B7 Diet

B7.1

1 Describe what is meant by a balanced diet

2 State the principal dietary sources and describe the importance of: (a) carbohydrates (b) fats and oils (c) proteins (d) vitamins, limited to C and D (e) mineral ions, limited to calcium and iron (f) fibre (roughage) (g) water

A balanced diet gives your body all the nutrients it needs in the right amounts to stay healthy. It includes carbohydrates, proteins, fats, vitamins, minerals, water, and fibre.

Main food groups:

Carbohydrates	Bread, rice, pasta	Main source of energy
Fats and oils	Butter, oils, nuts	Energy storage, insulation
Proteins	Meat, fish, eggs, beans	Growth, repair, enzymes
Vitamin C	Citrus fruits	Healthy skin, healing, prevents scurvy
Vitamin D	Fish, eggs, sunlight	Helps absorb calcium, prevents rickets
Calcium (mineral)	Milk, cheese	Healthy bones and teeth
Iron (mineral)	Red meat, spinach	Needed to make haemoglobin in red blood cells
Fibre (roughage)	Vegetables, whole grains	Helps food move through the gut
Water	Drinks, fruits, vegetables	Needed for all chemical reactions in the body

Digestive System

B7.2

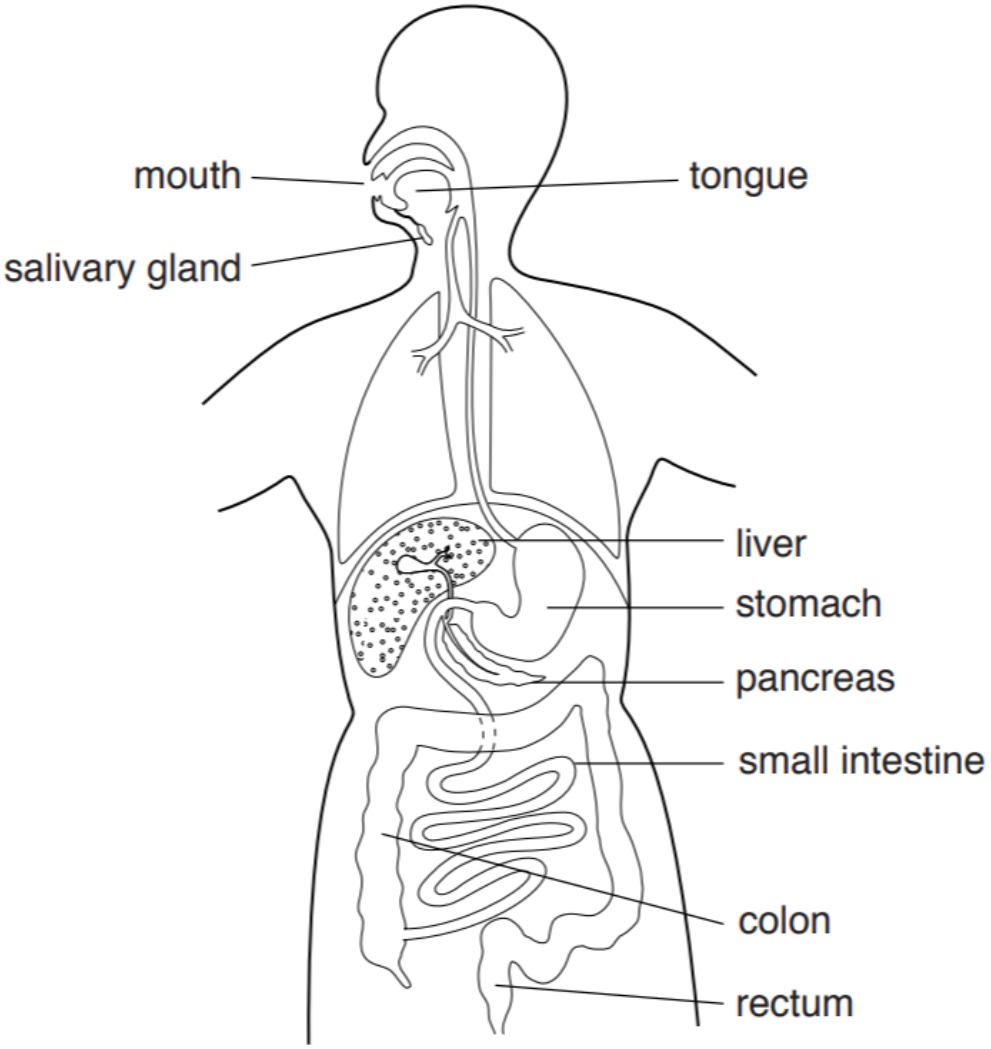
1 Identify in diagrams and images the main organs of the digestive system limited to: (a) alimentary canal; mouth, oesophagus, stomach, small intestine (duodenum and ileum) and large intestine (colon, rectum and anus) (b) associated organs; salivary glands, pancreas, liver and gall bladder

