ADVANCED BIOLOGY: INTRODUCTION-EVOLUTION AND THE FOUNDATIONS OF BIOLOGY

(USE CHAPTER 1 AS A FURTHER RESOURCE)

Read the overview

COMMON THEMES OF BIOLOGY

Theme: New Properties emerge at each level in biological hierarchy

1. Emergent properties
2. Structure and Function
3. The Cell: An Organism’s Basic Unit of Structure and Function
4. Eukaryotic Cell
5. Prokaryotic Cell

Theme: Life’s Processes Involve the Expression and transmission of Genetic Information

1. DNA Structure and Function
2. Genes
3. Structure
4. Function
5. Gene Expression
6. Genomics: Large Scale Analysis of DNA sequences
7. Genome
8. Genomics
9. Bioinformatics

Theme: Life Requires the Transfer and Transformation of Energy and Matter

1. Energy Flow
2. Chemical Cycling



Theme: Organisms Interact with Other Organisms and the Physical Environment

See Figure 1.4

THE CORE THEME: EVOLUTION ACCOUNTS FOR THE UNIT AND DIVERSITY OF LIFE

Classifying the Diversity of Life: The Three Domains of Life

1. Bacteria
2. Archaea
3. Eukarya
4. Unity in the Diversity of Life

Charles Darwin and the Theory of Natural Selection

1.

2.

3.

4. Natural Selection

The Tree of Life

1. Example: Mammalian forelimb
2. Descent with modification: Darwin’s finches (See figure 1.22)

BIOLOGICAL INQUIRY ENTAILS FORMING AND TESTING HYPOTHESES BASED ON OBSERVATIONS OF NATURE

Science and Inquiry

Making Observations

1. Data
2. Inductive Reasoning

Forming and Testing Hypotheses

1. Deductive Reasoning
2. Example: Dead flashlight
3. Experimental Controls

Theories in Science

1.

2.

3.