

Digestive System

Salivary Gland - Produce **amylase** enzymes in **Saliva**

Liver - **Bile** is produced.

Bile **neutralises stomach acid** once protease has been used on the food

Stomach - **Pummels** food with its **muscular walls**

- Produces **protease** enzyme, **pepsin**
- Produces **HCl**

Gall Bladder - **Bile** is **stored** before it is released into the small intestine

Pancreas - **Amylase**
- **Trypsin**
- **Lipase**

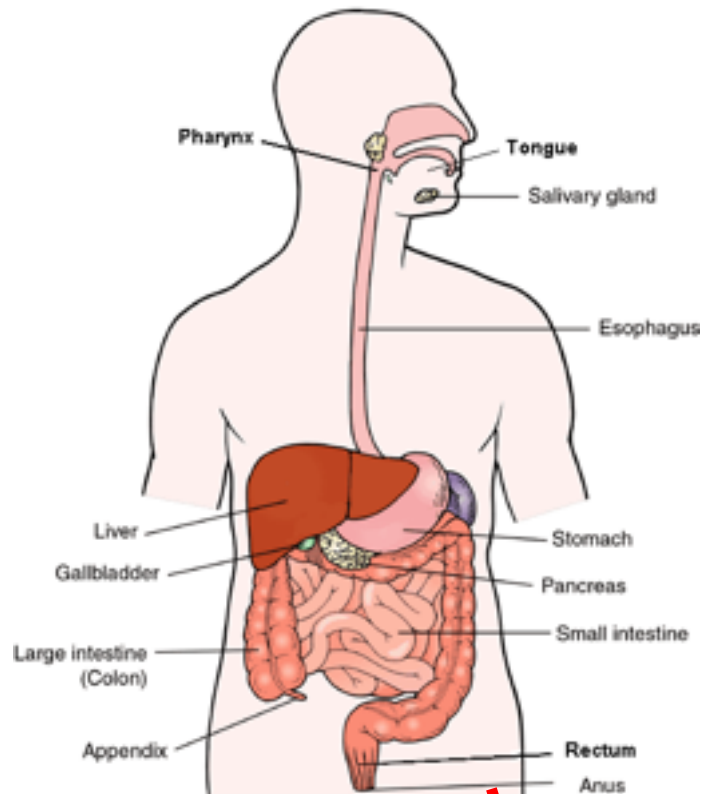
- These **enter** the **small intestine**

Large Intestine - Where **excess water** is **absorbed from food**

Small Intestine - Produces **lipase**, **protease** and **amylase** enzymes to complete digestion

- Digested food is **absorbed out** of the digestive system into the **blood**

Rectum - **Faeces** (mainly undigested food) are **stored** before they come out of the **anus**



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Microbes and Enzymes

Some microorganisms produce enzymes that **pass out of the cell**, these enzymes have many use in the home and in the industry.

In the Home:

- Biological detergents may contain **protein - digesting** and **fat - digesting** enzymes (proteases and lipase)
- Biological detergents are more effective at low temperatures than other enzymes
- They are ideal for getting rid of **stains** like food or blood

In Industry:

- **Protease** is used to '**pre-digest**' baby foods
- **Carbohydrases** are used to convert **starch** into **sugar syrup**
- **Isomerase** is used to convert **glucose syrup** into **fructose syrup**, which is much **sweeter** and therefore can be used in smaller quantities in slimming foods
- Enzymes are also used to bring about reactions at normal temperatures and pressures that would otherwise require expensive, energy-demanding equipment
- However they are **costly** to produce

'Hereditary Units' are genes but in Mendel's time no one knew about genes or DNA so the significance of his work was not realised until after his death

Mendel's work preceded the work by other scientists which linked Mendel's 'inherited factors' with chromosomes

Why Pea Plants?

