

Organisms

4. Digestion

CONCEPT 3

LESSON GUIDE

HUMAN DIGESTIVE SYSTEM

PRECISE LEARNING POINTS

KNOW

I know how to label a diagram of the human body to identify the key parts of the human digestion system.

APPLY

I can apply my knowledge to explain how each part of the digestive system treats food; and how enzymes play a role in this.

EXTEND

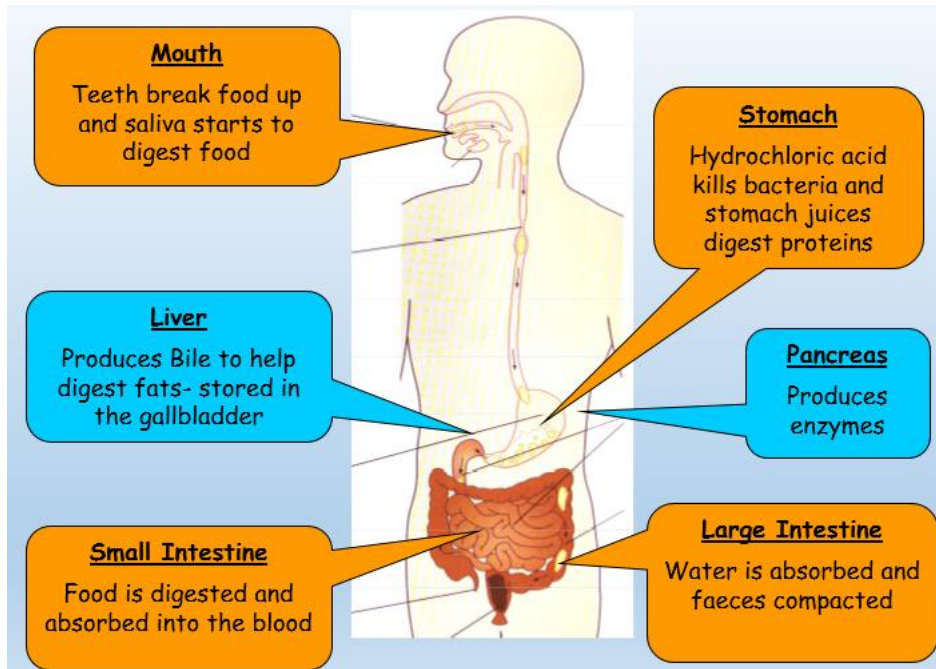
I can extend my knowledge to explain the role of bacteria in human digestion.

NOTES

THE HUMAN DIGESTIVE SYSTEM

The body needs food for a number of reasons. We need food for growth and to repair worn out or damaged parts. We also get chemical energy from food. Energy is used for movement, producing heat and to keep all the parts working properly.

Before the body cells can use the food we eat it must pass into our blood. The food is broken down into very small soluble molecules by the digestive system. These molecules then pass through the walls of the intestines by diffusion and into the blood. The food is taken to the cells of the body where they can be used to release energy via respiration.



STAGE 1: Food enters the **mouth**, where a process called mastication happens – your teeth and tongue break down the food into smaller pieces, moistened by saliva. **(0 hours)**

STAGE 2: Food is then swallowed and the muscles in the **gullet (oesophagus)** move the food towards the stomach. The oesophagus contains rings of muscle that contract behind the bolus (rounded mass of food and saliva) to move the food along. **(1 hours)**

STAGE 3: The **stomach** muscles breaks down food physically by muscle contraction and chemically by enzymes. The stomach acid kills any bacteria and helps the enzymes to work. **(2 hours)**

STAGE 4: Small intestine enzymes digest the food further using different enzymes. Nutrients are absorbed into the blood by diffusion. The small intestine has thin walls and a good blood supply to help absorption of nutrients into blood. **(6 hours)**

STAGE 5: Water is absorbed in **the large intestine** to make solid faeces **(10 hours)**

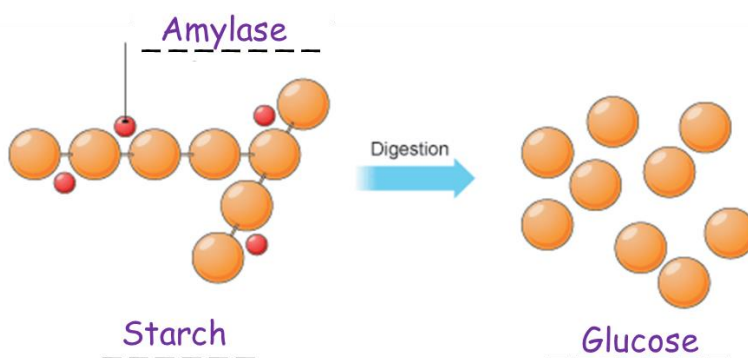
STAGE 6: Faeces collect in the **rectum (10 hours)**

STAGE 7: Faeces are passed through the **anus (16-24 hours)**

The **pancreas** is needed for digestion, but food does not pass through it – it simply releases enzymes that digest carbohydrates, proteins and fats.

THE ROLE OF ENZYMES AND BACTERIA

Enzymes are biological catalysts – they speed up reactions in our bodies. We have enzymes in our body that help break down food molecules- this is called chemical digestion. The enzymes are specific, which means that they only break down one type of molecule, so there is a specific enzyme for each food type.



FOOD GROUP	PRODUCT OF DIGESTION	ENZYME INVOLVED	WHERE THE ENZYME IS FOUND
Carbohydrate (starch)	glucose	amylase	Mouth and small intestine
Protein	amino acids	protease	Stomach and small intestine
Fats	fatty acids + glycerol	lipase	Small intestine

There are over 500 different types of bacteria living in your digestive system. We call these bacteria **gut flora**.

The most bacteria are found in the **large intestine**.

They can:

- Release energy when they breakdown food such as sugar.
- Make some enzymes that we need.
- Protect us from other disease-causing bacteria.