

Support systems in animals

Scope

Topic	Breakdown of topic
Support systems in animals	<u>Human skeleton:</u> <ul style="list-style-type: none">- the axial skeleton: mention of facial bones, cranium, foramen magnum, palate and jaws- appendicular skeleton <u>Functions of skeleton</u> <ul style="list-style-type: none">- Movement- Protection- Support- Storage of minerals- Hearing

Support systems

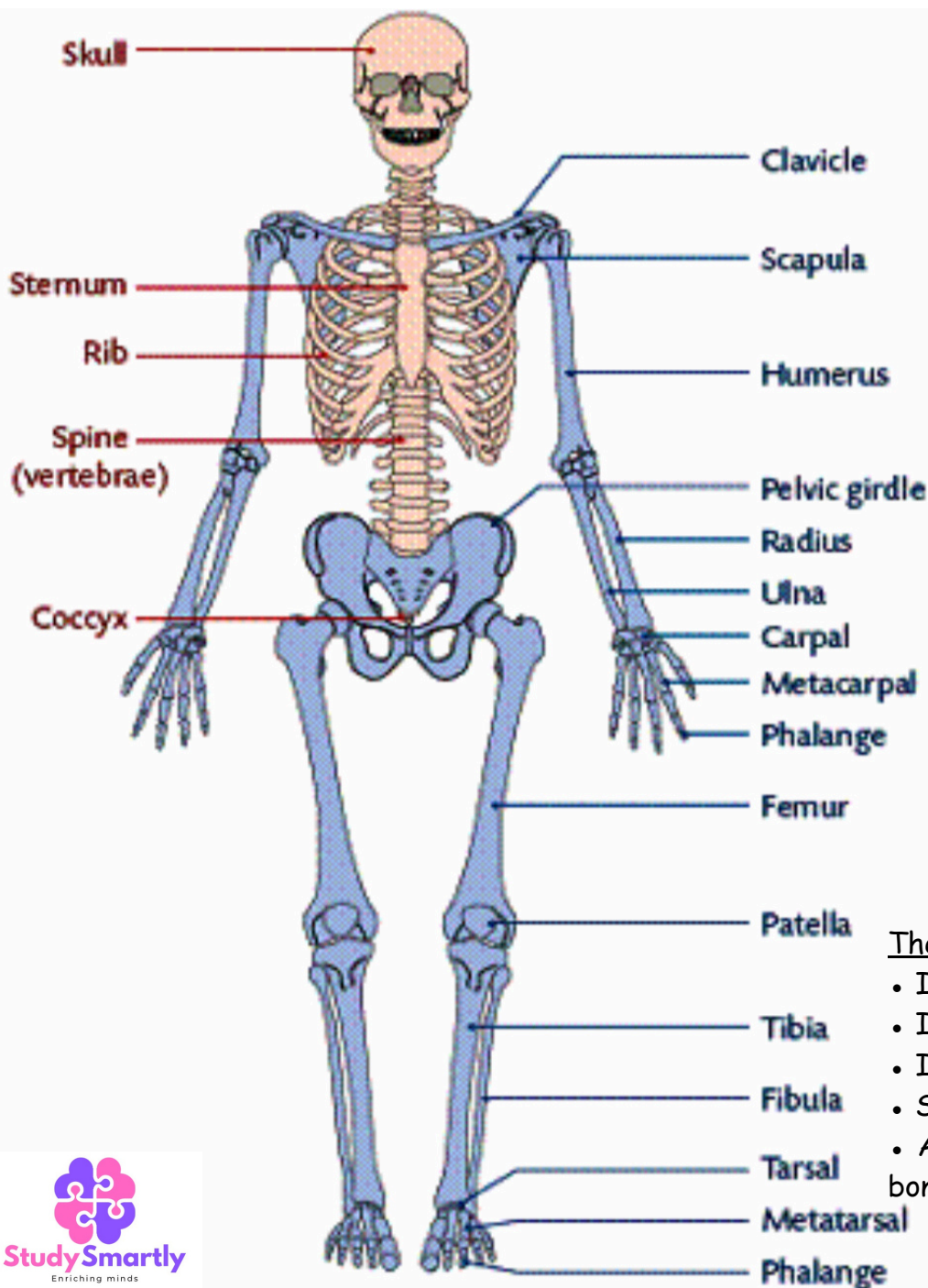
Notes

Human Skeleton

The human skeleton is composed of two parts:

