



Human Digestive System

Need to know

The functions of the main parts of the alimentary canal and the associated glands

Function of teeth . The human dental formula

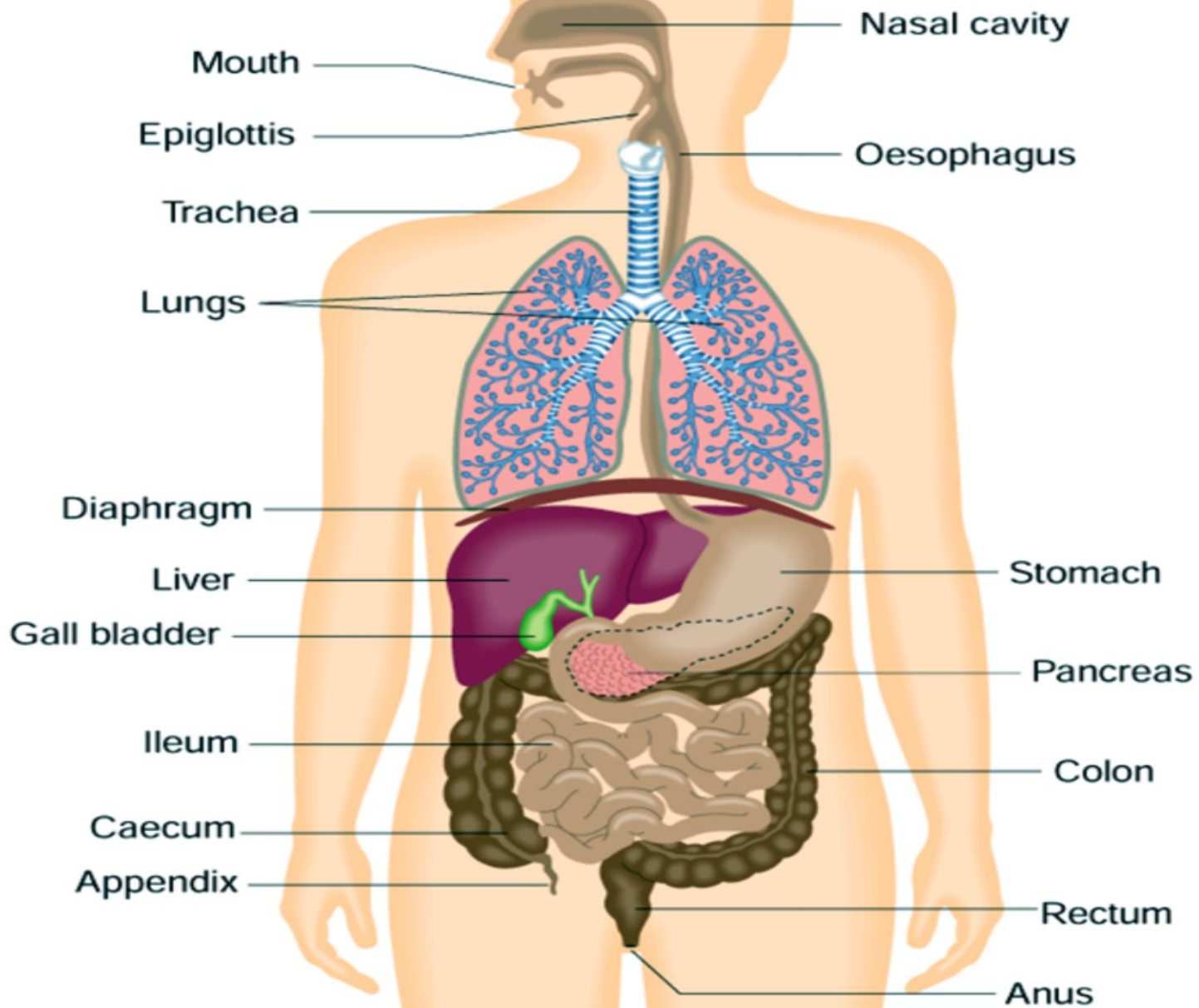
Role of mechanical digestion and peristalsis

Details of chemical digestion by one **amylase, one **protease** and one **lipase** . Role of **bile salts****

Symbiotic bacteria functions in the large intestine

Benefits of fibre

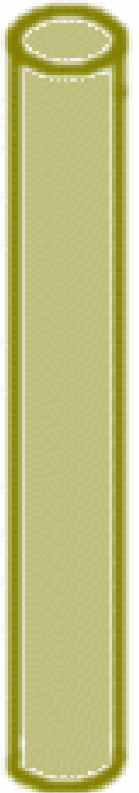
The Digestive System



Mechanical breakdown of food

1. Teeth
2. Contractions in stomach wall
3. Peristalsis

Rhythmic muscular contraction and relaxation in the wall of the alimentary canal causing the food to move along the canal



