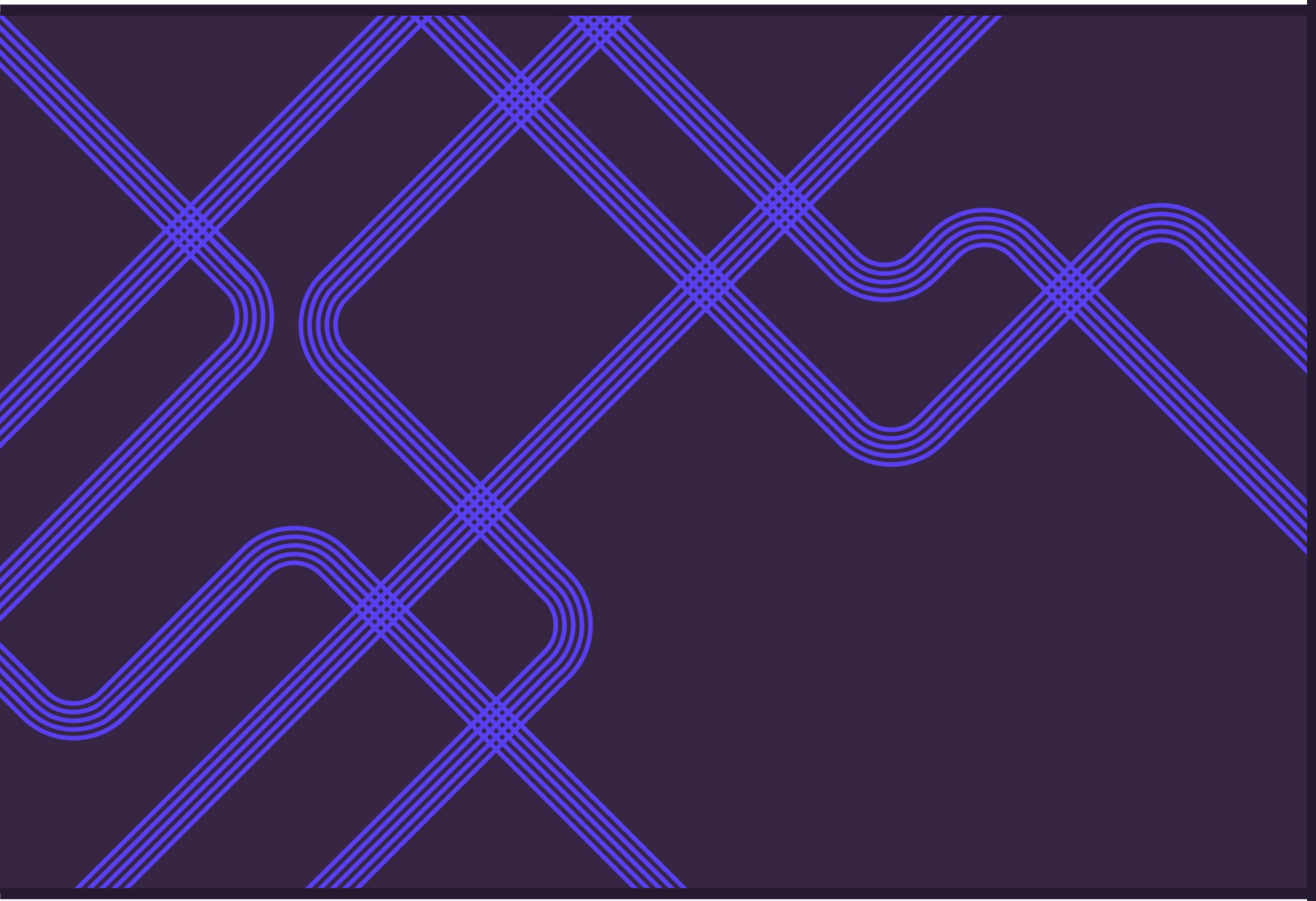


Fertilisation

Key Vocabulary

Genotype – The collection of alleles that determine an organisms characteristics (e.g. Bb, bb, BB

Phenotype – the physical manifestation of the genotype in someone's appearance (e.g. blue eyes)

