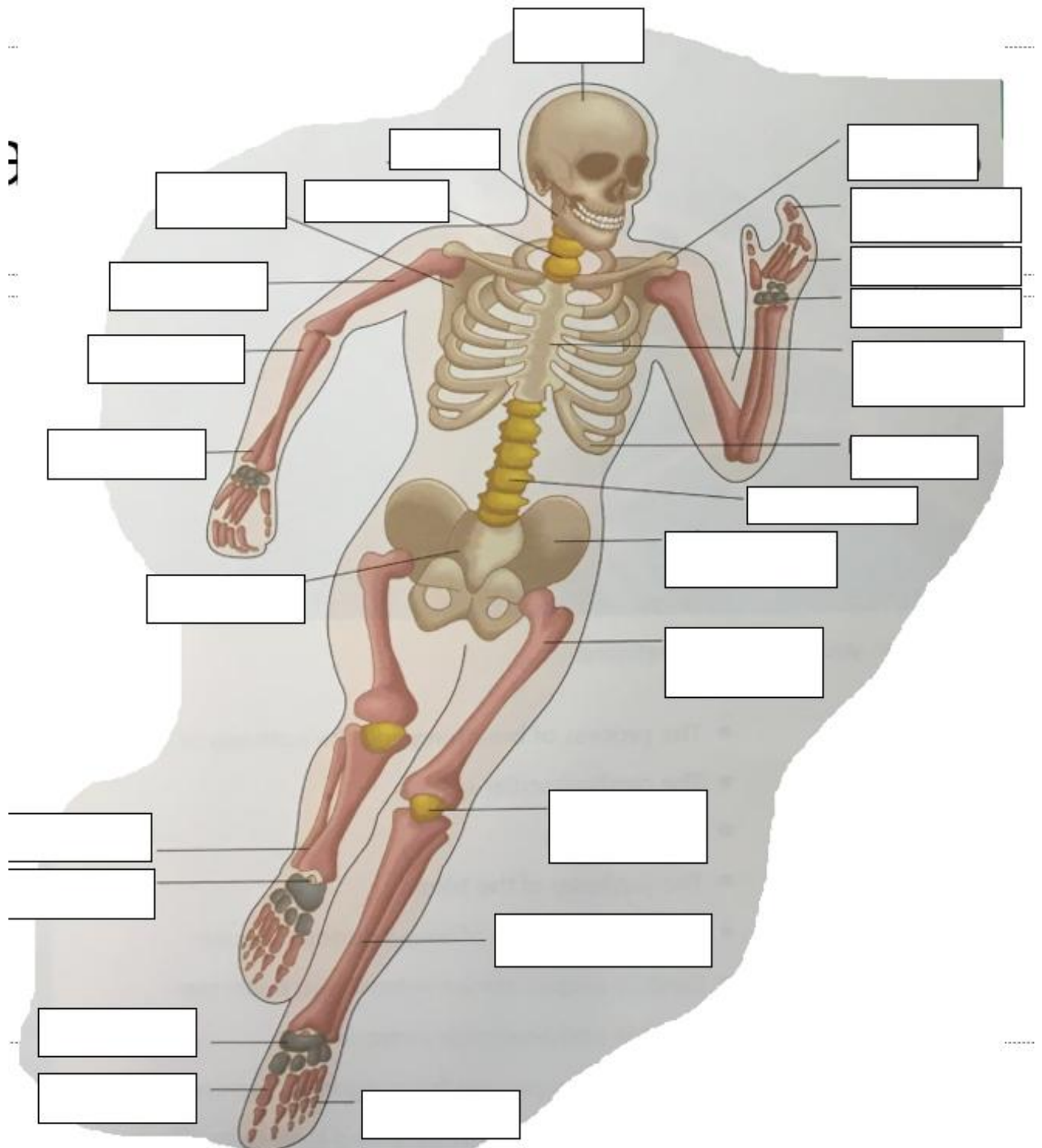
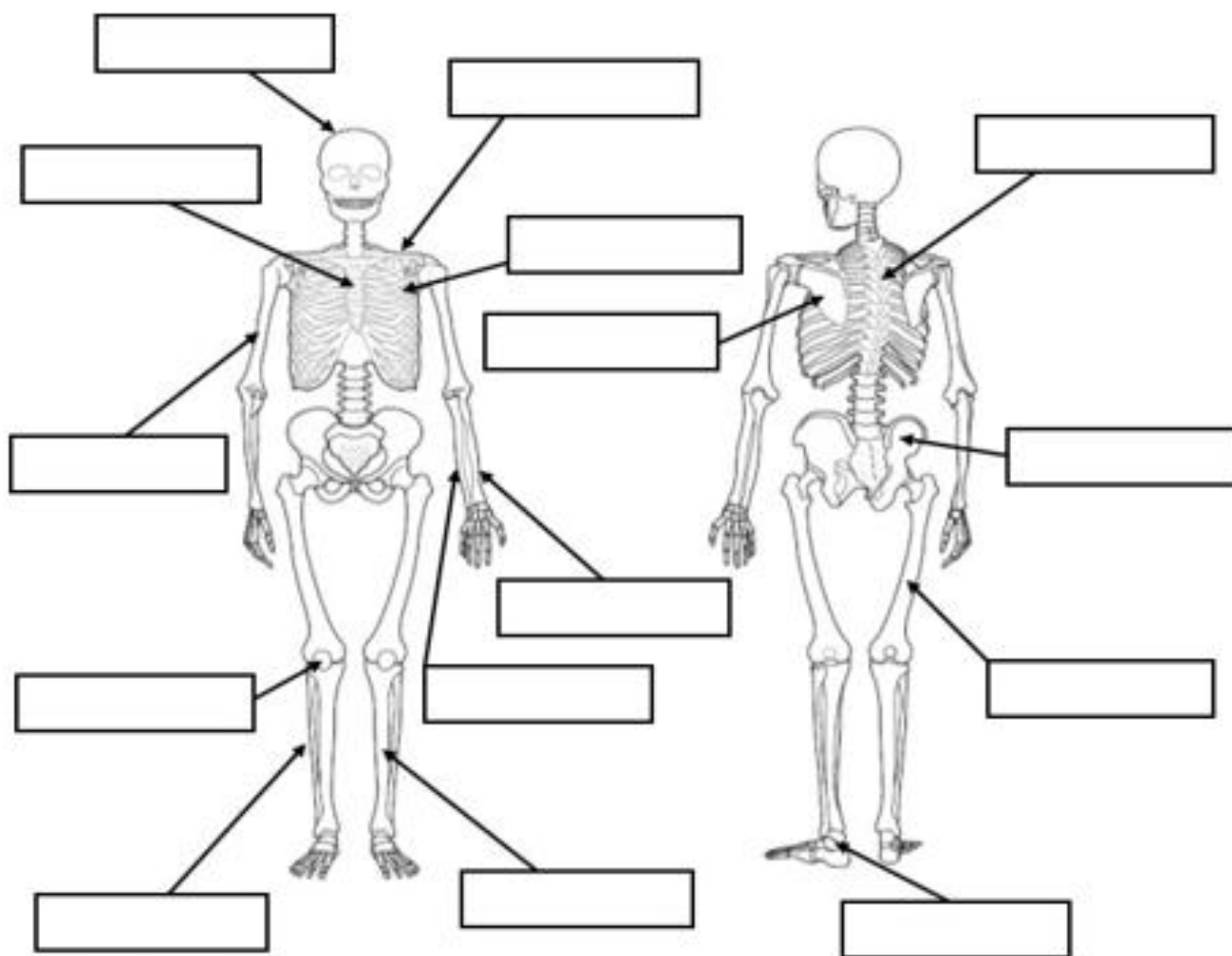


Skeletal System





Key Words

Ulna	Clavicle	Radius
Pelvis	Cranium	Sternum
Femur	Humerus	Scapula
Tibia	Ribs	Vertebrae
Fibula	Patella	Talus

Structure of a synovial joint

Label the synovial joint using the key words

Key words: Synovial fluid Synovial membrane Joint capsule
Bone Ligament Bursae Cartilage

