

Exercise walk-through

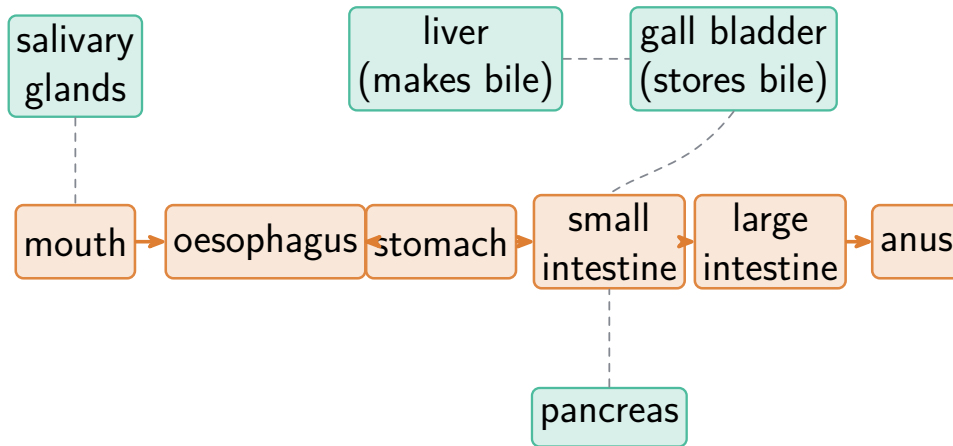
# 7.3

## Physical digestion

---

IGCSE Biology

# The digestive system



→ food's path    - - juices added

Food travels the **alimentary canal** : mouth →  
**oesophagus** →  
**stomach** → **small**  
**intestine** → **large**  
**intestine** . The **liver** ,  
**pancreas** & glands add  
 juices.

# The route, end to end

**Mouth to stomach** Mouth → **oesophagus** → **stomach** , which makes hydrochloric acid as part of the **gastric juice** .

**Small intestine** The **duodenum** , then the **ileum** : where most digestion finishes and **nutrients** are absorbed.

**Large intestine** The **colon** takes back water; the **rectum** stores the waste and the **anus** releases it.

**At the wall** **Maltase** sits on the membranes of the **epithelium** lining the small intestine and breaks maltose into **glucose** right where it is absorbed.

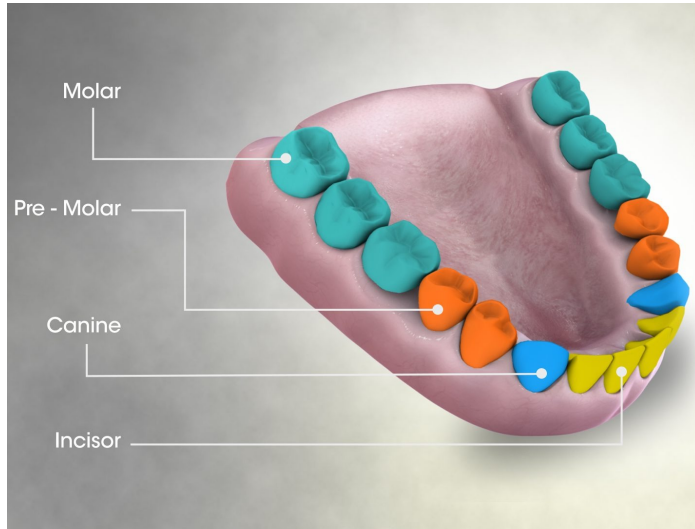
**Amylase** breaks starch into **reducing sugars** ; the last step happens at the wall, not in the cavity.

# Five processes



Take in → break down → into blood → used by cells → waste out. **Egestion** (faeces) is **not** excretion.

