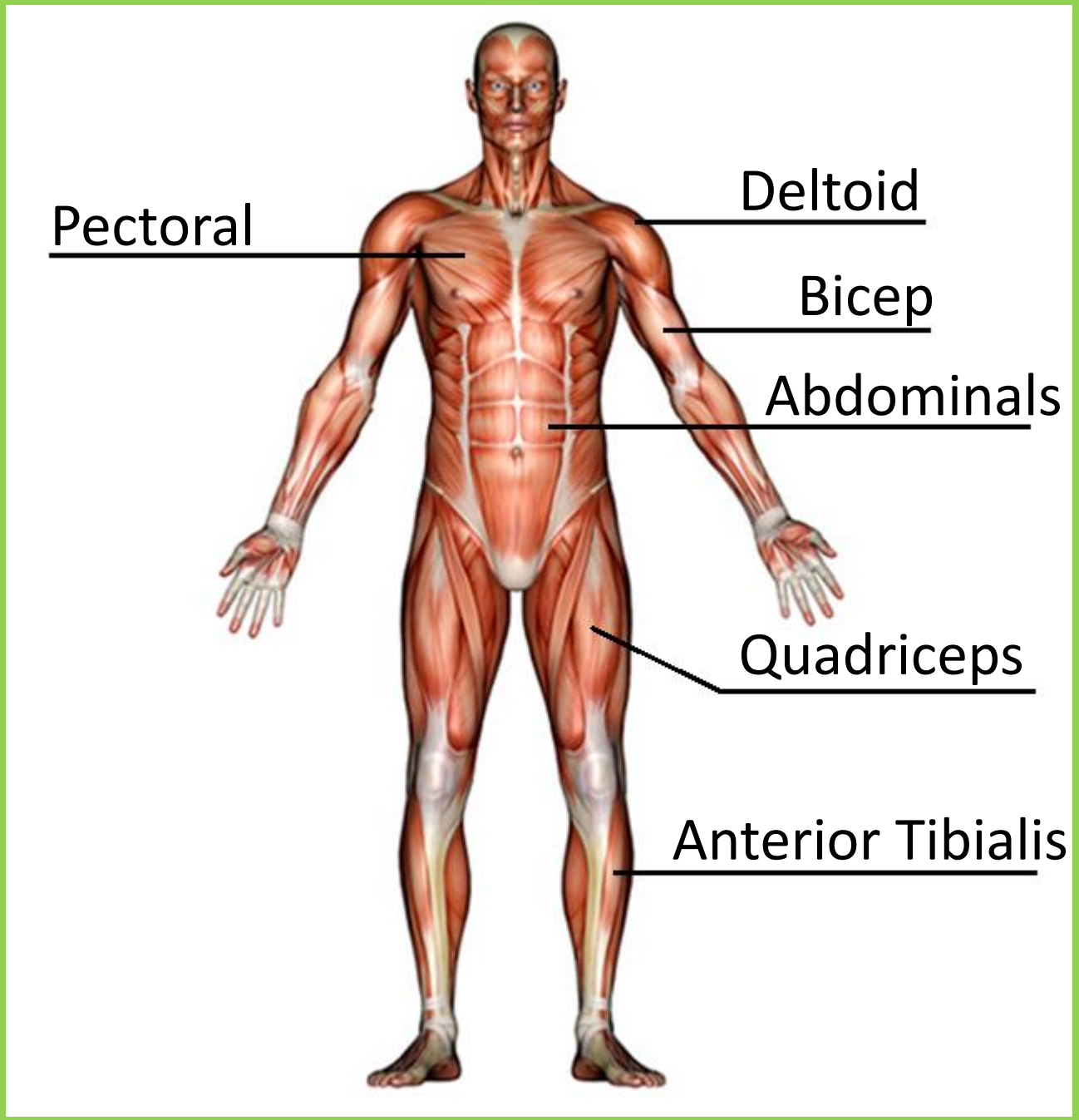
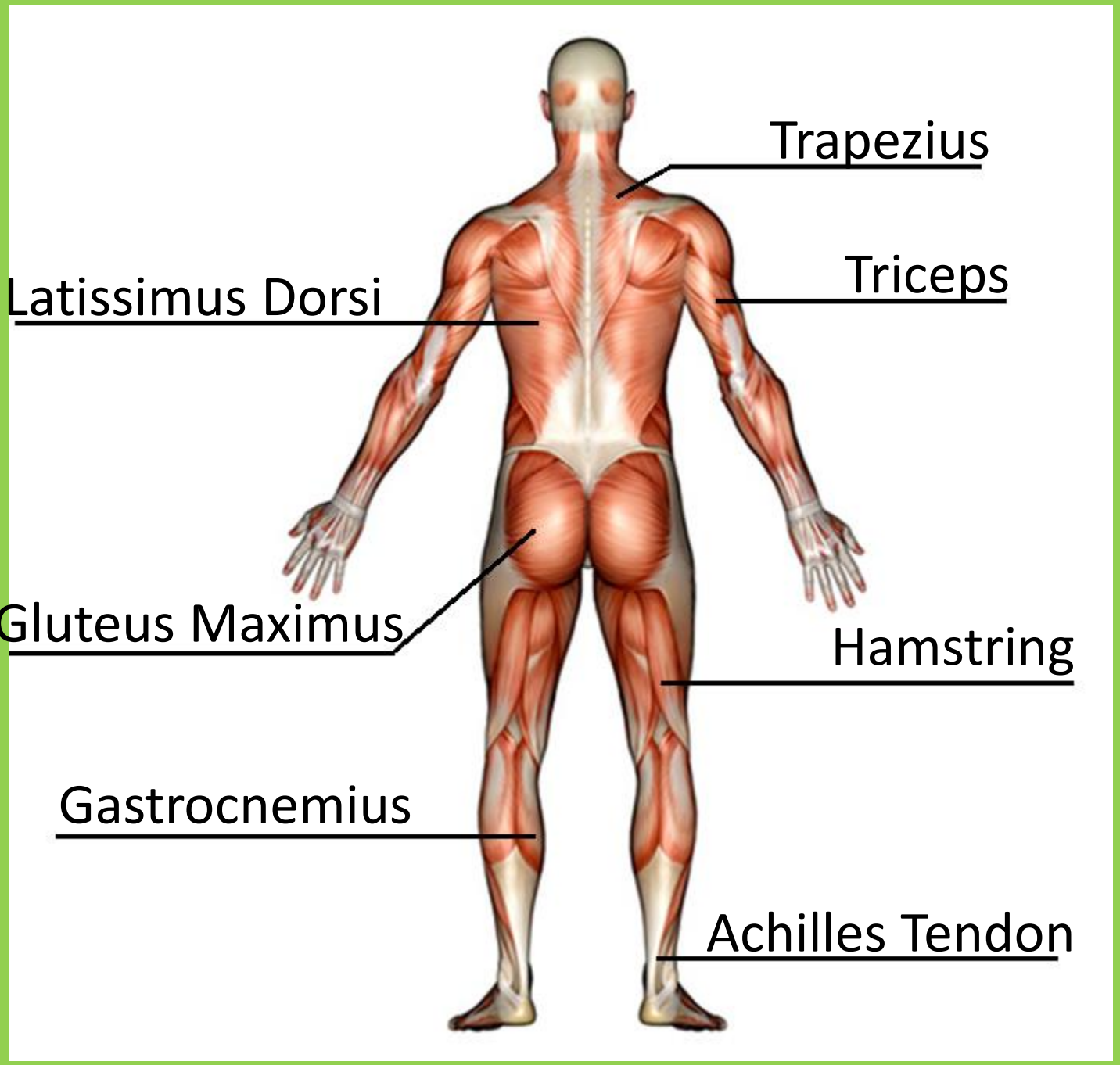
