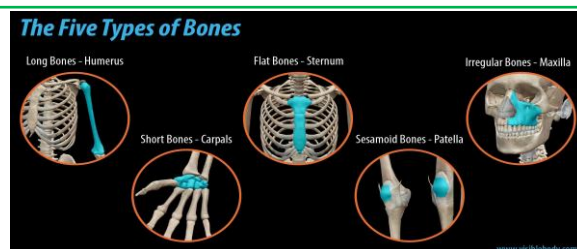




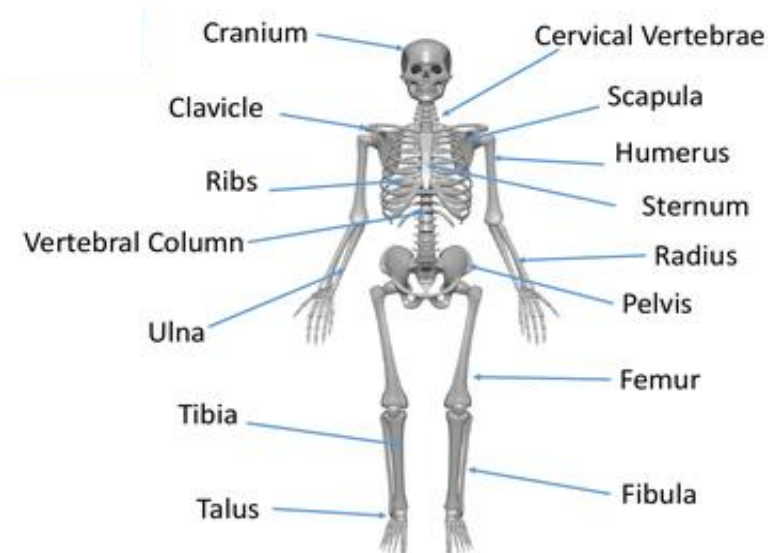
Keywords	
Word	Definition
Articulating bones	Where two or more bones meet to allow movement at a joint.
Synovial membrane	Secretes synovial fluid
Synovial fluid	Provides lubrication
Joint capsule	Encloses/supports
Bursae	Sacks of fluid to reduce friction
Cartilage	Prevents friction/bones rubbing together
Ligaments	Attach bone to bone.
Flexibility	The range of movement possible at a joint
Synovial joint	Where two or more bones meet (articulate) to allow a range of movements. The ends of the bones are covered in cartilage and are enclosed in a capsule filled with synovial fluid.

The bone shape:

- Short bones enable finer controlled movement.
- Long bones enable gross movement



Skeletal system provides a framework of bones for movement, in conjunction with the muscular system



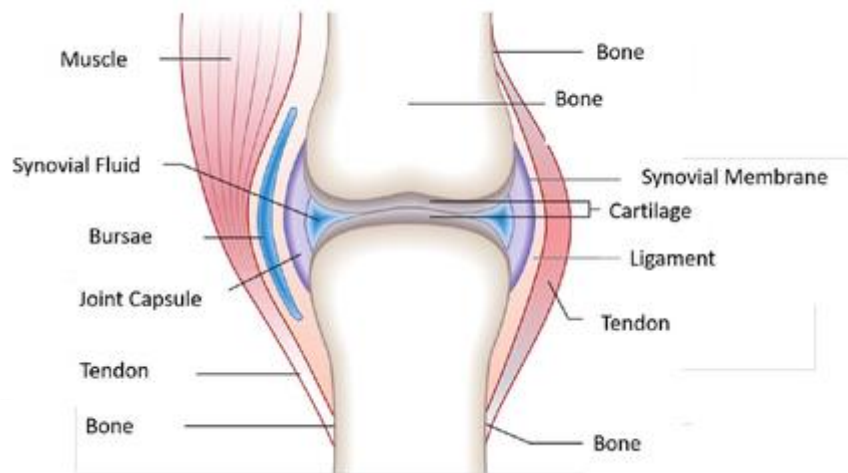
Functions of the skeleton:

- Support
- Protection of vital organs by flat bones
- Movement
- Structural shape and points for attachment
- Mineral storage
- Blood cell production.



Classification of joint

- Pivot (neck – atlas and axis)
- Hinge (elbow and knee)
- Ball and socket (hip and shoulder)



Different joints, different types of movement:

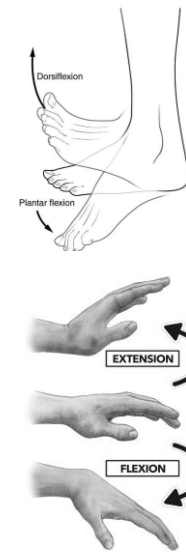
- Rotation of the shoulder flexion and extension at the shoulder, elbow, hip and knee.
- Adduction and abduction at the shoulder
- Plantar flexion and plantar dorsiflexion at the ankle.

