Life Processes in Animals

Class 7 – Science

Animals carry out several life processes to stay alive, grow, and reproduce. These processes are:

1. Nutrition

Animals take in food to get energy and nutrients.

Examples:

Herbivores eat plants, Carnivores eat meat, Omnivores eat both.



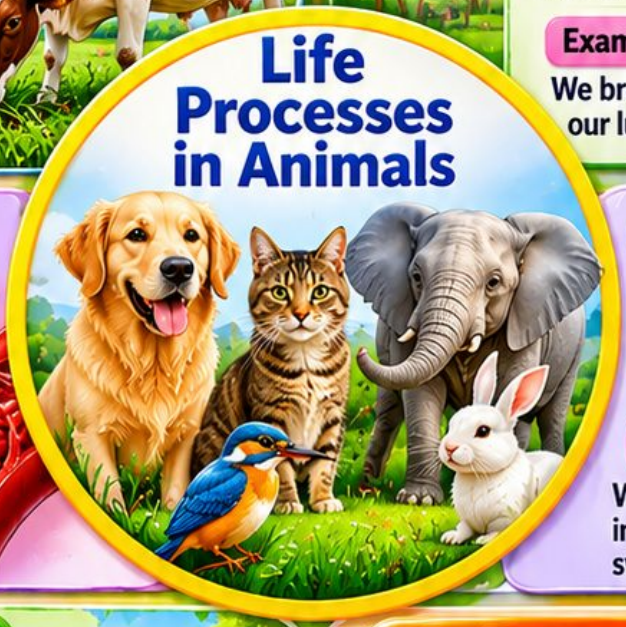
2. Respiration

Animals take in oxygen from air and give out carbon dioxide.

Examples:

We breathe through our lungs.





3. Transport

Nutrients, oxygen and waste products are transported through the body.

Examples:

Blood carries oxygen and nutrients.



4. Excretion

Animals remove waste products from their body.

Examples:

We remove waste in the form of urine, sweat and faeces.



5. Movement

Animals move from one place to another.

Examples:

Walking, flying, swimming and running.



6. Reproduction

Animals produce young ones to continue their species.

Examples:

A hen lays eggs, a cow gives birth to a calf.



Key Takeaways

- **Nutrition** – to get energy.
- **Respiration** – to release energy.
- **Transport** – to carry nutrients and oxygen.
- **Excretion** – to remove waste.
- **Movement** – to reach food and avoid danger.
- **Reproduction** – to produce young ones.

Life processes help animals survive!

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HUMAN DIGESTIVE SYSTEM

Turns food into energy for a healthy body!

DIGESTIVE SYSTEM – WHAT IS IT?

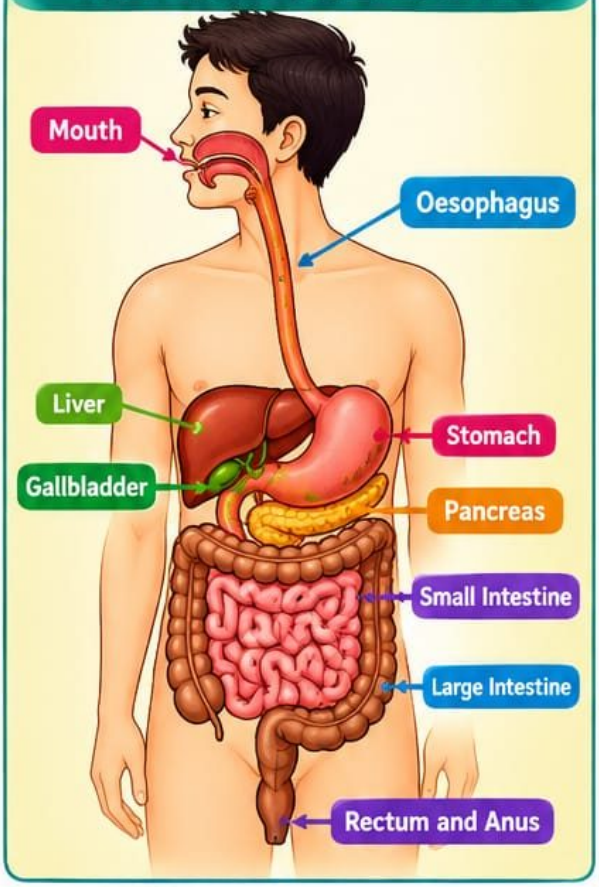
The digestive system is a group of organs that break down food into simpler forms, absorb nutrients and water, and remove waste from our body.

MAIN ORGANS

1. Mouth
2. Oesophagus
3. Stomach
4. Small Intestine
5. Large Intestine
6. Liver
7. Gallbladder
8. Pancreas
9. Rectum and Anus

Good food = Good health!

THE DIGESTIVE SYSTEM



FUNCTIONS OF EACH ORGAN

Mouth
- Chews food
- Mixes with saliva (amylase)

Oesophagus
- Moves food to stomach (peristalsis)

Stomach
- Churns food with acid
- Starts protein digestion

Small Intestine
- Completes digestion
- Absorbs nutrients

Large Intestine
- Absorbs water and minerals
- Forms waste

Liver
- Produces bile
- Helps in digestion of fats

Gallbladder
- Stores and releases bile

Pancreas
- Produces digestive enzymes
- Regulates blood sugar

Rectum and Anus
- Stores waste
- Removes waste from body

THE PROCESS OF DIGESTION

1 Ingestion
Food enters through the mouth.

2 Mechanical Digestion
Chewing and churning break food into smaller pieces.

3 Chemical Digestion
Digestive juices and enzymes break down food into simpler forms.

4 Absorption
Nutrients and water are absorbed in the small intestine and colon.

5 Egestion
Undigested waste is removed from the body.

IMPORTANT FACTS

- The small intestine is about 6 metres long.
- The large intestine is about 1.5 metres long.
- The liver is the largest internal organ.
- The stomach produces acid (pH 1–3).
- The digestive system works together with other systems like the circulatory and nervous system.

