

Chapter 9: Mendelian Genetics

I. Gregor Mendel (1822-1884): Father of Genetics; he was an Austrian monk who studied pea plants. *The short monograph, Experiments with Plant Hybrids, in which Mendel described how traits were inherited, has become one of the most enduring and influential publications in the history of science.*

He looked at flower color (purple or white), flower position, stem length, seed shape (round or wrinkled), seed color, pod shape, and pod color. Quick review of structure of a flower (self pollination and cross pollination)

- **Principle of segregation:**

For any particular trait, the pair of alleles of each parent separate and only one allele is passed on to an offspring. (=one chromosome of each pair passed to offspring)

- **Principle of independent assortment:**

Different pairs of alleles are passed to offspring independently of each other. (= chromosome #1 and chromosome #22 are independent of each other)

II. Genetics Vocabulary words

Genotype: genetic make up

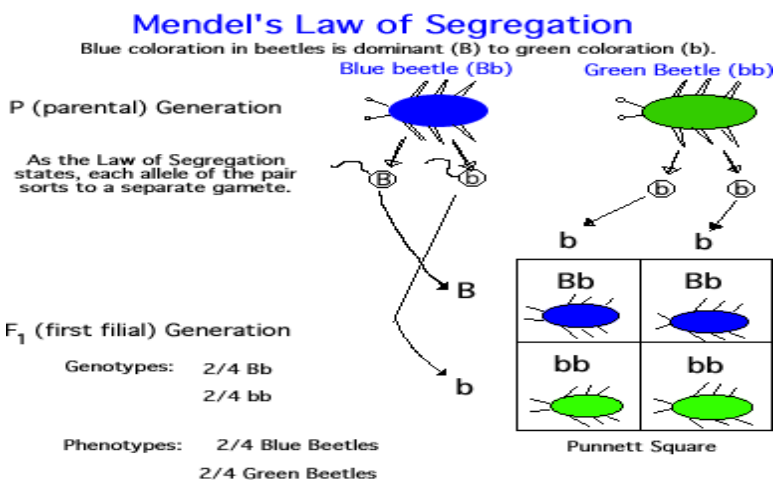
Phenotype: physical appearance

Heterozygous: Different pairs of allele (mixed, Aa)

Homozygous: Same pairs of allele (pure, AA or aa)

Allele: A type of gene (short or tall, for example)

A gene codes for a particular trait, and is represented by the alleles, A or a.



Dominant: allele that is fully expressed when carried by a pair of homologous chromosome. Example: Blue (B)

Recessive: allele that is not expressed in the presence of dominant allele but is expressed when both pairs of homologous chromosomes carried the allele.

Example: Green (b)

Monohybrid Cross: Crossing one trait

Dihybrid Cross: Crossing two traits (remember, principle of independent assortment)

Incomplete dominance: When two alleles are not dominant over the other but is expressed by an intermediate form. White x Red makes Pink.

Co-dominance: When both alleles are dominant and shows up (white and black makes checkered)

Sex-Linked: Allele is only on the X chromosome (ex: Hemophilia, color-blindness)

Multiple Allele: three or more allele forms of a gene (ex: blood type)

Polygenic Traits: trait determined by many genes (ex: eye color, skin color). Polygenic traits are not expressed as absolute or discrete characters, as was the case with Mendel's pea plant traits.