1. The **axial skeleton** is made up of all the bones around the axis of the body. This includes the skull bones, vertebral column and thoracic cage.
2. The **appendicular skeleton** are the upper and lower limbs as well as the shoulder and pelvic girdles. It's bones "append" to the axial skeleton.

In the diagram below the axial skeleton's labels are on the left-hand side and the appendicular skeleton's labels are on the right-hand side.



The functions of a skeleton:

- It facilitates movement
- It protects tissues and organs
- It supports the body
- Stores minerals
- Assists with hearing (ossicles bones in our ears)

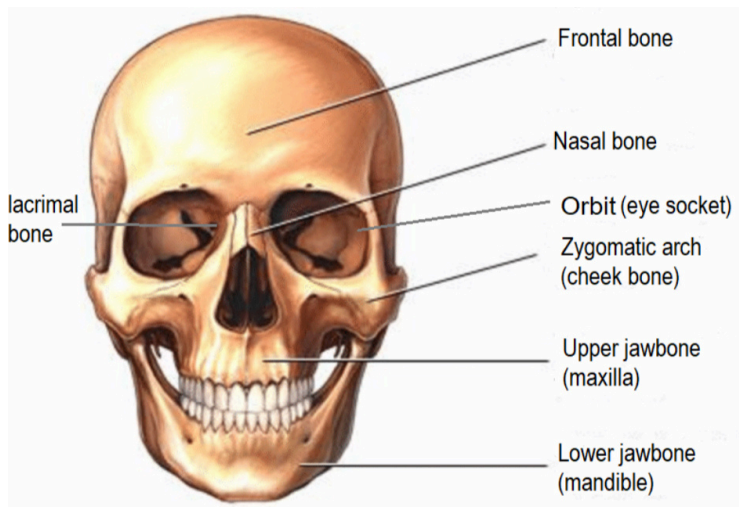
Support systems

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Axial Skeleton

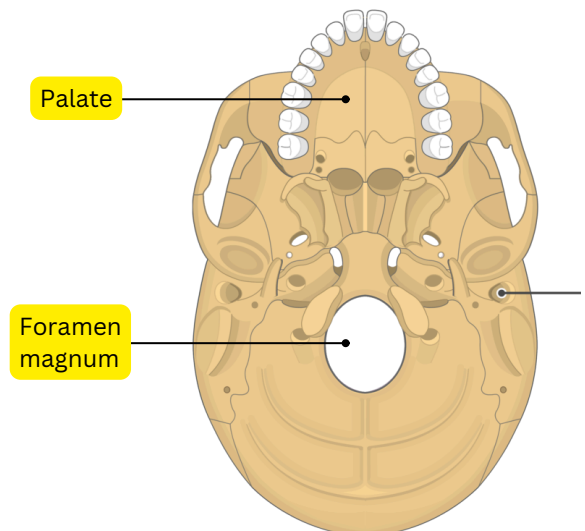
The skull is composed of the following facial bones:

- **Lacrimal** - Paired bones that form the wall of the orbit (eye socket)
- **Mandible** - Bone that forms the lower jaw.
- **Maxilla** - Bone that forms the upper jaw.
- **Nasal** - Paired bones that form the bridge of the nose.
- **Zygomatic arch** - Paired facial bones that form the cheeks.



