APES Unit 2 Exam: Common Study Guide
Basic Chemistry and Energy Concepts

You should know the following topics thoroughly. Be able to describe, explain, and/or give examples.

Chapter 4:

- Radioactive Decay
  - What it is? What is half-life?
  - Solve radioactive decay problems
- Properties of Water – Why is water a unique substance (Page 94)
- Macromolecules – Proteins, Nucleic Acids, Carbohydrates, Lipids (Pages 96-98)
- First Law of Thermodynamics
- Second Law of Thermodynamics
- Photosynthesis and Respiration
  - General Processes
  - Know the approximate efficiency (in %) of the conversion of light energy to chemical energy in photosynthesis.
- Energy vs. Power
  - Solve math problems using dimensional analysis
  - Power = Energy/Time
  - Incandescent Light Bulbs – 95% of electrical energy is converted to heat (only 5% to light).

Chapter 7:

- Positive vs. Negative Feedback Loops
- Dead Zones and Eutrophication
- Gross vs. Net Primary Production
  - Net Primary Production = Gross Primary Production – Respiration
- Limiting Factors – Phosphorus and Nitrogen
- Biogeochemical Cycles
  - Flux, Sources, Sinks
  - Know the largest reservoirs for each cycle
- Carbon Cycle
- Phosphorus Cycle
- Nitrogen Cycle
  - Nitrogen Fixation
  - Nitrification
  - Denitrification
  - Ammonification
  - Assimilation
- Hydrologic Cycle (Water Cycle)
  - Evaporation
  - Infiltration (Percolation)
  - Transpiration
  - Precipitation
  - Run-off
  - Aquifer (groundwater)

NOTE: YOU <u>MAY NOT</u> USE A CALCULATOR FOR THE MATH PROBLEMS ON THE TEST!