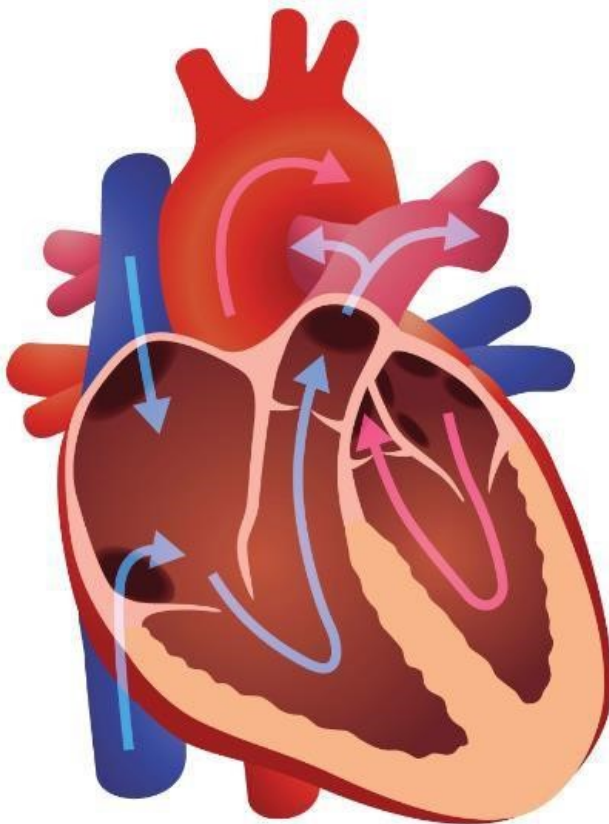


Understand the structure and function of the circulatory system

Task 1: Describe the function of the heart. (1.1)

The function of the heart is to act as a powerful muscle pump that circulates blood throughout the body

Task 2: Using the image and space below, describe how blood moves through the four chambers of the heart and the stages of systemic and pulmonary circulation. (1.2, 1.3)



Description of blood flow:

The right ventricle of the heart pumps oxygen poor blood through the lungs and the left ventricle pumps oxygen rich blood to the body.

Systemic and pulmonary circulation:

The pulmonary circulation pumps deoxygenated blood from the right ventricle to the lungs, where it becomes oxygenated before returning to the left atrium, while systemic circulation pumps this oxygenated blood from the left ventricle through the aorta to the rest of the body, and the deoxygenated blood then returns to the right atrium.

Task 3: Describe the structure and functions of blood vessels. (1.4)

Structure	Functions
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Arteries: Thick, muscular, and elastic walls Narrow Lumen No valves	Arteries: Carry oxygen-rich blood away from the heart under high pressure Can constrict and dilate to regulate blood flow and blood pressure
Capillaries: Microscopic and only one cell thick Very thin walls Leaky walls to allow for exchange	Capillaries: Site of gas, nutrient, and waste exchange between blood and tissues.
Veins: Thinner, less muscular walls than arteries Wider lumen One way valves, especially in the limbs	Veins: Carry deoxygenated blood back to the heart under low pressure Valves prevent back flow of blood

Task 4: Explain what blood pressure is and identify the different types of blood pressure classifications. (1.5, 1.6)

Blood pressure

Blood pressure is the force of blood pushing against the walls of your arteries as the heart pumps it throughout your body. Blood pressure is measured with two numbers systolic (top number) which is the pressure when the heart contracts and then the second number is diastolic (bottom number) which is the pressure when the heart rests between beats.

Blood pressure classifications

Blood pressure is categorised into normal, elevated, and two stages of hypertension, with a hypertensive crisis being the most severe. A normal reading is less than 120/80 mmhg, Elevated blood pressure is 120-129 systolic and less than 80 diastolic. High blood pressure, is divided into stage 1 (130-139/80-89 mmhg) and stage 2 (140+/ 90+ mmhg) A reading of 180/120 mmhg or higher is considered a hypertensive crisis requiring immediate medical attention.