# Teeth and physical digestion

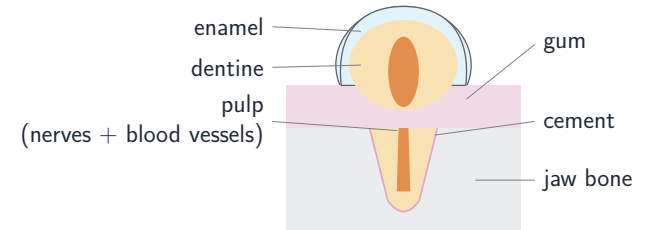


**Incisors**  
enamel  
enzymes.

cut, **canines**  
over **dentine**

tear, **premolars**  
, a soft **pulp**

& **molars** grind. A tooth: hard  
. Chewing makes more surface for



# The four kinds of tooth, and what a tooth is made of

## incisors

chisel-shaped, at the front – **cutting** and biting

## canines

pointed – **tearing**

## premolars and molars

broad with ridges, at the back – **grinding** and chewing

## enamel

the hard white outer layer – the **hardest material in the body**

## dentine

a softer, bone-like layer beneath the enamel

## pulp and cement

the pulp holds nerves and blood vessels; the cement fixes the root into the jaw

Chewing is **physical** digestion: it does not change any molecule, it only increases the **surface area** for the enzymes to act on.

## Exercises 2.1·2.2

---

**2.1** Name the type of tooth used for biting and cutting. [1]

---

**2.2** State why physical digestion is useful for later (enzyme) digestion. [1]

## Exercises 2.1·2.2

---

**2.1** Name the type of tooth used for biting and cutting. [1]

**2.1**

- biting and cutting: **incisors**
- 

**2.2** State why physical digestion is useful for later (enzyme) digestion. [1]

**2.2**

- physical digestion makes pieces smaller, giving a **larger surface area** for enzymes

## Exercise 3.1

---

**3.1** Bile emulsifies fats, which means it:

[1]

☐

**A** digests fat into fatty acids

**B** breaks large fat drops into small droplets

**C** neutralises acid

**D** absorbs fat

## Exercise 3.1

---

**3.1** Bile emulsifies fats, which means it:

[1]

☐

**A** digests fat into fatty acids

**B** breaks large fat drops into small droplets

**C** neutralises acid

**D** absorbs fat

**3.1 B**

- emulsifying **breaks large fat drops into small droplets**
- A is lipase; C is a second job of bile; D is absorption

## Exercise 3.2 (a)

---

**3.2** Bile is made in the liver.

(a) State where bile is stored.

[1]

## Exercise 3.2 (a)

---

**3.2** Bile is made in the liver.

(a) State where bile is stored.

[1]

(a)

- bile is stored in the **gall bladder**

## Exercise 3.2 (b)

---

**3.2** Bile is made in the liver.

(b) Explain why emulsifying fat speeds up its digestion.

[2]

## Exercise 3.2 (b)

---

**3.2** Bile is made in the liver.

(b) Explain why emulsifying fat speeds up its digestion.

[2]

(b)

- small droplets have a **much larger surface area**
- so lipase can digest the fat **faster**

## Exercise 3.3

---

**3.3** State the job of the molars and premolars.

[1]

## Exercise 3.3

---

**3.3** State the job of the molars and premolars.

[1]

**3.3**

- molars and premolars **chew and grind** food

## Exercise 3.4 (a)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(a) Name the four types of tooth and state the job of each.

[4]

## Exercise 3.4 (a)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(a) Name the four types of tooth and state the job of each.

[4]

(a)

- **incisors:** biting and cutting
- **canines:** tearing
- **premolars:** grinding and chewing
- **molars:** grinding food to a paste

## Exercise 3.4 (b)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(b) Explain what physical digestion is, and why it is needed before chemical digestion can work well. [3]

## Exercise 3.4 (b)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(b) Explain what physical digestion is, and why it is needed before chemical digestion can work well. [3]

(b)

- physical digestion breaks food into smaller **pieces** without changing the molecules
- it **increases the surface area**
- enzymes then act on far more of it, so chemical digestion is **faster**

## Exercise 3.4 (c)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(c) Bile is made in the liver and stored in the gall bladder. Describe its **two** jobs in the small intestine. [3]

## Exercise 3.4 (c)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(c) Bile is made in the liver and stored in the gall bladder. Describe its **two** jobs in the small intestine. [3]

(c)

- bile **neutralises** stomach acid so enzymes have the right pH
- it **emulsifies** fat, raising the surface area for lipase

## Exercise 3.4 (d)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(d) The stomach churns food, and stomach acid helps break down protein. Explain which of these is physical digestion and which is not. [2]

## Exercise 3.4 (d)

---

**3.4** Physical digestion happens in the mouth, the stomach and the small intestine.

(d) The stomach churns food, and stomach acid helps break down protein. Explain which of these is physical digestion and which is not. [2]

(d)

- **churning** is physical – pieces smaller, molecules unchanged
- acid breaking down protein is **chemical** digestion