Human Teeth



Incisors

Cutting

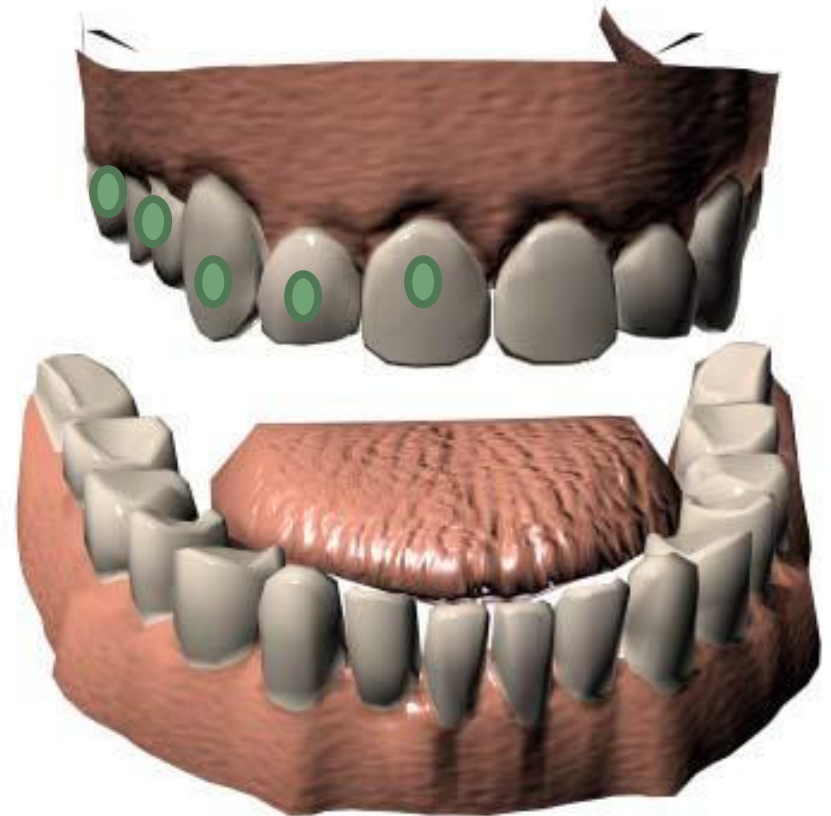
Canines

Tearing

Pre molars

Crushing
and
grinding

Molars



Human dental Formula

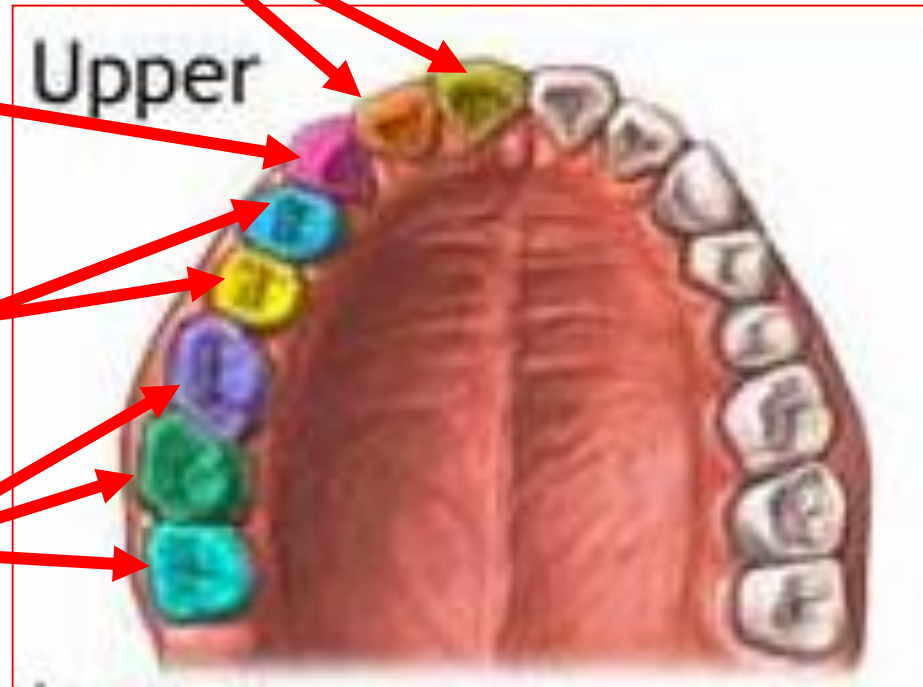
The number of each type of tooth in the upper jaw one side of the mouth