HEALTHY DIGESTION TIPS

- Eat a balanced diet with fruits, vegetables and fibre.
- Drink plenty of water.
- Chew food properly.
- Avoid junk food and excess sugar.
- Maintain regular physical activity.
- Keep good hygiene (wash hands and eat clean food).

Healthy gut, Happy you!

DID YOU KNOW?

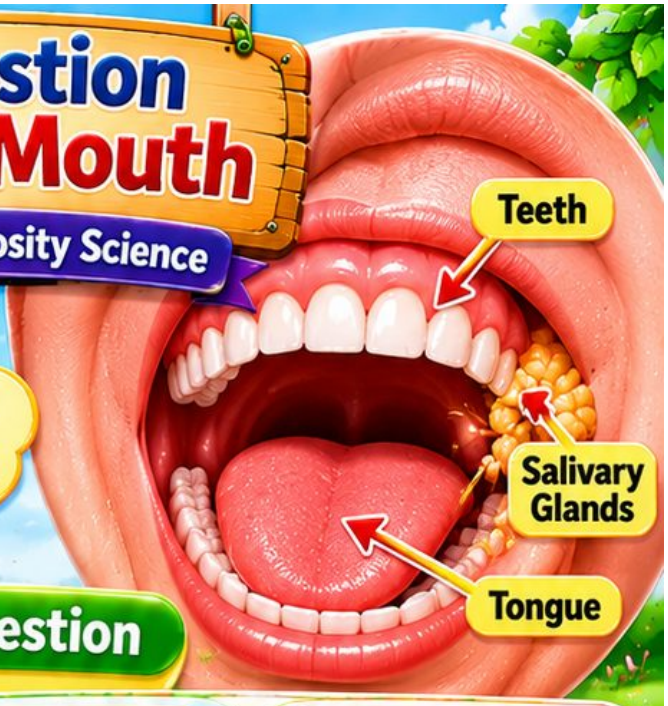
- Saliva contains amylase, an enzyme that starts carbohydrate digestion.
- Bile is not an enzyme, but it helps in fat digestion.
- The stomach acid is strong enough to kill most harmful germs.
- Good gut health boosts immunity and overall well-being.

Healthy food fuels your life!

How Digestion Occurs in Mouth

Class 7 – NCERT Curiosity Science





Digestion begins in the mouth!

What Happens?

In the mouth, food is broken down into smaller pieces and mixed with saliva.

Steps in Digestion



1 You Bite



Teeth bite the food into small pieces.

2 You Chew



Teeth help to chew the food well.

3 Saliva Works



Salivary glands release saliva, which contains enzyme **amylase**.

4 Food is Mixed



The tongue mixes food with saliva.

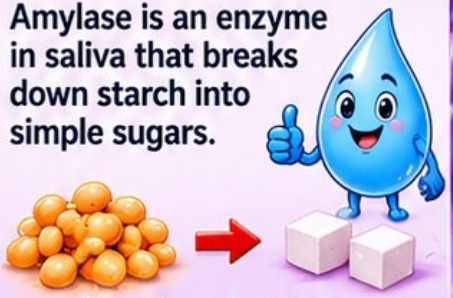
5 A Soft Mass is Formed



The chewed food and saliva form a soft ball called **food bolus**.

What is Amylase?

Amylase is an enzyme in saliva that breaks down starch into simple sugars.



Starch → Sugar

Key Facts

- Digestion in the mouth is mainly mechanical (chewing) and chemical (actions of saliva).
- It breaks down starch.

Remember!

Digestion in the mouth turns food into a soft **bolus**, ready to be swallowed.

Next Step

The food bolus is then swallowed and moves down the oesophagus.

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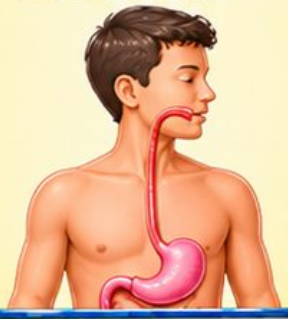
Movement of Food in the Oesophagus

Class 7 – NCERT Curiosity Science

Food travels down the oesophagus!

What is the Oesophagus?

The oesophagus is a muscular tube that connects the mouth to the stomach.



What is Peristalsis?

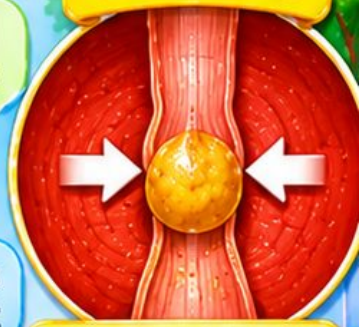
Peristalsis is the wave-like movement of muscles in the oesophagus that pushes food **down**.

Step-by-Step Movement

1. You swallow the food.
2. The muscles behind the food contract.
3. This pushes the food forward down the tube.
4. The muscles **relax** behind the food.
5. The food moves further down towards the stomach.