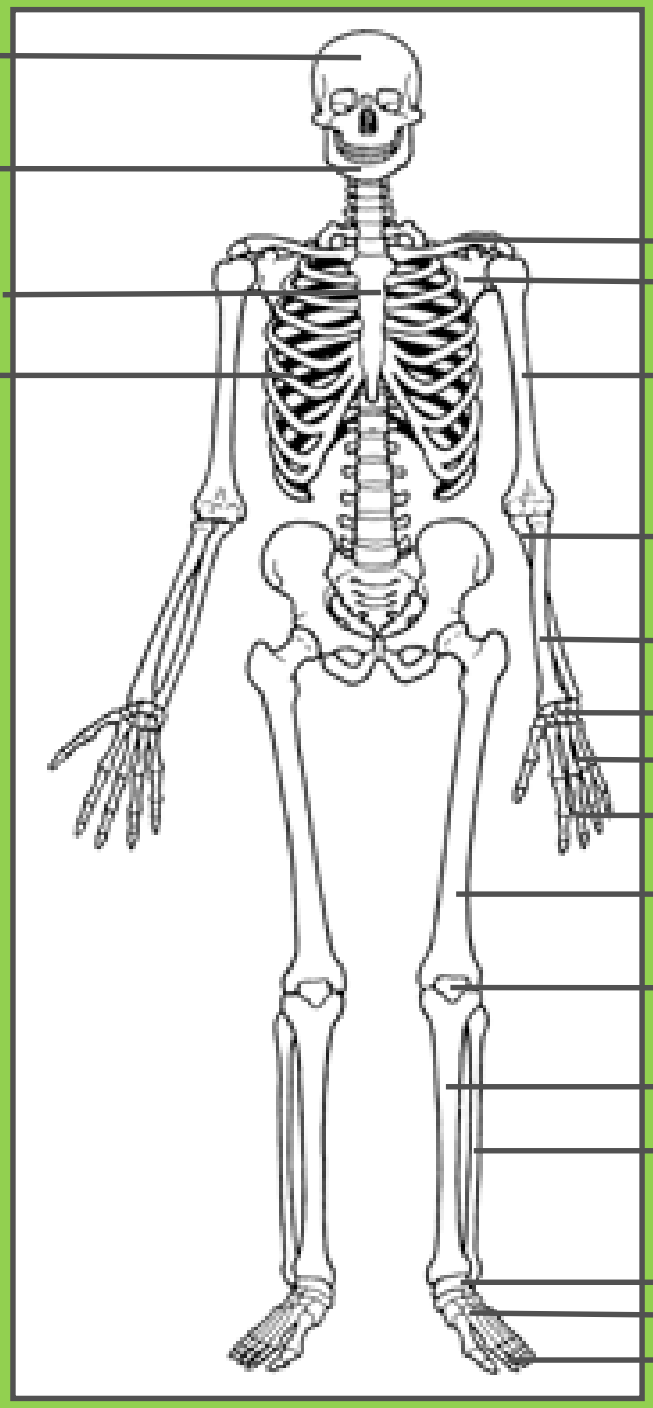
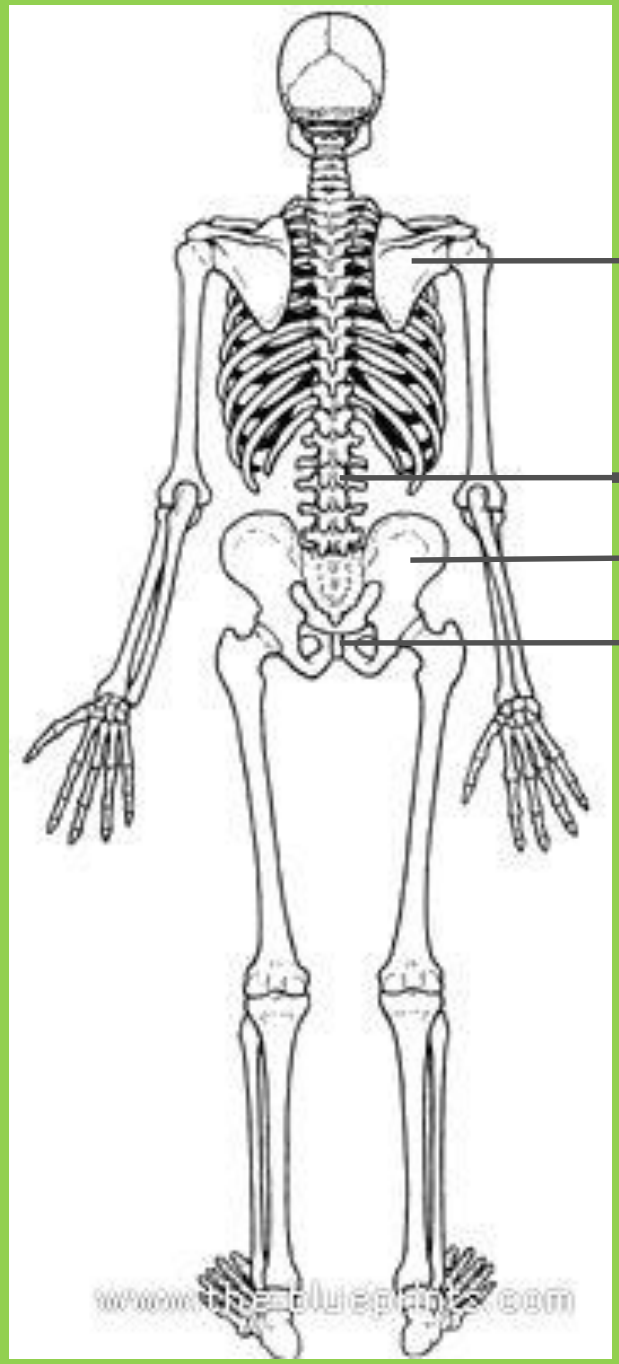
THE MUSCULOSKELETAL SYSTEM

