1.9** (Consider how energy is transformed and used throughout an ecosystem)

**Figure 1.15 and 1.16** (Link together to think about how an ecosystem and different species drive evolution of different species).

**Figure 1.19** (link to evolution and radiation of populations of one species, or closely related species).

**Conceptual Understandings** (Can you use the information from the text to do these things?)

1. I can describe the relationship and hierarchy of living things (**fig 1.3).**
2. I can explain how genes are inherited from parents to offspring (**page 5)**.
3. I can describe how energy is transformed and flows through an ecosystem (**fig 1.9**).
4. I can describe how form and function are related to species and evolution (**fig 1.4, 1.14, 1.16**).
5. I can describe the process of science, including deductive and inductive reasoning, hypotheses, and types of data (**Concept 1.3)**.
6. I can interpret data, observations, and conclusions of research and apply them to broad ideas in biology (**inductive reasoning, fig 1.19).**

**Big Ideas and Enduring Understandings** (These are the specific learning targets of the 4 big themes in AP Biology that are discussed in the chapter). These Big Ideas and Enduring Understandings will guide our learning throughout each unit, and allow you to make connections between different units.

* Big Idea #1: The process of evolution drives the diversity and unity of life.
  + **LT 1.A.1:** Natural selection is a major mechanism of evolution
* Big Idea #2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.
  + **LT 2.A.2:** Organisms capture and store free energy for use in biological processes.
* Big Idea #3: Living systems store, retrieve, and respond to information essential to life processes.
  + **LT 3.A.3**: The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parents to offspring.