Peristalsis



Wave-like muscular contractions push the food forward.

Key Takeaways

- Food moves down the oesophagus by peristalsis.
- Muscular contractions push the food.
- The food reaches the stomach.

Remember!

Peristalsis helps food travel down the oesophagus!

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From Mouth to Stomach... The Journey of Food!

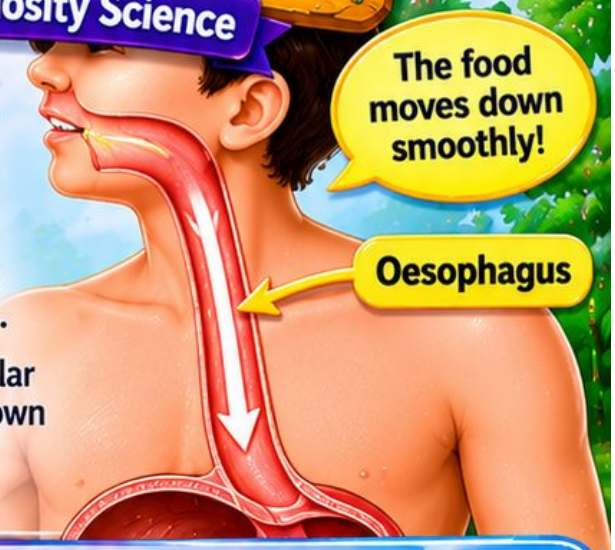
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1. Food Travels in the Oesophagus

After chewing, the food (chewed food) is swallowed and enters the **oesophagus**.

The oesophagus is a muscular tube that moves the food down using wave-like contractions (**peristalsis**).



2. The Food Enters the Stomach

The food moves through the oesophagus and reaches the stomach.



3. Digestion in the Stomach

The stomach churns the food with strong muscular movements and mixes it with **gastric juice**.

The food is turned into a semi-liquid form called **chyme**.

Gastric Juice contains:

- Acid – kills harmful germs.
- Enzyme (Pepsin) – breaks down proteins.

Key Facts

- The oesophagus moves food by peristalsis.
- The stomach churns food with gastric juice.
- Proteins are broken down in the stomach.



Remember!

Food travels from the mouth through the **oesophagus** and reaches the **stomach**, where it is mixed with gastric juice and digested into a soft liquid.

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From Stomach to Small Intestine

The Next Step in Digestion

Class 7 – NCERT Curiosity Science

1 Food in the Stomach

The food is churned in the stomach with gastric juice and broken down into a semi-liquid form called **chyme**.

Stomach

Liver

2 Role of the Liver

The liver produces **bile**, which breaks down fats into smaller droplets.

Bile

Pancreas

3 Role of the Pancreas

The pancreas releases digestive juices containing enzymes (**amylase**, **lipase and proteases**) into the small intestine.

Small Intestine

4 Food Enters the Small Intestine

The chyme from the stomach mixes with **bile** from the liver and digestive juices from the pancreas in the small intestine.

5 Final Digestion and Absorption

The enzymes complete the digestion of carbohydrates, proteins and fats. The **nutrients** are absorbed into the blood through the walls of the small intestine.

Villi absorb nutrients

Key Takeaways

- Food from the stomach enters the small intestine.
- Liver produces **bile** to help digest fats.
- Pancreas releases digestive enzymes into the small intestine.
- Nutrients are absorbed into the blood.

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Role of Pancreas and Liver in Digestion

Class 7 – NCERT Curiosity Science

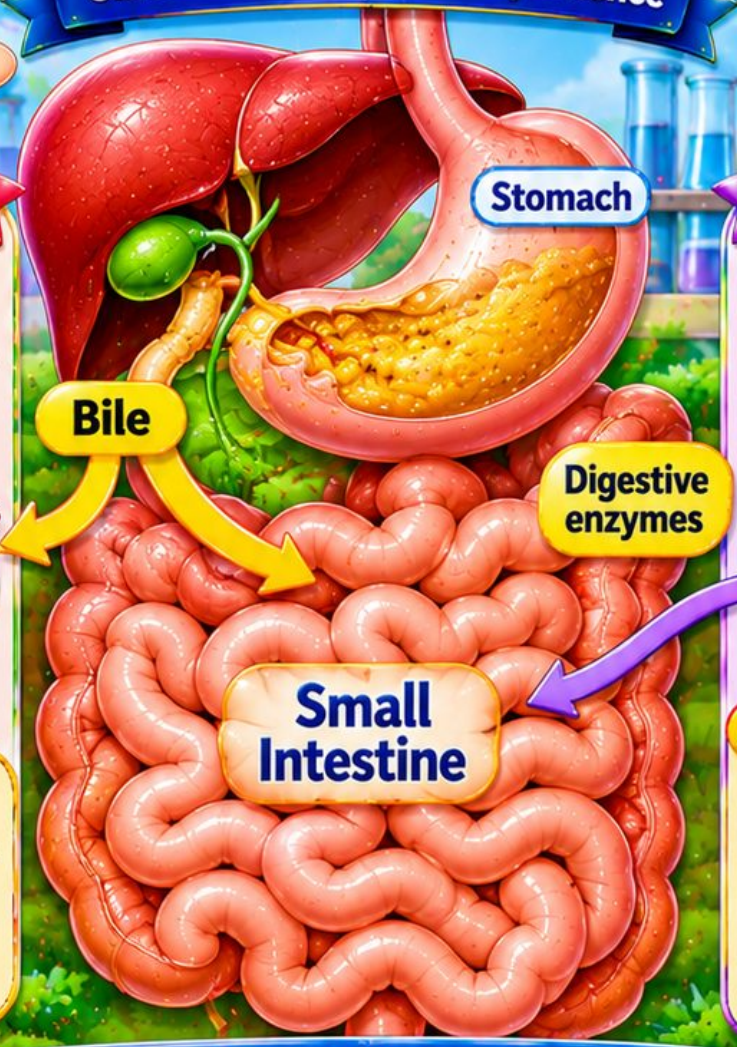
Liver

The liver produces **bile**, which helps to break down **fats** into tiny droplets.