Learning outcome 2

Understand the structure and functions of the respiratory system

Task 1: Look at the image below. Using the image and spaces provided, label and describe the structure and function of the respiratory system. (2.1)

Pharynx

Larynx

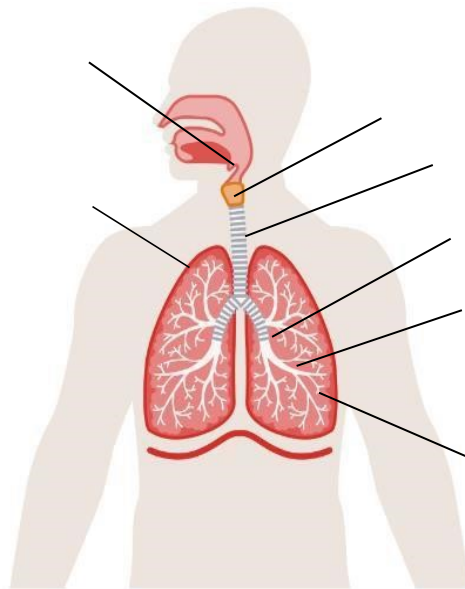
Lungs

Trachea

Bronchi

Bronchioles

Alveoli



Structure

The respiratory system structure involves the upper and lower airways, leading to the lungs where gas exchange occurs. Air enters through the nose or mouth, travels through the pharynx, larynx and trachea, which then branches into the bronchi and smaller bronchioles within the lungs. The lungs are a primary component.

Function

The main function of the respiratory system is gas exchange, which is the process of taking oxygen and releasing carbon dioxide. It also functions as a form of protection for the body from inhaled particles, enabling speech and smell, and helping to maintain the body acid-base balance.

Task 2: Identify the main muscles involved in breathing

The main muscles of the respiration system are the diaphragm and the external intercostal muscles. The diaphragm is the main muscle, which is a large and dome shaped muscle that forms the floor of the chest cavity where its used. The diaphragm contracts to expand the chest cavity during inhalation. The external intercostal muscles are the muscles located between the ribs, which they contract to lift the ribs up and outward, through this the chest cavity expands from side to side and front to back.

Task 3: Describe the route of air through the respiratory system.

Air follows the pathway of nose/mouth which then goes through the pharynx, larynx , where gas exchange happens. Before travelling down to the trachea the air is warmed and filtered in the nasal passages , after that, the air goes to the bronchi which branches to each lung. Inside the lungs the bronchi divide into smaller bronchioles that end in tiny air sacs called alveoli where oxygen moves into the blood and carbon dioxide moves out.

Task 4: Describe the process of gaseous exchange. (2.4)

Gaseous exchange is the process where oxygen is absorbed into the bloodstream from the air and carbon dioxide is removed from the blood and exhaled. This process occurs in the alveoli and relies on the principle of diffusion.

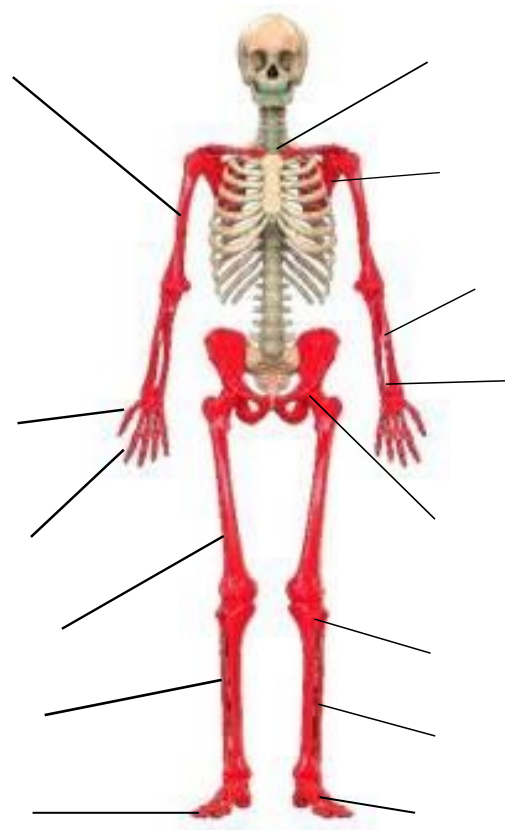
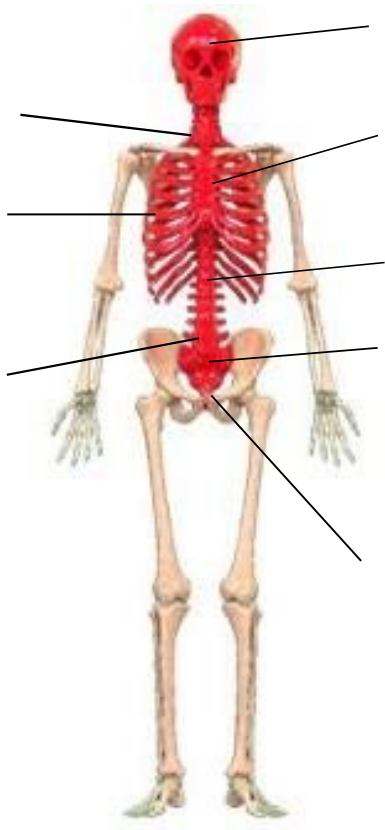
Learning outcome 3