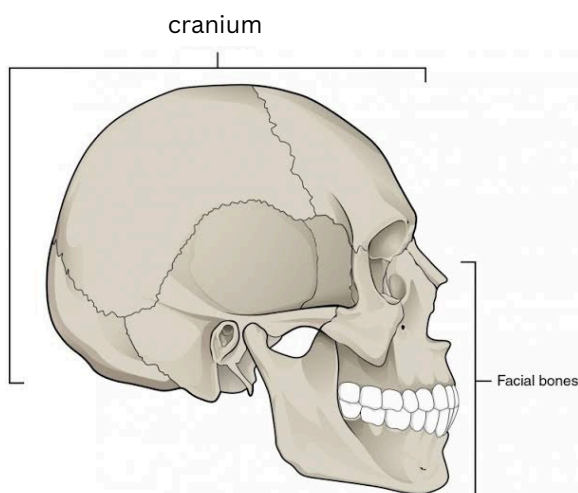
Ventral (bottom) side of the skull:

- The skull has an opening at the bottom where the spinal cord enters the skull. We call this opening the **foramen magnum**.
- The top part on the inside of the mouth is called the **palate** it separates the mouth cavity from the nose cavity. So, that you can eat and breath at the same time.



The Cranium of the skull:

The cranium of the skull is the part where the **brain** is situated. It forms a bony casing which protects the brain.



Ossicles - three bones in ear, helps with hearing (smallest bones in body)

Support systems

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The Spine

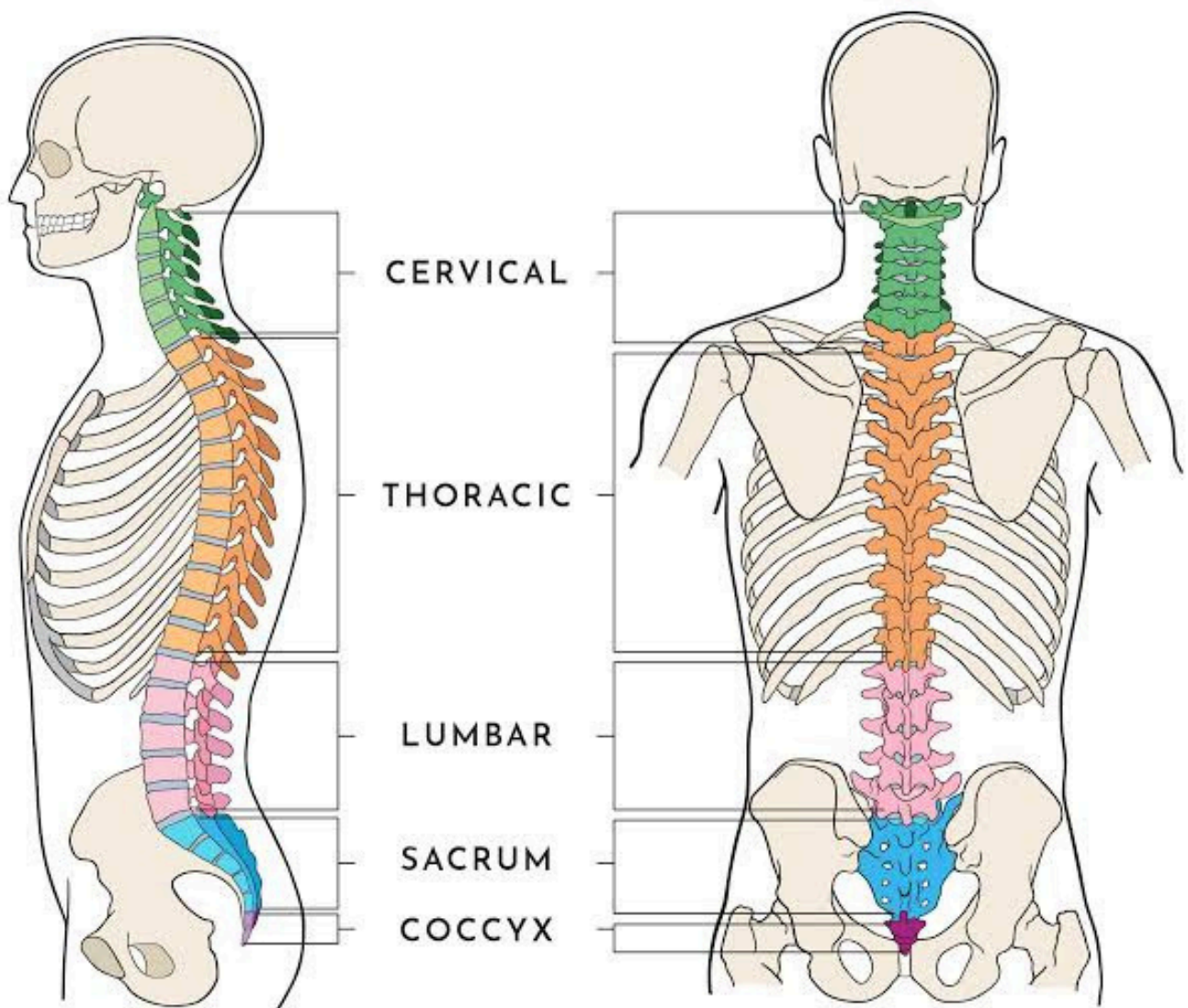
It is the central support of the body. It provides a framework to support the trunk and rigid protection for the spinal cord. Portions of the spine surround the spinal cord providing bony protection for the spinal cord just as the skull protects the brain with a bony shell. The Spinal Column made up of **24 Vertebrae**. These bones are stacked on top of one another.