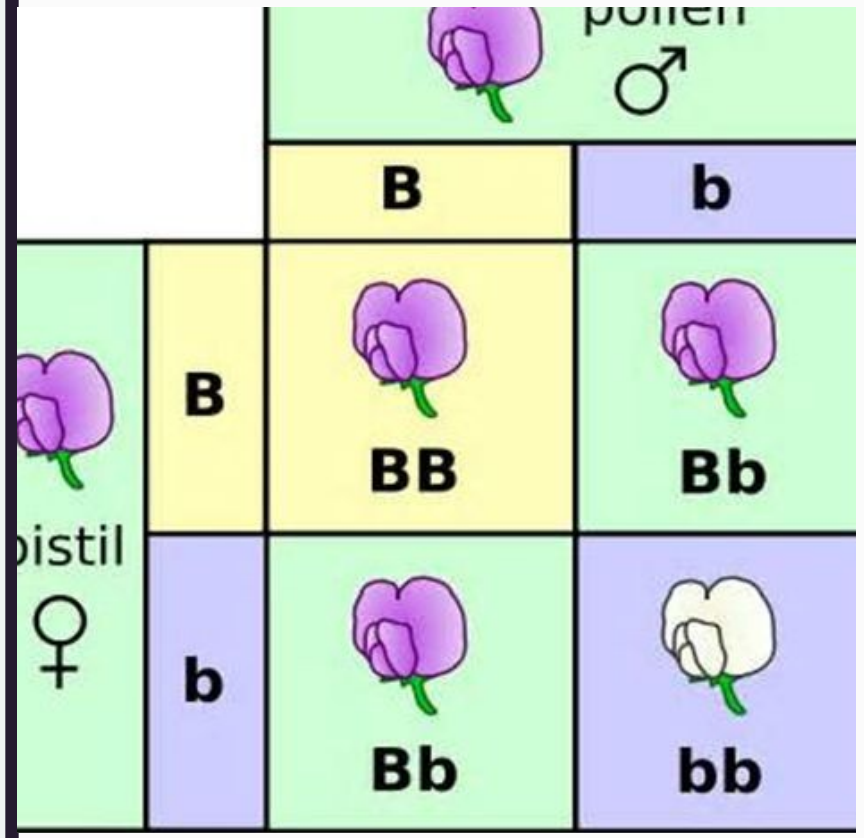
Dominant – only one dominant allele is required for it to be expressed

Recessive – two copies of the allele is required for it to be expressed

Homozygous – when an organism inherits two identical copies of an allele (e.g. bb, BB)

Heterozygous – when an organism inherits two different copies of an allele (e.g. Bb)

Genetic crosses



Purple flower is dominant, therefore the allele is represented as B

White flower is recessive therefore the allele is represented as b

Both of the parents (pollen and pistil) are heterozygous purple plants that carry the allele for white flowers, therefore are carriers.

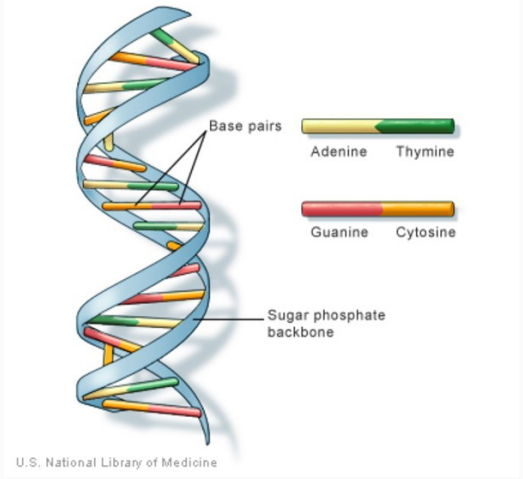
Genotype = Bb, bb, BB

Phenotype = Purple flower, white flower

75% of these plants offspring will be purple

Ratio of purple to white = 3:1

Structure of DNA



The shape of DNA is a double helix.