Understand the structure and functions of the skeleton

Task 1: The skeleton provides vital structure to the human body. Below, describe the basic functions of the skeleton. (3.1)

The basic functions of skeleton consists of support, where the skeleton provides the body's framework, supporting its weight, maintaining its shape and posture, and holding muscles and organs in place. Its also used as protection, where the bones act as natural armour for vital internal such as the brain, ribcage and vertebrae. Its used for movement, where it works in conjunction with muscles and joints to allow for a wide range of movements, Bones act as levers that muscles pull on to produce movement. Its functions as a method for blood cell production, the red bone marrow is found within certain bones such as the pelvis, sternum and femur, is the site for red blood cells, white blood cells and platelets are produced which is a process called hematopoiesis. The skeleton also functions as a storage of minerals and fats, Bones store essential minerals such as calcium and phosphorus, releasing them into the bloodstream when the body requires them for other functions. Finally the skeleton functions as a regulator for endocrine where bone cells release a hormone called osteocalcin, which helps blood sugar and fat deposition in the body.

Task 2: Using the images below, identify the bones of the axial and appendicular skeleton. (3.2)



Task 3: Identify the different classification of bones. (3.3)

1. Long Bones: These bones are longer than they are wide, with a shaft and two ends
Humerus, Femur, Tibia, Radius and Phalanges
Act as levers for movement

2. Short Bones: Cube- shaped, with roughly equal length and width
Carpal bones (wrist) and tarsal bones (ankle)
Provides stability and support, with some limited motion

3. Flat Bones: Thin, flattened, often curved
Skull bones, sternum, ribs and scapulae
Protects internal organs and serve as attachment points for muscles

4. Irregular Bones: Have complex shapes that do not fit into the other categories
Vertebrae and many facial bones
Primarily for protection, especially of the spinal cord and brain, and muscle attachment

5. Sesamoid Bones: Small, rounded bones embedded within tendons
Patella (knee cap), others found in hands and feet
Protect tendons from compressive forces and improve muscle function

Task 4: Describe the main features of a long bone. (3.4)

The main features of a long bone are elongated shape with a central shaft (diaphysis) and two expanded ends (epiphyses), a central hollow medullary cavity, and layers of compact bone surrounding the medullary cavity and spongy bone at the epiphyses.

Task 5: Describe the stages of bone growth. (3.5)

Bone growth occurs in stages, mostly through two processes, the first being the intramembranous ossification (from fibrous membranes, as in flat bones) and the second the process being the endochondral ossification (from a hyaline cartilage model, as in long bones). Both processes involve osteoblasts and osteoclasts and continue throughout life with appositional growth, which increase bone width, and continuous remodelling, which repairs micro-damage and shapes the skeleton. Growth in bone length occurs at the epiphyseal plates until they fuse in adulthood

Task 6: Describe the varying types of posture in terms of: (3.6)

