

Section 1a: Sexual and Asexual Reproduction

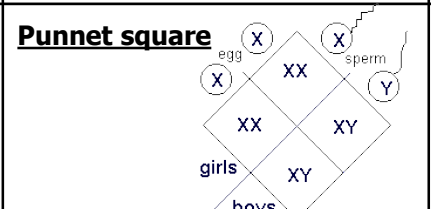
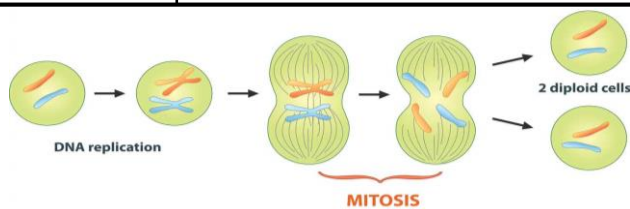
Sexual Reproduction	Reproduction involving the fusion of gametes .
Gamete	A sex cell that contains half the genetic information of a body cell. E.g. sperm and egg in animals, pollen and ovaries in plants.
Meiosis	The type of cell division that produces gametes . Four daughter cells are produced from one original cell. Each cell is genetically different. Each daughter cell has half the genetic information of a body cell.
Fertilisation	Fusion of gametes . Restores the full number of chromosomes.
Asexual Reproduction	Reproduction involving only one parent and no gametes . No mixing of genetic information so genetically identical clones are produced. Only mitosis is involved.
Mitosis	Cell division that produces two identical daughter cells with the full amount of chromosomes.

Section 1b: Mitosis and Meiosis

	Mitosis	Meiosis
Number of daughter cells produced	2	4
Variation in cells produced	Genetically identical to each other and parent cell	Different to each other and parent cell
Purpose	Growth, repair, asexual reproduction	Produce gametes for sexual reproduction
Number of chromosomes	Full amount (pairs of chromosomes)	Half (single chromosomes)

Section 1c: Advantages and Disadvantages of Different Types of Reproduction

	Advantages	Disadvantages
Sexual Reproduction	Produces variation . Offspring are more likely to survive changes to the environment and disease.	Requires a mate . Slower way of producing offspring.
Asexual Reproduction	Produce lots of offspring quickly . No mate needed. Time and energy efficient	Offspring are less likely to survive environmental changes or diseases.



Section 2: Genetics Key Terms

DNA	Genetic material . DNA is a polymer made up of two strands forming a double helix . The DNA makes up chromosomes.
Gene	A gene is a small section of DNA on a chromosome. Each gene codes for a particular sequence of amino acids , which make a protein .
Chromosome	A long coil of DNA . Found in the nucleus.
Genome	The entire genetic material of that organism .
Allele	Different versions of the same gene – dominant and recessive.
Dominant	A dominant allele is always expressed . Only one copy is needed.
Recessive	Only expressed if two copies are present .
Homozygous	Both alleles for a gene are the same (i.e. both are dominant or both are recessive).
Heterozygous	Both alleles for a gene are different (i.e. one is dominant, the other is recessive).
Genotype	The alleles present for a particular gene .
Phenotype	The physical feature expressed for a particular gene .
Single gene characteristics	Some characteristics are controlled by only one gene e.g. fur colour in mice, colour blindness in humans.
Multiple gene characteristics	Most characteristics are controlled by many genes e.g. height.

Section 3: Gender Inheritance

Human Chromosomes	Human body cells contain 23 pairs of chromosomes . 22 pairs control characteristics only, one pair controls sex .
Males	Males have two different chromosomes – XY .
Females	Females have two chromosomes that are the same – XX .

Section 4: Genetic Diseases

	Polydactyly	Cystic Fibrosis
Problem	Extra fingers and toes	Disorder of cell membranes. Causes sticky mucus on lungs.
Caused by...	Dominant allele	Recessive allele
Genotype of people with disease	PP or Pp	cc
Genotype of people without disease	pp	CC or Cc
Does the disease have carriers?	No	Yes – genotype Cc

KNOWLEDGE



Biology Topic B13 Reproduction (Separate)

ORGANISER

Section 5: Structure of DNA

DNA strands are **polymers** made up of lots of repeating units called **nucleotides**

Each nucleotide consists of one **sugar** molecule, one **phosphate** molecule and one **base**

The sugar and phosphate molecules in the nucleotides form a **backbone** to the DNA strands. The sugar and phosphate molecules alternate. One of four different bases — **A, T, C or G** — joins to each sugar

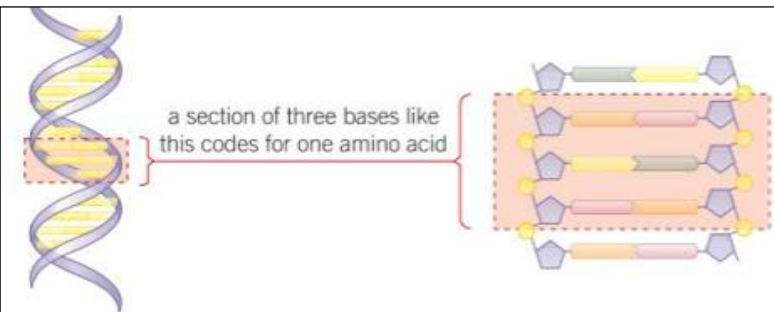
Each base links to a base on the opposite strand in the helix

A always pairs up with T, and C always pairs up with G. This is called **complimentary base pairing**.

