AP Biology Unit 6 –Genetics **GENERAL CONCEPTS**	
CH 10 Meiosis	Vocabulary: Heredity, variation, genetics, genes, gametes, somatic cells, locus, compare sexual and asexual reproduction, clone
	Animal/human life cycle (plants / fungi life cycles not included–no alternation of generation or sporophyte or gametophyte) Somatic cell vs gamete, What is a karyotype? How is a karyotype prepared? Vocab: homologous chromosomes, sister chromatids, nonsister chromatids, centromere, sex chromosomes vs autosomes, diploid vs haploid (cell types), fertilization, zygote, how to accurately count chromosomes in a cell (duplicated vs not-duplicated chromosomes)
	Meiosis – purpose; location; compare/contrast meiosis I and meiosis II, which is most similar to mitosis? Does meiosis I or II reduce the chromosome number by half? How is anaphase I different from anaphase II? Metaphase I from II? When does cross over take place? Independent assortment? Segregation? Role of cohesion protein
	Name three sources of variation arising from sexual reproduction What are recombinant chromosomes? If a chromosome with alleles ABCDE crosses over once with homologous chromosome abcde at the position between the first and second genes, what will the new order of alleles be on each chromosome?
	Compare/contrast mitosis and meiosis - # of divisions, parent vs. daughter cells, role in body, amount of DNA per cell after each division, number of chromosomes
Ch 11 Mendel and the Gene Idea	Blending hypothesis vs particulate inheritance Why garden peas? How are peas cross pollinated? Pea characteristics and traits Mendel studied Do plants do meiosis? Character vs trait, true-breeding, hybridization, genotype, phenotype, P/F1/F2 generation, allele, diploid, dominant allele, recessive allele, homozygous, heterozygous, what is a test cross? What does a test cross reveal?
	Mendel's Laws of Segregation and Independent Assortment… how are these related to the stages of meiosis?
	Punnett square, use the laws of probability multiplication and addition, Predicted phenotype and genotype ratios for a monohybrid cross, predicted phenotype ratios for a dihybrid cross. Predict the genotype and phenotype ratios of a cross following a trait that is co-dominant, incompletely dominant, sex linked –Ch 12)
	Frequency of dominant alleles. Give an example of incomplete dominance, codominance, multiple alleles, polygenic inheritance, carriers, pleiotropy, epistasis, multifactoral characters
	Analyzing a pedigree, determining pattern of inheritance, how blood typing is done, universal donor and recipient blood groups, genetic testing –amniocentesis vs chorionic villus sampling, newborn screening
	Human genetic disorders – CF, Tay-Sachs, polydactyl, sickle cell disease, Huntington's, Duchenne muscular dystrophy, hemophilia, PKU, dwarfism, genetic counseling
	Test your Understanding p226-227 Pracyice Problems
Ch 12 Chromosomal Basis of Inheritance	Why fruit flies? What is wild type?
	What is the Chi Square test for? How is it done (5 steps) and calculated? How are expected values determined? When are two/three/four categories used?
	Inheritance of Sex-linked traits –examples, barr body
	Linked genes and recombination frequency, parental vs recombinant offspring, linkage map, map units and recombination frequency, recombination frequency for linked and unlinked genes
	Genetic disorders due to altered chromosome number or structure -nondisjunction, aneuploidy; polyploidy, deletion, duplication, inversion, translocation, analyzing karyotypes, Down syndrome, Klinefelter syndrome, Turner syndrome, cri du chat, CML
	Inheritance of organelle genes

Lab work	Ch 13.4 PCR – purpose; function of each of the components involved; importance of Taq polymerase; what the thermal cycler does; role of Chelex/matrix beads(InstaGene)–when OK /not OK, end product; applications; compare/contrast with in vivo DNA replication PCR animations: https://www.dnalc.org/resources/animations/pcr.html https://www.dnalc.org/view/15475-The-cycles-of-the-polymerase-chain-reaction-PCR-3D-animation.html DNA sequencing how and why is it done? p265 animation: https://www.dnalc.org/view/15912-Sequencing-DNA.html
	Micropipetting – choosing, setting, and using a P20, P200, P1000, centrifuge short vs long spin
	Gel electrophoresis – function of loading dye, TAE buffer, agarose, how different sizes of DNA travel, size standards, how DNA is viewed, gel errors → analyzing problems What types of genetic variations can be identified with gel electrophoresis
	Alu – how was DNA isolated; purpose of PCR; what do final gels tell you?
	Fruit fly lab, *Drosophila melanogaster,* life cycle, how to immobilize, wild type, male vs female, varieties/ mutations, P, F1, F2 data collection, analyze data, assign allele symbols for Punnett squares, perform a chi square test for a data set
Ch 36.4 Human Reproduction	P736-737 How does meiosis differ in males and females?
Ch 18.1-18.4 Genomes	What is bioinformatics? What is the Human Genome Project? Proteomics? Describe how genomes vary in size, number of genes, and gene density. Describe the types of DNA sequences in the human genome (18.4) Transposable elements, Alu
Ch 16.1 Different Cell Types **Ch 16.2 Cloning and stem cells**	cell differentiation, morphogenesis, Cytoplasmic determinants, induction, determination, apoptosis, pattern formation, positional information, drosophila life cycle and development Figure 16.7, body axes, homeotic genes, head, thorax, abdomen, embryonic lethals, maternal effect genes, egg polarity genes, morphogens, bicoid. Totipotent –plant vs animal experiments Cloning mammals Stem cells of animals, pluripotent