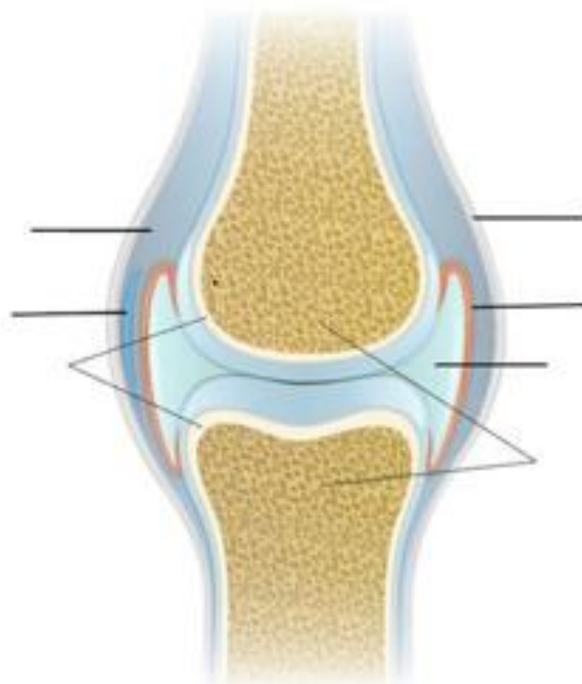
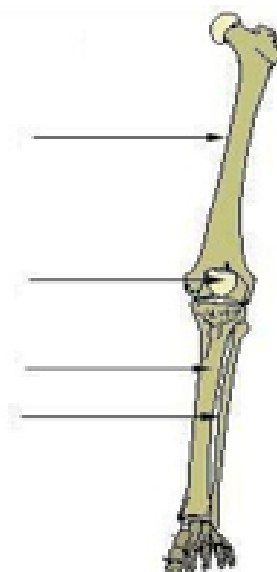


FIGURE 6-10

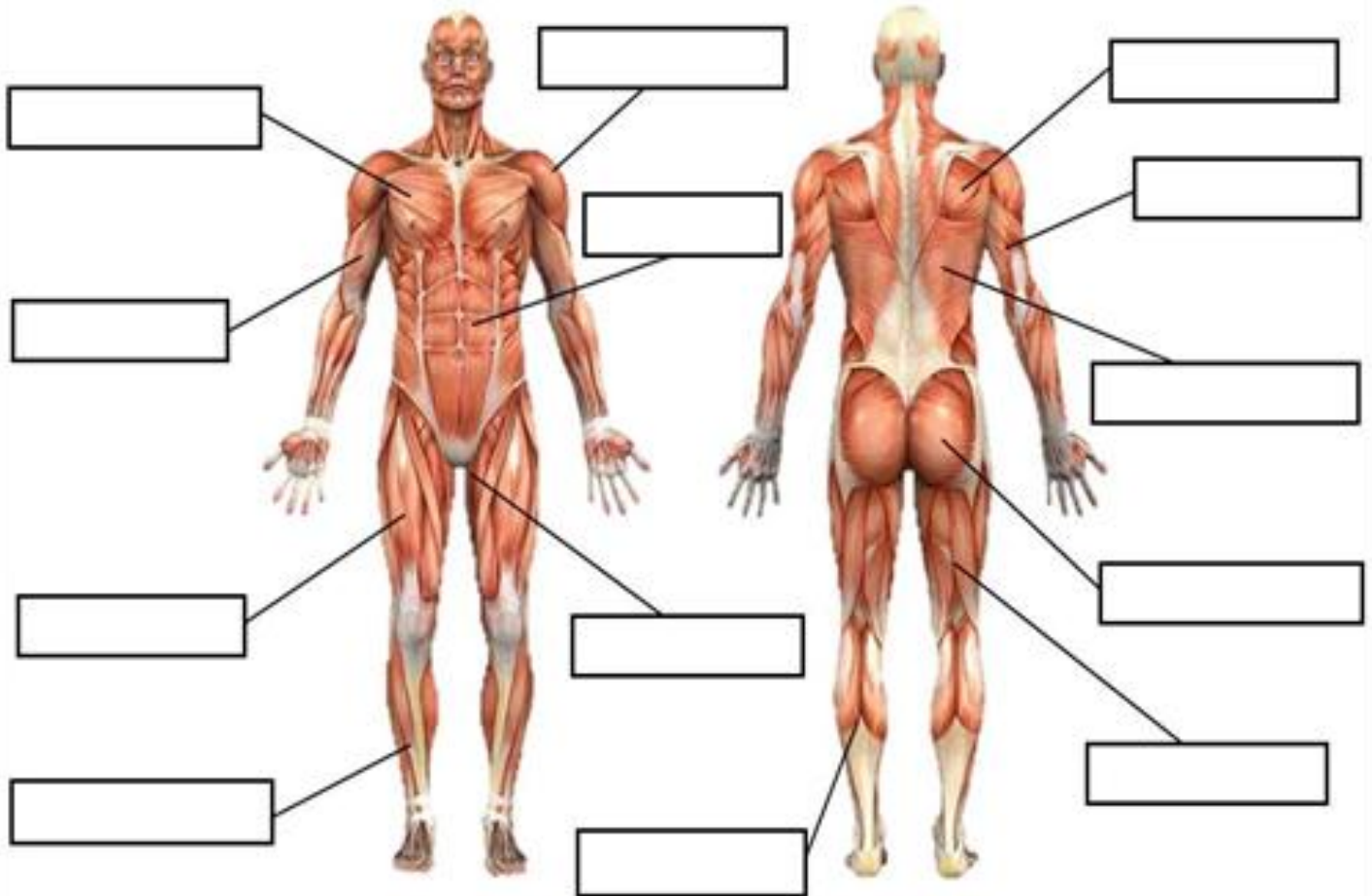
Identify the bones in the leg?



Muscular System

Muscles of the body

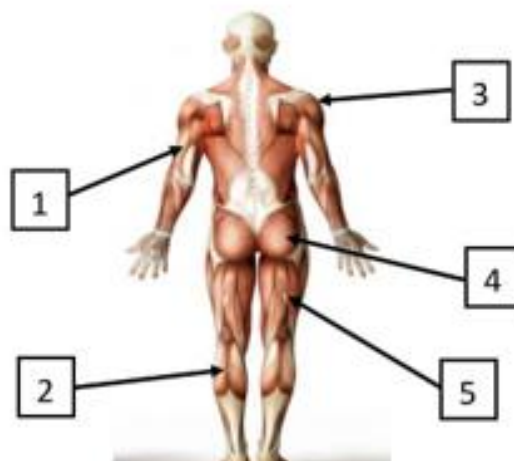
Label the muscles of the body using the key words



Key words: Deltoid Latissimus dorsi Gluteals Rotator cuffs Pectorals
Abdominals Biceps Quadriceps Triceps Gastrocnemius
Hip Flexor Hamstrings Tibialis anterior

Label the following muscles?