Bile helps:

- Emulsify fats (makes them easier to digest).
- Works in the small intestine.



Pancreas

The pancreas releases **digestive enzymes** (amylase, lipase and proteases) into the small intestine.



These enzymes help to:

- Break down carbohydrates (amylase).
- Break down fats (lipase).
- Break down proteins (proteases).

How it Works?

1. Food is partially digested in the stomach.



2. Bile from the liver reaches the small intestine and helps in digesting fats.



3. Enzymes from the pancreas break down carbohydrates, fats and proteins.



4. Digested nutrients are absorbed into the blood through the walls of the small intestine.



Key Takeaway

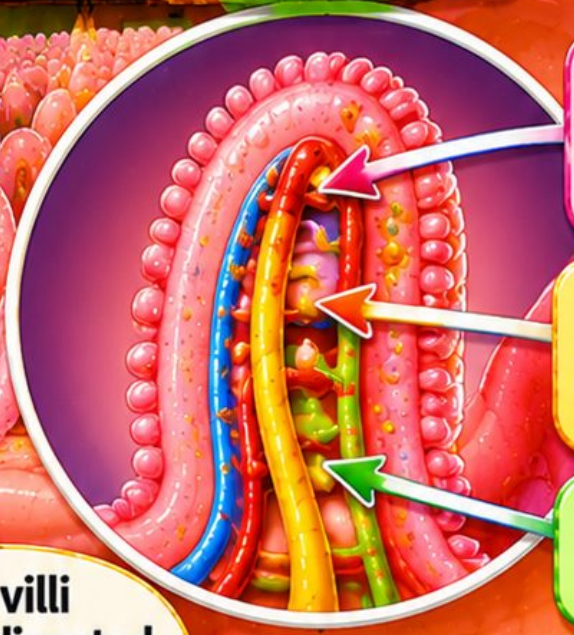
The **liver** and **pancreas** work together to complete digestion in the small intestine.

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Absorption of Nutrients by the Villi

Digested Food is Absorbed and Transported to All Parts of the Body

Villi
(tiny finger-like projections)



Absorbed nutrients
(glucose, amino acids, etc.)

Blood capillaries
(carry nutrients into blood)

Lacteal
(carries fats into lymph)



The villi absorb digested food into **blood** and **lymph**!

Transport to All Parts of the Body

Nutrients are carried by **blood** through blood vessels.



They reach all parts of the body – brain, muscles, bones and more!



Key Takeaways

- Villi absorb digested food.
- Nutrients enter blood and lymph.
- Food is transported to all parts of the body.

This process gives energy and helps us grow, stay healthy and active!



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Digestion of Food in the Large Intestine

The large intestine absorbs water and forms solid waste.



1 Water Absorption

The large intestine absorbs water from the remaining food.



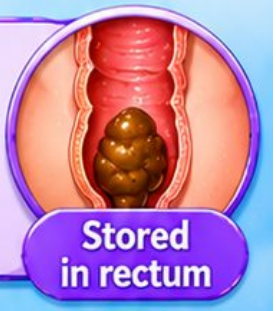
2 Formation of Solid Waste

The remaining undigested material becomes solid waste.



3 Storage

The solid waste is stored in the rectum.





A healthy diet with plenty of water helps the large intestine do its job well!

4 Egestion

The solid waste is finally pushed out from the anus.



Key Takeaways

- Large intestine absorbs water.
- Forms solid waste.
- Stores waste in rectum.
- Helps in egestion.

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DIGESTION IN RUMINANTS

Special Stomach • Unique Process • Healthy Life

Cows, Goats, Sheep and Deer are ruminants.

WHAT ARE RUMINANTS?

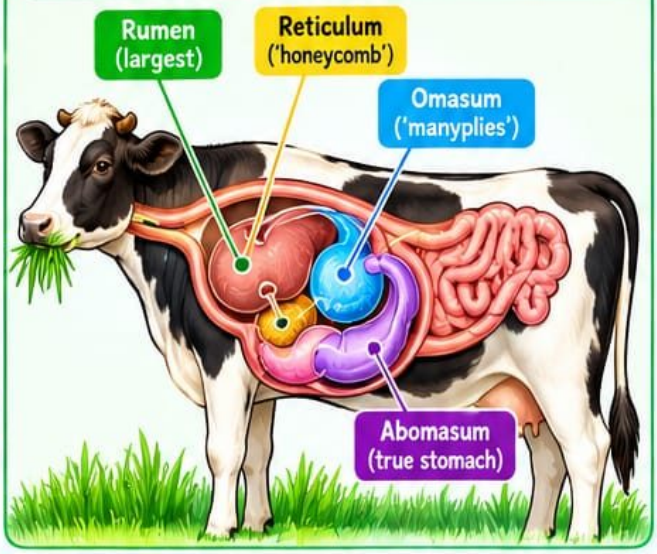
- Ruminants are herbivorous animals that chew cud.
- They have a special stomach with four compartments.
- They can digest cellulose (plant fibre) present in grass and other green plants.