Incisors

Canines

Pre molars

Molars



i	2	c	1	pm	2	m	3
	2		1		2		3

Learning check 1

Name four types of teeth

Write down the human dental formula

State the function of each of the four types of teeth

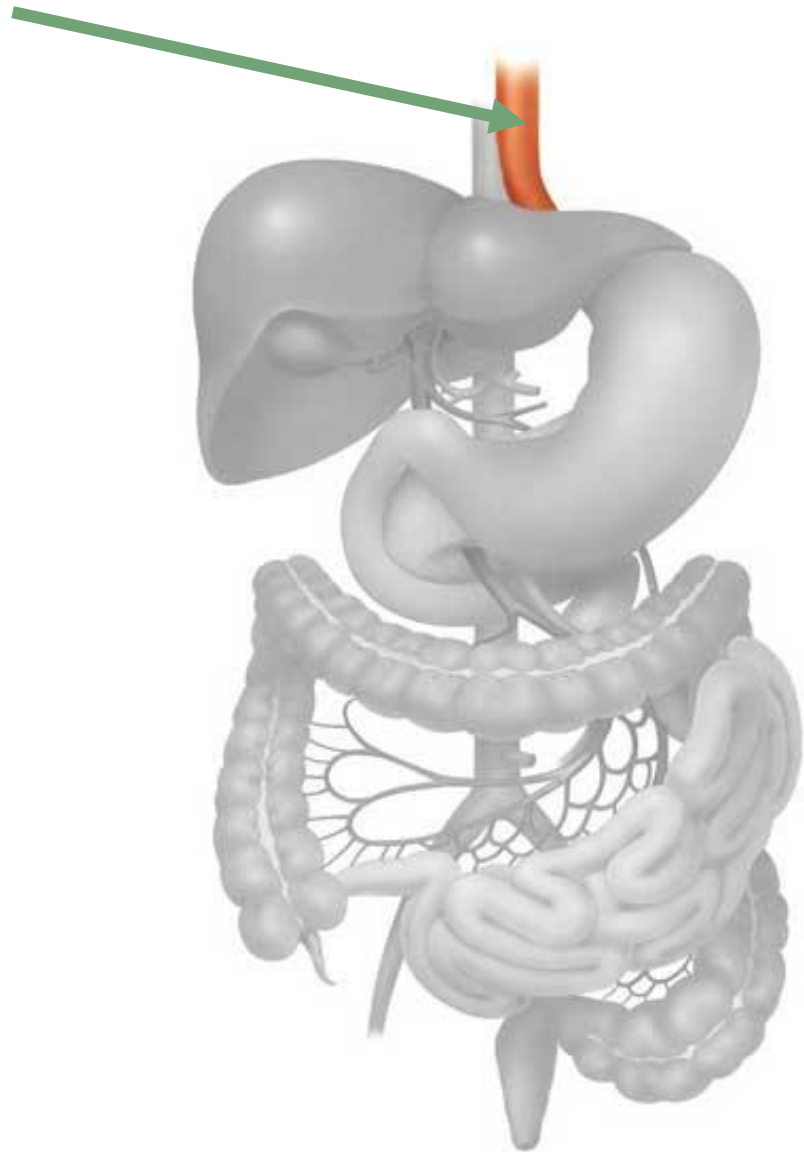


Oesophagus

A muscular tube
25 cm long

Connects Pharynx
to stomach

Food moves down
the Oesophagus by
Peristalsis



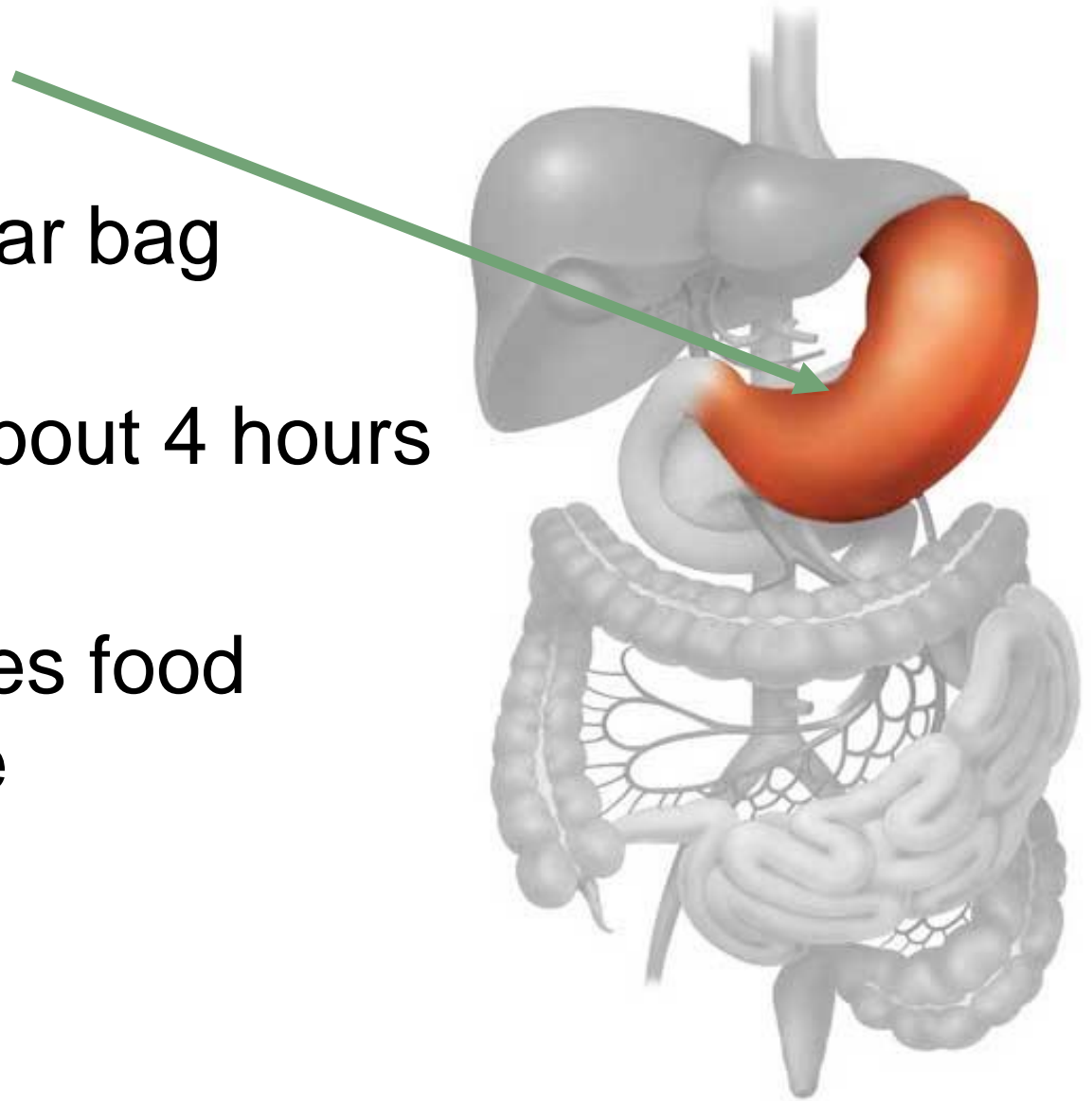
Stomach

J shaped muscular bag

Stores food for about 4 hours

Churns and mixes food
with gastric juice
forming Chyme

Digest food



Digestion in the Stomach

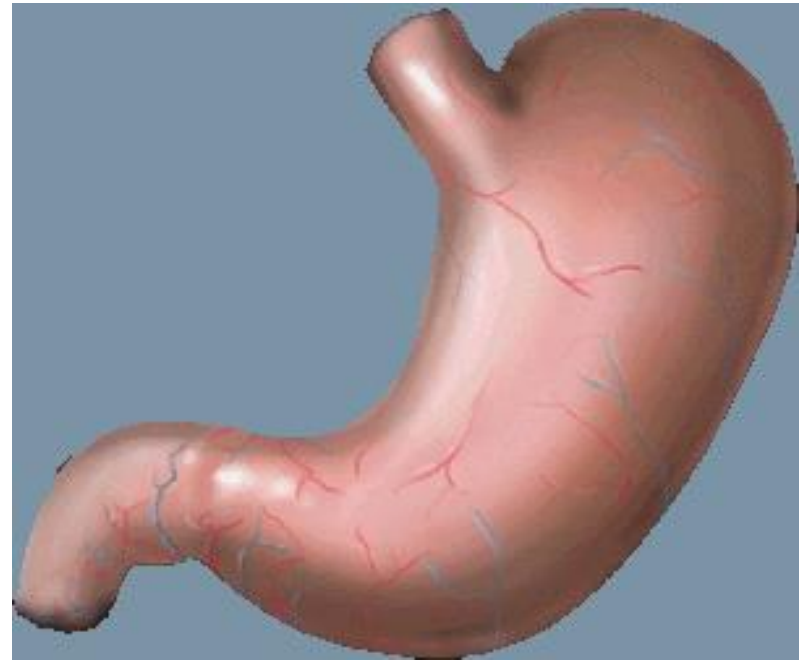
1. Mechanical Digestion

Peristalsis physically breaks up food particles

2. Chemical Digestion

using Gastric Juice containing