Lever

A rigid bar (bone) that turns about an axis to create movement. The force to move the lever comes from the muscle(s). Each lever contains a fulcrum - fixed point, effort (from the muscle(s) to move it) and a load/resistance (from gravity).

Movement at a joint

Flexion-decrease in the angle of the bones at a joint
extension - increasing the angle of bones at a joint
abduction - movement away from the body midline
Adduction- movement towards the body midline
Rotation- movement around an axis
plantar flexion- pointing the toes at the ankle/increasing the ankle angle
dorsi flexion - toes up at the ankle/decreasing the ankle angle.



Box 6: Pathway

Previous knowledge: from teaching sequence

Future links: from teaching sequence

Careers: from curriculum narratives

Box 7: Cross curricular links

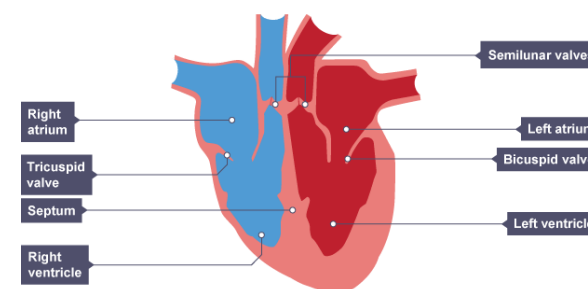


Keywords	
Word	Definition
Capillaries	Microscopic blood vessels that link arteries to veins. Thin walls to allow O ² and CO ² to pass through during gaseous exchange.
Veins	Carry deoxygenated blood back to heart. Thin walls but wider than arteries as pressure is lower.
Arteries	Carry oxygenated blood away from the heart under pressure. Thick muscular walls, small diameter
Stroke volume	The volume of blood pumped out of the heart by each ventricle during one contraction.
Backflow	The flowing backwards of blood. Valves in the veins prevent this from happening.
Embolism	Blockage of a blood vessel.
Inspire/inhale	Breathe in
Expire/exhale	Breathe out
Deep breathing	Slow, deep breaths whilst relaxed
Alveoli	Air sacs in the lungs
Residual volume	Air left in the lungs after maximal expiration
Gaseous exchange	The process where oxygen in alveoli moves into the blood whilst removing carbon dioxide
Haemoglobin	The substance in the red blood cells which transports oxygen (as oxyhaemoglobin) and carbon dioxide.
Cardiac output	The amount of blood ejected from the heart in one minute or stroke volume x heart rate.
Cardiac cycle	The process of the heart going through the stages of systole (ejection) and diastole (filling) in the atria and ventricles

Heart

Pathway of the blood:

1. deoxygenated blood into right atrium
2. then into the right ventricle
3. the pulmonary artery then transports deoxygenated blood to the lungs
4. gas exchange occurs (blood is oxygenated)
5. pulmonary vein transports oxygenated blood back to the left atrium
6. then into the left ventricle before oxygenated blood is ejected and transported to the body via the aorta



Vasoconstriction-Narrowing of internal diameter of a blood vessel to restrict the flow of blood. The arteries constrict during exercise so that less blood is delivered to inactive areas.

Vasodilation- Widening of internal diameter of a blood vessel to increase the volume of blood travelling through it. The arteries dilate during exercise so that more blood is delivered to active areas, increasing their O² supply

Blood pressure: The pressure that blood is under.

Types of pressure:

- systolic - when the heart is contracting
- diastolic - when the heart is relaxed.



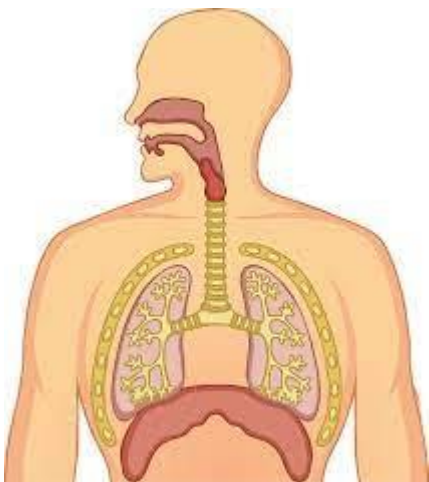
The pathway of air:

Mouth/Nose – Trachea – Bronchi – Bronchioles – Lungs - Alveoli.

