**Study Guide Unit 4 Exam AP Biology**

**Campbell’s Chapters 13-15**

* Be able to relate the terms: homologous chromosomes, sister chromatids and tetrad
* Know what karyotypes are and how they are used
* Be able to use a karyotype to identify a chromosomal abnormality (Down’s, Klinefelters, XXX, XYY, Turners)
* Understand diploid vs. haploid and be able to determine chromosome number of an organism if given either the haploid or diploid number
  + Ex. n=16, 2n=?
* Know how many autosomes and sex chromosomes are found in typical human somatic and germ (gamete) cells
* Know the sex chromosomes of a human female and of a human male
* Be able to classify somatic and gamete cells as either haploid or diploid
* Be able to describe the life cycle of animals, plants and algae in terms of haploid/diploid alternation in generations
* Know the following terms: sporophyte, spores and gametophyte
* Understand the role of meiosis (*think about the products*)
* Know what crossing over is and when it occurs. Be able to use the following terms in your explanation: homologous chromosomes, chiasmata, synapsis and tetrads
* Be able to identify/describe the different phases of meiosis I and meiosis II
* Know what role crossing over, random fertilization and independent assortment play in meiosis and sexual reproduction
* Know what nondisjunction is an be able to predict its effects at a given stage in meiosis
* Be able to complete monohybrid, incomplete dominance, codominance, sex-linked and multiple allele punnett squares and analyze the offspring/progeny in terms of genotype (homozygous vs. heterozygous) and phenotype
* Be able to determine whether a trait is dominant or recessive based on the phenotypes of the parents and offspring
* Know what a testcross is and why it is used
* Know the difference between true-breeding and hybrid
* Understand the following terms: pleiotropy, epistasis, incomplete dominance, codominance, multiple alleles and polygenic inheritance
* Know what information a recombination frequency provides
* Be able to estimate using a gene map which genes would have the highest recombination frequency *(This would be based on distance from one another)*
* Understand the pattern of inheritance for sex-linked traits
* Know what Barr bodies and gene inactivation are and how they affect the expression of traits in females
* Be able differentiate between the following terms: aneuploidy, monosomy, trisomy, polyploidy, triploidy and tetraploidy
* Know what genomic imprinting is and what implications it has on normal development
* Be able to relate the processes of sexual and asexual reproduction including advantages and disadvantages
* Be able to provide examples of organisms that reproduce sexually and asexually
* Be able to relate the processes of mitosis and meiosis to sexual and asexual reproduction appropriately

***Test Format:***

* 35 Multiple Choice Questions
* 1 FRQ (Free-Response Question)