

### Genetic Code

<b>Chromosomes</b>	structures made of DNA molecules that contain the genes.
<b>Genes</b>	sections of chromosomes/DNA that code for our characteristics
<b>Alleles</b>	alternatives forms of a gene
<b>Trait</b>	a genetically determined characteristic or condition
<b>Homologous Pair</b>	a pair of 2 chromosomes: 1 from the mother and 1 from the father
<b>Organism</b>	an individual animal, plant, or single-celled life form.
<b>Genotype</b>	the combination of alleles that an organism has
<b>Phenotypes</b>	the characteristic produced by the genotype
<b>Dominant Allele</b>	always expressed (shows the trait) if present (eg. B)
<b>Recessive Allele</b>	only expressed when the dominant allele is absent (eg. b)
<b>Homozygous</b>	having two identical alleles (eg. bb)
<b>Heterozygous</b>	having two different alleles (eg. Bb)

DNA carries the genetic information in a cell. A gene and an allele are both made of DNA. A gene is a length of DNA that codes for a particular characteristic, whereas an allele is the alternative form of a gene containing a different base sequence. A gene for a characteristic consists of two alleles.

### DNA Structure

<b>DNA</b>	genetic material stored in the nucleus of cells
<b>Nucleus</b>	contains the chromosomes
<b>DNA Structure</b>	double helix which consists of <b>nucleotide</b> subunits
See diagram of DNA structure here:	<a href="https://en.wikipedia.org/wiki/File:DNA-structure-and-bases.png">https://en.wikipedia.org/wiki/File:DNA-structure-and-bases.png</a>
<b>Complementary Base Pairing</b>	there are four bases, two pairs:
Adenine (A)	Thymine (T)
Guanine (G)	Cytosine (C)

Remember adenine pairs with thymine as 'Apples grow on Trees'.  
Remember guanine pairs with cytosine as 'Carrots grow in the Ground'.

### Variation

#### Why is variation important?

-Variation increases the chance of survival of a species if there is a change in the environmental pressure.

-Without variation in a species any sudden environmental change can mean that no individual has a phenotype that allows it to survive, causing the species to become extinct.

### Pure Breeding

An organism that always passes down certain phenotypic traits to its offspring of many generations. The organisms's parents and ancestors all belong to the same breed.

Pure bred genotypes are always homozygous.

genotype of parent 1: PP, genotype of parent 2: PP

### Pure Breeding (cont)

genotypic ratio of the offspring: 4PP, 0pp, 0Pp

phenotypic ratio of the offspring: 4purple, 0white

In pigs, curly tails are dominant. To work out if a curly-tailed pig is homozygous dominant or heterozygous for this trait, mate the curly-tailed pig with a straight-tailed pig. We know the straight-tailed pig's genotype is tt. If any offspring have straight tails we know the curly-tailed pig is heterozygous because they must be carrying the recessive allele for a recessive offspring to be produced. If no offspring have straight tails it is likely that the curly-tailed pig is TT.

### Meiosis

**Haploid** a cell that contains a single set of chromosomes.

**Meiosis** a type of cell division that produces 4 gametes (sex cells- sperm and egg) each with only half the number of chromosomes (23).

There are two main ways meiosis produces variation:

#### 1. Crossing Over

#### 2. Independent Assortment

These steps are important because they mix up allele combinations, causing variation.



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