Mechanics of breathing

As we inhale/inspire the chest cavity changes shape and size. The diaphragm contracts and flattens. The intercostal muscles (which are attached to the ribs) contract, raising the ribs up and pushing out the sternum, making the chest cavity larger. This reduces the air pressure inside the chest cavity and causes air to be sucked into the lungs. When we exhale/expire the reverse occurs. The diaphragm relaxes and becomes dome shaped. The intercostal muscles relax, lowering the ribs and dropping the sternum, making the chest cavity smaller. This increases the air pressure inside the air cavity and causes air to be pushed out of the lungs.

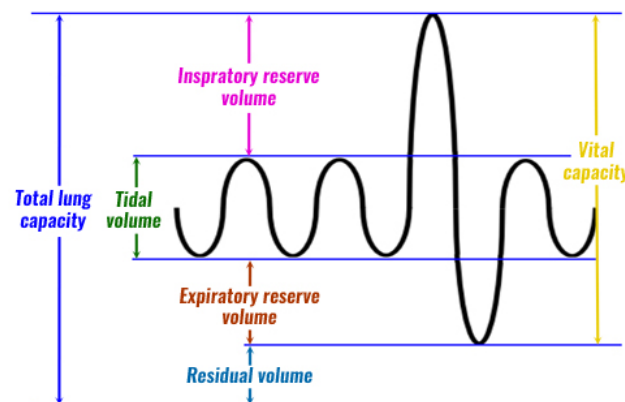
Lungs can expand more during exercise (inspiration) due to the use of pectorals and sternocleidomastoid. During exercise (expiration), the rib cage is pulled down quicker to force air out quicker due to use of the abdominal muscles.



Gaseous exchange at the alveoli

Oxygen that is breathed in passes through the **alveoli** and into the red blood cells in the **capillaries**. In the capillaries the oxygen combines with **haemoglobin** to form **oxyhaemoglobin**. Haemoglobin carries carbon dioxide from the blood to the capillaries which is then passed through the alveoli and breathed out.

Spirometer Trace: equipment that measures air capacity in the lungs



Box 6: Pathway

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Future links: from teaching sequence

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Box 7: Cross curricular links



Keywords

Word	Definition
Agonist (prime mover)	Muscle or group responsible for the movement.
Antagonist	Acts to produce the opposite action to the agonist. They work in antagonistic pairs.
Prime mover (agonist)	Muscle or muscle group responsible for the movement.
Isometric contraction	Muscle contraction where the length of the muscle does not alter. The contraction is constant, i.e. pushing against a load.
Isotonic contraction	Muscle contraction that results in limb movement: • Concentric contraction - shortening of the muscle • Eccentric contraction - lengthening of the muscle.