The vertebral column can be divided into 5 regions:

- **Cervical spine**: 7 vertebrae of the neck (curves inward)
- **Thoracic spine**: 12 vertebrae of the mid-back (curves outward)
- **Lumbar spine**: 5 vertebrae of the lower back
- **Sacrum**
- **Coccyx**

A normal vertebral column creates a **double-S curve** when viewed from the side of the body.

This structure gives the spinal column great **strength** and **shock-absorbing** qualities.



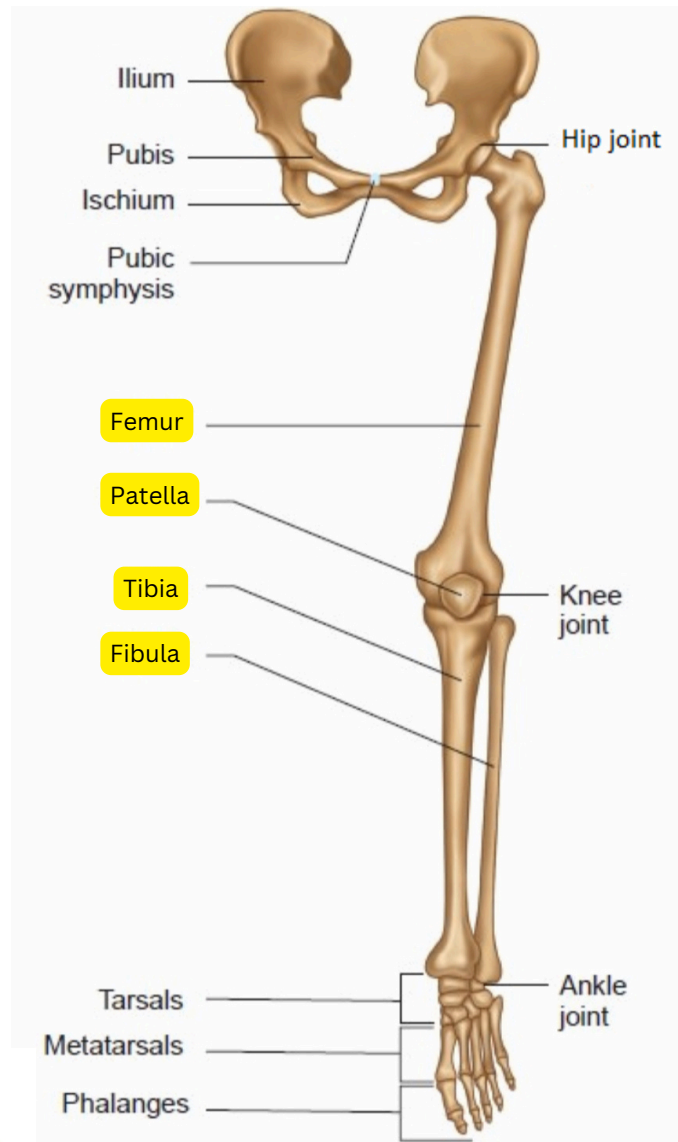
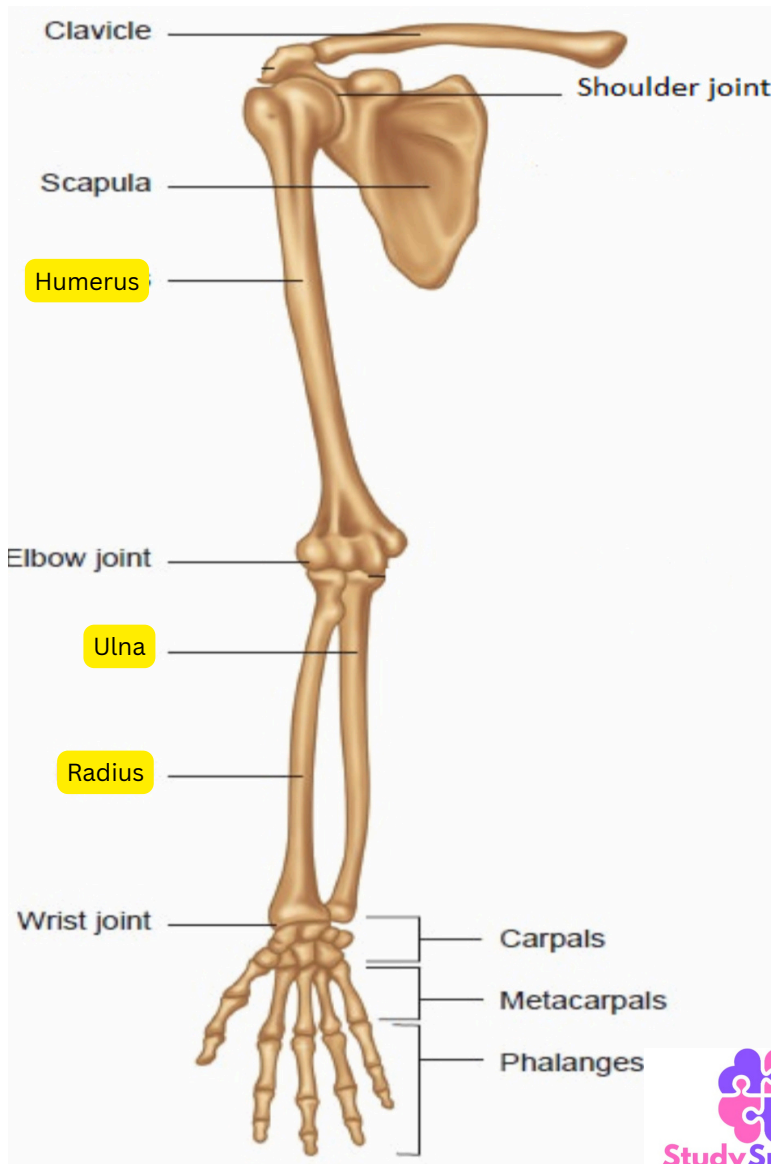
Support systems *Notes*

Appendicular skeleton

The **appendicular skeleton** includes the bones of the *shoulder girdle*, the **upper limbs**, the **pelvic girdle**, and the **lower limbs**.