- a. Mucus
- b. HCl
- c. Pepsinogen



Functions of gastric juice

1. Mucus

Lines and protects the stomach wall

2. HCl

a. Kills bacteria

b. Activates pepsinogen

3. Pepsinogen

Converted to the active enzyme Pepsin by HCl.

Pepsin digests protein to peptides

Learning check 2

Define peristalsis

What is the function of HCl in the stomach

Why is pepsin secreted as inactive pepsinogen

Why is the function of mucus in the stomach



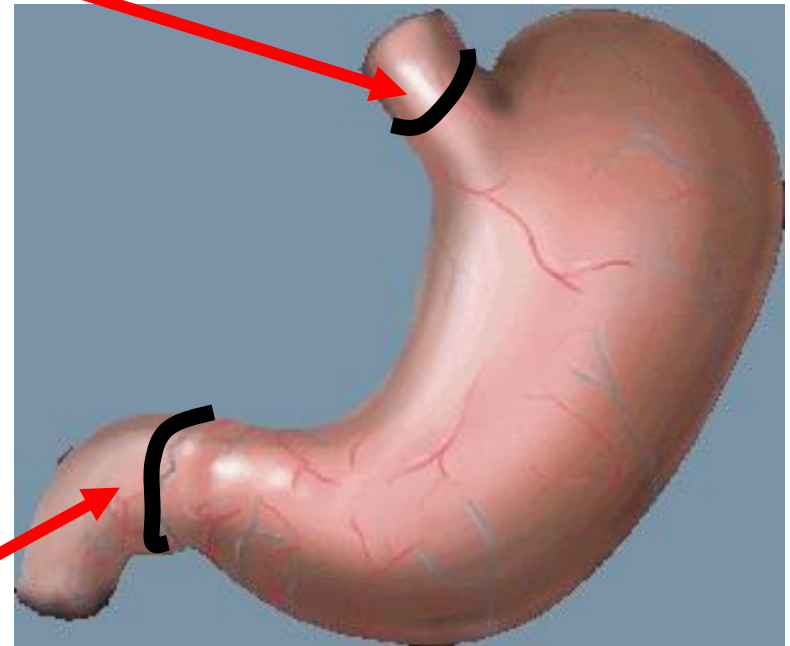
Sphincter Muscle Location

Cardiac Sphincter Muscle

Circular muscle which contracts to close entry from oesophagus to stomach

Pyloric Sphincter Muscle

Circular muscle which contracts to close the entry to duodenum from the stomach. (Open when relaxed)



