AP Bio Unit 5 Cheat Sheet

by abrilolz via cheatography.com/203061/cs/43193/

5.1 Meiosis

Meiosis - a type of cell division that results in four daughter cells each with half the number of chromosomes of the parent cell. During the process of meiosis, each sex cell only contains n amounts of chromosomes, so that the resulting gamete would be 2n, or a *diploid* cell. Meiosis consists of two steps: Meiosis I and Meiosis II.

Meiosis I *Prophase I* - the first phase in meiosis I where chromosomes condense, homologous chromosomes pair up to form tetrads, and crossing over occurs. *Metaphase I* - homologous (pairs of mother and father chromosomes) align at the equator of the cell. *Anaphase I* - homologous chromosomes seperate and move towards opposite poles of the cell. *Telophase I* - divided genetic material gathers at both poles forming two new cells.

Meiosis II *Prophase II* - chromosomes condense and become visible while spindle fibers form and attach to these chromosomes. *Metaphase II* - chromosomes align at the equator of the cell before they are pulled apart. *Anaphase II* - the sister chromatids, now individual chromosomes, separate and move towards opposite poles of the cell. *Telophase II* - the final phase in meiosis where nuclear membranes form around each set of chromosomes, which decondense back into chromatin. The cytoplasm then divides resulting in four haploid daughter cells.

5.2 Meiosis and Genetic Diversity

Crossing over - a process that occurs during meiosis where two chromosomes pair up and exchange segments of their genetic material.

Independent Assortment - a principle stating that genes for different traits can segregate independently during the formation of gametes.

Random Fertilization - each sperm and egg combination is unique due to independent assortment and crossing over during meiosis

Nondisjunction - occurs when chromosomes fail to separate properly during meiosis, resulting in gametes with an abnormal number of chromosomes.

5.3 Mendelian Genetics

Gregor Mendel - 19th century scientist and Augustan friar who is best known for his experiments with pea plants that laid the foundation for the source of genetics.

Law of Segregation - states that the two alleles from each parent are segregated during gamete formation. each gamete gets only one of the two copies of the gene.

5.3 Mendelian Genetics (cont)

Law of Independent Assortment - states that the two alleles get split up without regard to how other alleles get split up.

Punnet Squares - a diagram used by biologists to predict the outcome of a genetic cross. shows all possible combinations of alleles that can result from a genetic cross.

Sex-linked traits - genes that are located on the sex chromosomes (X and Y in humans). their expression can result in traits that differ between sexes.

5.4 Non-Mendelian Genetics

Multiple alleles - occur when there are three or more variations of a particular gene present within a population.

Incomplete dominance - a form of intermediate inheritance in which one allele for a specific trait is not completely expressed over its paired allele. this results in a third phenotype, where the expressed physical trait is a combination of the phenotypes of both alleles.

Co-dominance - both alleles are equally dominant (WW, RR)

5.5 Environmental Effects on Phenotype

Environmental conditions - all external factors influencing the life and development of an organism.

Selective pressure - an environmental factor that causes certain traits to be more or less advantageous, leading to changes in the frequency of those traits over generations.

Phenotypic plasticity - the ability of an organism to change its phenotype in response to changes in the environment.

5.6 Chromosomal Inheritance

Chromosomes are inherited from both parents following the rules of genetics. There is an equal chance that either version of a gene may be inherited in offspring due to the law of independent assortment. random fertilization allows for even more variation in that it is simply by chance that a certain egg and a certain sperm combine to form a zygote. Crossing over in the first stages of meiosis leads to number of different chromosomal combinations that increase the amount of variety in a population.

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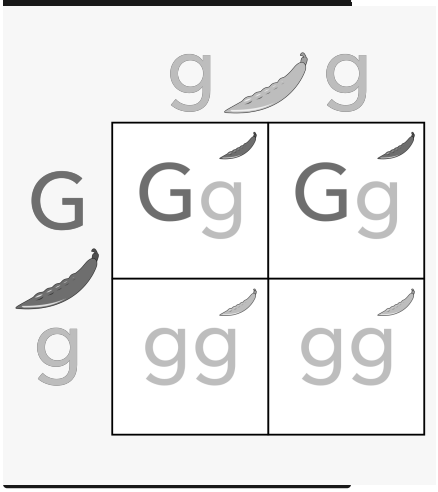
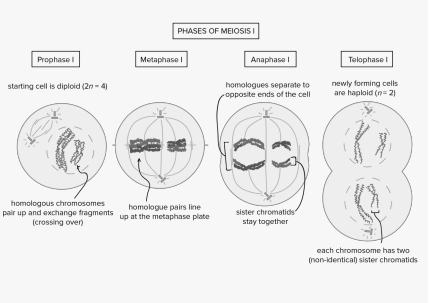
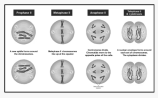
Punnet Square



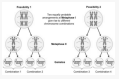
Meiosis I



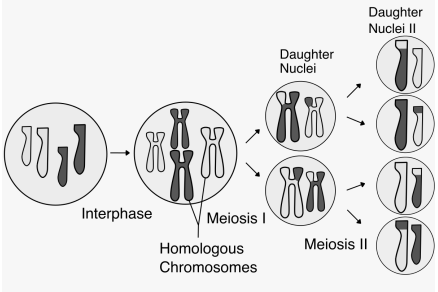
Meiosis II



Independent Assortment



Meiosis



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