There are over **650** muscles and **206** bones in a ‘normal’ adult skeleton


Pectoral
Deltoid
Bicep
Abdominals
Quadriceps
Anterior Tibialis


Trapezius
Triceps
Latissimus Dorsi
Gluteus Maximus
Hamstring
Gastrocnemius
Achilles Tendon


Cranium
Mandible
Sternum
Ribs
Clavicle
Scapula
Humerus
Ulna
Radius
Carpals
Metacarpals
Phalanges
Femur
Patella
Tibia
Fibula
Tarsals
Metatarsals
Phalanges

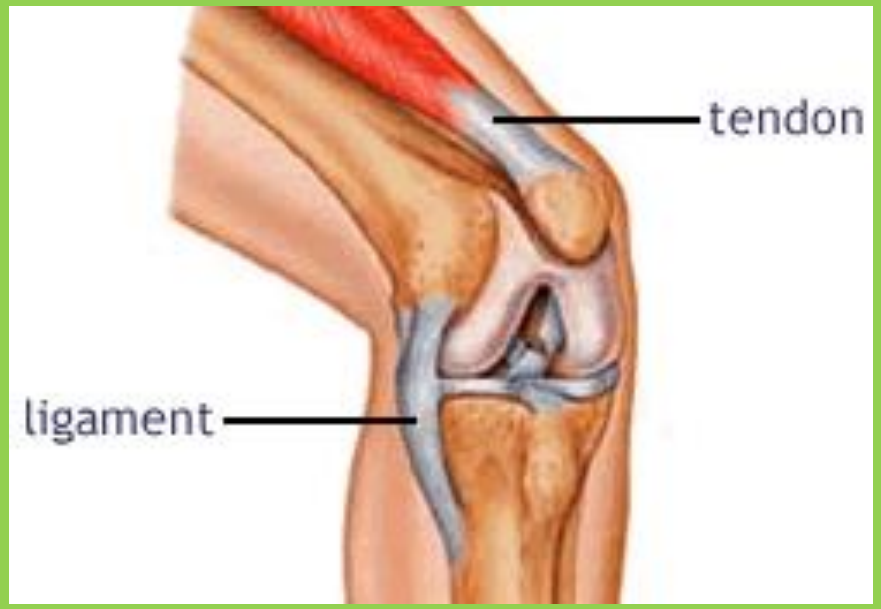

Scapula
Vertebrae
Pelvis
Coccyx

JOINTS

A joint is the junction between 2 or more bones.

LIGAMENTS

- Attaches bone to bone
- Helps support a joint and hold bones together



TENDONS

- Attaches muscle to bones

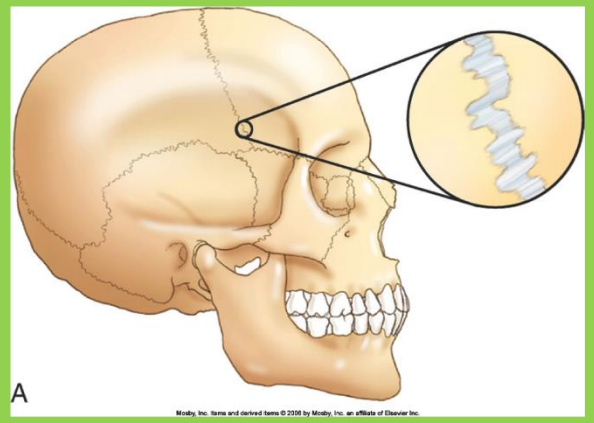
CARTILAGE

- Coats the end of bones
- Provides a smooth surface that reduces friction between moving bones.

TYPES OF JOINTS

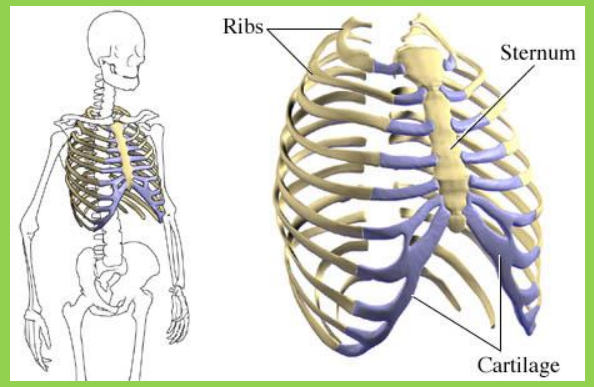
Fibrous Joints

- Immovable joints that are fixed together by fibrous tissue, **e.g.** – cranium.



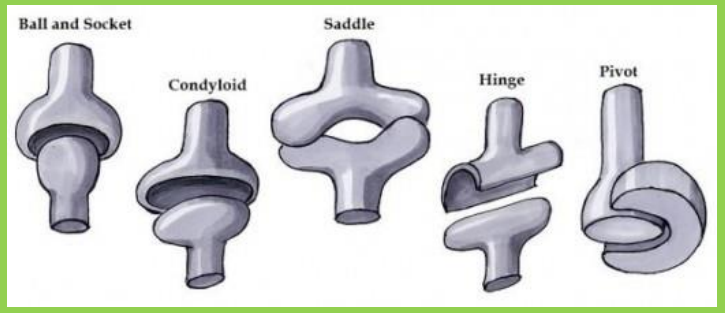
Cartilaginous Joints

- Slightly moveable joints where bones are firmly united by cartilage, **e.g.** – between the ribs and the sternum & also the intervertebral joints.



Synovial Joints

- Freely movable joints which are the most common joint in the body.

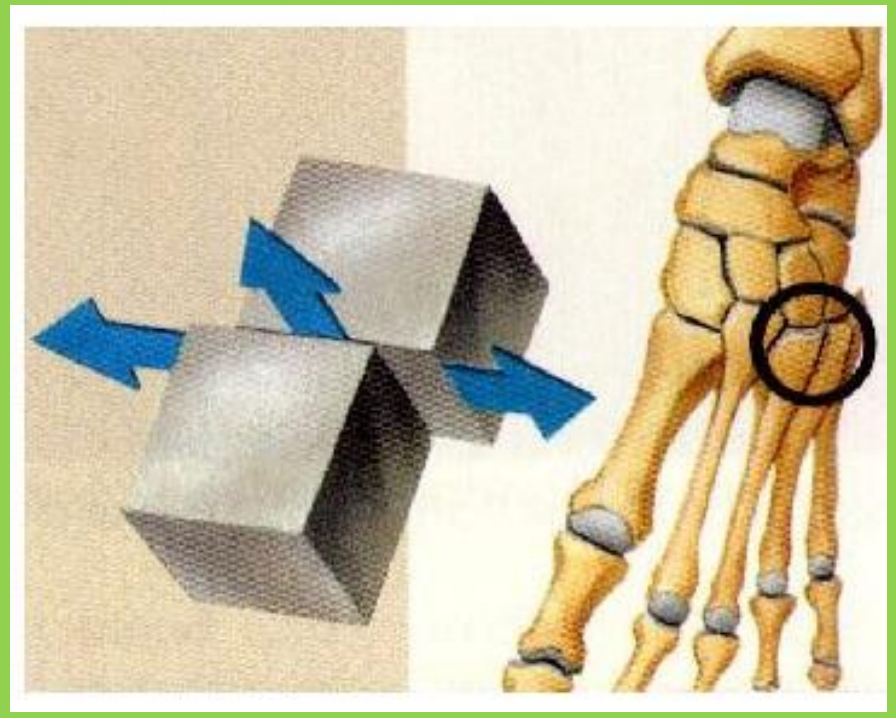


SYNOVIAL JOINTS

Gliding and/or Sliding Joint

- One bone slides or glides across another bone.

e.g, joints between the carpal & tarsal bones.