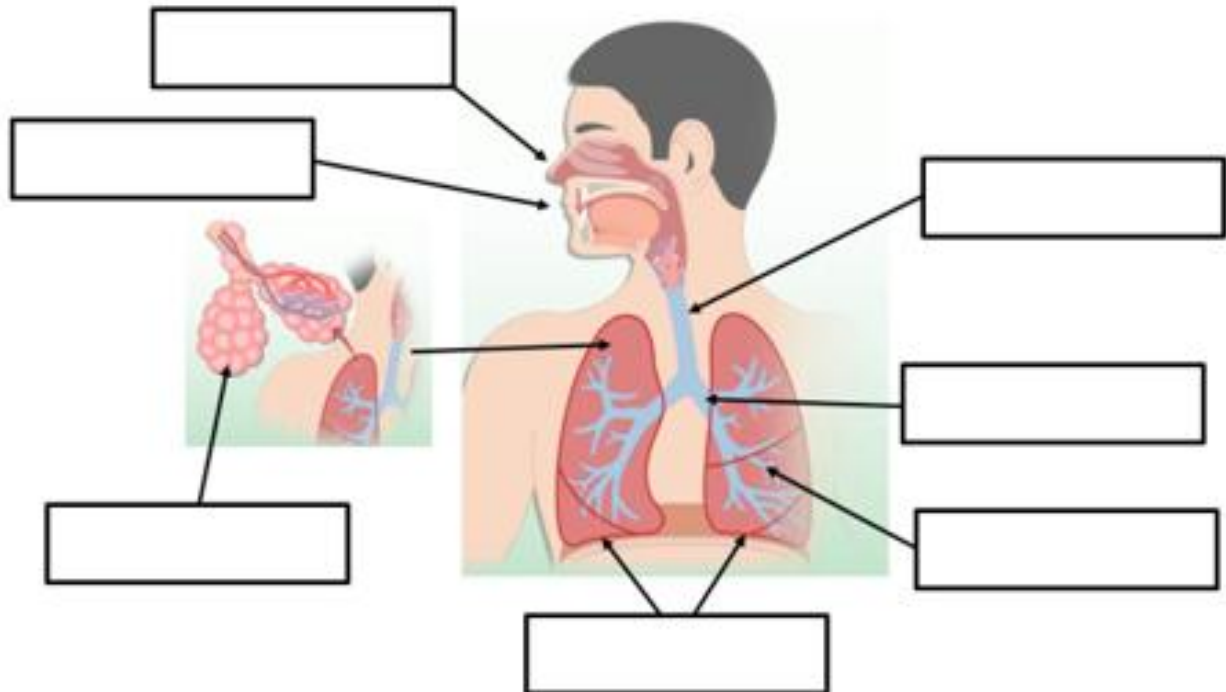
- 1
- 2
- 3
- 4
- 5



Respiratory System

The Pathway of air into the lungs

Using the key words label the main structures of the respiratory system



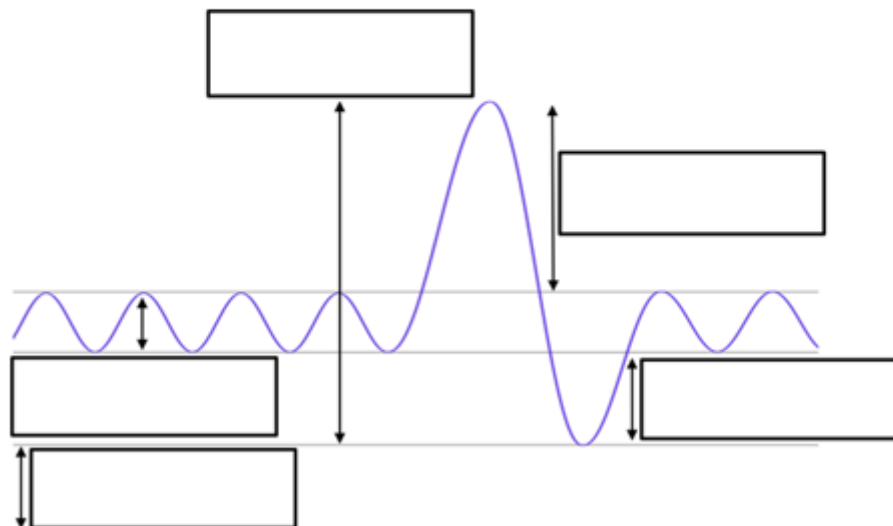
Key words: Alveoli Trachea Mouth Lungs Nose Bronchi Bronchioles

Lung Volumes

The machine that measures lung volumes is called a **spirometer**

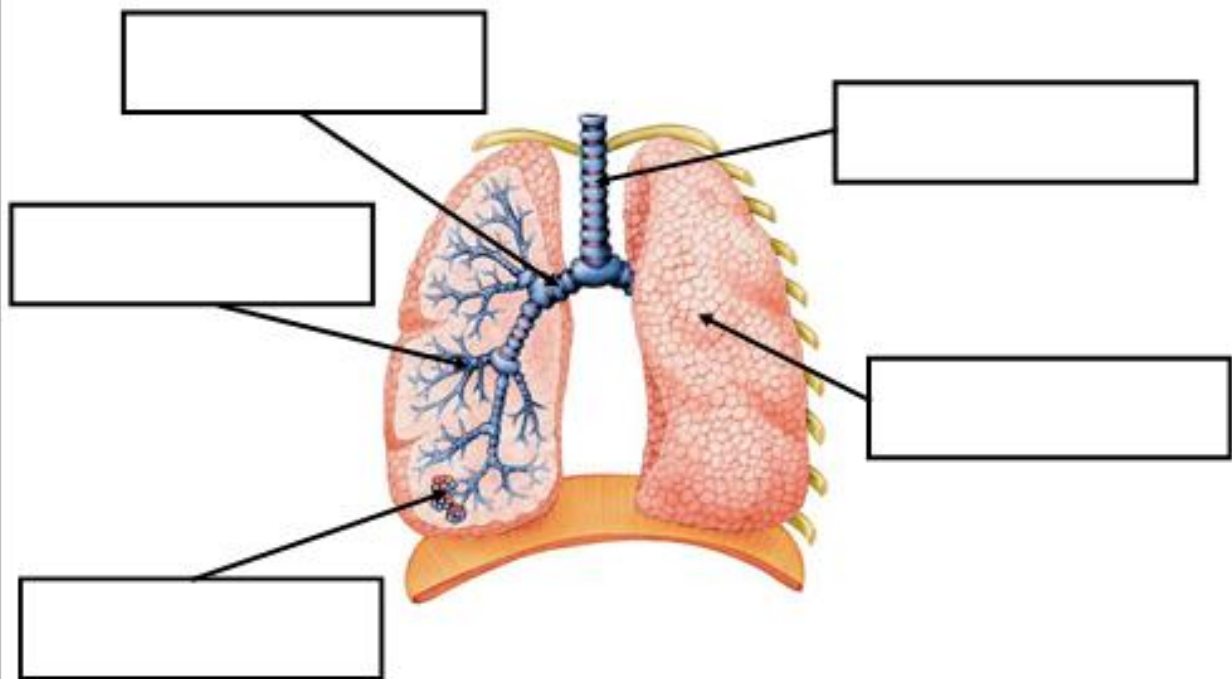
As the individual breathes in and out a line is drawn by the spirometer, showing the depth and rate of breathing. This is called a spirometer trace.

Fill in the missing lung volumes below on the spirometer trace:



Apply your knowledge

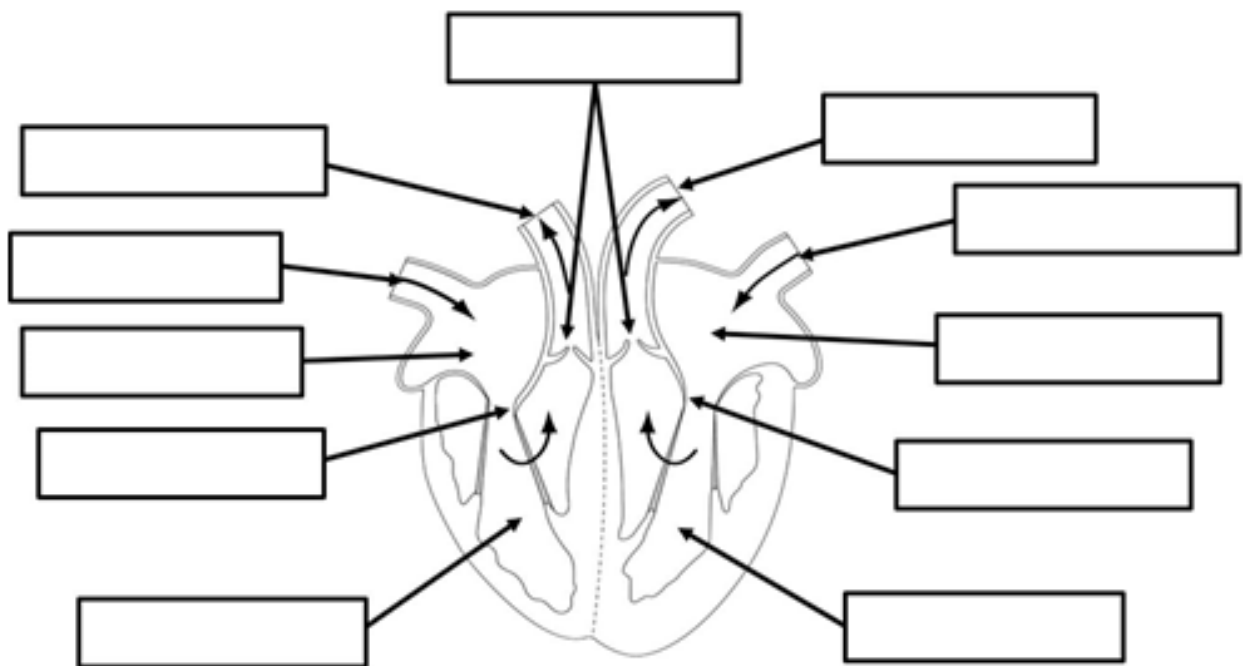
Label the components of the respiratory system? (5 marks)