The **pectoral girdle** bones provide the points of attachment of the upper limbs to the axial skeleton. The human pectoral girdle consists of the **clavicle** (or collarbone) in the anterior (front), and the **scapula** (or shoulder blades) in the posterior(back).

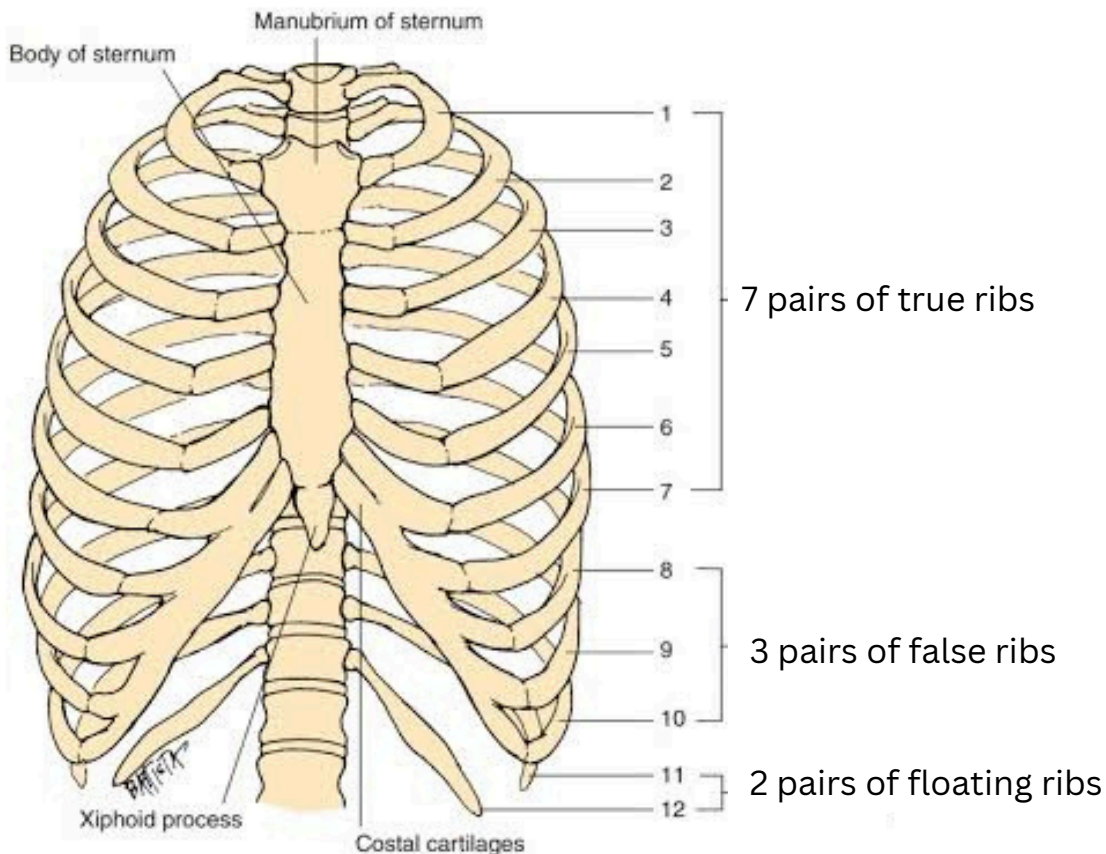
The **pelvic girdle** attaches to the lower limbs of the axial skeleton. Because it is responsible for **bearing the weight** of the body and for **locomotion**, the pelvic girdle is securely attached to the axial skeleton by strong ligaments. It is composed of **ilium**, **ischium** and **pubis** bones.



