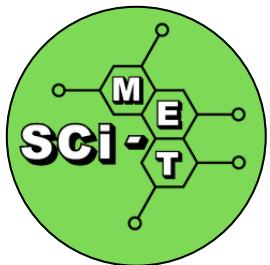


4



SCIENCE

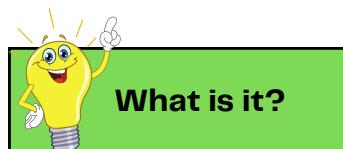
Quarter 2: Major Organs of the Human System



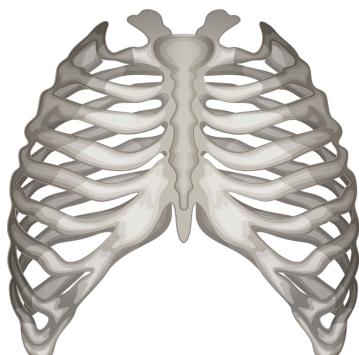
Bones and Muscles

Did you know that your body is packed with powerful muscles and strong **bones**? These amazing parts work together to help you move, play, and stay active every day. But how exactly do they do it? And what are some of the different muscles and bones in your body?

In this module, we'll explore the incredible teamwork between your muscles and bones. We'll discover how they support you, protect you, and make it possible for you to run, jump, and play.



The skeletal system consists of all the bones in your body. It forms the framework that supports and shapes your body, protects vital organs, enables movement by working with **muscles**, produces **blood cells** in the **bone marrow**, and stores essential minerals like **calcium**. The human skeleton is made up of 206 bones, including:



- **Skull** – Protects the brain.
- **Ribs** – protect the heart and lungs.
- **Backbones/ spine/ spinal column** – protect the spinal cord.
- **Pelvic Bone/Pelvis** – protect the internal organs and supports the weight of the upper body when sitting and standing. It is the largest bone in the body.

Figure 1. Rib Cage

Joints – the areas where two or more bones meet, allowing movement.

Muscles make up the fleshly parts of our body. They enable us to move, shape our body, and protect our delicate organs.

Muscles can be classified into two types:

- Voluntary Muscles: These are muscles that we can control.
- Involuntary Muscles: These are muscles that we cannot control.

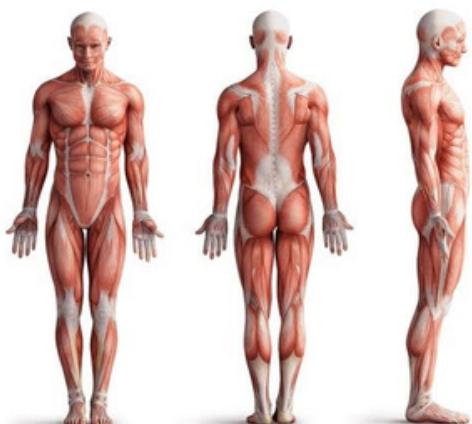


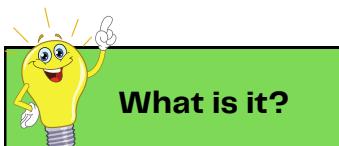
Figure 2. Muscles

- The bones provide support as you move, but it's the muscles attached to them that make the movement possible. Muscles are present in almost every part of your body, and without them, you wouldn't be able to do anything.
- Some muscles and bones work together. Skeletal muscles are muscles that are connected to bones by tendons.
- **Tendons** are stretchy, rubber-like cords that help muscles move bones.

Stomach and Intestines

Have you ever felt a growling sound in your stomach when you're hungry? That's your body telling you it's time to eat! But did you know that the food you eat doesn't just get absorbed by your body right away? Your **stomach** and **intestines** work hard to break down food into tiny pieces that your cells can use for energy.

In this module, you'll learn all about the stomach and intestines—the amazing organs that help **digest** your food. We'll explore how they work together to make sure your body gets the nutrients it needs to keep you strong and healthy.



