Unit 1: Genetics Vocabulary List

Allele: Alternative forms of a trait (For example: Hair color can be brown, blonde, red or black).

Anaphase: The third stage of mitosis or meiosis, during which sister chromatids (mitosis or meiosis II) or chromosome pairs (meiosis I) are separated by the spindle fibers and are moved toward opposite poles of the cell.

Asexual reproduction: The type of reproduction in which offspring receive genetic material from one parent (clone).

Autosome: Non-sex chromosomes. Meaning chromosomes which do NOT affect the gender of the offspring.

Cell cycle: The sequence of events in a cell life span including growth, duplication of genetic material, and division. The cell cycle consists of interphase, mitosis, and cytokinesis.

Cell Differentiation: The process by which committed cells acquire the structures and functions of highly specialized cells.

Centromeres: A region of condensed chromosome which looks pinched and is where the two sister chromatids join. It is the point where spindle fibers attach to pull the chromatids apart during mitosis and meiosis.

Chromatid: One half of a duplicated chromosome. It is joined to its pair at a centromere. Sister chromatids are formed during interphase of cell division and then separate to become individual chromosomes.

Chromatin: A group of nucleic acids (DNA or RNA) coiled around proteins (histones) that compress together to form a chromosome during cell division.

Chromosome: One long continuous thread of coiled DNA and associated proteins that consists of numerous genes along with regulatory information. They are found in the nucleus of eukaryotic cells, or as a circular strand of DNA in the cytoplasm of prokaryotic cells.

Crossing Over: The exchange of genetic information from homologous chromosomes. It increases the genetic variability of the offspring.

Cytokinesis: The division of cytoplasm into two daughter cells during cell division, generally occurring during telophase:

Determination: Within a few weeks after fertilization, most stem cells become committed to develop into only one type of cell. These committed cells still retain all of the genetic material needed to build an entire organism. However, during determination, they lose the ability to express some of this information.

Diploid: A cell with two sets of chromosomes.

Dominant Trait: A trait which covers up another trait.

Egg (Ovum): The haploid sex cell for females.

Embryo: A group of cells which are developing into a complete organism prior to birth.

Exons: Regions of DNA which code for proteins.

Fetus: Unborn offspring from the end of the eighth week after conception to the moment of birth.

Gamete: A haploid cell that has half of the normal amount of chromosomes.

Gene: A segment of DNA which codes for proteins.

Genotype: The genetic representation of a trait (Bb).

Interphase: The longest phase of the cell cycle, occurring between cell division, where the cell undergoes growth and replication of its chromosomes and organelles. This phase is in the cell cycle (NOT mitosis).

Introns: Non-coding regions of DNA.

Haploid: A cell with one set of chromosomes.

Heterozygous: Traits given by both parents which are different.

Histones: A group of proteins in which DNA wraps around at regular intervals.

Homologous chromosomes: A pair of chromosomes in a diploid cell that have corresponding DNA sequences with one coming from each parent; also called homologues. These chromosomes have similar traits on them (hair color, eye color, etc.).

Homozygous: Traits given by both parents which are the same.

Karyotype: A complete set of chromosomes.

Meiosis: The process of cell reduction where one diploid cell will divide into 4 haploid cells. It produces gametes (sex cells – sperm or ovum)

Metaphase: The second stage of mitosis and meiosis, during which the chromosomes align along the equator of the cell.

Mitosis: A process where a eukaryotic cell divides to result in two somatic daughter cells, each containing the same number of chromosomes and genetic content as the original cell.

Nondisjunction: During the process of meiosis, chromosomes are dividing. If the chromosomes do not separate properly, the result may be that the haploid cell (gamete) may have more genetic information or less genetic information than is normal.

Phenotype: The outward appearance of a trait (Brown hair).

Prophase: The first stage of mitosis and meiosis, during which chromatin condenses to form chromosomes, the nuclear envelope disappears, and the spindle fibers begin to form.

Recessive Trait: A trait which is covered up by another trait.

Sex-linked trait: A trait (colorblindness for example) which is located on a sex chromosome.

Sexual reproduction: The type of reproduction in which genetic material is passed by two parents to an offspring.

Sister Chromatids: Two identical chromatids.

Sperm: The haploid sex cell for males.

Spindle fiber: A microtubule structure that controls chromosomes movement during mitosis and meiosis.

Stem Cells: Cells produced during the first few divisions of the zygote which have the potential to become any type of specialized cell in the body.

Telomeres: The ends of the DNA molecules which are made of repeating nucleotides that do not form genes.

Telophase: The fourth stage of mitosis and meiosis, during which chromosome separation is completed, chromosomes uncoil, the spindle fibers break down, and daughter nuclei form at the two poles of a cell. Cytokinesis usually begins during telophase.

Zygote: A fertilized egg which is formed from the union of an egg and sperm.