HONORS BIOLOGY: FINAL EXAM REVIEW

BIOCHEMISTRY/PHOTOSYNTHESIS/CELLULAR RESPIRATION

- **Know the four basic organic molecules and be able to identify examples**
- **Know the function of enzymes**
- **Know the different types of transport and which is active and passive**
- **Know isotonic, hypotonic, hypertonic solutions**
- **Know the differences between a prokaryotic and eukaryotic cell**
- **Know the goal, basic steps, and products of cellular respiration**
  - **glycolysis**
  - **Kreb's Cycle**
  - **Relationship between photosynthesis and cellular respiration**
  - **the difference between aerobic and anaerobic respiration**
- **Know the goal, steps, and the products (and their sources) of photosynthesis**
  - **Why plants are green!**
  - **Light reactions (parts of a photosystem)**
  - **Calvin Cycle**
  - **Photosystem I and II and destinations for their electrons**
  - **Products/reactants**

CELL CYCLE/CHROMOSOMES/MITOSIS

- **Know the phases and events of the cell cycle**
  - **G1, S, G2, M, C**
- **Know the structure of a chromosome**
- **Know the order and main events of all mitotic phases**

DNA STRUCTURE & REPLICATION

- **Know the basic structure of DNA and RNA, especially the differences between them**
  - **Number of strands, sugar, bases**
  - **Base-pairing rules**
- **Know the goal and basic process of DNA replication**
  - **Template, semiconservative model**
  - **Major enzymes involved and their functions**
    - **DNA helicase**
    - **primase**
    - **DNA polymerase**
    - **DNA ligase**
    - **DNA mutations**
    - **bacteriophages**

PROTEIN SYNTHESIS

- **Know the types of RNA and their functions**
  - **mRNA, tRNA, rRNA**
- **Know the definitions of codon and anticodon**
- **Know the goal and basic process of transcription (DNA → RNA)**
- **Know the goal and basic process of translation (RNA → protein)**
- **Promoters**
- **RNA processing**

MEIOSIS

- **Know the goal and phases of meiosis**
  - **Difference between diploid and haploid cells**
  - **Matching with phases of meiosis I and II**
- **Know the differences between mitosis and meiosis**
- **Know when crossing-over occurs and what its result is**

MENDELIAN GENETICS

- **Know the terminology of genetics – dominant, recessive, heterozygous, homozygous, genotype, phenotype**
- **Know how to perform and analyze Punnett squares as well as genotype and phenotype ratios for important crosses**

HUMAN GENETICS

- **Know the types of inheritance that do NOT follow Mendel's rules**
  - **Incomplete dominance**
  - **Multiple alleles (blood-type crosses)**
  - **Sex-linked traits (be able to perform crosses and analyze them)**

EVOLUTION

- **Know the types of evidence for evolution**
- **Know Darwin's theory of natural selection**

ECOLOGY

- **Species Interaction**
  Ex: competition, predation, mutualism, parasitism, commensalism
- **Carrying Capacity**
- **Growth curves**
- **Limiting factors on populations (why do populations not experience exponential growth forever?)**
- **Ecosystems**