Cardiac System

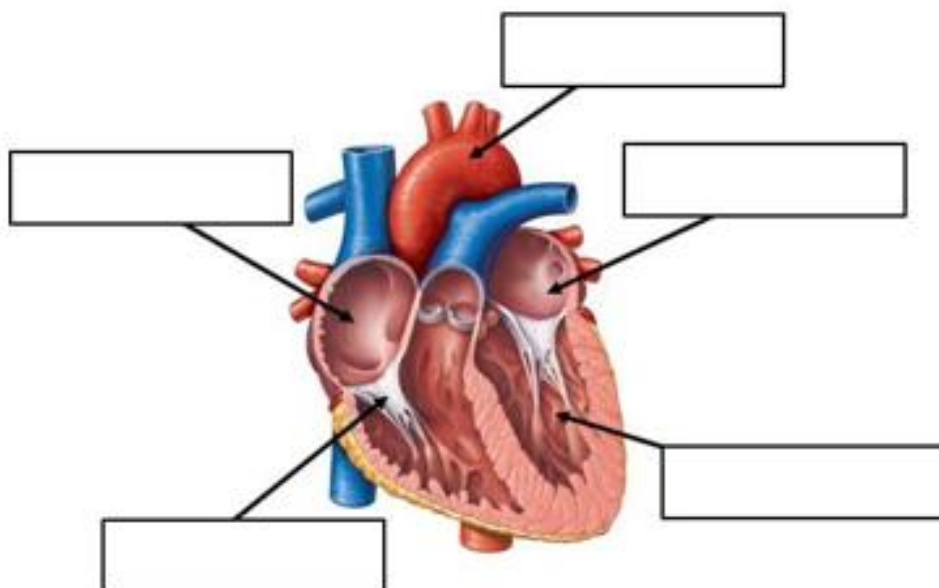
Structures of the heart

Label the structures of the heart using the key words



Key words: Pulmonary artery Valves Aorta Vena Cava Left atrium
Left ventricle Right atrium Right ventricle Pulmonary vein

Identify the following structures of the heart (5 marks)



Levers, Planes and Axis

Key words

Lever = is a bone and is shown as a straight line



Fulcrum = is a pivot or joint and is shown as a triangle



Effort = is a force provided by muscles as is shown by an arrow



Load = is the weight of the body that is being moved it is shown as a square



First Class Lever System

Draw a 1st class lever system



Second Class Lever System

Draw a 2nd class lever system



Third Class Lever System

Draw a 3rd class lever system



Apply your knowledge

Identify the planes of movement from the pictures?



Fill in the table below Pairing the correct axis with the plane?

Plane		Axis
Sometimes	&	The
Fun	&	Starts
Too	&	Late

Only certain movements can happen in each plane and around each axis you need to be able to link the different movement possibilities to each plane and each axis, giving examples from sport