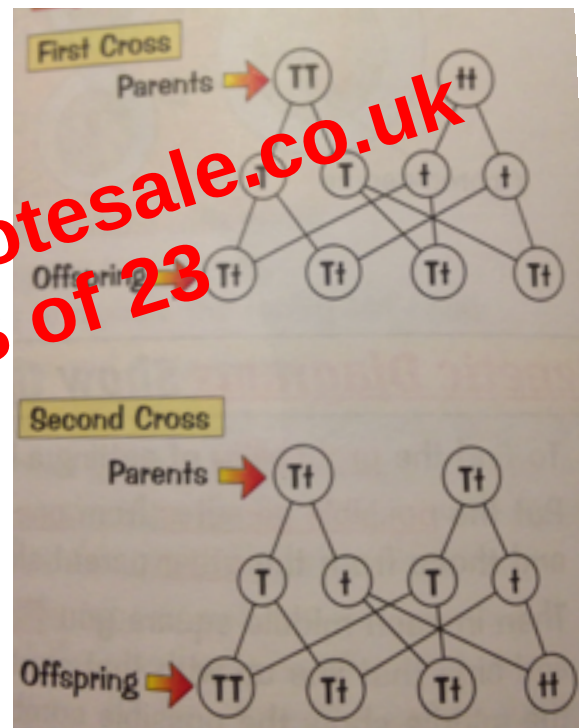
- They are easy to grow
- They have short life cycles
- They produce lots of offspring

What do we now call a 'factor'?

- Alleles travel in pairs - the dominant gene is one of the two and is the one you then possess.
- An allele is two different forms of a gene
- He had a pea plant with one gene
- This gene had two possible forms called alleles, one was a dominant allele and the other recessive.
- The dominant allele cannot produce this protein and so produces white flowers
- **Dominant Allele** - Expressed over recessive allele

Parents where **one** parent has the recessive gene and one has the dominant gene

Parents where **both** parents have the dominant and recessive gene



Genetic Diagrams

- Alleles are different versions of the same gene
- In genetic diagram letters are usually used to represent the alleles
- If an organism has two alleles for a particular gene the same, then it is homozygous
- If its two alleles for a particular gene are different, then it is heterozygous
- If the two alleles are different, only one can determine what characteristic is present
- The allele for the characteristics that's shown is called the dominant allele (e.g. C)

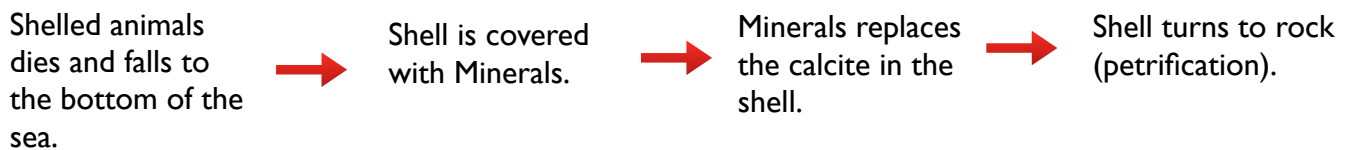
Old and New Species

Fossils are the remains of an organisms or part of an organism such as bone or shell or the impression of an organism in rocks from many years ago.

What does fossil record show us?

1. What the organism looked like
2. How long ago it existed, by the type of rock its in. Generally speaking older fossils are built into deeper down rocks in the layers.

Mineral Replacement: Minerals in water filtering through the organisms replace minerals in the hard parts of the skeleton or shell.



Fossils are Formed in Various Ways:

- From the hard parts of animals that do not decay easily
- From parts of organisms that have not decayed because one or more conditions needed for decay were absent
- When parts of the organisms are replaced by other materials as they decay
- As preserved traces of organisms, e.g. footprints, burrows

Fossils are found:-

- In quarries
- Warm places
- The top of the mountains

How was the baby mammoth fossilised?

The mammoth was preserved by the cold in the ice and snow because the microbes could not survive the harsh cold conditions.

Places Where No Decay Occurs:

- The freezing conditions of Siberia are far too cold for decay to take place. Woolly mammoths have been found here in almost perfect conditions.
- Some complete insects have been fossilised inside a resin (amber) from trees. The resin excludes oxygen, which would normally allow decay to take place.
- Waterlogged bogs - too acidic for decay microbes. Pete bog man was found preserved in a bog.

What Are the Major Causes of Extension?

Mass Extinction of species have been caused by:

- Huge volcanic eruptions
- Meteors bringing about suffer drops in worldwide temperatures
- Acidification of the oceans
- Volcanic activity may have led to global warming
- Global warming may have led to a rise in sea levels