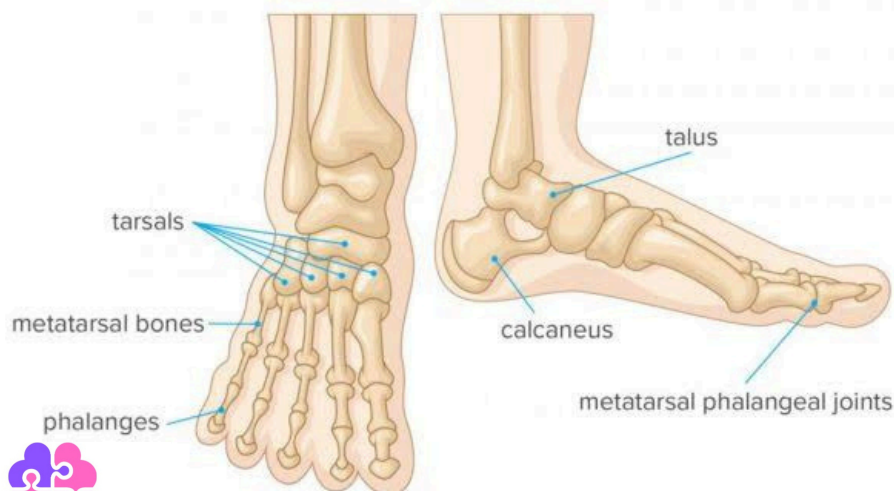
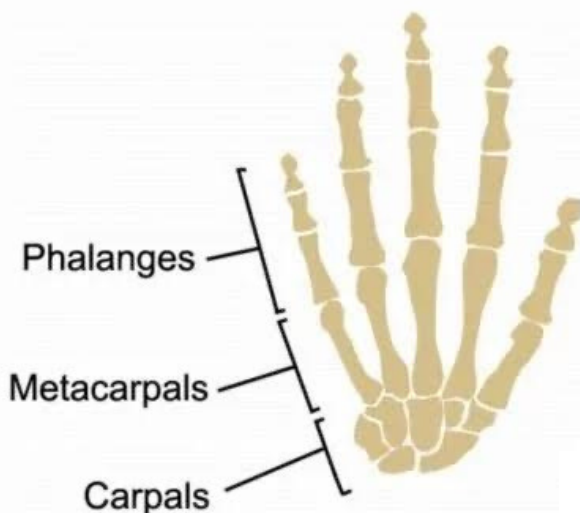
Support systems *Notes*

The thoracic cage

The rib cage consists of 12 pairs of ribs. 7 pairs of true ribs, 3 pairs of false ribs and 2 pairs of floating ribs.



Hand & Foot bones



Support systems *Terminology*

Biological term	Description
Axial skeleton	made up of all the bones around the axis of the body
Appendicular skeleton	the upper and lower limbs as well as the shoulder and pelvic girdles
Carpal	the bones in the wrist, also known as the carpal bones
Coccyx	small, triangular bone located at the base of the spine
Clavicle	The collar bone
Cranium	The bones of the skull that protects the brain
Foramen magnum	An opening at the base of the skull where spinal cord enters
Lacrimal	Paired bones that form the wall of the orbit (eye socket)
Mandible	Bone that forms the lower jaw
Maxilla	Bone that forms the upper jaw
Metacarpal	the bones in the palm of the hand, connecting the wrist (carpal bones) to the fingers (phalanges)
Ossicle	three bones in ear, helps with hearing (smallest bones in body)
Palate	The top part on the inside of the mouth that separates the mouth cavity from the nose cavity
Pectoral girdle	bones provide the points of attachment of the upper limbs to the axial skeleton
Pelvic girdle	Bones that attaches to the lower limbs of the axial skeleton
Phalanges	small bones that make up the fingers and toes
Sacrum	a large, triangular bone located at the base of the spine and connects the spine to the pelvis
Scapula	Shoulder bones
Tarsal	refers to the seven bones that make up the ankle joint in humans
Thoracic cage	the bony structure that protects the organs within the chest cavity, including the heart and lungs
Veterbrae	the individual bones that make up the spine
Zygomatic arch	a prominent curved bone structure that forms the cheekbone