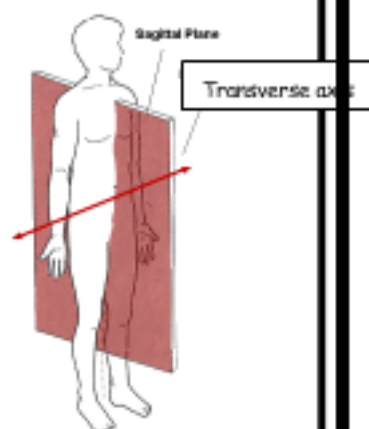
Sagittal Plane & Transverse Axis

Movements that can occur

-
-

Sporting example

-



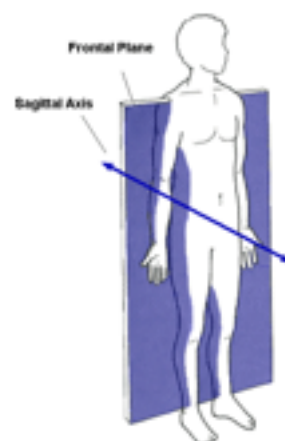
Frontal Plane & Sagittal Axis

Movements that can occur

-
-

Sporting example

-



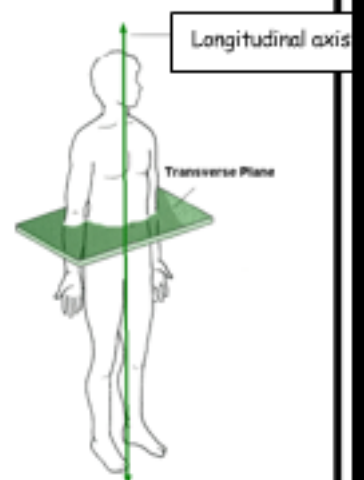
Transverse Plane & Longitudinal Axis

Movements that can occur

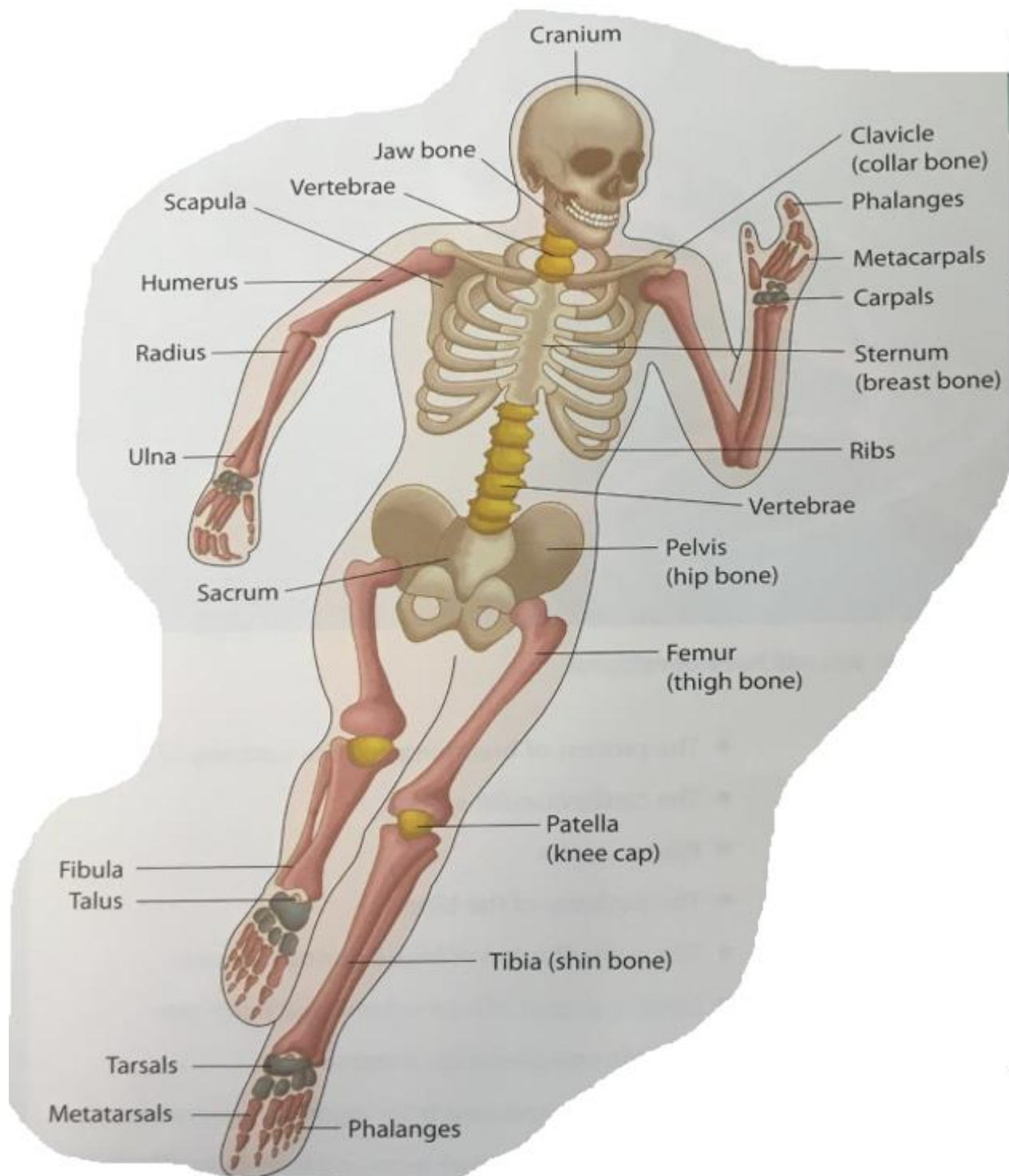
-
-

Sporting example

-



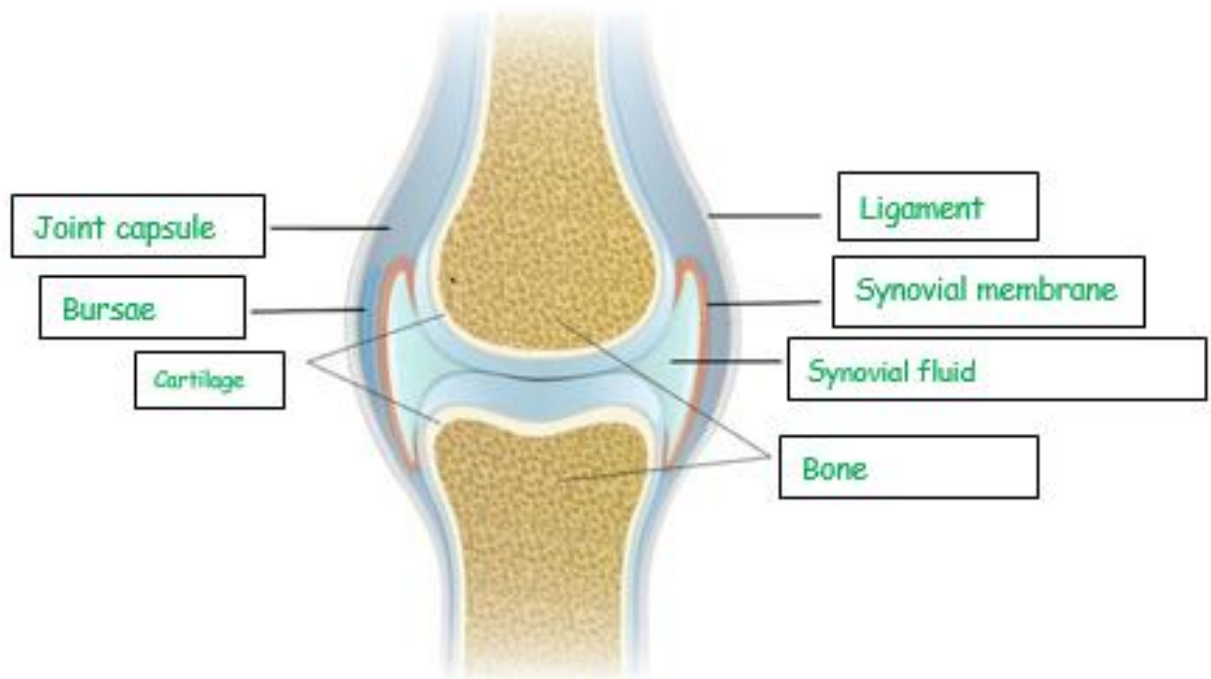
Answers



Structure of a synovial joint (read page 3 of textbook)

Label the synovial joint using the key words

Key words: Synovial fluid Synovial membrane Joint capsule
Bone Ligament Bursae Cartilage



Function of cartilage

Covers ends of bones providing a smooth, friction-free surface.

Function of ligaments

Join bone to bone.

Function of the joint capsule

Tough fibrous tissue - surrounds synovial joints; usually supported by ligaments.

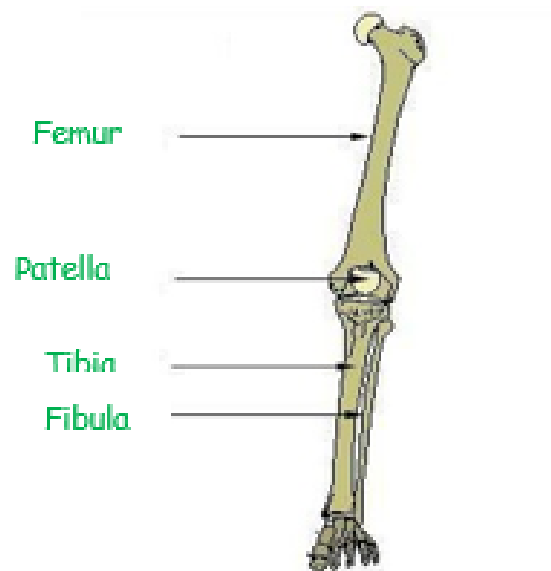
Function of synovial fluid

Produced by the synovial membrane to lubricate the joint.

Function of bursae

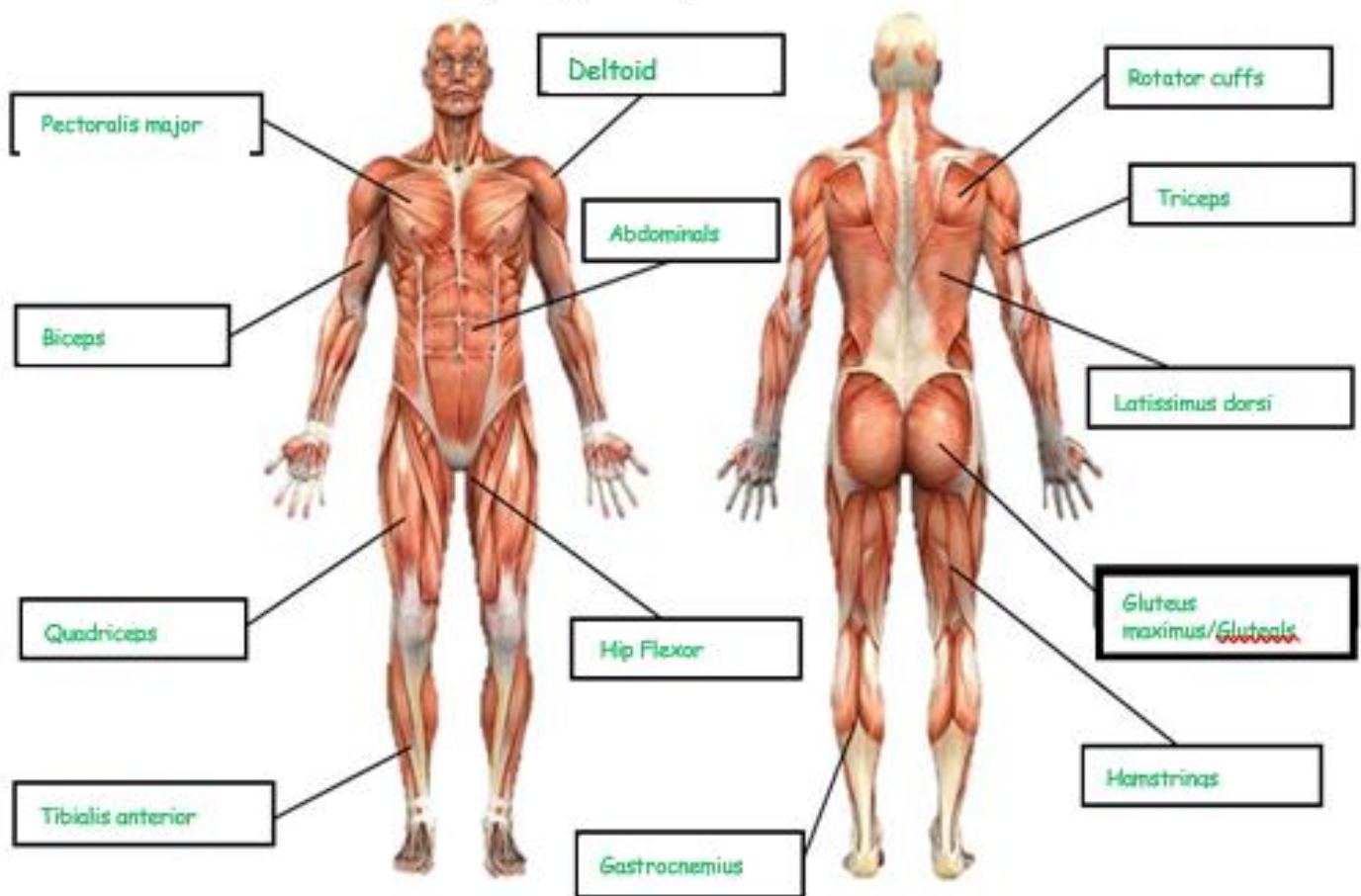
Fluid-filled bag that helps reduce friction in a joint.

Identify the bones in the leg? (4 marks)



Muscles of the body

Label the muscles of the body using the key words



Key words: Deltoid Latissimus dorsi Gluteals Rotator cuffs Pectorals
Abdominals Biceps Quadriceps Triceps Gastrocnemius
Hip Flexor Hamstrings Tibialis anterior

The role of ligaments and tendons

Ligament:

Ligaments attach bone to bone and hold the joint in place.

Example in physical activity and sport

In rugby the ligaments keep the bones of the knee in their correct position when someone impacts the player performing a chop tackle dangerously.

Tendon:

A tendon is a band of tissue that connects a muscle to a bone.