Small Intestine

Muscular tube 5-6m long

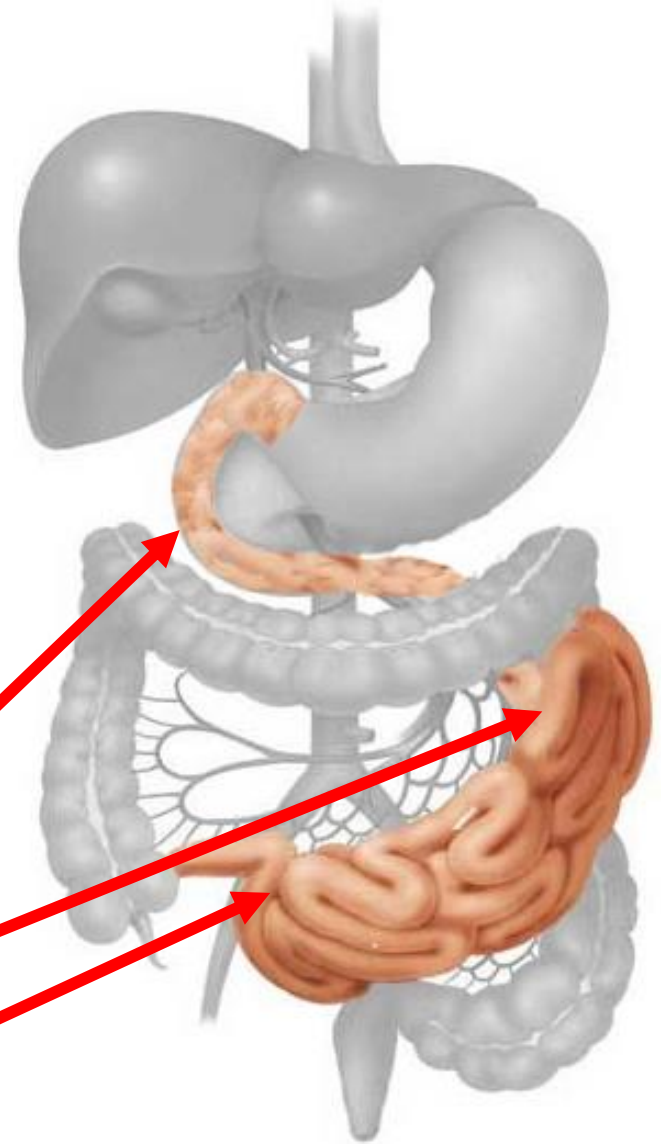
Functions

Digestion

Absorption

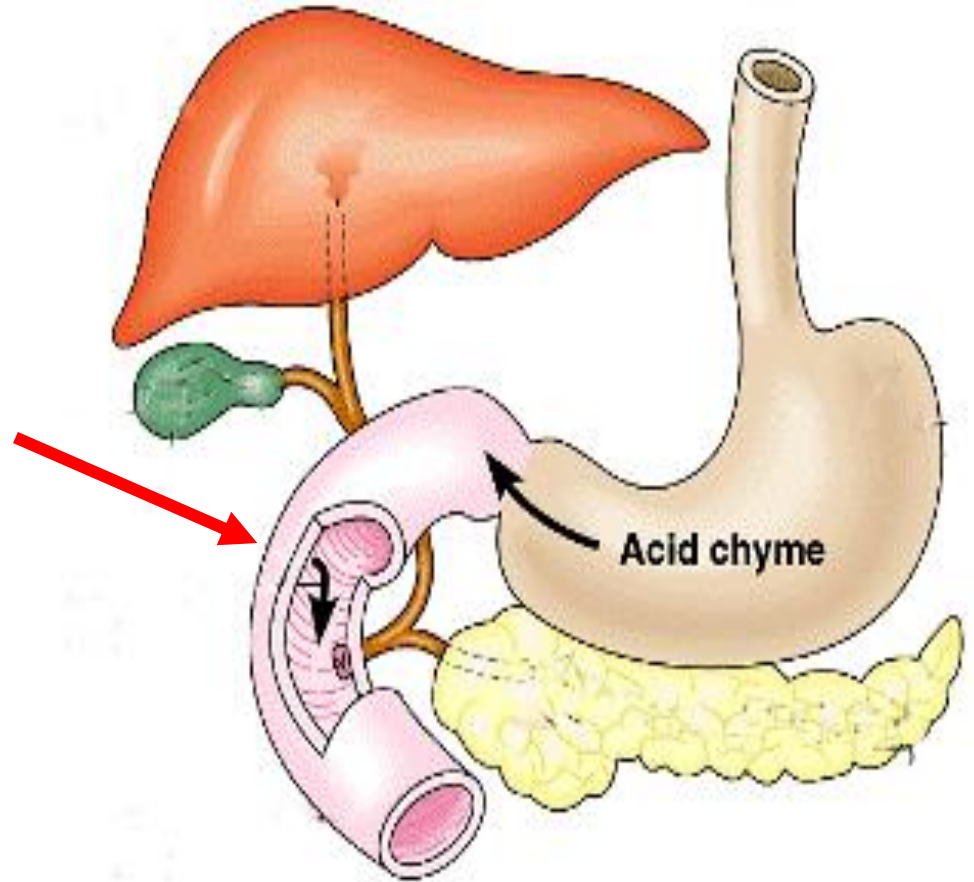
Has three parts

1. duodenum
2. jejunum
3. ileum



Duodenum

25cm muscular tube



Function

Most Digestion takes place in the duodenum

Jejunum / ileum

Function

Absorb nutrients