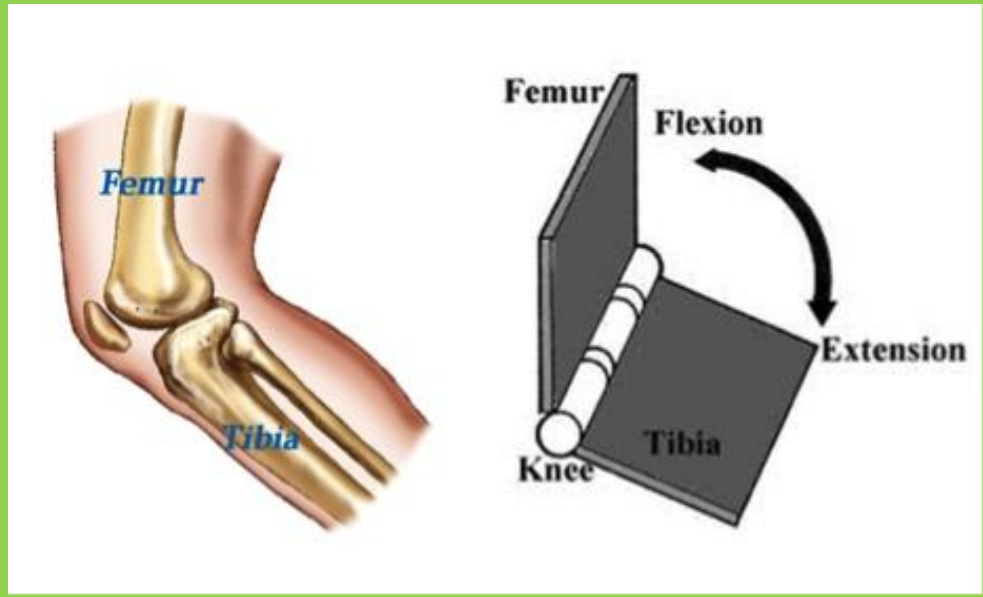


SYNOVIAL JOINTS

Hinge Joint

- Allows only back and fourth movement such as bending and straightening.

e.g, knee & elbow

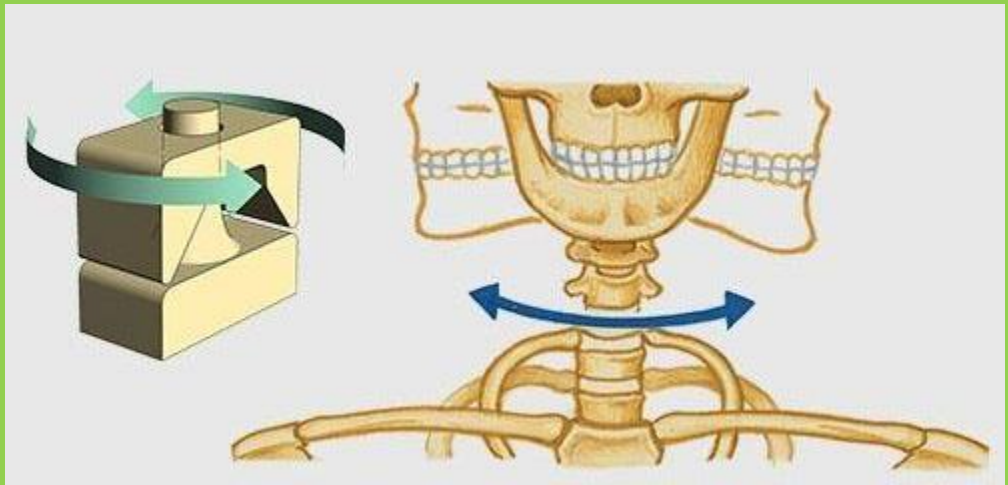


SYNOVIAL JOINTS

Pivot Joint

- Allows only rotation

e.g, top of the spine

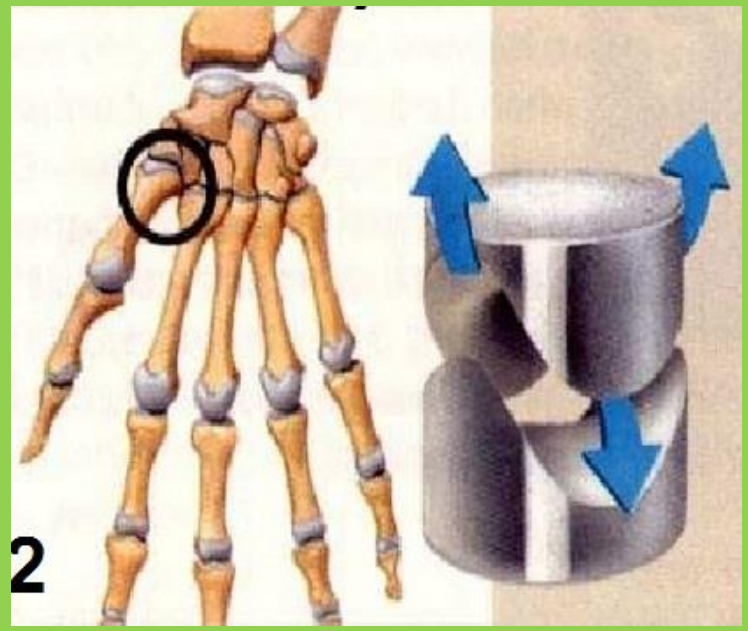


SYNOVIAL JOINTS

Saddle Joint

- Allows side to side & back and forth movement.

e.g, thumb joint – crossing over the palm.

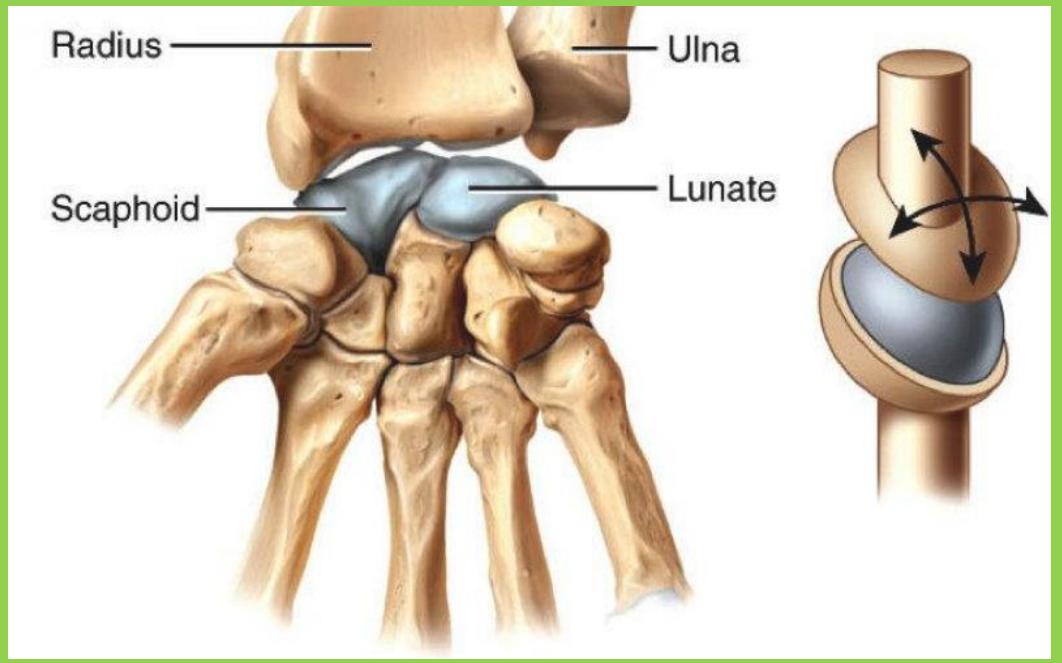


SYNOVIAL JOINTS

Condyloid Joint

- Allows back and forth, side to side & some rotation.