Example in physical activity and sport

They help stabilise the ankle and move the foot down into plantar flexion when pushing off the blocks in a sprint start. (Achilles tendon)

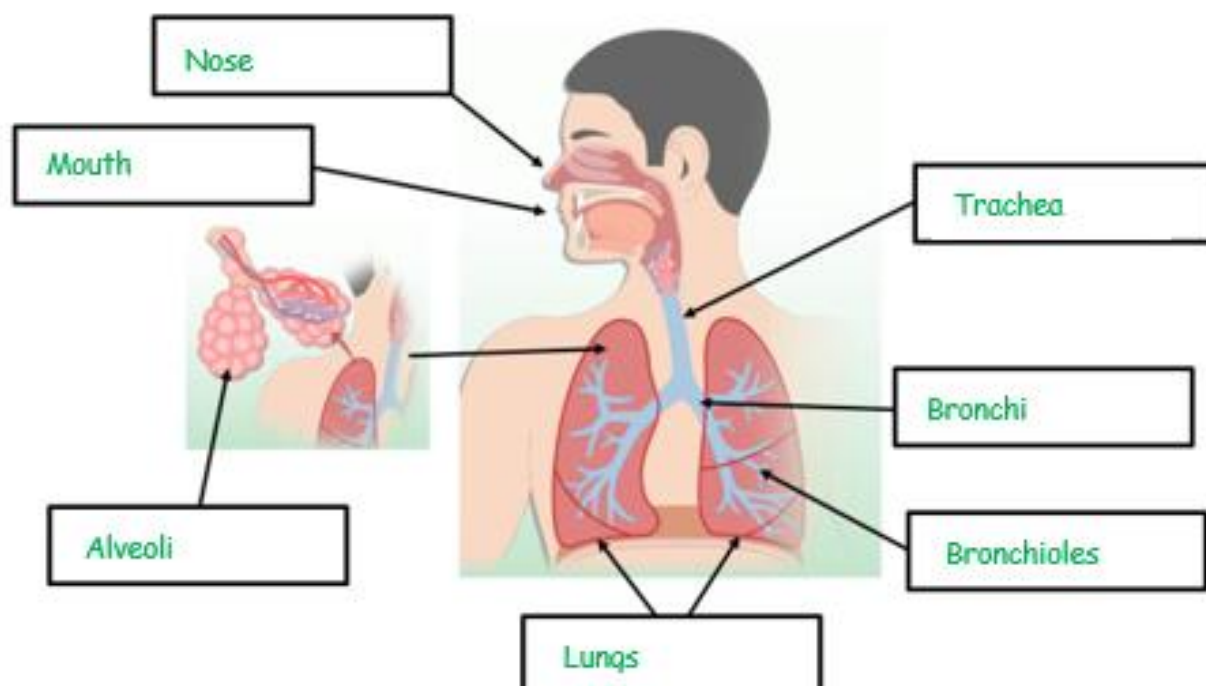
Label the following muscles? (5 marks)

- 1 Triceps
- 2 Gastrocnemius
- 3 Deltoid
- 4 Gluteals/gluteus maximus
- 5 Hamstrings



The Pathway of air into the lungs

Using the key words label the main structures of the respiratory system



Key words: Alveoli Trachea Mouth Lungs Nose Bronchi Bronchioles

Nose & Mouth

When we breathe in, air moves through the mouth and nose.

Trachea

The trachea carries air from the mouth and nose to the lungs.

The surface of the trachea is covered in tiny hairs called cilia, which catch particles of dust.

Bronchi

The bronchi (left and right) carries air from the trachea into the lungs.

Bronchioles

Bronchioles carry air from the bronchi to the alveoli.

Bronchioles are very narrow tubes, less than 1 millimetre in diameter.

Alveoli

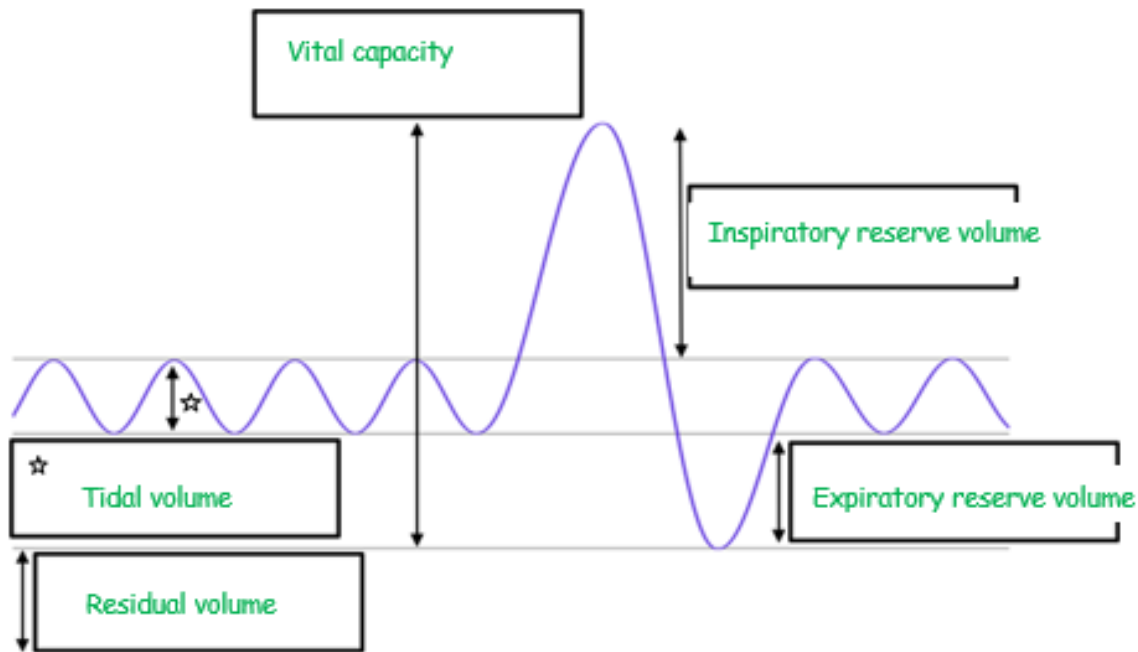
Alveoli are tiny air sacs in the lungs which allow for rapid gaseous exchange.

Lung Volumes

The machine that measures lung volumes is called a **spirometer**

As the individual breathes in and out a line is drawn by the spirometer, showing the depth and rate of breathing. This is called a spirometer trace.

Fill in the missing lung volumes below on the spirometer trace:



Tidal volume

(TV) The volume of air breathed in (or out) during a normal breath at rest.

Vital capacity

Vital capacity (VC) is the maximum amount of air a person can expel from the lungs after a maximum inhalation.

Expiratory reserve volume

(ERV) The additional air that can forcibly be exhaled after the expiration of a normal tidal volume.

Inspiratory reserve volume

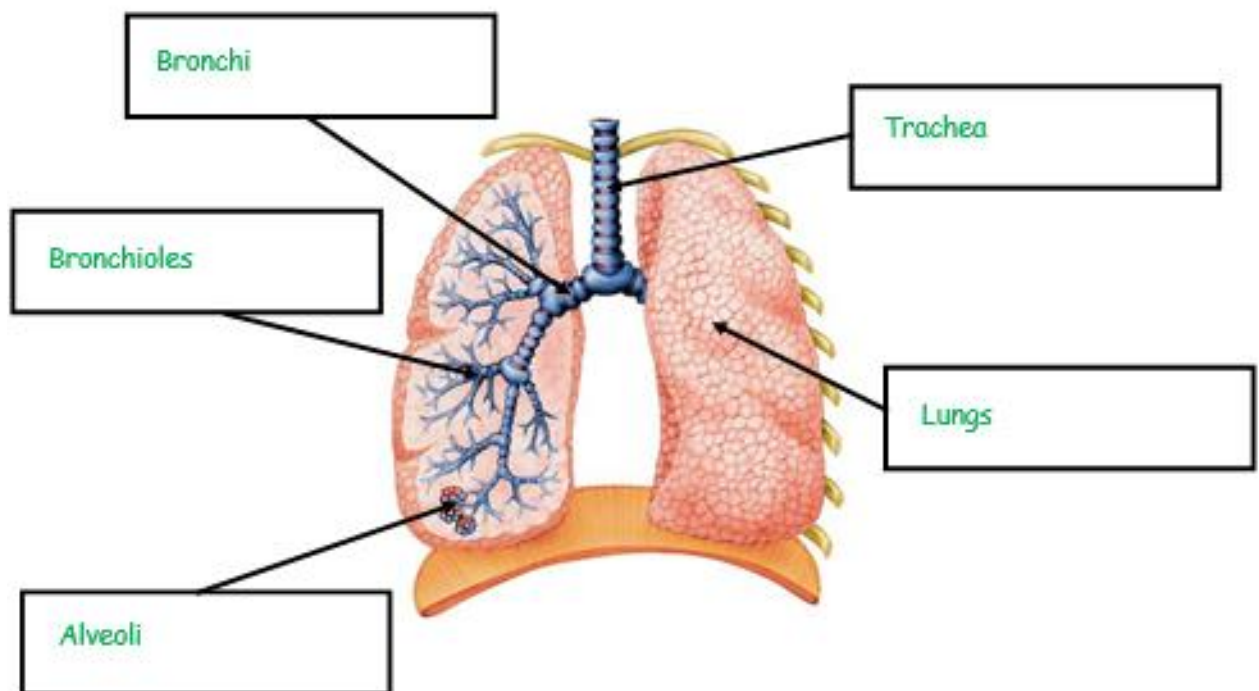
(IRV) The additional air that can be forcibly inhaled after the inspiration of a normal tidal volume.