Postural term	Description
Curves of the spine	There are six posture types which include normal (neutral), exaggerated, and abnormal curves like Kyphosis (excessive upper back outward curve), Lordosis (excessive lower back inward curve), Scoliosis (lateral curve), Flat back (loss of lumbar curve) and forward head posture. Healthy posture maintains natural cervical (inward), thoracic (forward), and lumbar (inward) curves
Neutral spine alignment	Postural types vary from the natural spine's balanced, S-shaped alignment to deviations like kyphosis (hunchback), lordosis (excessive lower back curve), flat back (loss of natural lumbar curve) and sway back (hips tilted forward). A neutral spine has natural cervical, thoracic and lumbar curves, while other postures involve excessive or reduced curvature, which can strain the spine and surrounding muscles
Movement potential of the spine	Posture varies in its movement potential, with neutral posture allowing for optimal spinal movement, while postures like kyphosis, lordosis, flat back, and scoliosis indicate spinal misalignments that can restrict or alter the spine's natural movement potential. The conditions limit the movements flexion (bending forward), extension (bending backward), lateral flexion (side bending), and rotation (twisting) in certain ways, depending on the misalignment.
Postural deviations	Postural deviations include kyphosis (excessive outward upper back curve), lordosis (excessive inward lower back curve), and scoliosis (lateral, S-shaped spine curve). Other common types are flat back , where the spine loses its natural curve, and forward head posture , where the head juts forward. These deviations can cause pain, poor balance, and musculoskeletal strain, and they can result from poor habits, muscle imbalances, or underlying conditions

Learning outcome 4

Understand joints in the skeleton

Task 1: Identify the classifications of joints. (4.1)

1. Fibrous Joints: Bones are connected by dense fibrous connective tissue, they allow for little to no movement . E.g Sutures in the skull

2. Cartilaginous Joints : Bones are joined by cartilage
Joints in spine

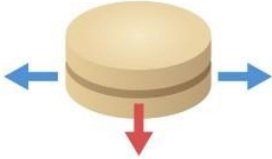
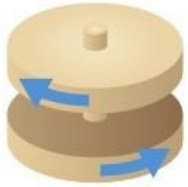
3. Synovial joints: Freely moving joints that are enclosed with fluid filled joint capsule
Shoulder, elbow, knee joints

Task 2: Describe the structure of synovial joints. (4.2)

The synovial joint structure is designed for mobility and low friction, which includes a joint cavity filled with synovial fluids, articular cartilage covering bone ends, a fibrous joint capsule and supporting ligaments. The synovial membrane produces the lubricating synovial fluid, while the joint capsule and ligaments provide stability

Task 3a: Using the table below, identify the types of synovial joint and their range of motion.(4.3)

Synovial joint	Joint type	Range of motion available
	Hinge Joint	Flexion/ extension

	Saddle joint	flexion/ extension, abduction/adduction a little more freedom
	Plane joint	Intercarpal/tarsal - sliding/gliding
	Ball and socket joint	Flexion, extension, rotation, abduction, adduction
	Ellipsoid/ Condyloid joint	flexion/ extension, abduction/adduction
	Pivot joint	Rotation

Task 3b: Describe joint movement potential and joint actions. (4.4, 5.6)

Joint action	Description	Joint example, eg wrist	Muscle example, eg quads
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Flexion and extension	Flexion is bending a joint, decreasing the angle between bones and flexion is straightening the joint increasing the angle between bones	Elbow, knees	Biceps, brachii, hamstrings, hip flexors, triceps, quadriceps, gluteus maximus
Adduction and abduction	Adduction is moving a body part towards the midline, abduction is moving it away from the midline	Shoulder, hips, fingers, toes	Abductor muscles: deltoid, gluteus medius Adductor muscles: latissimus dorsi, pectoralis major, adductor Magnus
Circumduction	Circular movement of a limb, combining flexion, extension, abduction and adduction, allowing a body part to trace a cone shape.	Arm, leg	Deltoid, rotator cuff, pectorals, lats, biceps, triceps, gluteus maximus, hamstrings, quadriceps
Supination and pronation	Forearm rotations movements occurring at the proximal and distal radioulnar joints	Forearm, ankle	Biceps brachii, supinator
Plantar flexion and dorsiflexion	Movements at the ankle hinge joint, dorsiflexion is lifting the toes up and plantiflexion is pointing the does down	Ankle	Gastrocnemius , soleus, tibialis anterior
Lateral flexion and reduction	Bending the spine sideways in the frontal plane, while reduction is restoring a neutral spine	Spine, head/ neck	Quadrates lumborum, internal/ external obliques
Horizontal flexion and extension	Shoulder joint movements in the transverse plane, where flexion brings the arm across the chest	Arm, shoulder	Pectoralis major, posterior deltoids, rotator cuff

Elevation and depression	Primary actions, for the shoulder girdle and jaw, occurring mainly in the frontal plane	Jaw, scapula	Trapezius/ rhomboids, masseter/ temporalis
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Task 4: Identify the body's anatomical planes of movement. (4.5)