2 Describe the functions of the organs of the digestive system listed in 7.2.1, in relation to: (a) ingestion – the taking of substances, e.g. food and drink, into the body (b) digestion – the breakdown of food (c) absorption – the movement of nutrients from the intestines into the blood (d) assimilation – uptake and use of nutrients by cells (e) egestion – the removal of undigested food from the body as faeces.

Process	Meaning
Ingestion	Taking food into the mouth
Digestion	Breaking food into smaller molecules
Absorption	Taking nutrients from intestine into the blood
Assimilation	Cells use the nutrients (e.g. for growth)
Egestion	Removing undigested food (faeces) from the body

Main parts of the digestive system:

Organ	Type	Function
Mouth	Alimentary canal	Chewing (mechanical digestion), saliva contains amylase
Salivary glands	Associated organ	Produce saliva with amylase
Oesophagus	Alimentary canal	Tube that moves food to the stomach
Stomach	Alimentary canal	Churns food, produces acid and protease
Liver	Associated organ	Makes bile to help digest fats
Gall bladder	Associated organ	Stores bile
Pancreas	Associated organ	Produces enzymes (amylase, protease, lipase)
Small intestine	Alimentary canal	Digestion (duodenum), absorption (ileum)
Large intestine (colon, rectum, anus)	Alimentary canal	Absorbs water, stores faeces, egestion



Digestion

B7.3

1 Describe physical digestion as the breakdown of food into smaller pieces without chemical change to the food molecules.

2 Describe chemical digestion as the breakdown of large insoluble molecules into small soluble molecules

3 State that physical digestion increases the surface area of food for the action of enzymes in chemical digestion.

4 State the role of chemical digestion in producing small soluble molecules that can be absorbed

Physical digestion: This is breaking food into smaller pieces (e.g. chewing) or the churning that occurs in the stomach. There is no change to the chemical structure of food. It increases the surface area of food so enzymes can work faster during chemical digestion.

Chemical digestion: Enzymes break large insoluble molecules into small soluble ones. It produces small soluble nutrients that can pass into the bloodstream and be used by the body.

5 Describe the functions of enzymes as follows: (a) amylase breaks down starch to simple reducing sugars (b) proteases break down protein to amino acids (c) lipase breaks down fats and oils to fatty acids and glycerol

