Genetics - Summary Notes

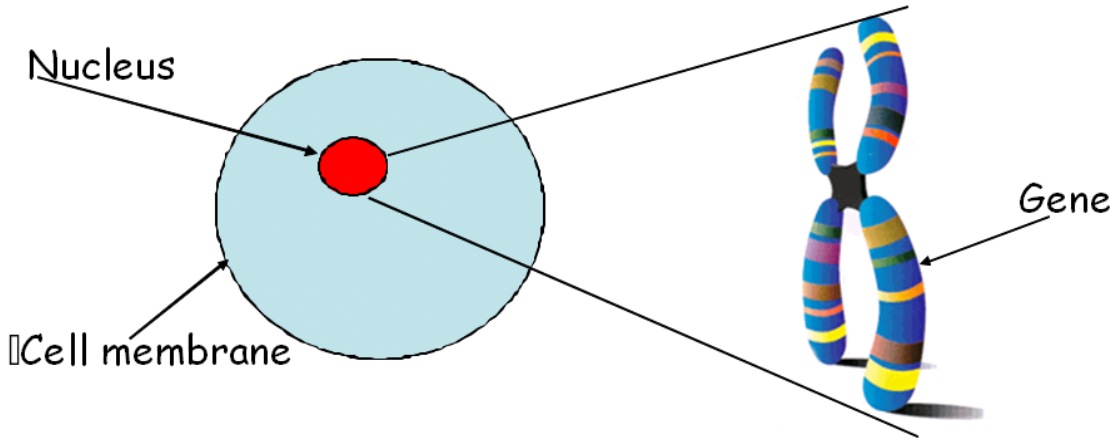
Biological keys are used as a tool to identify organisms based on variation (differences) in their characteristics. *NOTE – YOU NEED TO BE ABLE TO USE A BRANCHED KEY*

Variation is the scientific word used to describe the differences between organisms.

Features that show continuous variation fit into a range of possible measurements; examples include height, weight, hand span and arm length.

Characteristics that show discontinuous (discrete) variation can be classed into 2 or more distinct groups; examples include eye colour, hair colour, left or right handedness and blood groups

Living things contain lots of cells; chromosomes are structures found inside the cell nucleus. These are made of long strands of DNA. Sections of this DNA are called genes.



Humans contain special cells called sex cells (gametes). Females have eggs and males have sperm.

In all living things characteristics are passed on by the genes that offspring inherit from their parents.

The **phenotype** of an organism is the **physical appearance** which results from the genetic information inherited from parents (e.g. tongue roller or non-tongue roller).

The **genotype** of an organism is **the genes** that an offspring has **inherited** (e.g. 1 copy of the tongue roller and 1 copy of the non-roller gene)

A **dominant** gene is one that is expressed (shown) if there are 1 or 2 copies of the gene.

A **recessive** gene is one that is only expressed if there are 2 copies of the gene (the dominant gene is not present).

NOTE – YOU NEED TO BE ABLE TO USE PUNNET SQUARES!

Selective breeding is used to improve characteristics in certain species.

Selective breeding can be used to

(i) Increase yield (how much is produced)
(ii) Increase growth (size)
(iii) Increase resistance to disease

Stem cells are able to **self-renew** (copy themselves) and **differentiate** (specialise into different types of cell). This ensures that stem cells do not run out and that dead or damaged cells get replaced.

There are different kinds of stem cell:

1. **Tissue** stem cells which are in our bodies all our lives. These only make particular cell types.
2. **Embryonic** stem cells which are found in the early embryo. These can make all of the cells in the body.