

4.1 – Genetic Information

Organisation of Genetic Information	Cells have a nucleus -> contains pairs of chromosomes -> made up of DNA which stores genetic information .
Chromosomes	Structures made up of long threads of DNA coiled up . Human body cells contain 46 chromosomes organised in 23 pairs .
DNA	Deoxyribonucleic acid . Molecule made up of two long strands arranged in a spiral . Double helix structure.
Genes	Short section of DNA . Contains information which controls a characteristic .
Discovery of DNA	Franklin produced images of DNA using x-ray crystallography . Watson and Crick used these images to make a model of DNA.

4.2 - Inheritance

Gametes	Sex cells . Contain half a set of chromosomes – one from each pair. Sperm and egg in animals. Pollen and ovule in plants.
Sperm Cell	Male gamete . Produced in testes . Human sperm contain 23 chromosomes .
Egg Cell	Female gamete . Produced in ovaries . Human eggs contain 23 chromosomes .
Fertilisation	Nucleus of sperm and egg cell fuse together. Zygote formed which divides repeatedly to form an embryo . Human zygote contains 46 chromosomes .
Sexual Reproduction	Two parents. Offspring are not identical to each other or parents due to inheriting a mixture of DNA from mother and father.
Asexual Reproduction	One parent. Offspring are genetically identical to each other and parent. Produces clones .

4.3 – Variation & Evolution

Species	Organisms of the same species can breed together to produce fertile offspring .
Variation	Differences in characteristics between organisms of the same species .
Inherited Variation	Variation caused by inheriting genes from your parents or by random genetic mutations .
Environmental Variation	Variation caused by your surroundings . E.g. diet, education and lifestyle .
Theory of Evolution	All today's species have evolved from simple life forms that first started to develop over 3 billion years ago.
Natural Selection	Charles Darwin's theory. Organisms with the most suitable characteristics are more likely to survive and reproduce and pass on the genes for these characteristics to their offspring .

4.4 - Extinction

Extinct Species	No more organisms of that species are left anywhere in the world. E.g. dinosaurs, dodos, woolly mammoths, quaggas .
Causes of extinction	New predator , new disease , destruction of habitat , competition for food , flooding , drought , volcano eruption , asteroid , temperature change , ice age .
Endangered Species	Only a small population of the species left in the world. E.g. red squirrel, black rhino, Asian elephant .

4.5 – Selective Breeding

Process	Breed organisms with desirable traits . Select offspring with desirable traits and breed . Keep repeating process.
Desirable characteristics	Animals – quality meat, large eggs, lots of milk, strong . Plants – resistance to disease, large fruit or flowers .
Advantages	Higher yield , higher profit for farmers / breeders.
Disadvantages	Inbreeding can cause genetic problems e.g. short nose dogs .

Y8 Science Cycle 3 - Sheet 4

Genetics