Residual volume

The volume of air that remains in the lungs after a maximal expiration.

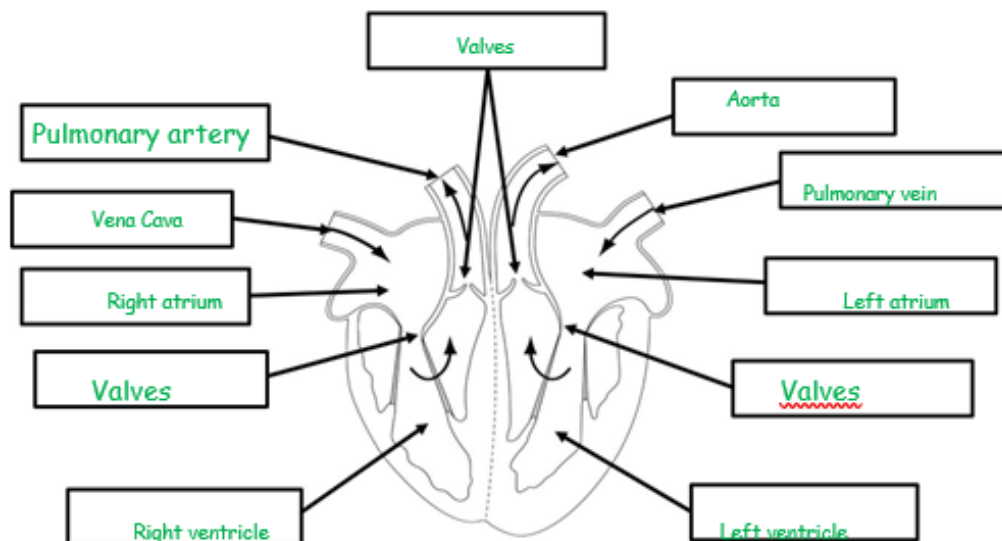
Apply your knowledge

Label the components of the respiratory system? (5 marks)



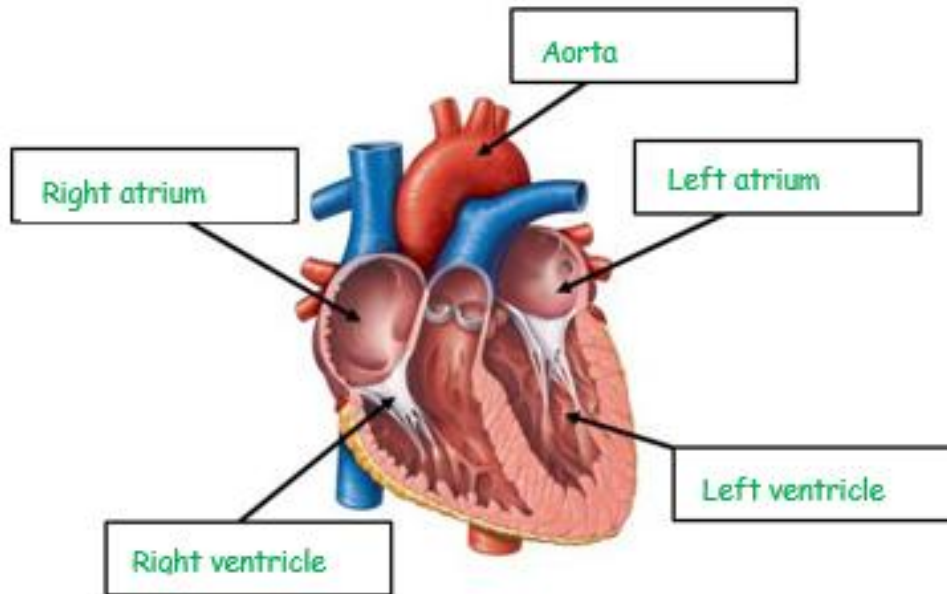
Structures of the heart

Label the structures of the heart using the key words



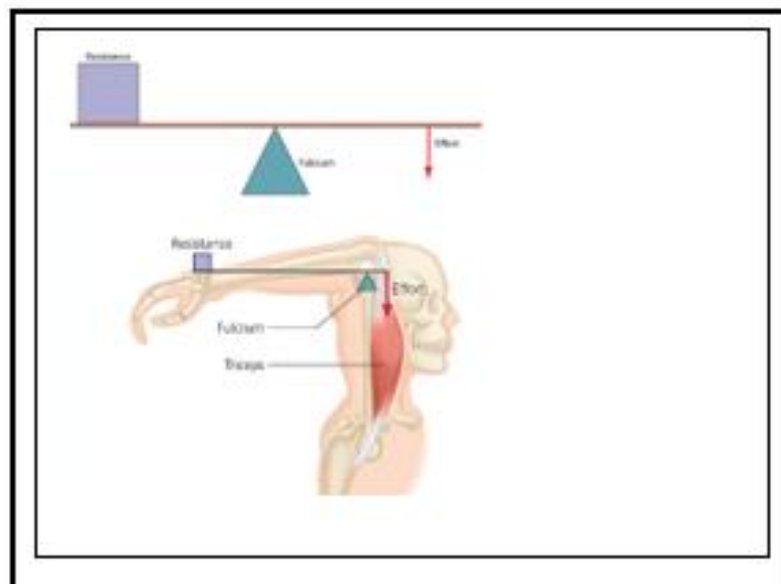
Key words: Pulmonary artery Valves Aorta Vena Cava Left atrium
Left ventricle Right atrium Right ventricle pulmonary vein

Identify the following structures of the heart (5 marks)



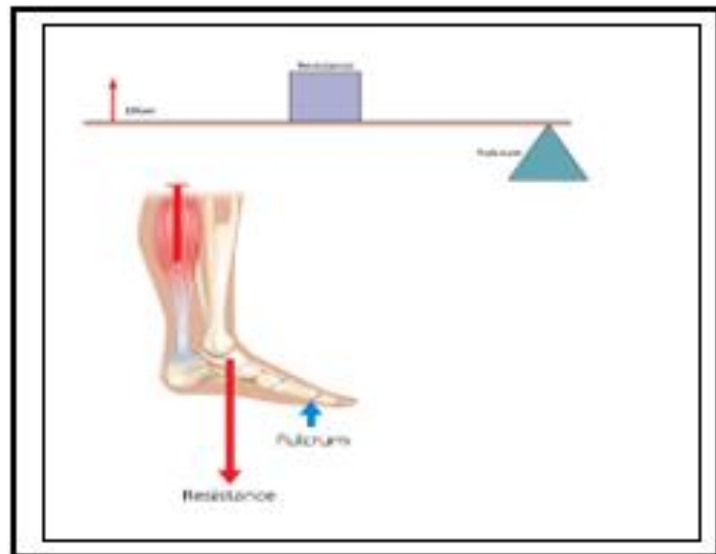
First Class Lever System

Draw a 1st class lever system



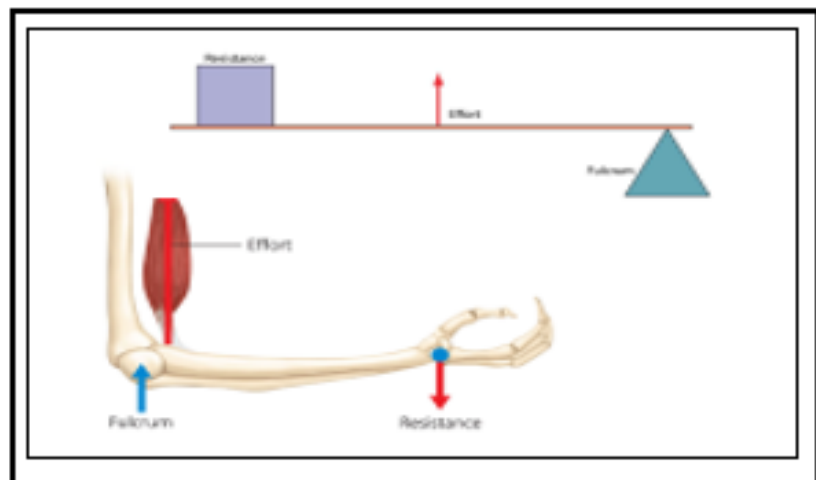
Second Class Lever System

Draw a 2nd class lever system



Third Class Lever System

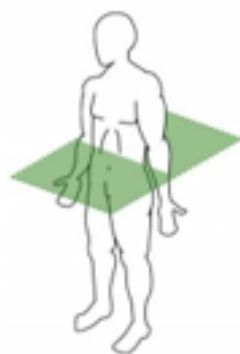
Draw a 3rd class lever system



For levers you only need to draw the line, square for the load, triangle for the fulcrum (remember it must always be underneath the line) and arrow for effort. The head, arm and elbow are just showing you examples.

