

Welcome to AP Biology/Gemini Bio 121!

In order to be prepared for the rigors of AP Biology, you will need to read the first two chapters of the text *Campbell Biology, AP Edition 11th edition* by Urry, Cain, Wasserman, Minorsky, and Reece. You will be assessed on the objectives and vocabulary terms listed on this sheet on the second day of class.

Chapter 1: Evolution, the Themes of Biology, and Scientific Inquiry

- Know levels and examples of biological organization (Figure 1.3)
- Unifying themes of biology
- Importance of *reductionism* to the study of biology
- Emergent properties with examples
- Systems biology
- Importance of relating structure to function in biological studies
- Eukaryotic vs prokaryotic cells (Figure 1.4)
- Importance of DNA as genetic material (Figures 1.5, 1.6, 1.7)
- Gene expression (Figures 1.8)
- Genome and Genomics
- Proteome and Proteomics
- Bioinformatics
- Energy flow and Chemical cycling (Figure 1.9)
- Producers and consumers
- Feedback regulation (Figure 1.10)
- Positive feedback
- Negative feedback
- Organism's interactions with other organisms and the physical environment (Figure 1.11)
- Climate change (Figure 1.12)
- Evolution accounts for the unity and diversity of life
- Three domains of life (Figure 1.13)
- Unity in the diversity of life (Figure 1.14 and 1.15)
- Charles Darwin and the Theory of Natural Selection (Figure 1.16 and 1.17)
- Natural selection (Figure 1.18)
- Evolutionary adaptations (Figure 1.19)
- The Tree of life (Figure 1.20)
- Relationship between science and inquiry

- Exploration and observations
- Data
- Inductive reasoning (See Figure 1.22)
- Hypothesis
- Experiment
- Deductive reasoning
- Flexibility of the scientific process (Figure 1.23)
- *A Case Study in Scientific Inquiry: Investigating Coat Coloration in Mouse Populations* (Figure 1.24 and 1.25)
- Controlled experimental design
- Independent variable
- Dependent variable
- Importance of a control group
- Scientific theory
- Quantitative vs Qualitative studies
- Cooperation in science
- Model organisms
- Science, Technology, and Society
- DNA technology and forensics (Figure 1.26)

Chapter 2: The Chemical Content of Life

- Elements in the human body (Table 2.1)
- Matter
- Elements
- Compounds
- Essential elements
- Trace elements
- *Case Study: Evolution of Tolerance to Toxic Elements* (Figure 2.3)
- Atomic structure
- Subatomic particles: protons, neutrons, electrons
- Atomic number vs Mass number
- Atomic mass
- Isotopes
- Radioactive isotope (Figure 2.5)
- Radioactive tracers
- Radiometric dating and half-life
- Energy
- Potential energy

- Valence electrons
- Chemical bonds
- Covalent bond (Figure 2.10)
- Single covalent bond
- Double covalent bond
- Valence
- Electronegativity
- Polar covalent bond (Figure 2.11)
- Nonpolar covalent bond
- Ionic bond (Figure 2.12)
- Ion
- Cation
- Anion
- Ionic compounds or salts (Figure 2.13)
- Hydrogen bond (Figure 2.14)
- van der Waals interactions
- Molecular mimics Natural endorphin vs morphine(Figure 2.16)
- Chemical reactions
- Reactants vs products
- Chemical equilibrium