They get energy from plant material.

THE PROCESS IN DETAIL

1. Food is chewed and mixed with saliva in the mouth.
2. It goes to the rumen, where microbes break down cellulose. This produces volatile fatty acids (VFA) which provide energy to the animal.
3. The food is regurgitated as cud, chewed again and swallowed.
4. It passes through the reticulum, omasum and abomasum.
5. Nutrients are absorbed in the small intestine.

FOUR COMPARTMENTS OF STOMACH



RUMINATION (CHEWING CUD)



1. Eating
2. Cud in mouth (chewing again)
3. Swallowing
4. Back to rumen

MICROBIAL DIGESTION



Bacteria, protozoa and fungi live in the rumen. They break down cellulose into simpler compounds like volatile fatty acids, which are used for energy by the animal.

THE DIGESTION PROCESS

1. **INGESTION** — The cow eats grass and other plant material.
2. **RUMINATION (CHEWING CUD)** — The food is brought back from the rumen to the mouth, chewed again and swallowed.
3. **MICROBIAL DIGESTION** — Microorganisms in the rumen break down cellulose into simpler substances.
4. **PASSAGE TO OMASUM** — The partially digested food moves to the omasum, where water is absorbed.
5. **TO ABOMASUM** — It then moves to the abomasum where digestive enzymes and acid complete the digestion.
6. **INTESTINES** — Nutrients are absorbed in the small intestine. Undigested matter moves to the large intestine and is passed out as faeces.

WHY IT IS IMPORTANT

- Helps in digesting fibrous plant material (cellulose).
- Provides energy and nutrients.
- Maintains the health and well-being of the animal.
- Supports milk and meat production.



KEY FACTS

- Ruminants have a four-chambered stomach (rumen, reticulum, omasum, abomasum).
- Cellulose is digested by microorganisms in the rumen.
- They regurgitate and chew cud.
- The process takes time and is essential for their survival.

EXAMPLES OF RUMINANTS



Cow, Goat, Sheep, Deer, Buffalo

REMEMBER

Ruminants turn grass into milk, meat and healthy life!

Nature's recyclers • Ruminants make the best use of plants!

Digestion of Food in Birds

From Beak to Body – A Smooth Journey!



1 Beak
Food is picked up and swallowed.

2 Oesophagus
Food travels down to the crop.

3 Crop
Food is stored for some time and becomes soft.

4 Stomach
Digestive juices break down food.

5 Gizzard
Strong muscular walls crush food with the help of small stones.

6 Small Intestine
Digested food is absorbed into the blood.

7 Large Intestine
Water is absorbed and solid waste is formed.

8 Cloaca
Solid waste is expelled from the body.

Special Features in Birds

- Crop – stores food
- Gizzard – crushes food
- Efficient digestion for high energy

Key Takeaways

- Birds have a crop and gizzard.
- Food is digested in stages.
- Nutrients are absorbed in the small intestine.
- Water is absorbed in the large intestine.
- Birds get energy to fly and stay active!

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HUMAN RESPIRATORY SYSTEM

Breathe In Life • Breathe Out Waste

WHAT IS IT?

The respiratory system helps us breathe. It takes in oxygen from the air and removes carbon dioxide from our body.

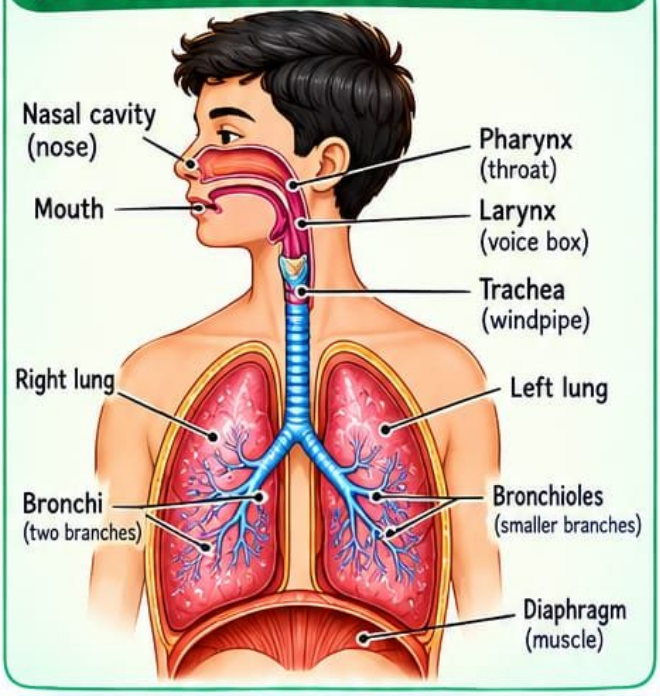
Oxygen gives us energy and helps us live.

THE LUNGS

- We have two lungs (right and left).
- They are spongy and full of tiny air sacs called alveoli.
- Alveoli help in the exchange of oxygen and carbon dioxide.