The digestive system is made up of several important organs that work together to break down food so your body can use it for energy and growth. It includes the mouth, esophagus, stomach, small intestine, and large intestine.

The process by which the food you eat gets broken down into smaller pieces, with the nutrients being absorbed into your body is called digestion.

Digestion takes place as soon as we start to **chew** our food.

The tongue, lips, and cheeks move the food between the teeth and we use our teeth to cut, break and chew the food.

Salivary gland produces **saliva** which mixes with food in the teeth and makes the food soft and easier to swallow.

The food travels down the **esophagus**. It is like slippery tube and it carries the chewed food down to the stomach.

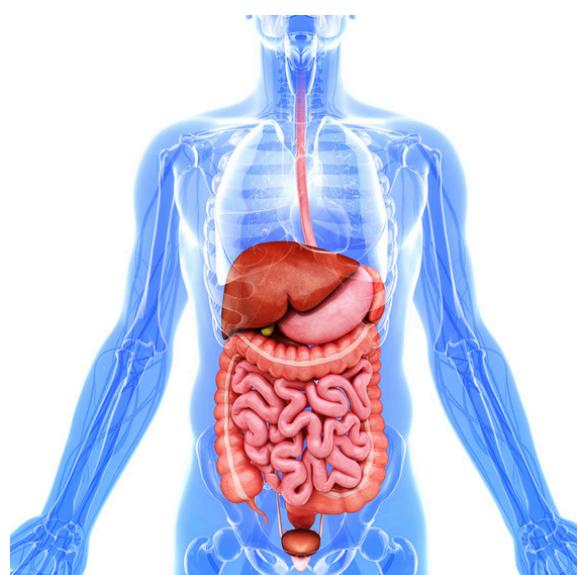


Figure 3. Digestive System

Chewed food is pushed into a big stretchy bag organ called the stomach. The muscles in the stomach mix the food with digestive **enzymes** and juices, breaking it down into smaller pieces that can be absorbed in the intestine.

From the stomach, the partly digested food, known as **chyme**, moves into the small intestine, which is about 2.5 cm wide and 7 meters long. Here, **digestive juices** from the liver and pancreas help break down the food further. The small intestine has tiny finger-like structures called **villi** that absorb nutrients into the **bloodstream**, allowing them to be distributed throughout the body.

Any leftover waste goes to the large intestine where water is absorbed, and what remains is formed into **feces**.

Feces, or body waste, is kept in the lowest section of the large intestine, known as the rectum. The **rectum** holds this waste until it leaves the body through the **anus**.



Figure 4. Large Intestine

Kidney

Have you ever woken up in the middle of the night just to use the bathroom? That's your body at work, filtering out wastes and extra water from your blood while you sleep. This important job is done by your amazing kidneys.

In this lesson, you'll discover how your kidneys help eliminate wastes and keep your body healthy.

What is it?

A cartoon illustration of a yellow lightbulb with a smiling face, arms, and legs. It is pointing towards the right side of the frame. Below the lightbulb is a green rectangular box containing the text "What is it?" in white.

The urinary system is responsible for the disposal of liquid waste. The kidneys, the primary organs of this system, are crucial for filtering and removing waste products from the body.

The kidneys are bean-shaped organs, each about 4 to 5 inches long and 2 to 3 inches wide. They are located in the upper **abdominal** area against the back muscles, with the right kidney slightly lower due to the liver's position. Acting like filters, they remove excess fluids and waste from the body through **urine**.

They are located in the upper abdominal area against the back muscles, with the right

kidney. Acting like filters, they remove excess fluids and waste from the body through urine.

The kidneys filter **urea** from the **blood** through tiny units called **nephrons**. Each kidney contains about 1 million nephrons, which are essential for their function.

Nephrons take in blood, metabolize nutrients, and help pass out waste products from the filtered blood.