e.g, wrist

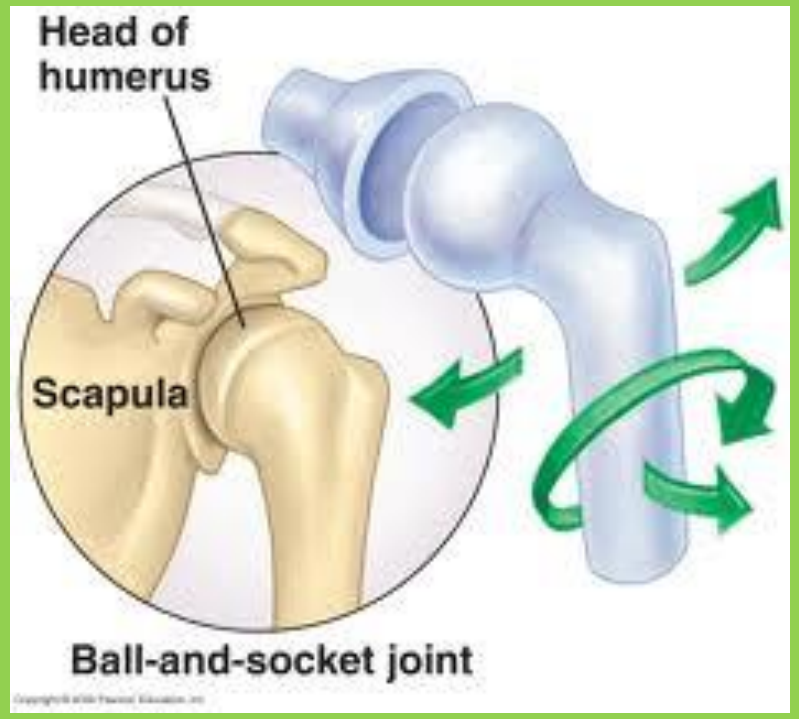


SYNOVIAL JOINTS

Ball & Socket Joint

- Allows movement in all directions.

e.g, shoulder & hip



JOINTS REVIEW VIDEO

- https://www.youtube.com/watch?v=DLxYDoN634c
  - 4:40 onwards

FUNCTIONS OF BONES

1. **SUPPORT** - is provided for soft tissues. The skeleton provides the framework for our body shape.

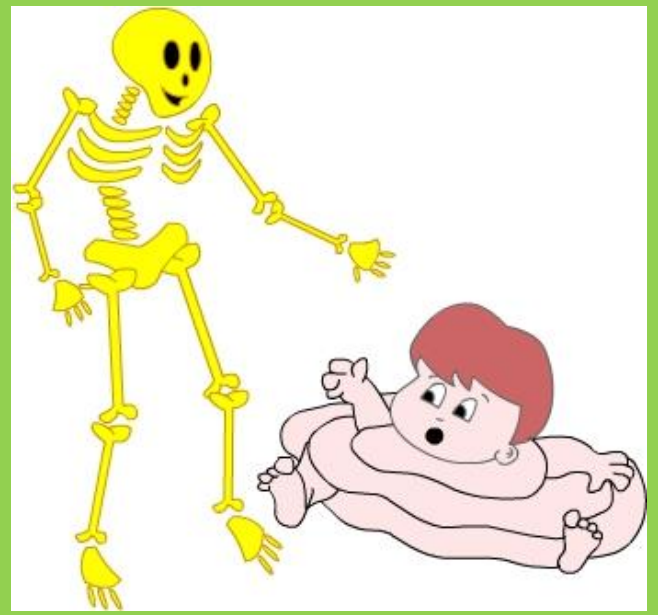
2. **PROTECTION** - for our vital organs **e.g.** our skull protects the brain and our ribs protect the lungs.

3. **MOVEMENT** - Our bones act as leavers when the muscles work in pairs.

FUNCTIONS OF BONES

4. **BLOOD CELLS** - production of red blood cells, predominantly found in the marrow of long bones.

5. **STORAGE OF MINERALS** - bones store calcium, phosphorus, small amounts of magnesium and sodium.



TYPES OF BONES

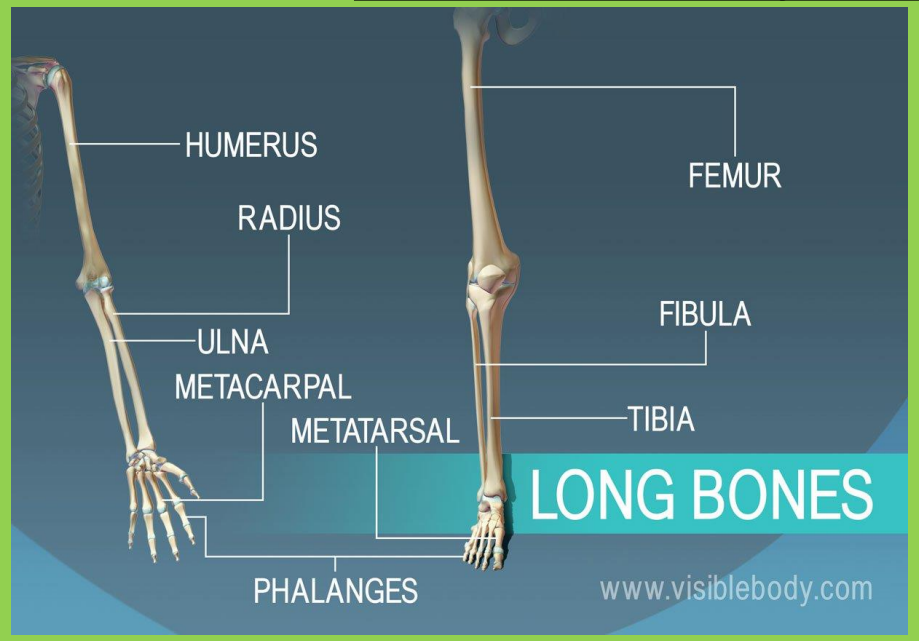
LONG BONE - light weight for movement
e.g. femur, humerus

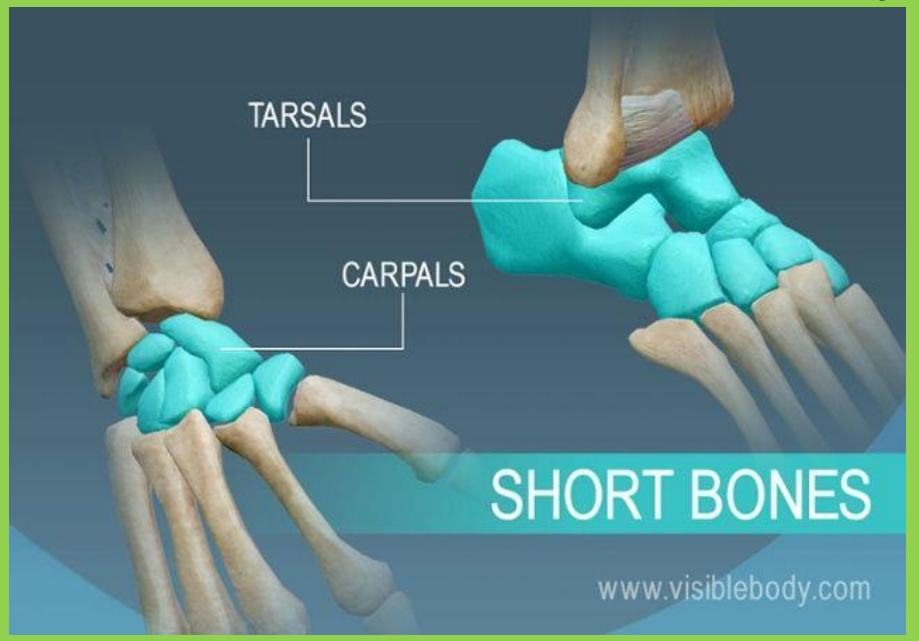
SHORT BONE - rounded and used for partial movement **e.g.** carpals, tarsals