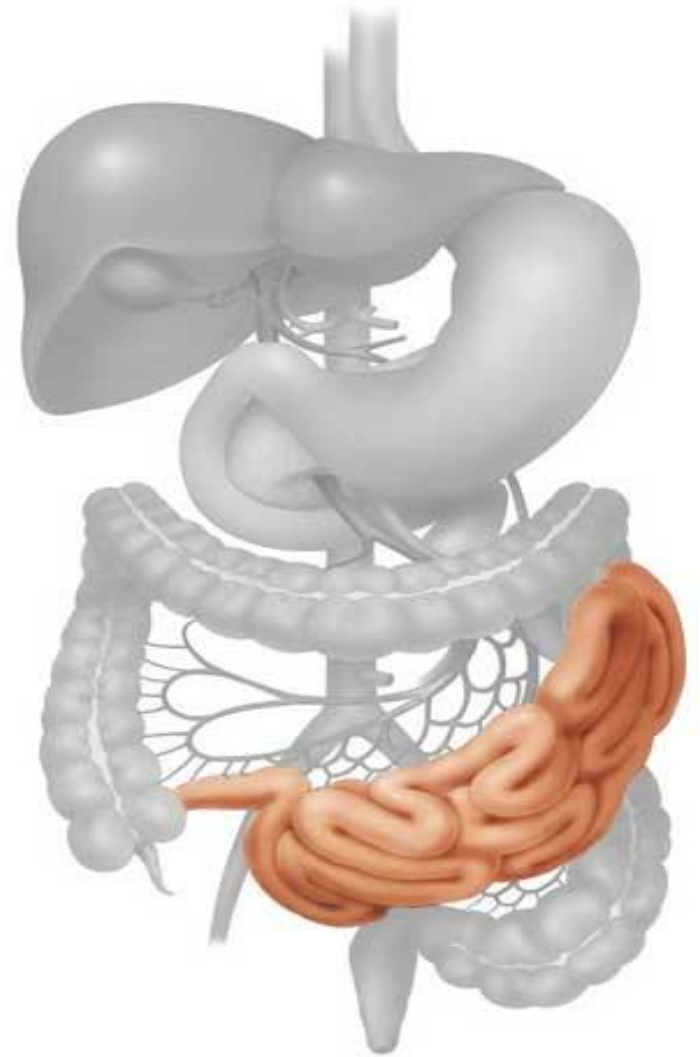
Adaptations for absorption

1. Long tube.

This gives time for absorption

2. Villi.

Infoldings which increase the surface area available for the absorption of food



Villi

Infolding in the lining of the small intestine

Function

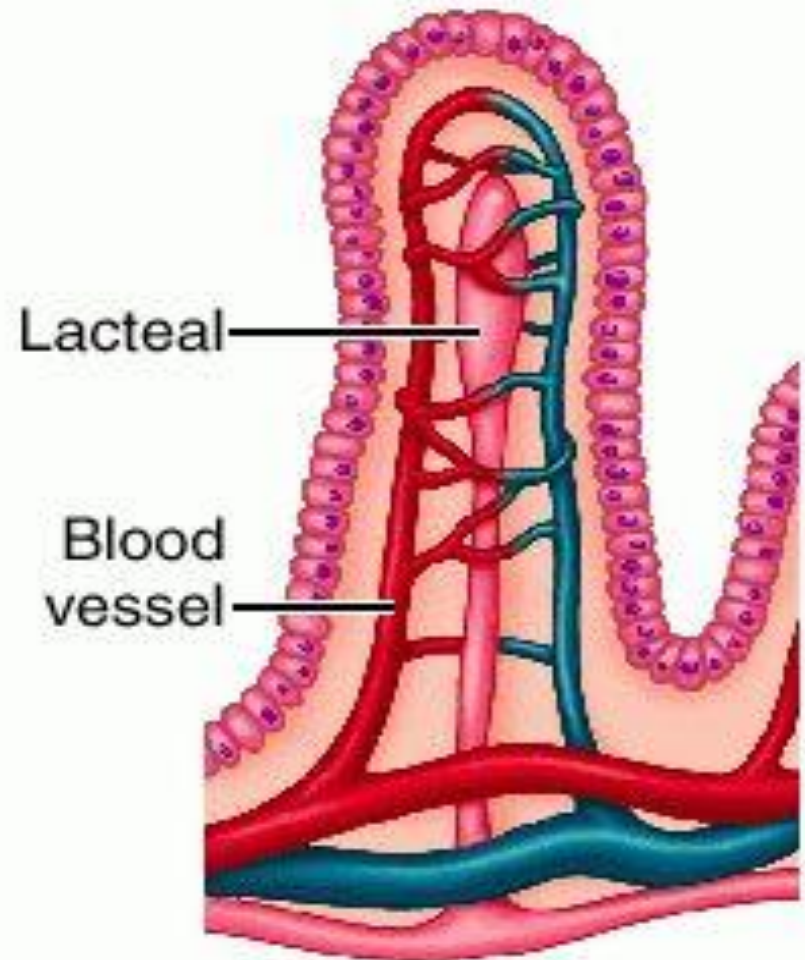
Increase
surface area
for absorption
of digested
food



