

Exercise walk-through

7.2

Digestive system

IGCSE Biology

What we will cover

- 1 A balanced diet
- 2 The digestive system
- 3 Teeth & physical digestion
- 4 Enzymes & chemical digestion
- 5 Stomach acid & bile
- 6 Absorption & villi



teeth and physical digestion

Seven parts of a balanced diet

Carbohydrates

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for energy – the everyday fuel.

Fats and proteins

Fats are the energy *store* and insulate; **proteins** are for growth and repair.

Vitamins

Small amounts, specific jobs: vitamin C for connective tissue, vitamin D for calcium uptake.

Mineral ions

Mineral ions : calcium for bones and teeth, and **iron** – from red meat and leafy greens – to make **haemoglobin**, the red pigment that carries oxygen.

Fibre and water

Fibre gives the gut muscles something to push against; water is the solvent everything else travels in.

“Balanced” means all seven, in the right proportions for that person’s age, sex and activity – not simply enough food.

The digestive enzymes, and what each does

amylase

starch → maltose. Made in the **salivary glands** and **pancreas**

maltase

maltose → glucose. On the wall of the **small intestine** – so starch takes **two** steps

protease

protein → amino acids. **Pepsin** in the stomach, **trypsin** from the pancreas – again **two** proteases

lipase

fats → fatty acids and glycerol. Made in the pancreas

bile

made in the liver, stored in the **gall bladder**. **Alkaline**, so it **neutralises** the acidic food entering the **duodenum**, and it **emulsifies** fat

Bile is **not** an enzyme. It does two physical jobs – change the pH, and break fat into droplets so lipase has more surface to work on.

Exercises 2.1·2.2

2.1 Name the parts of the alimentary canal that food passes through, in order. [3]

2.2 Define egestion. [1]

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2.1

- mouth → oesophagus → stomach → small intestine → large intestine → anus
-

2.2 Define egestion. [1]

2.2

- egestion is **undigested food leaving the body as faeces**

Exercise 3.1

3.1 Which organ adds digestive juice but food does **not** pass through it?

[1]

☐

A stomach

B small intestine

C pancreas

D oesophagus

Exercise 3.1

3.1 Which organ adds digestive juice but food does **not** pass through it?

[1]

☐

A stomach

B small intestine

C pancreas

D oesophagus

3.1 C

- the **pancreas** adds juice; food does **not** pass through it
- A, B and D are parts of the canal

Exercise 3.2 (a)

3.2 Food is taken in and later leaves the body.

(a) Name the process of taking food into the body.

[1]

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[1]

(a)

- taking food in is **ingestion**

Exercise 3.2 (b)

3.2 Food is taken in and later leaves the body.

(b) Explain the difference between egestion and excretion.

[2]

Exercise 3.2 (b)

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(b) Explain the difference between egestion and excretion.

[2]

(b)

- **egestion** removes undigested food that was never absorbed
- **excretion** removes waste products of metabolism made inside cells

Exercise 3.3 (a)

3.3 Food passes along the alimentary canal: mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus. The liver and pancreas are helper organs.

(a) Name the five processes of the digestive system and state briefly what each means. [5]

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(a)

- **ingestion:** taking food in through the mouth
- **digestion:** large insoluble molecules → small soluble ones
- **absorption:** small molecules pass through the gut wall into the blood
- **assimilation:** absorbed molecules used by cells
- **egestion:** undigested food leaves through the anus

Exercise 3.3 (b)

3.3 Food passes along the alimentary canal: mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus. The liver and pancreas are helper organs.

(b) State where in the canal each of these mainly happens: chemical digestion; absorption of digested food; absorption of water. [3]

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(b) State where in the canal each of these mainly happens: chemical digestion; absorption of digested food; absorption of water. [3]

(b)

- chemical digestion: mainly the **small intestine**
- absorption of digested food: **small intestine** (villi)
- absorption of water: **large intestine**

Exercise 3.3 (c)

3.3 Food passes along the alimentary canal: mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus. The liver and pancreas are helper organs.

(c) The liver and the pancreas are not part of the canal. State what each adds to it, and where. [2]

Exercise 3.3 (c)

3.3 Food passes along the alimentary canal: mouth → oesophagus → stomach → small intestine → large intestine → rectum → anus. The liver and pancreas are helper organs.

(c) The liver and the pancreas are not part of the canal. State what each adds to it, and where. [2]

(c)

- liver makes **bile**, released into the small intestine
- pancreas makes **pancreatic juice** with enzymes, into the small intestine

Exercise 3.3 (d)

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(d) Explain how peristalsis moves food along the canal. [2]

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(d)

- circular and longitudinal muscles **contract and relax** in turn
- a wave of contraction **pushes food forward**