ORGANS OF THE RESPIRATORY SYSTEM



PARTS AND THEIR JOBS

Part	Function
Nasal cavity	Filters, warms and moistens the air.
Mouth	Alternate route for air.
Pharynx	Common passage for food and air.
Larynx	Produces voice.
Trachea	Windpipe, carries air to bronchi.
Bronchi	Two main branches to each lung.
Bronchioles	Smaller branches, carry air to alveoli.
Alveoli	Site of gas exchange.
Diaphragm	Muscle that helps in breathing.

MAIN FUNCTIONS

1. Takes in oxygen from the air.
2. Removes carbon dioxide from the body.
3. Helps in voice production (with the help of larynx).
4. Keeps the body at the right temperature and humidity.

THE PROCESS OF RESPIRATION

1. Air enters through the nose or mouth.
2. Passes through the pharynx, larynx and trachea.
3. Reaches the bronchi and bronchioles.
4. Oxygen enters the blood in the alveoli.
5. Carbon dioxide from the blood is released into the air.

DID YOU KNOW?

- We breathe about 12–20 times per minute.
- The right lung is slightly larger than the left lung.
- Our lungs contain nearly 300 million alveoli!
- We can live only a few minutes without oxygen.



KEEP YOUR LUNGS HEALTHY


Do not smoke.


Avoid pollution.


Exercise regularly.


Eat healthy food.


Drink plenty of water.


Practice deep breathing.

REMEMBER

Healthy lungs = Healthy life



INTERESTING FACTS

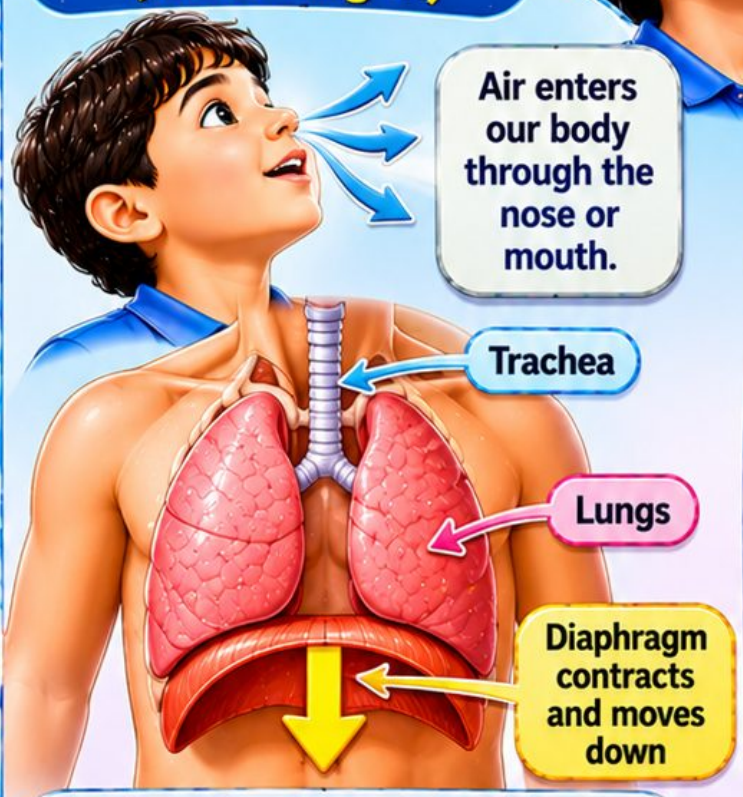
- Human lungs have about 300 million alveoli.
- Total surface area of alveoli is nearly 70 m^2 (about the size of a tennis court)!
- The respiratory system also helps in speaking, smelling, and keeping the body warm and moist.

Mechanism of Breathing in Humans

Inhalation and Exhalation

Breathing helps us get **oxygen** and remove **carbon dioxide**!

Inhalation (Breathing In)



1. Diaphragm contracts and moves down.
2. Rib cage moves up and out.
3. Lungs expand and air enters.

Exhalation (Breathing Out)



1. Diaphragm relaxes and moves up.
2. Rib cage moves down and in.
3. Lungs get smaller and air is pushed out.

Key Takeaways

- Diaphragm helps us breathe.
- Lungs take in oxygen and remove carbon dioxide.
- Inhalation brings air in, Exhalation pushes air out.

Breathe Healthy... Live Healthy!

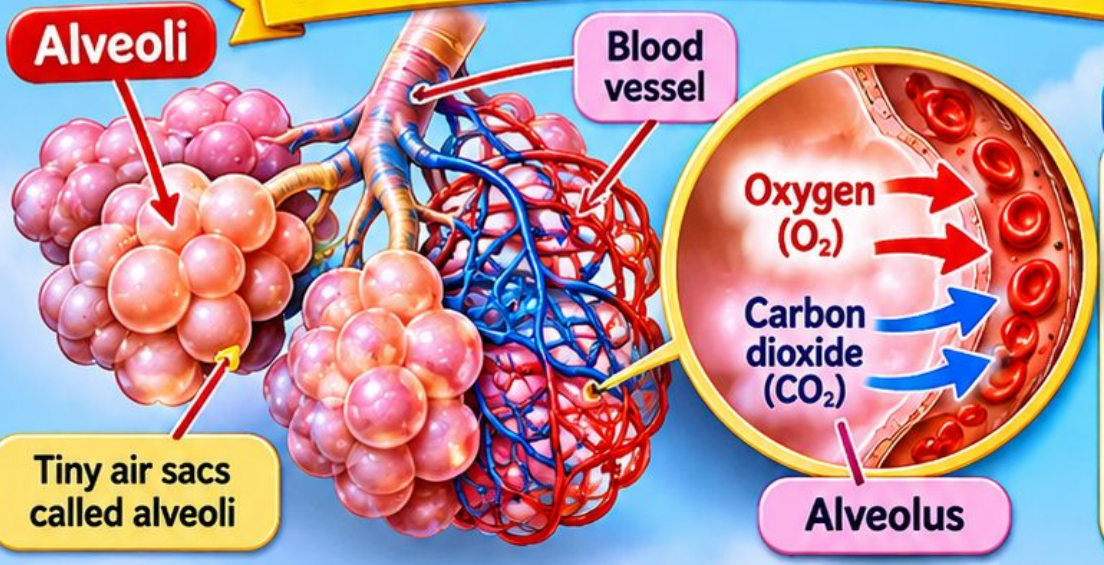
Remember:



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How Does the Exchange of Gases Happen?

Through the tiny air sacs in our lungs – Alveoli!



1. The Lungs

Our lungs contain millions of alveoli, which have very thin walls.



2. Oxygen Enters the Blood

Oxygen from inhaled air diffuses through the thin walls of alveoli into blood capillaries.



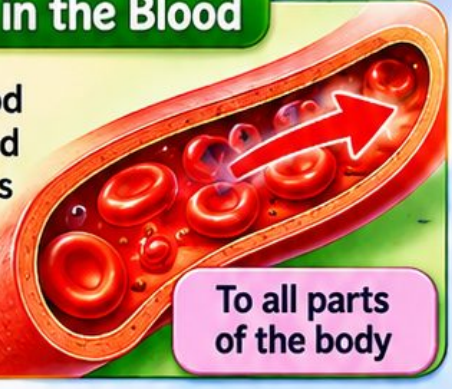
3. Carbon Dioxide Leaves the Blood

Carbon dioxide from blood diffuses into the alveoli and is breathed out.



4. Transport in the Blood

Oxygen-rich blood is carried by blood vessels to all parts of the body.



5. Breathing Out

Carbon dioxide-rich blood returns to the lungs. We breathe out CO_2 through our nose or mouth.



Key Takeaways

- Alveoli help in the exchange of gases.
- Oxygen enters the blood.
- Carbon dioxide is removed from blood.
- This process helps us to stay alive!

Remember:

We breathe in **Oxygen**, and breathe out **Carbon Dioxide!**



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How the Food We Eat Gives Us Energy?

From Plate to Power!



1 Digestion

Food is broken down in the mouth, oesophagus, stomach and intestines into simple nutrients (glucose).



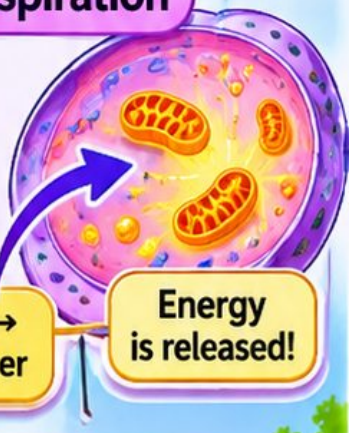
2 Absorption

Glucose is absorbed into the blood through the small intestine and carried to all parts of the body.



3 Cellular Respiration

In our body cells, glucose reacts with oxygen to produce energy, releasing carbon dioxide and water.



Glucose + Oxygen → Energy + CO_2 + Water

Energy is released!

4 Energy for the Body

The released energy helps us:

- Move and play
- Think and learn
- Keep our body warm
- Grow and stay healthy



5 Waste Products

Carbon dioxide is breathed out through lungs, and water is removed in urine and sweat.



CO_2 (out in breath)



Water (out in urine and sweat)

So, the food we eat is converted into energy that keeps us alive and active!

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Do other animals breathe the same way as humans?

Animals Breathe Differently!

You have learnt that different animals live in different habitats. You may have observed birds flying and fish swimming.

How do they breathe?



Gills – Breathing in Water

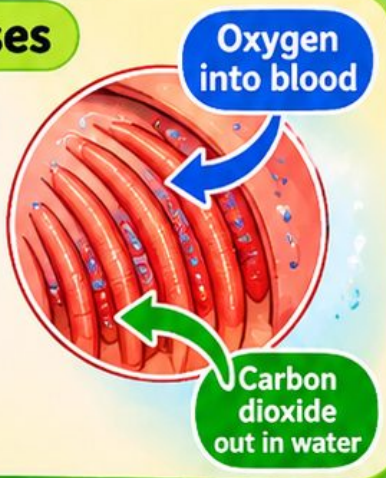
Animals like fish, elephants, lions, cows, goats, lizards and snakes breathe through their lungs. Although all these animals have lungs, the structure of their lungs is quite different.



Most aquatic animals like fish, have specialised structures known as **gills.**

Exchange of Gases

These are richly supplied with blood vessels. The exchange of oxygen and carbon dioxide between the blood and the gases dissolved in water takes place across the gills.



Amphibians – Land and Water

Amphibians, like frogs, live both on land and in water. They use different body parts for breathing at various stages of their life.



Tadpoles breathe through gills.



Adult frogs use lungs and skin.



Adaptation Helps Them Survive

For example, tadpoles breathe through gills, while adult frogs use lungs for breathing on land and skin for gas exchange when they stay in water.



Earthworms – Moist Skin

Earthworms use their moist skin for the exchange of oxygen and carbon dioxide.



In Summary

Different animals have different breathing mechanisms to suit their unique habitats. Apart from the digestive system, the respiratory system and the circulatory system, there are other systems which work together to sustain life.

