# Notes - Mendel & Punnett Squares

Gregor Mendel
- Austrian Monk and gardener in the 19th century
- Carefully controlled experiments on pea plants with good methods and good records
- His discoveries were unnoticed for over 50 years but now form our basic understanding of inheritance and the basic principles of genetics

Why Peas?
- easy to remove stamen & control pollination
- seven distinct traits, each with only two phenotypes
- each generation matures in about 90 days

Generations
P- parent generation- initial cross
$F_1$- first "filial" generation- result from initial P-cross
$F_2$- second "filial" generation- result from an $F_1$ x $F_1$ cross

Punnett Square- A grid that illustrates all of the parental alleles and the genotypes of the resulting crosses
1. make a key to the traits and alleles
2. write the cross
3. set up the Punnett Square using the law of segregation
4. perform the cross
5. give the predicted outcomes (genotype/phenotype ratios)

Ratios:
Genotypic Ratio- describes the possible genotypic results
Ex. 1:1 Homozygous dominant: Heterozygous or <50%/50%>
Phenotypic Ratio- describes the possible phenotypic results
Ex. 3 Tall: 1 Short or 75% Tall/25% Short

Mendel's Laws
1. The Law of Segregation- the genes separate when gametes form during meiosis
2. The Law of Dominance- one allele can control the trait and another can remain hidden
3. The Law of Independent Assortment- genes separate randomly and independently of other genes.