1. Sagittal Plane : Divides: the body into left and right halves Movements: Forward and backward motions e.g flexion and extension
2. Frontal Plane: Divides: Front and back halves Movements: side to side motions e.g abduction and adduction
3. Transverse Plane: Divides: horizontally into top and bottom sections Movements: Rotational movements

Task 5: Define the anatomical terms of location. (4.6)

Table heading	Table heading
Distal	Position in a limb that is farther from the point of attachment
Proximal	The appendage joins the body
Anterior	Toward the front
Posterior	To the back
Inferior	Lower
Superior	Higher
Deep	Further from the body's surface
Superficial	Closer to the body's surface
Medial	Toward the midline/ away from the midline
Lateral	Side or direction toward the side of the body

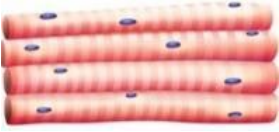
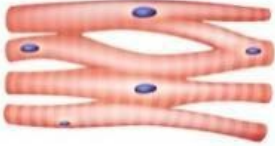
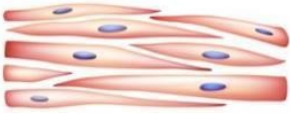
Task 6: In the table below, describe the exercise variables and their effects on biomechanics and kinesiology. (4.7)

Exercise variable	Description	Effect on exercise
Levers	Formed by bones, joints, muscle and body parts/external weight, dictate movement efficiency, strength and speed	First class: Can provide mechanical advantage (strength) or disadvantage (speed/range), depending on placement. Second class: provides a technical advantage Third class: provides a disadvantage
Centre of gravity	dynamic, shifting with body movements, posture, and external loads. It is crucial for stability, balance, and efficient movement	Stability and balance, movement efficiency control, posture and injury prevention
Momentum	The quantity of motion an object possesses, fundamentally dictates movement	Helps conserve energy, maximise speed and power
Force	Causing movement by generating internal muscle tension and interacting with external force to produce motion	Internal forces change body shape but external forces needed to translate these changes into actual movement.

Learning outcome 3

Understand the muscular system

Task 1: Describe the characteristics and functions of the body's 3 types of muscle. (5.1)

Muscle cell	Muscle type	Function	Characteristic
	Skeletal muscle	Attached to bones via tendons, responsible for body movement, posture, generating heat and supporting skeleton	Striated, long cylindrical cells, multinucleate, voluntary control
	Cardiac muscle	Contracts rhythmically to pump blood throughout the body	Striated, branched cells, single nucleus, involuntary control, interconnected via intercalated discs, rich in mitochondria
	Smooth muscle	Slow, sustained contractions to move substances through internal organs	Non-striated, spindle-shaped cells, single nucleus, involuntary control, arranged in sheets

Task 2: Describe the basic structure of skeletal muscle. (5.2)

Skeletal muscle structure progresses from the large muscle belly down to the molecular level of myofilaments. The primary functional unit is the sarcomere, which contains the proteins responsible for contraction. This intricate organization allows for coordinated, voluntary movement

Task 3: Using the images below, identify and locate the anterior and posterior skeletal muscles.
(5.3)