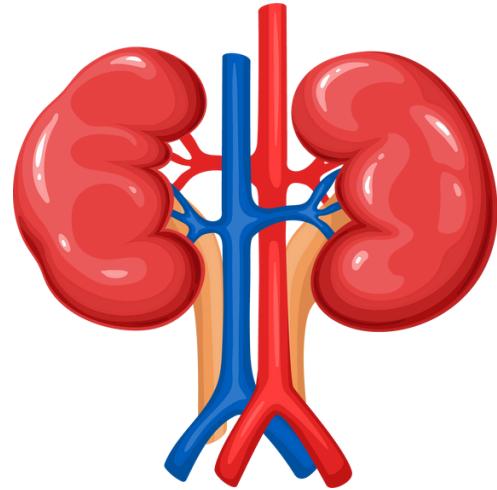


Figure 5. Kidneys

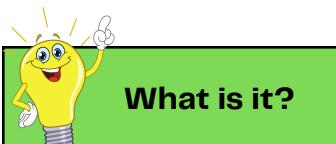
Functions of the Kidneys

1. Remove liquid waste from the blood in the form of urine.
2. Maintain a stable balance of salts and other substances in the blood.
3. Produce **hormones** that aid in the formation of **body cells**.

Heart and Lungs

Have you ever noticed your heartbeat getting faster when you run or play? That's your heart working hard to pump blood and nutrients throughout your body. But did you know your lungs are also working together with your heart during these activities? When you breathe in, your lungs take in oxygen, which is then carried by your blood to fuel your muscles.

In this lesson, you will discover how your heart and lungs work as a team to keep you active and healthy.



The heart is a hollow, muscular organ about the size of your fist, located near the lungs and protected by the rib cage. It's made up of **cardiac muscles** that contract involuntarily, meaning you can't control them with your will. These contractions help the heart pump blood, distributing nutrients from the small intestines and oxygen from the lungs to different parts of the body.

When you engage in physical activities like running or jumping, your **pulse rate**

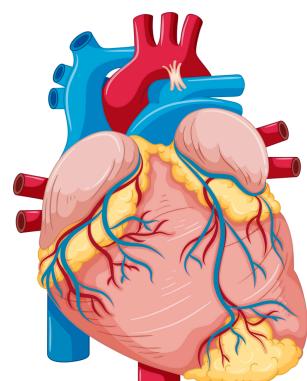


Figure 6. Heart

increases compared to when you're sitting or sleeping. This is because exercise causes the heart muscles to contract more frequently, pumping blood more efficiently to meet the body's increased demand for oxygen and nutrients.

The lungs are composed of tiny **air sacs** that filter oxygen as it enters the body. They are also located near the heart and protected by the rib cage. The lungs supply the necessary oxygen for **respiration** and remove **carbon dioxide**, a waste product, from the body.

Our pair of lungs works in coordination with the heart by oxygenating the blood that passes through them. The lungs, through their air sacs, ensure the oxygen quality by filtering it, leaving the good oxygen in the blood and expelling waste gases like carbon dioxide.

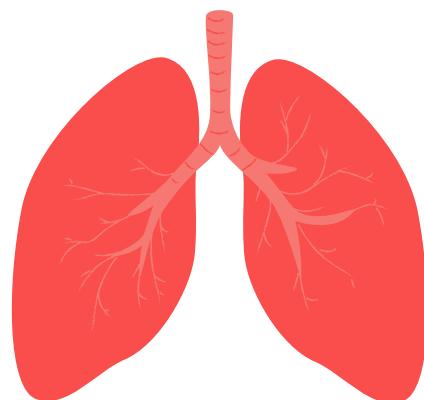


Figure 7. Lungs

Brain

One of the most important organs of our body is the brain. It helps us do everything from thinking and moving to feeling and learning. This amazing organ is responsible for controlling different parts of our body and making sure everything works properly.

In this lesson, you'll discover how this organ functions and what are the parts of it.

What is it?

A cartoon-style lightbulb character with a smiling face and a hand pointing upwards, enclosed in a green rectangular frame.

