**Mendel and Genetics**

Gregor Mendel was an Austrian monk who lived in the 1800s. He was very interested in science. For most of his adult life he studied how certain traits were passed down in pea plants.

Gregor Mendel was able to conclude some key ideas about the inheritance of traits which underpin our understanding of genetics.

* Each organism possesses two copies of each gene. These two copies may be identical or different to each other.
* Different forms of the same gene are called **alleles**.
* Alleles may be dominant or recessive.
* A **Dominant** allele is very `powerful’ and is always expressed (causes the trait) if it is present. It can “mask” the presence of a recessive gene.
* A **recessive** allele is not `powerful’. It will only be expressed if no dominant allele is present – meaning the person has two recessive alleles to have the recessive trait.
* **Purebred** or **Homozygous** means an organism has two identical alleles (two dominant **or** two recessive).
* **Hybrid** or **Heterozygous** means an organism has two different alleles (1 dominant, 1 recessive).
* Genotype is a written trait of the two alleles present.
* Phenotype is the physical appearance of a trait.

**Example:**

Consider the human trait **Tongue Rolling**. The ability to roll your tongue is determined by a single gene. You have two copies of this gene – and two alleles of this gene are possible.

T = dominant allele = CAN roll tongue

t = recessive allele = CANNOT roll tongue

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| Phenotype | Genotype you could have | Description |
| Can roll tongue | **TT** | Homozygous (purebred) dominant |
| Can roll tongue | **Tt** | Heterozygous (hybrid) dominant |
| Can roll tongue | **tT** | Heterozygous (hybrid) dominant |
| Cannot roll tongue | **tt** | Homozygous (purebred) recessive |