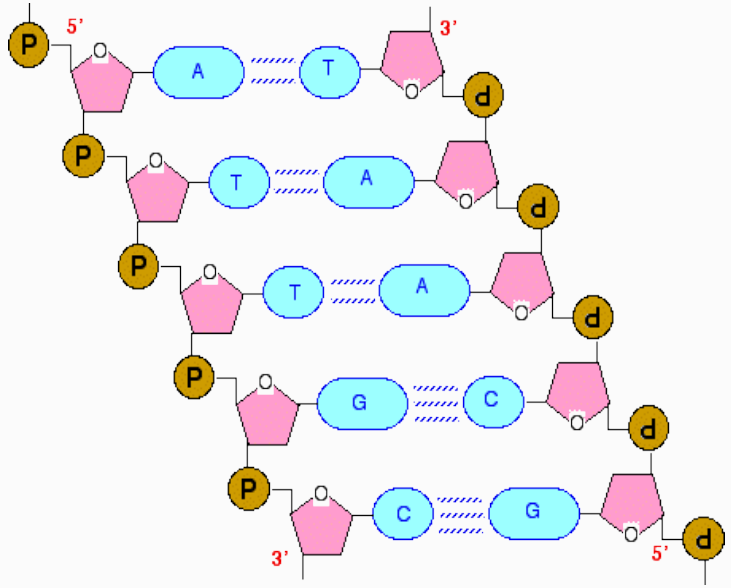
It is a polymer made up of nucleotides.

Nucleotides are made up of a phosphate group, a sugar molecule and a base

There are four bases known as: A (adenine),
C (cytosine),
G (guanine),
T (thymine

Complimentary strands: C always links to G
A always links to T

A pattern of three bases forms a Codon
One codon = one amino acid



Protein synthesis

Step 1 – DNA is copied as RNA, however RNA has the bases A, U, G, C.

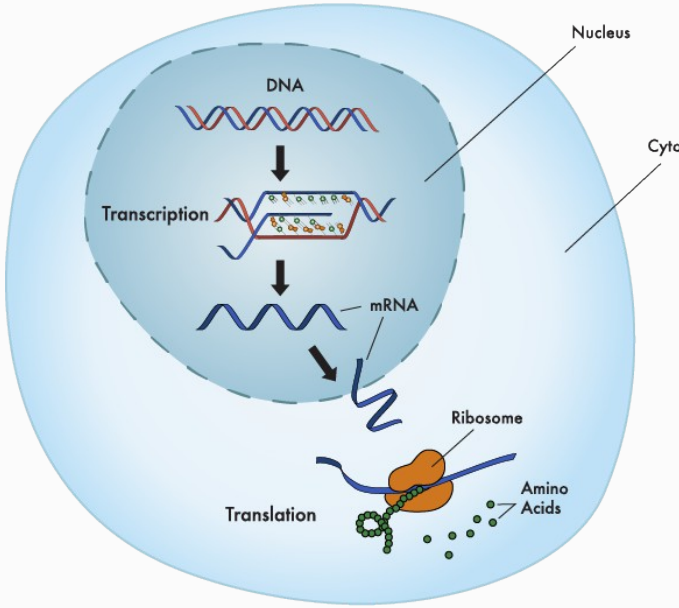
Step 2 – RNA leaves the nucleus and attaches to the ribosome in the cytoplasm

Step 3 – A carrier molecule brings specific amino acids to attach to codons (three bases) in the RNA

Step 4 – The ribosome moves along the RNA so the carrier molecule can keep bringing amino acids for each three bases.

Step 5 – The amino acids form a chain.

Step 6 – The amino acid chain can fold into a unique shape specialised to perform a function of an enzyme or antibody.



Embryo Screening

When embryos are screened they are checked medically for any signs of genetic conditions or disabilities that may reduce their quality of life when they're born. Embryos with said conditions can be destroyed.

Pros:

- The passing of genetic conditions is reduced
- Increases life chances
- Unused embryos could be used in research or donated to other people.

Cons:

- Ethical problems with destroying potential life
- People may exploit it to achieve the perfect "designer baby"
- Genetic modification

Meiosis

Step 1 – Interphase occurs, where the cell grows and internal structures are copied.

Step 2 – The chromosomes line up at the centre and are pulled to each end by spindle fibres.

Step 3 - The nucleus and cell membrane divides, producing two identical daughter cells.

Step 4 – The chromosomes in the daughter cells line up and split (they do not copy)

Step 5 – Four new cells are produced, each with half the chromosomes of the original daughter cell. These cells are gametes.