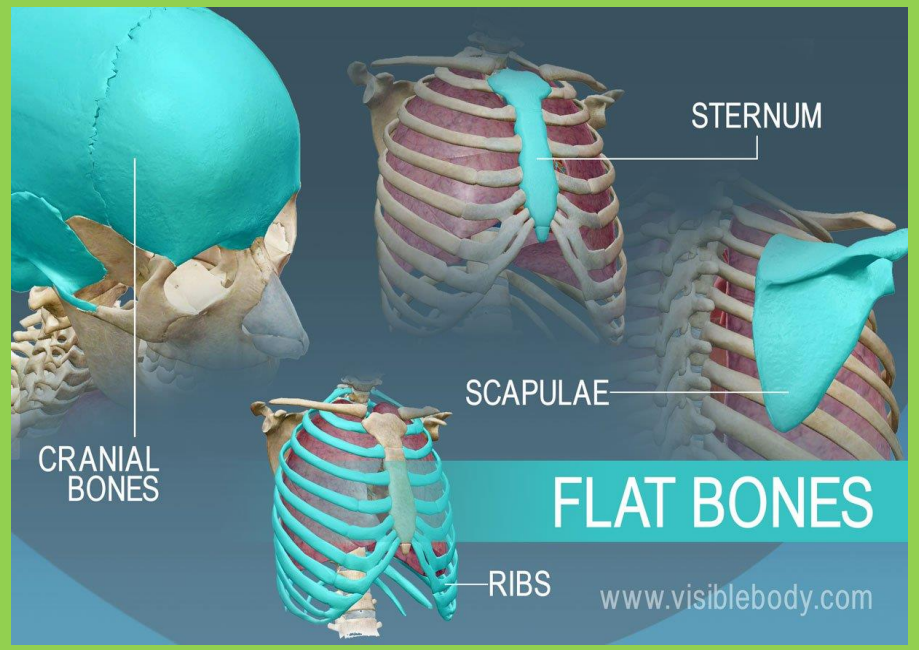
FLAT BONE - broad and smooth for protection **e.g.** skull, sternum etc

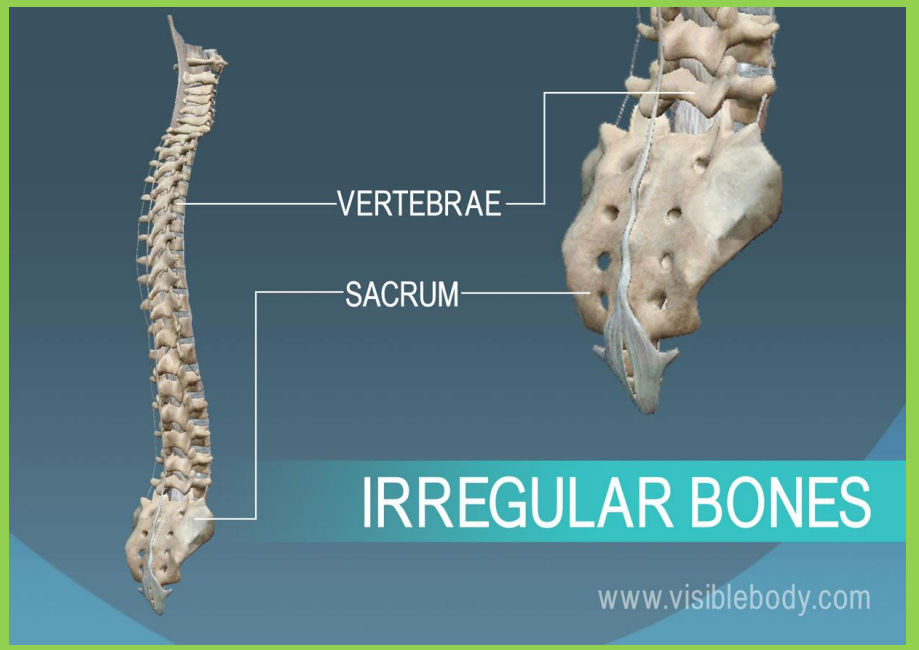
IRREGULAR BONE - different shapes with special functions **e.g.** vertebrae, pelvis

You tube: "The Skeletal System " 50 sec mark – 5 minute mark only





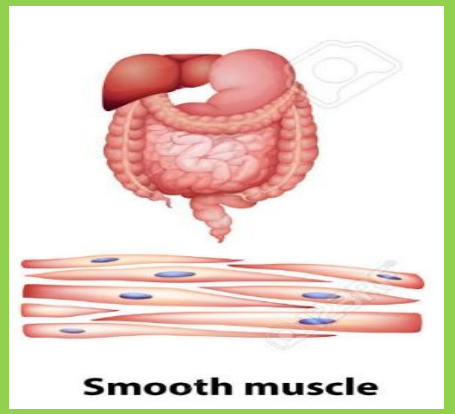




MUSCLE TYPES

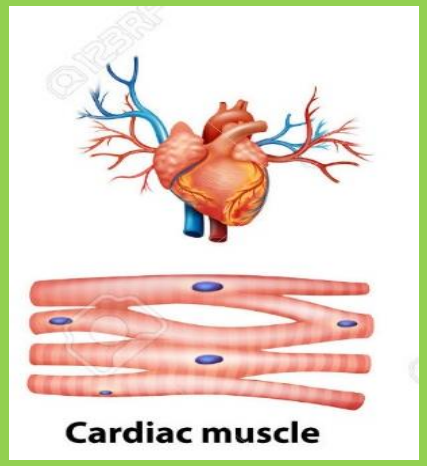
Smooth

They make up the walls of the internal organs such as the stomach and blood vessels.



Cardiac

is your heart muscle.



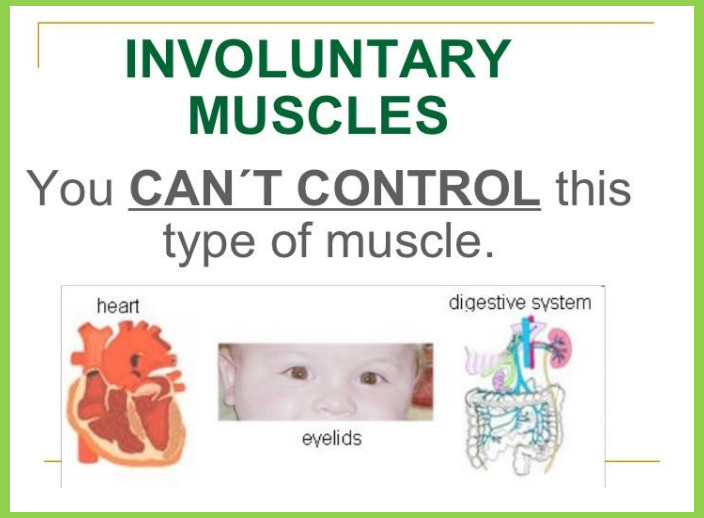
Skeletal

These are the muscles that are attached to your bones and make movement possible.