Deltoid

Pectoralis major

Bicep

Abdominal
external oblique

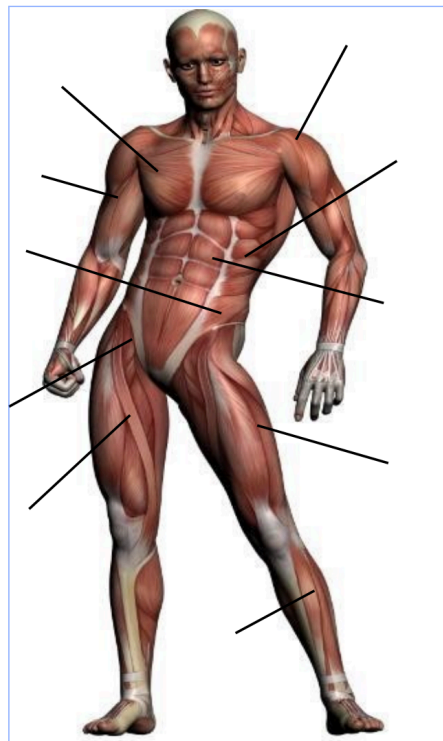
Iliopsoas

Sartorius

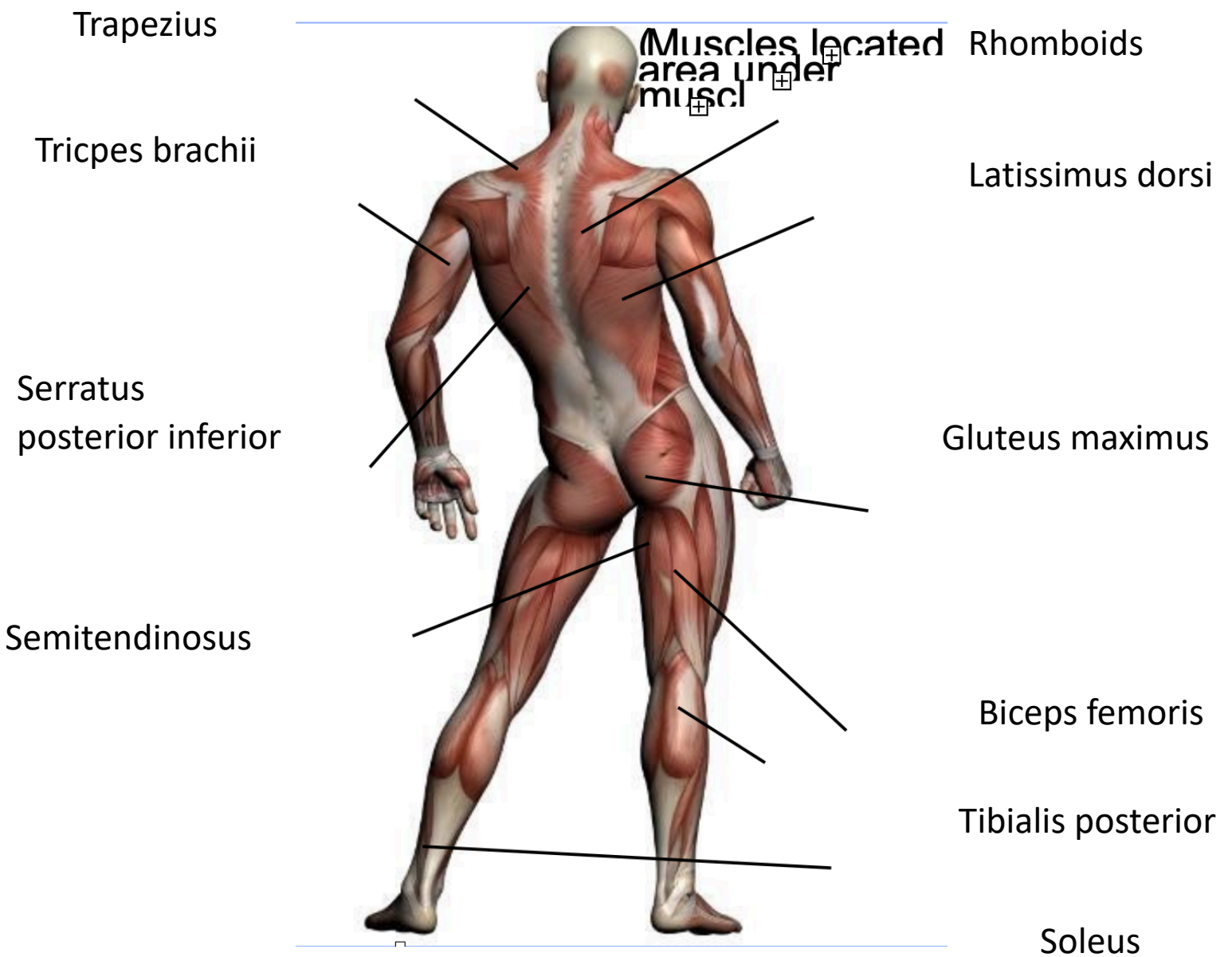
Brachialis

Rectus
Abdominis

Rectus femoris

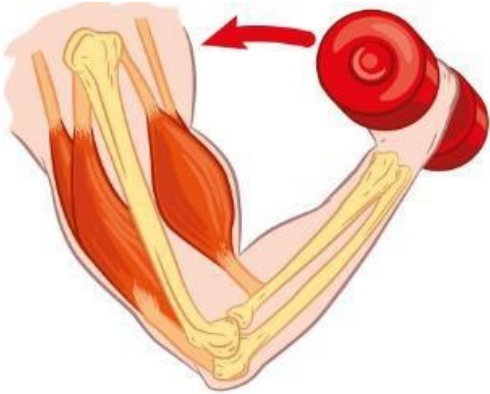
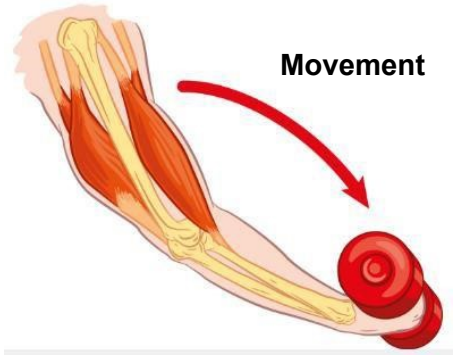
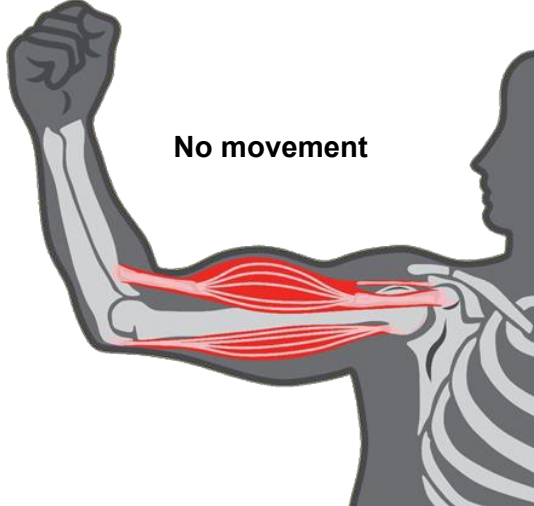


Tibialis anterior



Task 4: Describe the structure and function of the pelvic floor muscles. (5.4)

The pelvic floor is a group of muscles that form a sling like structure the base of the pelvis. It is used to support organs such as the bladder, bowel and uterus. The main functions of the pelvic floor muscles are supporting theses organs, controlling urination and defecation and playing a role in sexual function.

Muscle action Muscle action type and description	Muscle action Muscle action type and description
Movement 	Concentric contraction: The muscles shortens as it generates force, with its origin and insertion moving closer together e.g dumbbell bicep curl
 Movement	Eccentric contraction: The muscle lengthens while under tension, resisting a force, causing origin and insertion to move apart E.g lowering dumbbell back down during a bicep curl
No movement 	Isometric contraction: The muscles generates tensioning force but does not change length, the origin and iteration point stay the same distance apart E.g Plank

Muscle fibre	Description of characteristics
Type 1	These muscle fibre have a high fatigue resistance and reliance on aerobic metabolism, which make this muscle fibre type ideal for endurance activities like marathon running. The type 1 muscle has an abundant of mitochondria, myoglobin, and capillaries for steady oxygen supply.
Type 2	Type 2a muscle fibres are versatile, fast twitch fibres that balance strength and endurance. These muscle fibres contract quickly, produce moderate force and have a moderate fatigue resistance. These muscle fibre appear in a pink-ish red. These muscle fibres use both aerobic/anaerobic energy which makes it good for activities like rugby and football.
	Type 2b muscle fibres are fast twitch glycolytic fibres. These muscle fibres are characterised by rapid, powerful contractions. They appear in a white colour. The type 2b muscle fibre have high glycogen stores, using anaerobic glycolysis. Also this muscle fibre fatigue's very quickly which makes it more useful for short explosive sports like sprinting, powerlifting

Learning outcome 6

Understand the life course of the musculoskeletal system and its implications for special populations' exercise

Task 1: Describe the life course of the musculoskeletal system and its implications for exercise for the below special populations: (6.1)