It's the **order of bases** in a gene that decides the order of amino acids in a protein

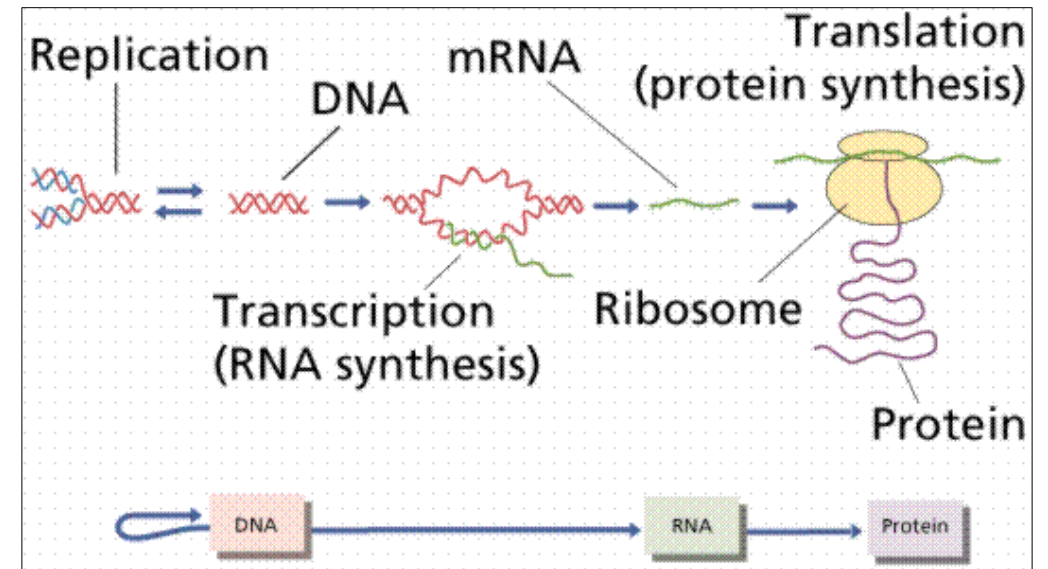
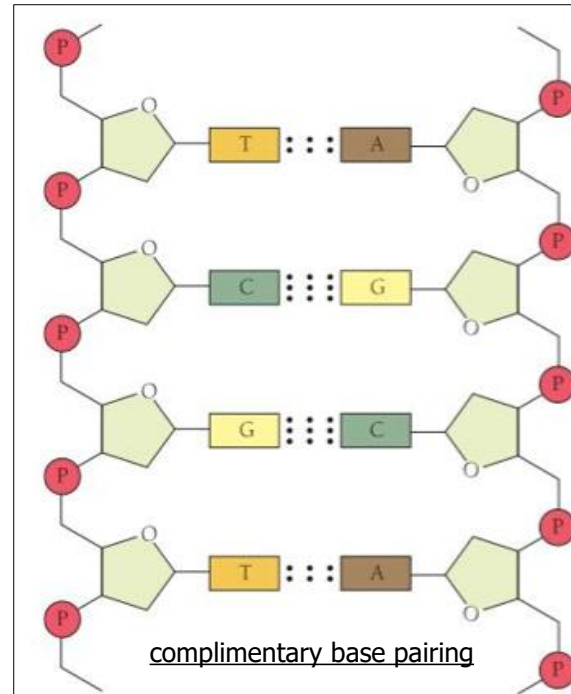
Each amino acid is **coded for** by a sequence of three bases in the gene

The amino acids are joined together to make various proteins, depending on the order of the gene's bases



Section 6: Protein synthesis

Proteins	Examples include enzymes, hormones, structural proteins like collagen
Transcription	The first part of the process of making a protein. It takes place inside the cell nucleus. Transcription involves copying the DNA
Translation	Takes place in the ribosomes that are found in the cytoplasm. This is where the messenger RNA is 'interpreted' and the new protein formed
mRNA	Messenger RNA
tRNA	Transfer RNA



Section 7: Mutations

A mutation	A random change in the DNA
Cause?	Exposure to certain substances/some radiation types
Types?	Insertions, deletions, substitutions

Section 8: Organisms reproducing both sexually and asexually

Malaria parasites reproduce sexually in mosquitoes and asexually in their human hosts
Many fungi reproduce asexually by spores but can also reproduce sexually to give variation
Many plants produce seeds sexually but also reproduce asexually e.g. by runners or bulb division