INVOLUNTARY & VOLUNTARY MUSCLES

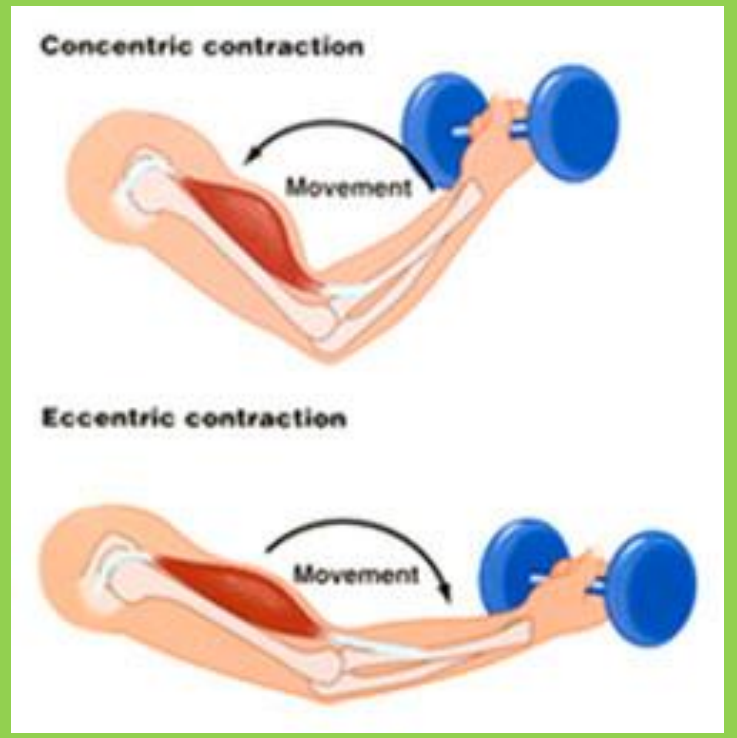
Both **smooth** and **cardiac** muscles are classified as Involuntary muscles because you cannot consciously control their movement.

Skeletal muscles are called voluntary muscles because you can control them.



MUSCLE CONTRACTIONS

An **isotonic contraction** is a muscle contraction that pulls on the bones and produces movement of body parts. There are 2 types of isotonic contractions.



1) **<u>Concentric</u> contraction**

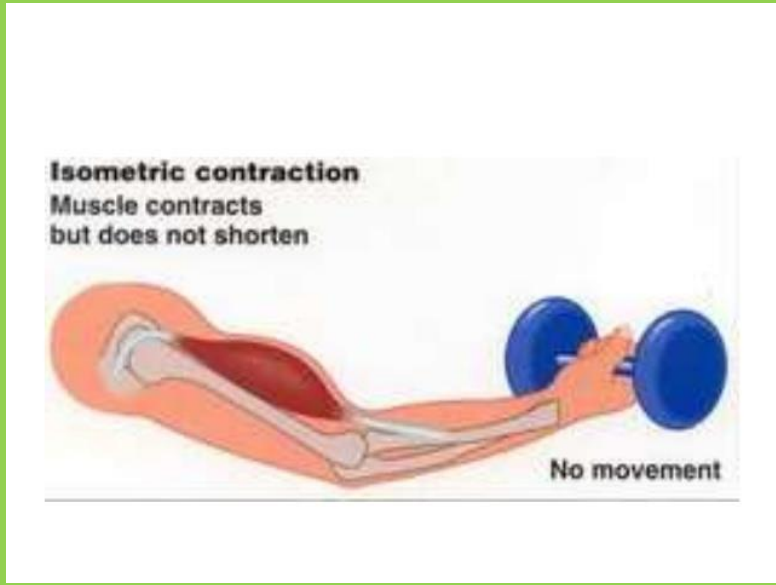
e.g, the shortening of the muscle.

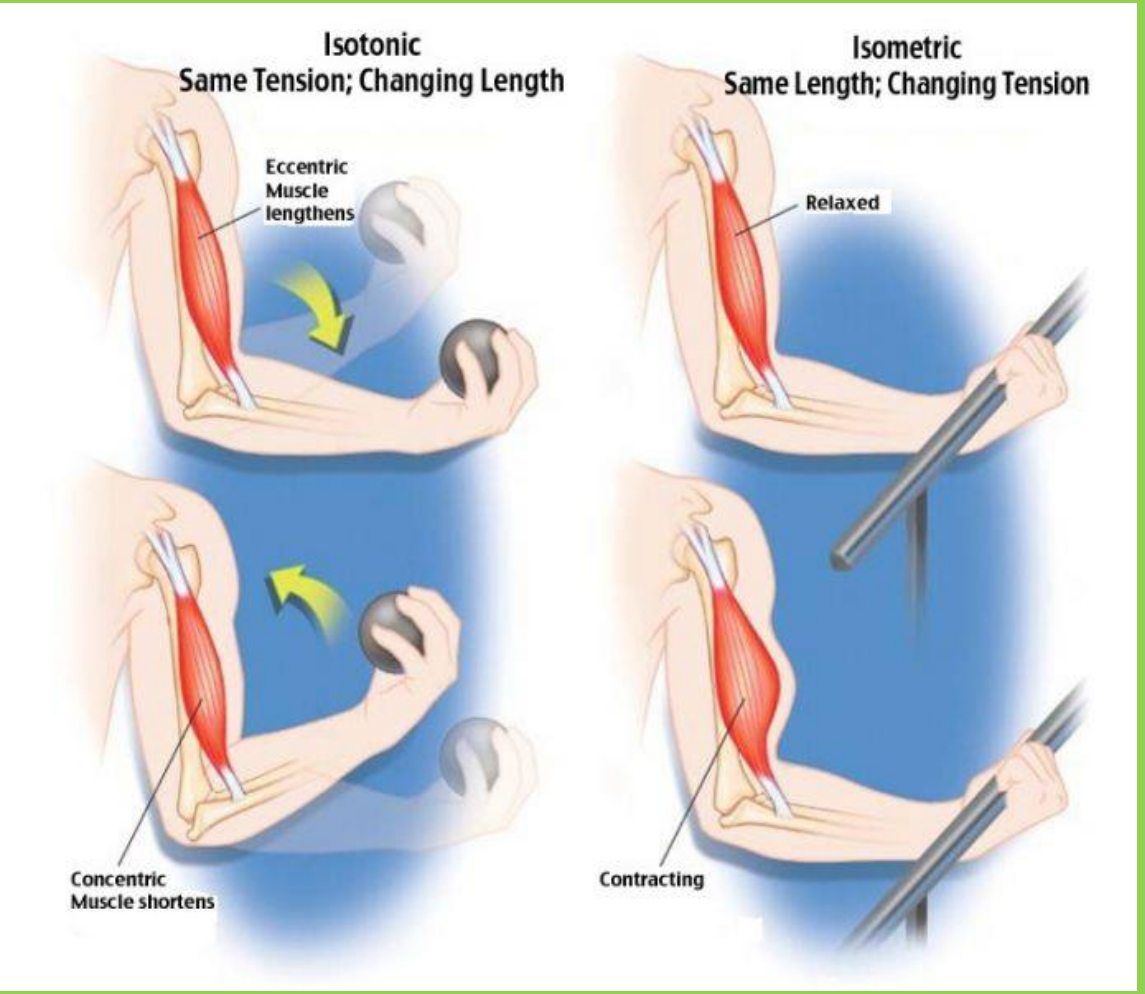
2) **<u>Eccentric</u> contraction**

e.g, the lengthening of the muscle.

MUSCLE CONTRACTIONS

An **isometric contraction** occurs when muscles contract and pull with equal force in opposite directions, so no movement can occur.