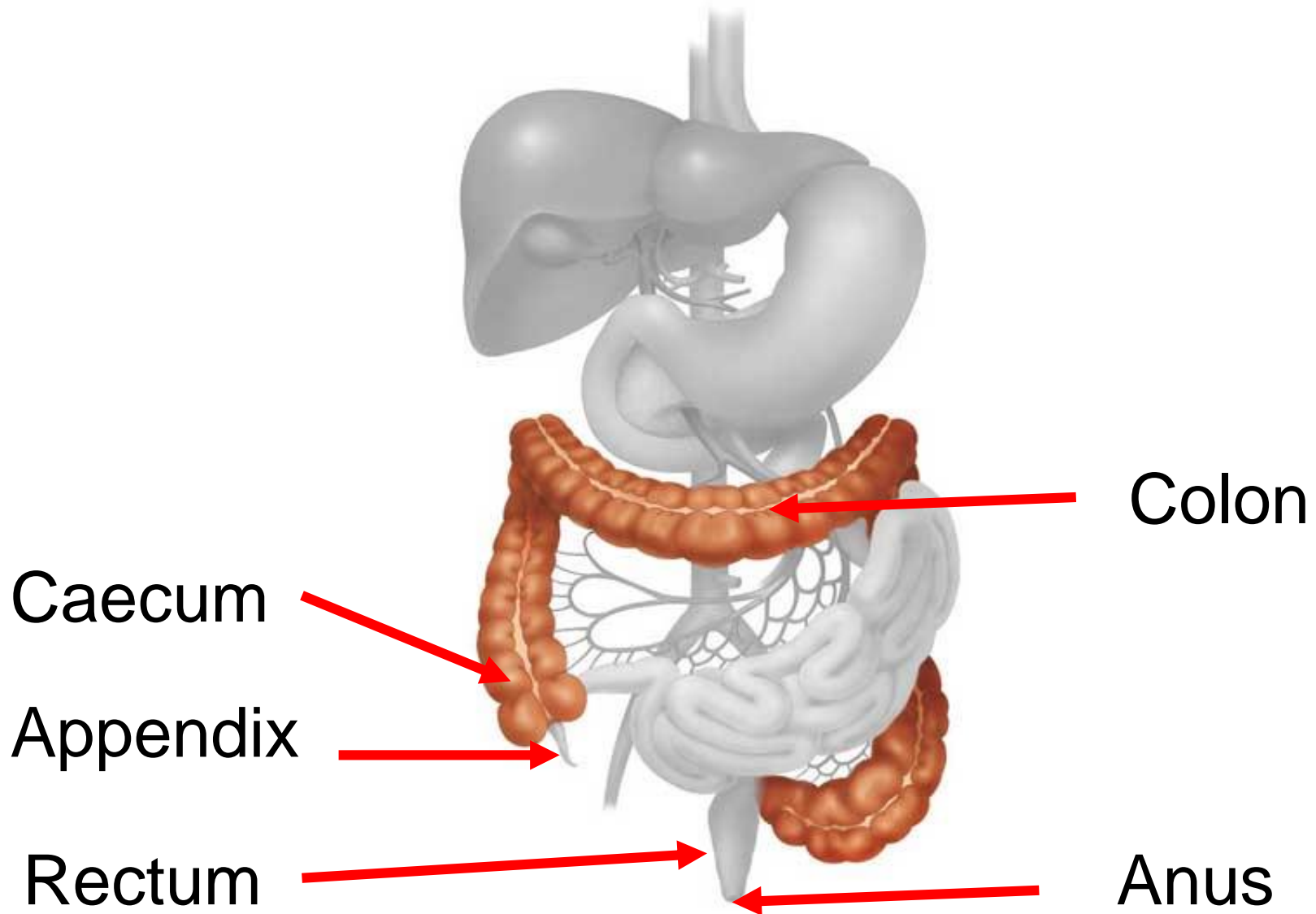
A single Villus

Fatty acids and Glycerol are absorbed into the Lacteal

All other digested food are absorbed into the blood vessels



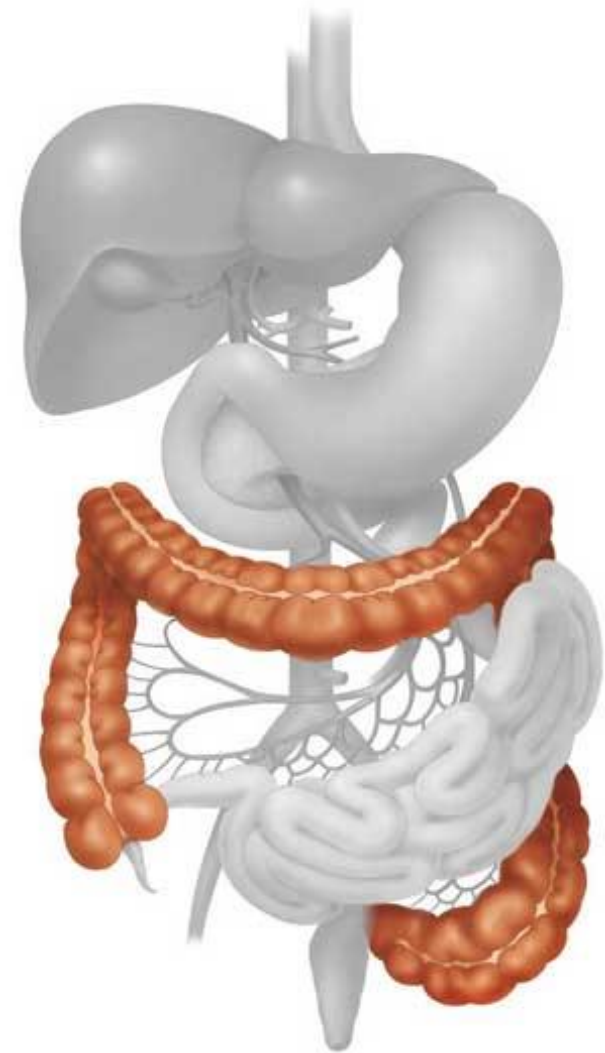
Large Intestine



Large Intestine Functions (Colon)