It is found in the head and protected by the skull. It contains billions of units of **neurons** for the processing of information and weighs about 1.5 kg. It is also known as the central processing unit of the body, for its main function is to process and interpret the information. It receives and sends back the most appropriate reaction of the involved body parts.

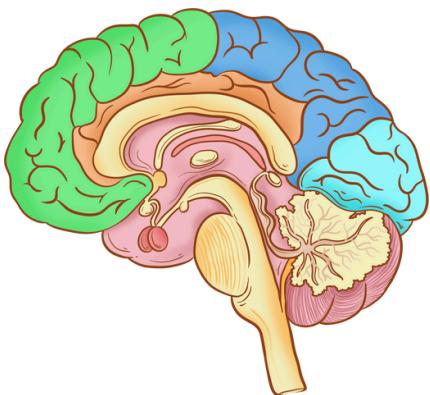


Figure 8. Brain

Functions of the Brain

1. It controls the voluntary activities of the body. Like thinking, solving problems, and memorizing.
2. Details and decision-making.
3. It controls the muscle movement of our body, like walking and writing.
4. It coordinates muscular actions.
5. It is responsible for man's ability to learn habits and develop skills.

6. It helps maintain man's sense of balance.
7. It controls the involuntary muscles of the body and

Parts of the Brain

- Frontal Lobe – responsible for thinking, speaking, and memory.

Olfactory Bulb – involved in the sense of smell.

- Primary Motor Cortex - controls voluntary muscle movements.
- Temporal Lobe - important for processing auditory information and memory.
- Cerebellum - coordinates muscle actions and helps maintain balance.
- Central Sulcus - a groove in the brain that separates the frontal lobe from the parietal lobe.
- Primary Somatosensory Cortex - processes sensory information from the body.
- Parietal Lobe - manages sensory information and spatial awareness.
- Occipital Lobe – responsible for visual processing.

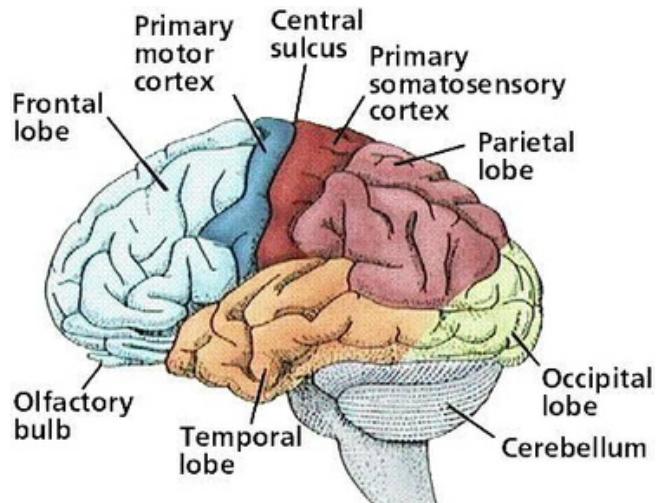


Figure 9. Brain and its Parts

References

- Department of Education. (2020). Science Q2W1 major organs of human body. <https://www.scribd.com/document/527916947/Science4-Q2-Mod1-Major-Organs-of-the-Human-Body-version3>
- Department of Education. (2020). Science Q2W2 making connections. Scribd. <https://www.scribd.com/document/607859842/SCIENCE-Q2W2-MAKING-CONNECTIONS>
- Grundy, P.L. (n.d.). Basic Brain Anatomy. Google image result for <https://www.google.com.ph/imgres?imgurl=http%3A%2F%2Fwww.brainumoursurgery.co.uk%2Fimages%2Fcerebrumdiagram.jpg&tbnid=PkEsAdI7fJ695M&vet=1&imgrefurl=http%3A%2F%2Fwww.brainumoursurgery.co.uk%2Fbrainanatomy%2F&docid=XP3qQkPK3bUpwM&w=464&h=381&itg=1&hl=en-ph>
- Pinterest. (n.d.). Muscular System. Google image result for <https://www.pinterest.com/pin/103793966392183525/>