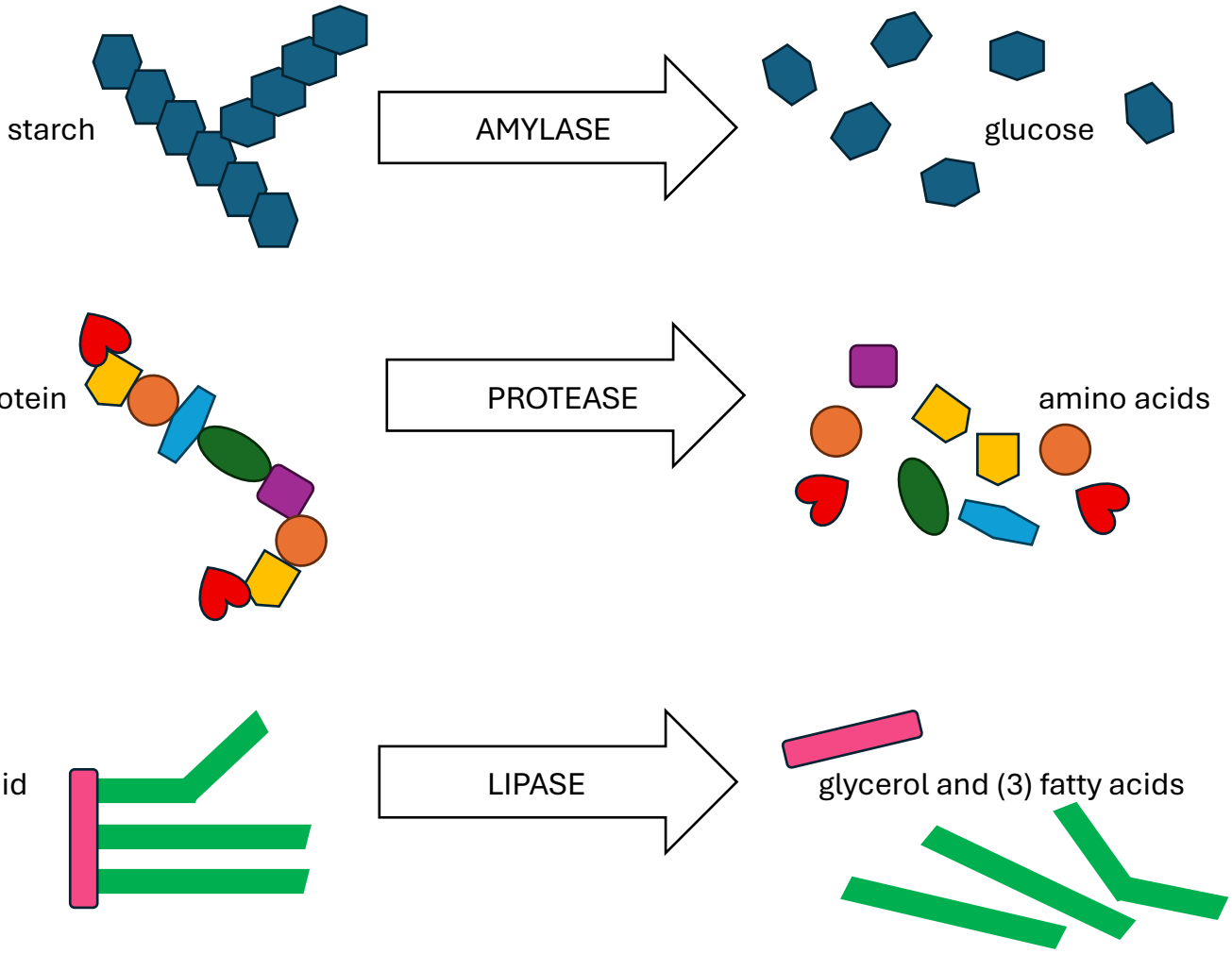
6 State where, in the digestive system, amylase, protease and lipase are secreted and where they act

7 Describe the functions of hydrochloric acid in gastric juice, limited to killing harmful microorganisms in food and providing an acidic pH for optimum enzyme activity of proteases in the stomach

Main digestive enzymes:

Enzyme	Breaks down	Product	Where it is secreted (made)	Where it works
Carbohydrase e.g. Amylase	Starch	Simple sugars (e.g. glucose)	Salivary glands, pancreas	Mouth, small intestine
Protease	Protein	Amino acids	Stomach, pancreas	Stomach, small intestine
Lipase	Fats and oils	Fatty acids + glycerol	Pancreas	Small intestine

Hydrochloric acid in the stomach kills harmful microbes in food. It also provides the acidic pH needed for protease enzymes to work.


starch
AMYLASE
glucose
protein
PROTEASE
amino acids
lipid
LIPASE
glycerol and (3) fatty acids