Pectoralis Major

Deltoid

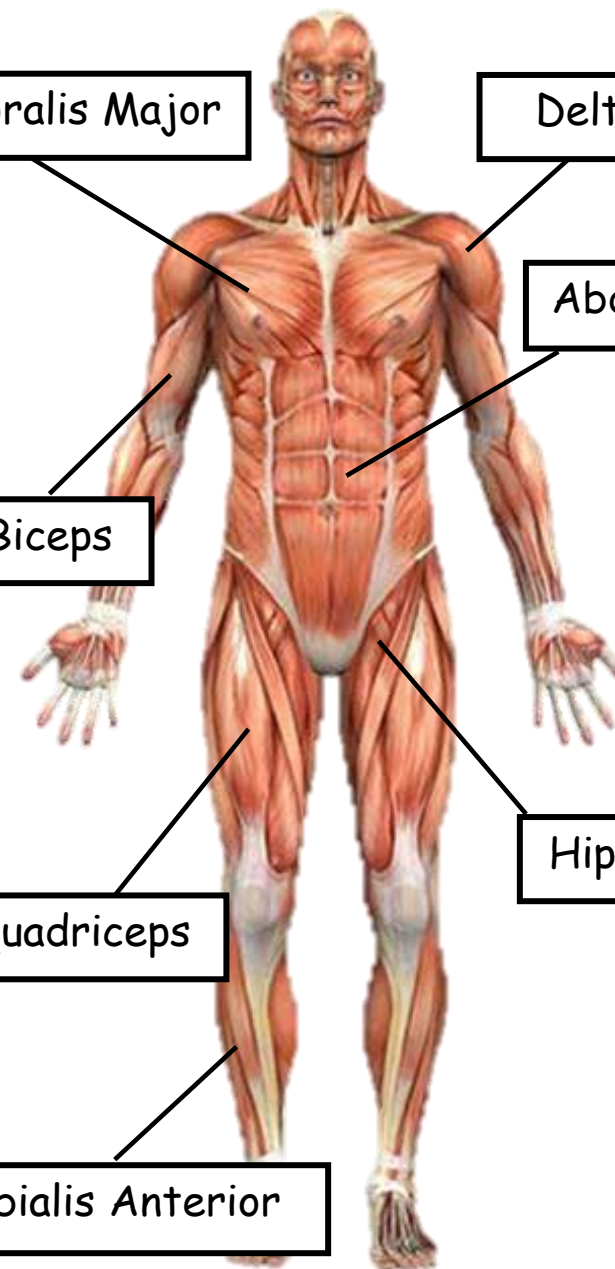
Abdominals

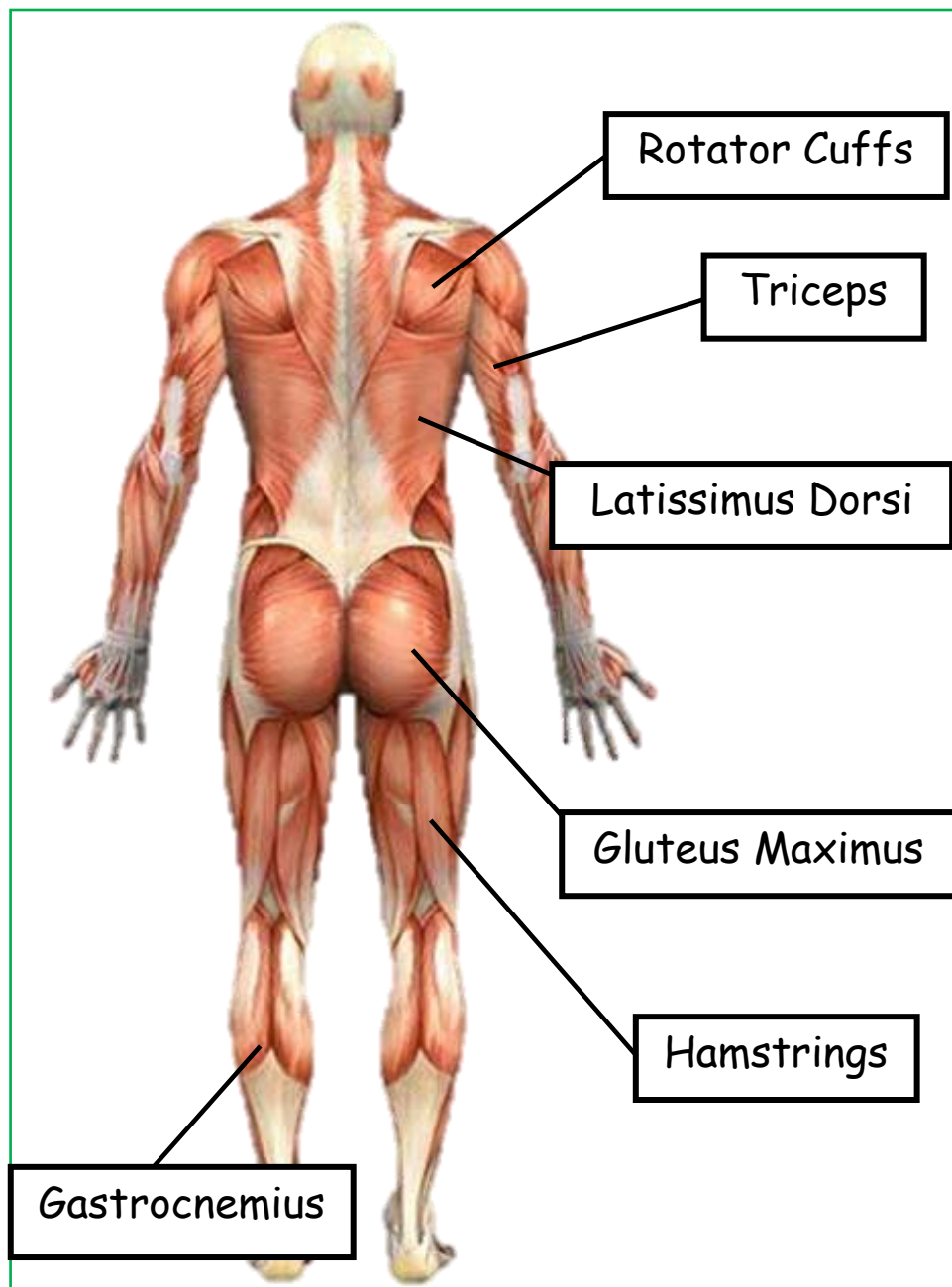
Biceps

Hip Flexors

Quadriceps

Tibialis Anterior





Isometric contraction

Muscle contraction where the length of the muscle does not alter. The contraction is constant, i.e. pushing against a load.

Isotonic contraction

Muscle contraction that results in limb movement:

- Concentric contraction - shortening of the muscle
- Eccentric contraction - lengthening of the muscle.

Box 6: Pathway

Previous knowledge: from teaching sequence

Future links: from teaching sequence

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Box 7: Cross curricular links