Apply your knowledge

Identify the planes of movement from the pictures?



Transverse



Frontal



Sagittal

Fill in the table below Pairing the correct axis with the plane?

Plane		Axis
Sometimes Sagittal	&	The Transverse
Fun Frontal	&	Starts Sagittal
Too Transverse	&	Late Longitudinal

Only certain movements can happen in each plane and around each axis you need to be able to link the different movement possibilities to each plane and each axis, giving examples from sport

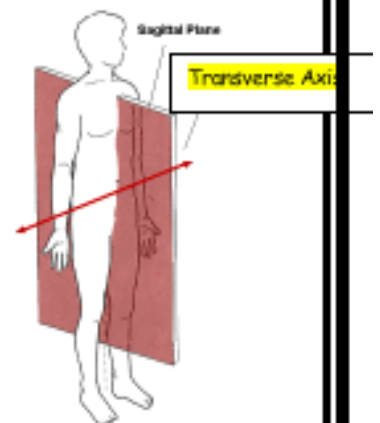
Sagittal Plane & Transverse Axis

Movements that can occur

- Backwards (flexion)
- Forwards (extension)

Sporting example

- Walking, bicep curl, leg extension, front somersault



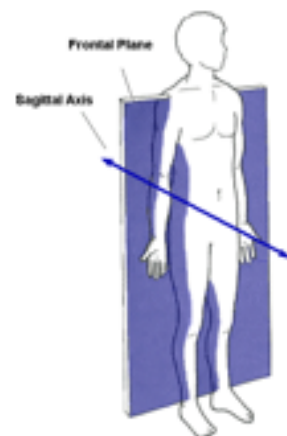
Frontal Plane & Sagittal Axis

Movements that can occur

- Side to side movements
- Abduction and adduction.

Sporting example

- Star jump, cartwheel, side-bending.



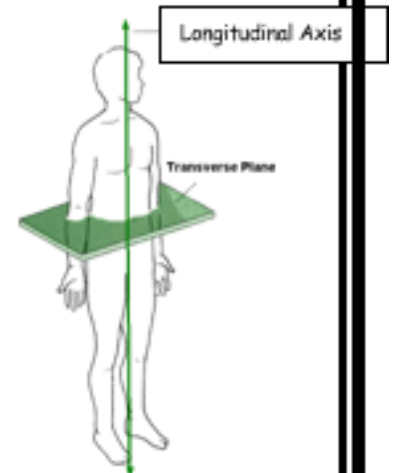
Transverse Plane & Longitudinal Axis

Movements that can occur

- Rotating movements
- Spins

Sporting example

- Discus and hammer throws, 360° twist, ice-skating spin.



Definitions

1. Skeletal System

Axial Skeleton – The central part of the skeleton consisting of the skull, vertebral column, ribs and sternum.

Appendicular Skeleton – The limbs and girdles attached to the axial skeleton.

Long Bone – A bone longer than it is wide, designed for movement (e.g. femur).

Short Bone – A cube-shaped bone that provides stability and support (e.g. carpals).

Flat Bone – A thin bone that provides protection and muscle attachment (e.g. sternum).

Irregular Bone – A bone with a complex shape that does not fit other categories (e.g. vertebrae).

Sesamoid Bone – A small bone embedded within a tendon (e.g. patella).

Synovial Joint – A freely movable joint containing synovial fluid.

Ligament – Connective tissue that joins bone to bone.

Tendon – Connective tissue that joins muscle to bone.

Cartilage – Smooth tissue covering the ends of bones to reduce friction.

Synovial Fluid – Lubricating fluid within a synovial joint.

Joint Capsule – Fibrous structure enclosing a synovial joint.

Joint Movements

Flexion – Decreasing the angle at a joint.

Extension – Increasing the angle at a joint.

Abduction – Movement away from the body's midline.

Adduction – Movement towards the body's midline.

Circumduction – Circular movement of a limb.

Rotation – Turning around a longitudinal axis.

Pronation – Turning the palm downward.

Supination – Turning the palm upward.

Dorsiflexion – Toes move towards the shin.

Plantar Flexion – Toes point away from the shin.

2. Muscular System

Muscle Fibre – A single muscle cell.

Agonist – The muscle primarily responsible for producing a movement.

Antagonist – The muscle that opposes the agonist.

Fixator – A muscle that stabilises a joint.

Synergist – A muscle that assists the agonist.

Isotonic Contraction – A contraction involving movement.

Concentric Contraction – Muscle shortens while producing force.

Eccentric Contraction – Muscle lengthens while producing force.

Isometric Contraction – Muscle contracts without changing length.

Muscle Hypertrophy – Increase in muscle size.

Muscle Atrophy – Decrease in muscle size.

Slow Twitch (Type I) – Fatigue-resistant muscle fibres suited to endurance activities.

Fast Twitch (Type II) – Powerful muscle fibres suited to explosive activities.

3. Cardiovascular System

Heart Rate (HR) – Number of heart beats per minute.

Stroke Volume (SV) – Amount of blood pumped from the left ventricle per beat.

Cardiac Output (Q) – Amount of blood pumped by the heart per minute.

Cardiac Output Formula – $HR \times SV$.

Blood Pressure – Force exerted by blood against artery walls.

Systolic Pressure – Pressure during ventricular contraction.

Diastolic Pressure – Pressure during ventricular relaxation.

Artery – Blood vessel carrying blood away from the heart.

Vein – Blood vessel carrying blood towards the heart.

Capillary – Small blood vessel where exchange occurs.

Red Blood Cell – Cell responsible for oxygen transport.

Haemoglobin – Protein in red blood cells that carries oxygen.

White Blood Cell – Cell involved in immune defence.

Platelet – Cell fragment involved in blood clotting.

Vascular Shunt – Redistribution of blood to working muscles.

4. Respiratory System

Ventilation – Movement of air into and out of the lungs.

Inspiration – Breathing in.

Expiration – Breathing out.

Tidal Volume (TV) – Volume of air inhaled or exhaled in a normal breath.

Respiratory Rate (RR) – Number of breaths per minute.

Minute Ventilation (VE) – Volume of air breathed per minute.

Minute Ventilation Formula – $TV \times RR$.

Alveoli – Tiny air sacs where gas exchange occurs.

Gaseous Exchange – Movement of oxygen and carbon dioxide between lungs and blood.

Diffusion – Movement of particles from high to low concentration.

Vital Capacity – Maximum amount of air exhaled after a maximal inhalation.

5. Energy Systems

ATP (Adenosine Triphosphate) – The body's immediate source of energy.

ATP-PC System – Anaerobic energy system using phosphocreatine for short, explosive activity.

Phosphocreatine (PC) – High-energy compound used to rapidly resynthesise ATP.

Lactic Acid System – Anaerobic energy system that breaks down glucose without oxygen.

Aerobic System – Energy system that uses oxygen to produce ATP.

Anaerobic – Energy production without oxygen.

Aerobic – Energy production with oxygen.

Lactate – By-product of anaerobic glycolysis.

Energy Continuum – The way all three energy systems work together depending on exercise intensity and duration.

EPOC – Excess Post-exercise Oxygen Consumption; additional oxygen needed after exercise for recovery.

6. Training Adaptations

Acute Response – Immediate effect of exercise on the body.

Chronic Adaptation – Long-term physiological change caused by training.

Hypertrophy – Increase in muscle size due to training.

Bradycardia – Lower than average resting heart rate, often seen in trained athletes.

Resting Heart Rate – Heart rate measured at complete rest.

VO₂ Max – Maximum amount of oxygen the body can utilise during exercise.

Recovery Rate – Speed at which the body returns to resting levels after exercise.