1. Reabsorb water
2. Produce B group vitamins
3. Digest cellulose

Functions 2 & 3 are carried out by symbiotic bacteria



Large Intestine Functions

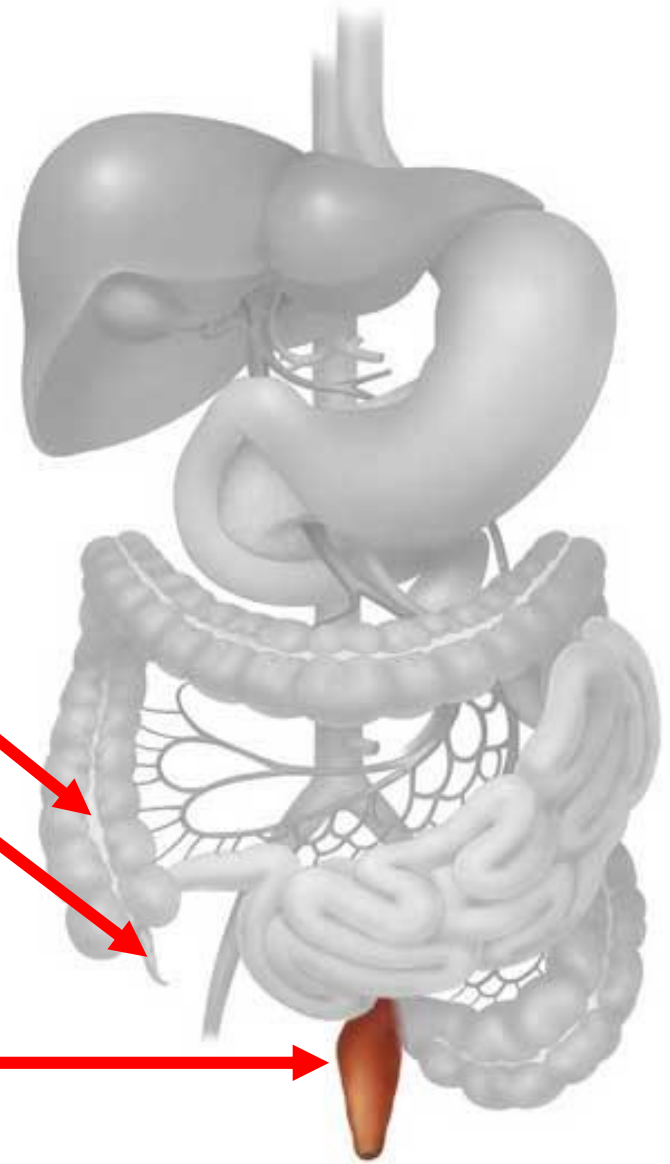
Caecum

Appendix

Function unknown
in humans

Rectum

Stores Faeces



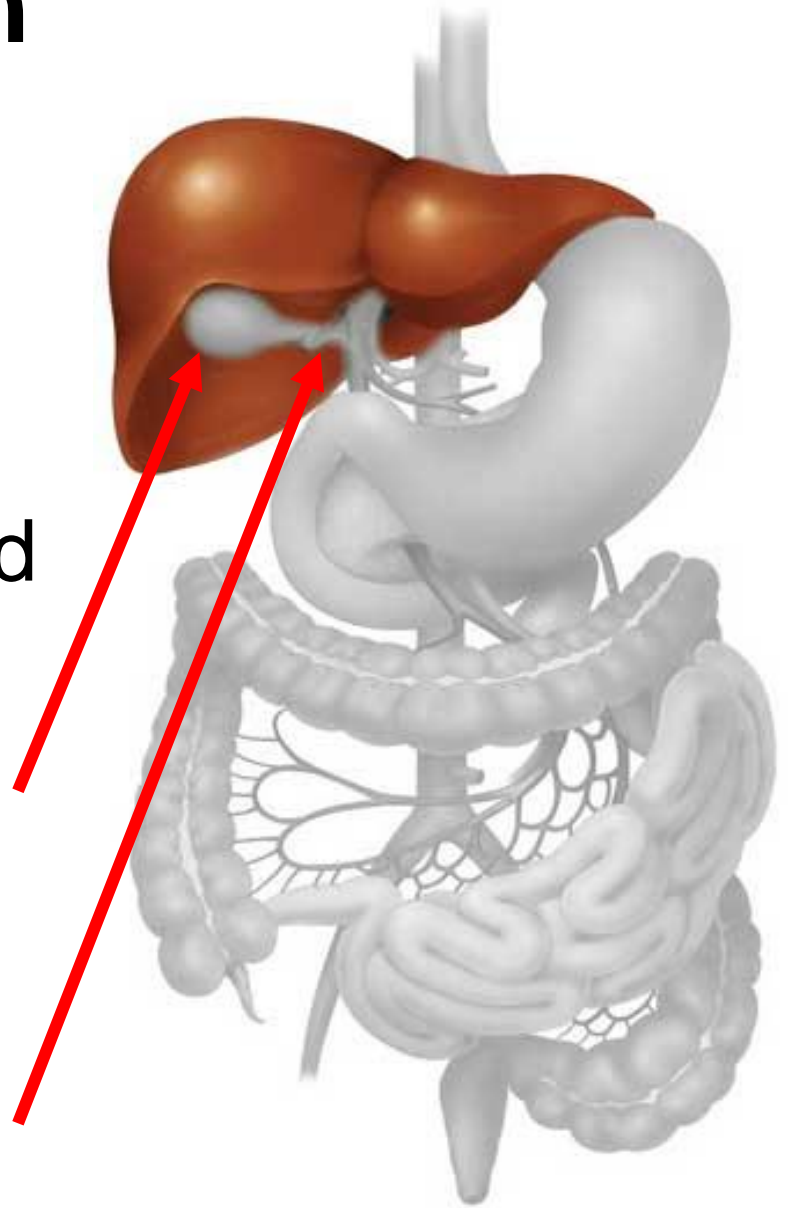
Role of the Liver in digestion

The liver produces bile

Bile is a yellow-green liquid

Bile is stored in the gall bladder

Bile enters the duodenum through the bile duct



Bile consists of

1. Water
2. Bile salts
3. Bile pigments

Function of bile

1. Emulsifies fat This increases the surface area of the fat droplets
2. Neutralises the acidic chyme from stomach

Learning check 3



State two ways in which the small intestine is adapted to absorb digested food

What are the main functions of the large intestine

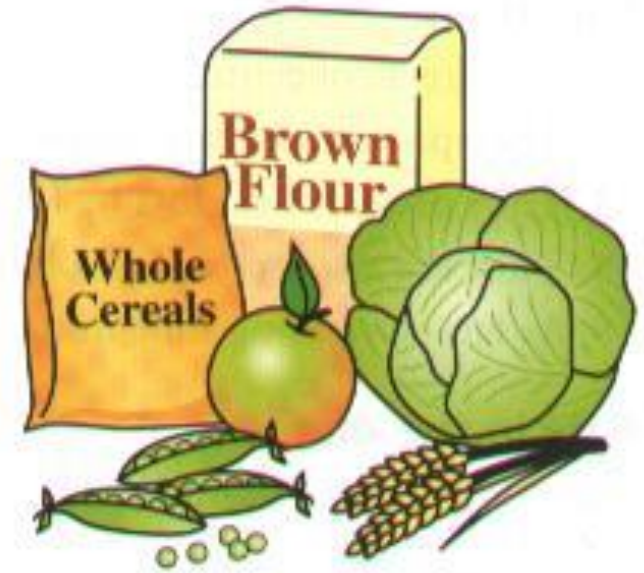
How are the products of fat digestion transported away from the small intestine

Give the function of the liver in digestion

Benefits of dietary fibre

Fibre stimulates peristalsis in the colon

Helps prevent constipation



High-fibre foods

Constipation results when undigested material passes through the colon too slowly.

This leads to too much water being reabsorbed

Three enzymes involved in digestion

Enzymes are biological catalysts

1 Amylase

2 Pepsin

3 Lipase



Salivary amylase

Role

Digest starch

Production site

Salivary glands

Where it acts

Mouth

pH in mouth

Alkaline, pH =8

Digestion product

Maltose

Pepsin

Role	Digest protein
Production site	Gastric glands in Stomach wall
Where it acts	Stomach
pH in mouth	Acid, pH =2
Digestion product	Peptides

Lipase

Role

Digest fat

Production site

Pancreas

Where it acts

Dudenum

pH in mouth

Alkaline, pH =8

Digestion product

Fatty acids + Glycerol

Learning check 4

Explain the benefits of fibre in the diet

Name a protease enzyme

Give the site of action of the protease and state the pH at this location

What is the product of the action of the protease





ctangular S

HOMework

It is important to
read the topics
we cover in class
to re-enforce
your learning

End