

The digestive system

Revision notes · The organs of the alimentary canal and the associated organs, the five processes of nutrition, physical digestion, stomach acid and bile.

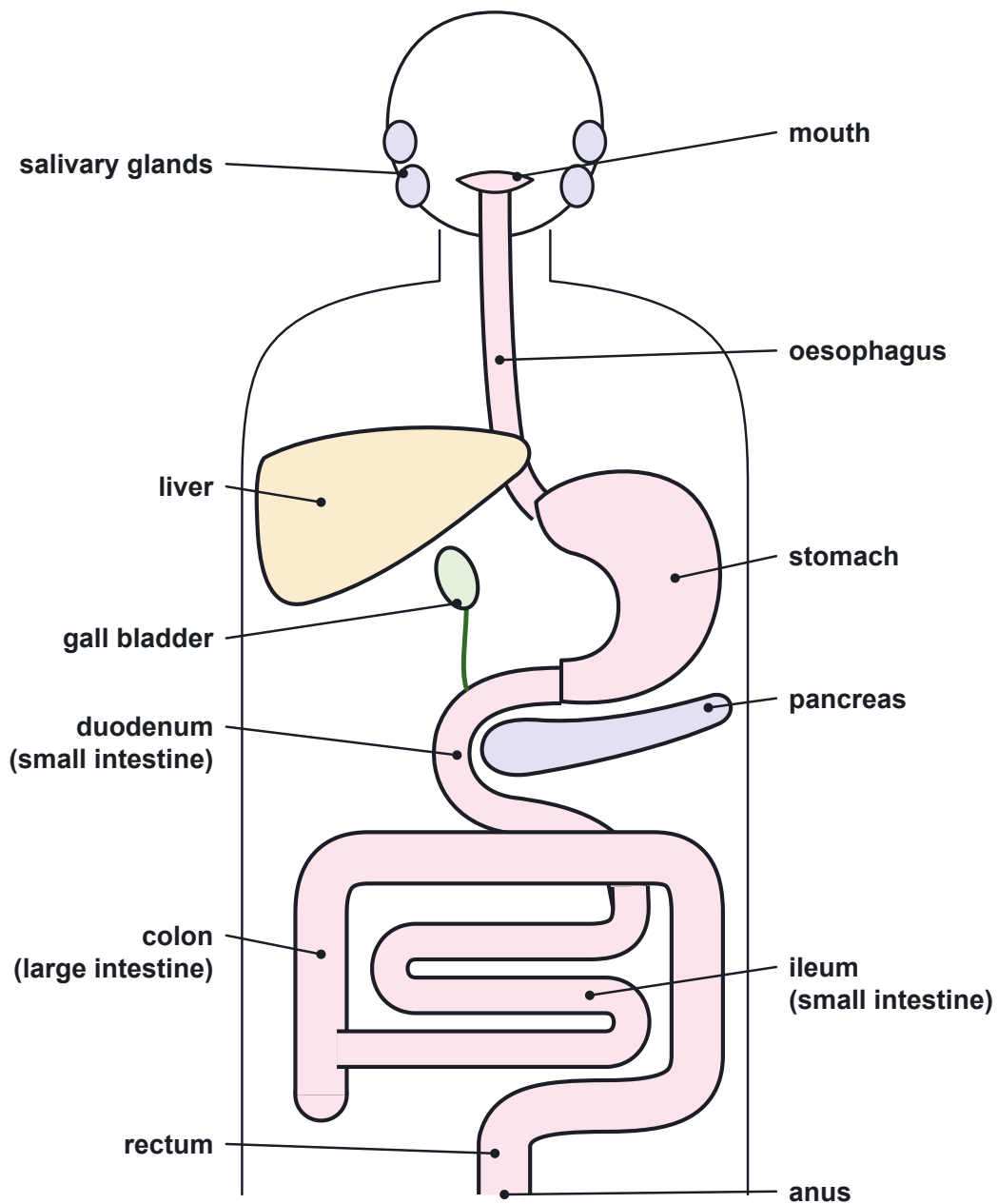
For Cambridge IGCSE Combined Science 0653. **Supplement** is Extended content, only examined on Papers 2 and 4.

The digestive system Spec B7.2, B7.3

Organs of the digestive system Spec B7.2.1, B7.2.2

The **alimentary canal** is the long tube that food passes through from mouth to anus. The **associated organs** are not part of the tube, but they make and store the juices that digest food.

- Alimentary canal: mouth, oesophagus, stomach, small intestine (duodenum and ileum) and large intestine (colon, rectum and anus).
- Associated organs: salivary glands, pancreas, liver and gall bladder.



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The **alimentary canal** (pink) runs from mouth to anus; the **associated organs** (salivary glands, liver, gall bladder, pancreas) are shown in other colours.

Five processes of nutrition

Ingestion	The taking of substances, e.g. food and drink, into the body.
Digestion	The breakdown of food.
Absorption	The movement of nutrients from the intestines into the blood.
Assimilation	Uptake and use of nutrients by cells.
Egestion	The removal of undigested food from the body as faeces.

Functions of the organs		
Organ	Function	Process
Mouth	Food and drink are taken in; teeth break food up; food mixes with saliva	Ingestion; digestion
Salivary glands	Make saliva containing amylase, which starts chemical digestion of starch	Digestion
Oesophagus	Carries food from the mouth to the stomach	(moves food along)
Stomach	Churns food; makes gastric juice containing protease and hydrochloric acid	Digestion
Liver	Makes bile; absorbed nutrients are carried to the liver in the blood, and some are used there, e.g. amino acids to make proteins	Digestion; assimilation
Gall bladder	Stores bile and releases it into the duodenum	Digestion
Pancreas	Makes enzymes (amylase, protease, lipase) and releases them into the duodenum	Digestion
Small intestine: duodenum	Receives bile and pancreatic juice; digestion of food continues	Digestion
Small intestine: ileum	Digestion is completed; nutrients and most of the water are absorbed into the blood	Digestion; absorption
Large intestine: colon	Absorbs some water from the undigested food	Absorption
Rectum	Stores faeces	(before egestion)
Anus	Faeces leave the body	Egestion

Assimilation happens after absorption. The blood carries the absorbed nutrients to the body's cells, which take them up and use them, for example glucose for respiration and amino acids to make proteins.

Common mistake: Egestion is the removal of undigested food as faeces. It is not excretion, and it is not the same as absorption.

Physical digestion and teeth Spec B7.3.1, B7.3.3

Physical digestion is the breakdown of food into smaller pieces without chemical change to the food molecules.

Supplement

Physical digestion increases the **surface area** of the food, so enzymes in chemical digestion can act on more of it at once.

The stomach, acid and bile Spec B7.3.7

The stomach

Supplement

Hydrochloric acid in gastric juice has two functions:

Supplement

- It kills harmful microorganisms in food.
- It provides an acidic pH, which is the optimum pH for the protease enzyme in the stomach to work.

Bile

Bile is made in the liver, stored in the gall bladder and released into the duodenum.

Quick check

1. Name the process: the removal of undigested food as faeces.
2. **Supplement** Give two functions of hydrochloric acid in the stomach.

Quick check answers

The digestive system

1. Egestion.
2. It kills harmful microorganisms in food and provides an acidic pH for optimum enzyme activity.