Muscles review - https://youtu.be/VVL-8zr2hk4

VERTEBRAE AND VERTEBRAL COLUMN

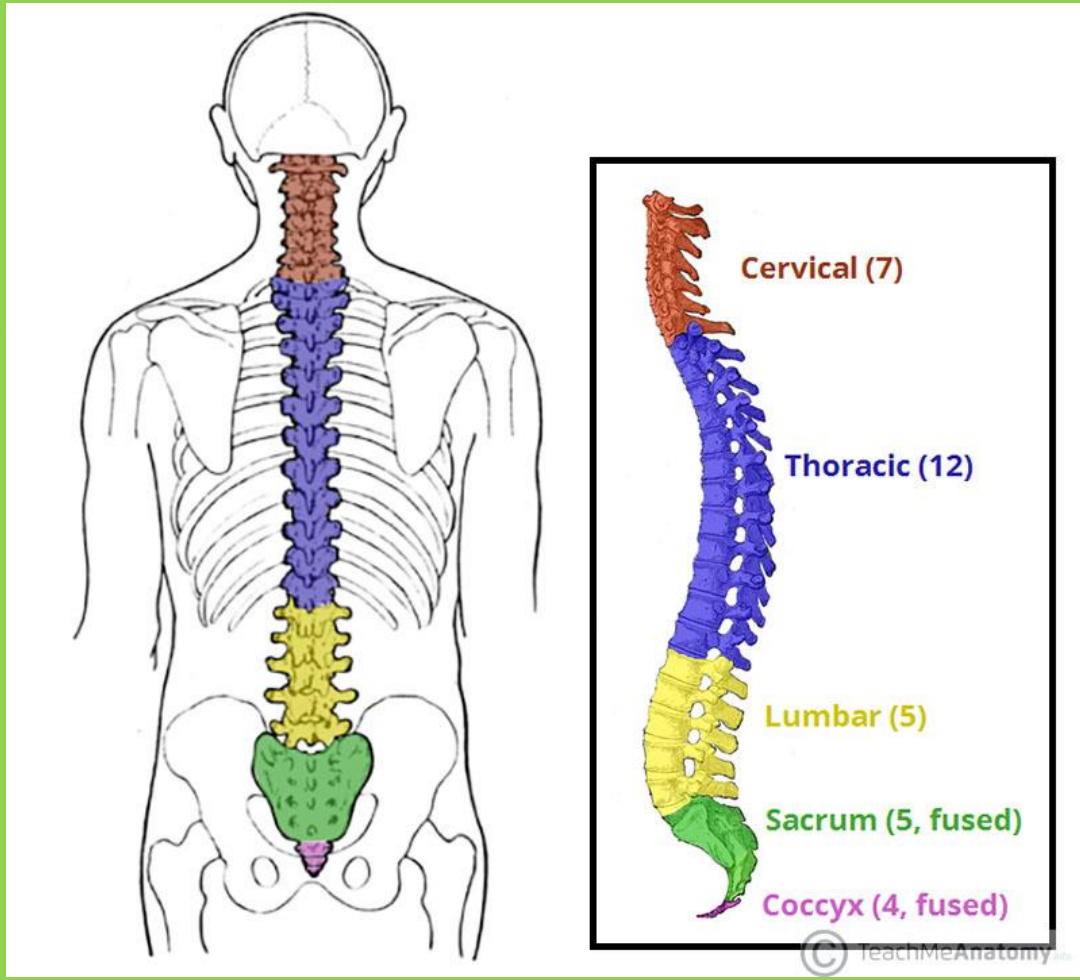
Cervical - 7

Thoracic - 12

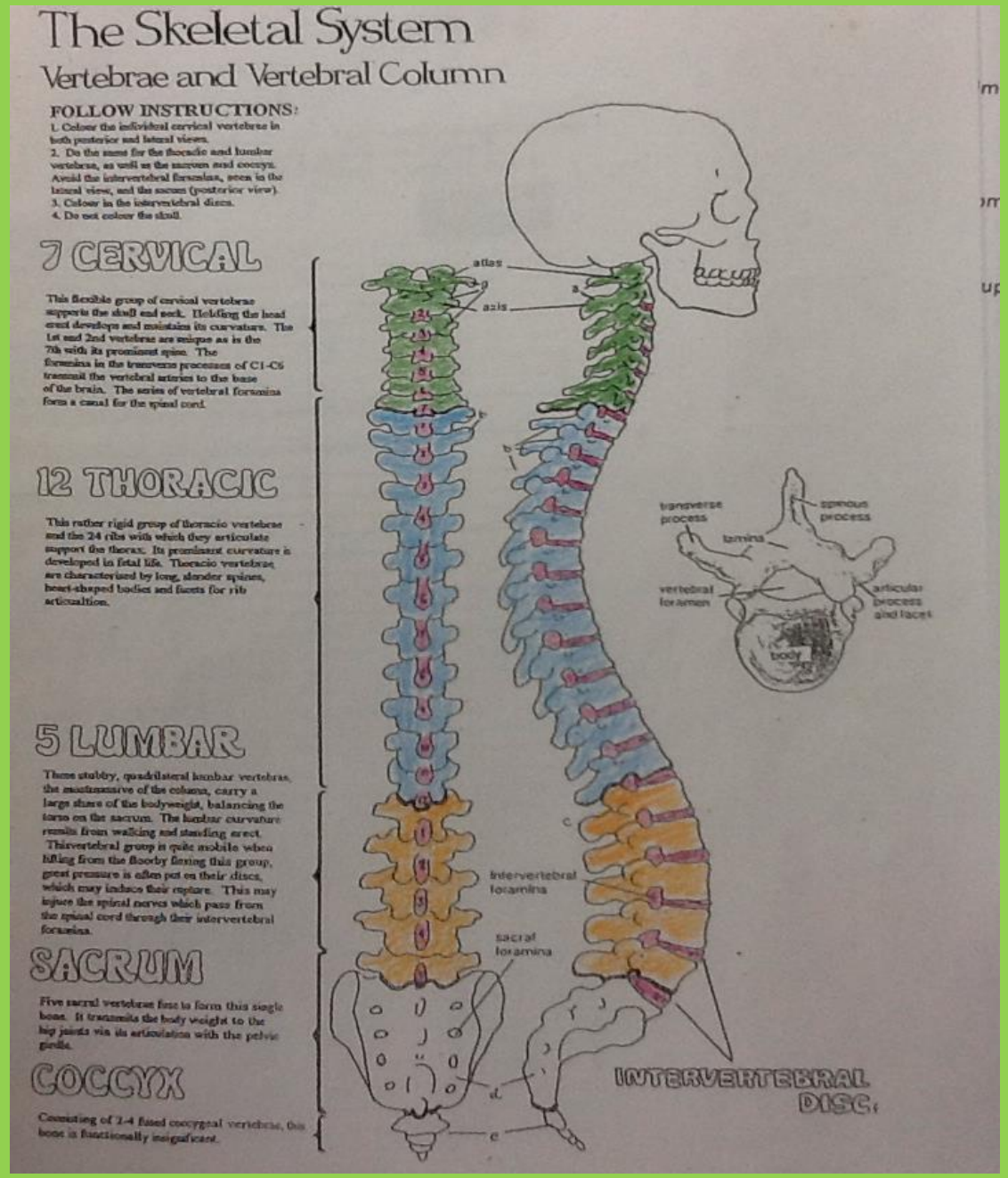
Lumbar - 5

Sacrum – 5 (fused)

Coccyx – 4 (fused)



You tube: "Spine anatomy" 1:44sec



Worksheet

colour in diagram of vertebrae

You tube: "Cervical spine anatomy"

3:10sec

THE MUSCULOSKELETAL SYSTEM