You will study about them in higher grades.

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Respiration in Fishes

Fishes breathe through gills!



Gills are special respiratory organs that help fish to take oxygen from water and remove carbon dioxide from their body.



How Respiration Occurs?

1 Water Enters

The fish opens its mouth and takes in water.



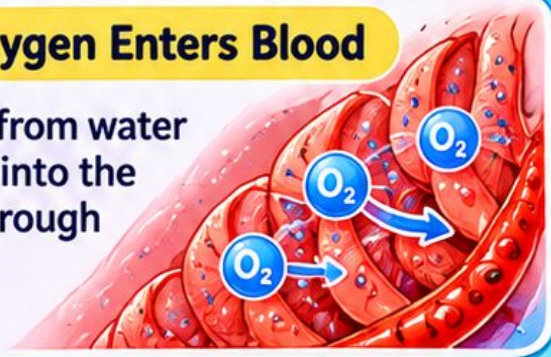
2 Water Passes Over Gills

The water flows across the gills, where exchange of gases takes place.



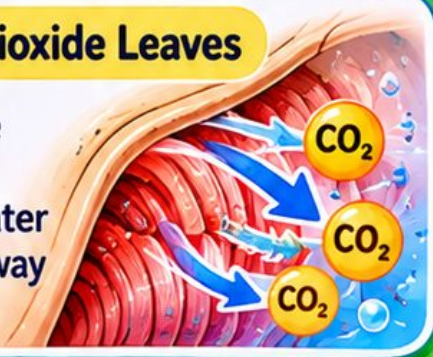
3 Oxygen Enters Blood

Oxygen from water diffuses into the blood through the gills.



4 Carbon Dioxide Leaves

Carbon dioxide from the blood diffuses into water and is carried away with the water.



Why Gills are Important?

- Help fish to breathe underwater.
- Allow exchange of gases.
- Keep the fish alive in water.



Interesting Facts!

- Gills have many thin filaments for more surface area.
- Fish breathe continuously while swimming.



Respiration in fishes keeps them alive in the water!

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Respiration in Frogs

Frogs breathe through lungs and skin!



1. How Frogs Breathe?

Frogs use both **lungs** and **skin** for respiration.

2. Breathing with Lungs

Frogs draw air into their lungs through their mouth and nostrils.



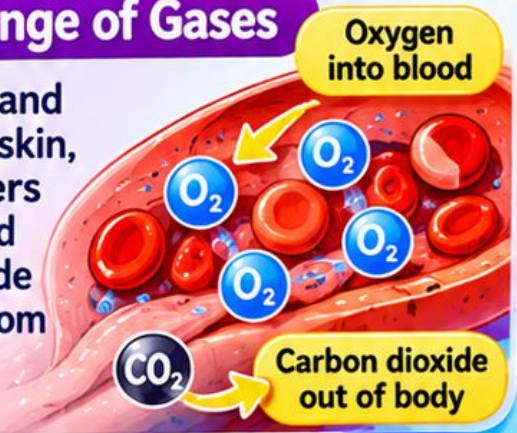
3. Breathing through Skin

Frogs can also absorb oxygen through their **moist skin.**



4. Exchange of Gases

In the lungs and through the skin, oxygen enters the blood and carbon dioxide is removed from the body.



5. During Different Stages



- Tadpoles breathe through gills.
- Young frogs use lungs and skin.
- Adult frogs breathe mainly through lungs, and also through skin.

Interesting Facts!

- Frogs can survive both in water and on land.
- Their moist skin helps them breathe even in water.
- This dual method helps them live in different habitats.

In Short...

Frogs breathe with **lungs** and **skin** for a healthy and active life!



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Respiration in Earthworm

Earthworms breathe through their moist skin!



What is Special?

Earthworms do not have lungs. They breathe through their **moist skin**.

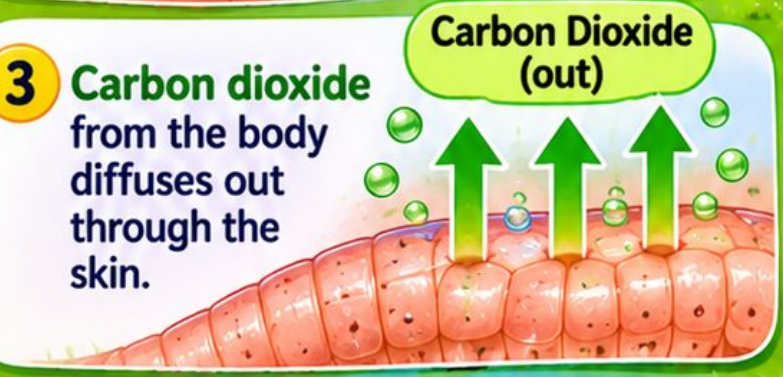
How It Works?



1. **Oxygen** from air dissolves in the moist skin.



2. Oxygen diffuses into the **blood** and is carried through the body.



3. **Carbon dioxide** from the body diffuses out through the skin.

Where Does It Occur?

Throughout the body surface of the earthworm because its skin is **thin and always moist.**



Why is Moisture Important?

- Moist skin helps gases to dissolve and diffuse.
- In dry conditions, earthworms may struggle to breathe.



Quick Facts!

- Earthworms respire through moist skin.
- They need oxygen to live.
- They also remove carbon dioxide from their body.



Healthy Soil, Happy Earthworms!

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