Special population	Life course changes	Implications for exercise
Young people (13-18 years)	Bones are growing in size and density, bone formation exceeding removal. Growth spurts. Muscle development, ligament/tendon changes	Engaging in weight bearing activities to maximise bone density to avoid osteoporosis. Injury prevention, avoid overloading
Antenatal and postnatal women	Antenatal: Hormone changes, postural shifts, gait changes Postnatal: lingering laxity, pelvic floor weakness, core weakness	Antenatal: Maintain fitness, posture and core stability. Postnatal: Timing; consult midwife, start gentle exercise around 6-8 weeks Gradual return to activity, focus on pelvic floor and deep core rehabilitation Gradually reintroduce intensity avoid heavy abdominal work
Older adults (50+ years)	Loss of muscle mass, strength, decreased bone mass and integrity, joint degeneration, narrowing discs leading to pain and reduced mobility. Difficulty with daily activities	Resistance training, balance/functional training, aerobic activity

Learning outcome 7

Understand energy systems and their relation to exercise

Task 1: Describe how carbohydrates, fats and proteins are used in the production of energy. (7.1)

Macronutrient	Description
Carbohydrate	Carbohydrates is the body's main fuel source, which is broken down into glucose and is used to generate adenosine triphosphate.
Protein	The body uses protein when the main fuel sources of the body (carbohydrates and fats) are depleted. The body will breakdown the protein into amino acids and channeling their carbon skeletons into the cellular respiration pathways to produce ATP
Fat	Fat is used for energy through the process of lipolysis, in this process triglycerides are broken down into fatty acids and glycerol. Those fatty acids are then transported to muscles and other tissues. Then they go through the process called beta-oxidation to produce acetyl-CoA. Which enters the citric acid cycle to generate ATP.

Task 2: Explain the use of the 3 energy systems during aerobic and anaerobic exercise. (7.2)

Table Energy system	Explanation
ATP-PC	The ATP-PC system provides immediate, explosive energy anaerobically for the first few 10 seconds of high intensity exercise. During aerobic exercise, the ATP-PC system is quickly depleted and largely inactive, as the body relies on the slower but sustained aerobic system for longer, lower intensity activities.
Aerobic	Aerobic energy predominates in long-duration/low intensity exercise, while anaerobic energy is primary for short/high intensity bursts. Both systems contribute to all activities, with aerobic energy providing the sustained power.
Anaerobic glycolysis	During anaerobic exercise, your body uses the quick, oxygen free systems for explosive power, for a limited time of 10 seconds due to acid lactic buildup, which is ideal for sprinting and powerlifting.

Task

3: Identify the by-products of the 3 energy systems and describe their role in muscle fatigue. (7.3)

By-product	Role in muscle fatigue
ATP-PC	This energy is used in explosive, short term activities like sprinting or powerlifting. The energy/fuel stores phosphocreatine. There is no fatiguing waste products. Its role in fatigue is due to the rapidly depleting of PC stores which limits the ATP production
Glycolytic	Glycolytic system is used in High intensity, moderate duration activities such as 400m runs and repeated sprints. This system is fueled by carbohydrates. The by product/ waste fuel is pyruvic acid, which converts to lactic acid and hydrogen ion. Its role in muscle fatigue is the accumulation of hydrogen ion, not the lactic acid alone. It increases the muscle acidity which interferes with muscle contraction, which causes the burning sensation and fatigue
Aerobic	This system is a low to moderate intensity, long duration activities such as marathon running or long distance bike rides. The fuels used are fats, carbohydrates and protein. The waste fuel it creates are carbon dioxide and water. Its role in muscle fatigue is generally due to fuel depletion or dehydration, which aren't significant fatiguing by products, as this system is highly efficient and uses oxygen

4. Define anabolism, catabolism and excess post-exercise oxygen consumption (EPOC).

Task

Anabolism	Anabolism is the set of metabolic processes that build complex molecules from simpler ones, requiring energy to form essential components like proteins, DNA and fats for growth, repair and energy storage. It's crucial for building new cells, healing wounds and developing tissues.
Catabolism	Catabolism, Is the set of metabolic pathways that breakdown large, complex molecules into smaller, simpler ones, releasing energy in the process. This energy is used by the body to fuel cellular activities and is often captured in the form of ATP.
EPOC	EPOC, is the elevated oxygen intake your body uses after intense activity to restore itself to its resting state. This is essentially “repaying an oxygen debt” by burning extra calories to replenish energy, repair muscles and clear waste like lactic acid.

Learning outcome 8

Understand the nervous system and its relation to exercise

Task 1: Describe the role and functions of the nervous system. (8.1)

Role	Functions
Sensory input	Detects changes in both the external environment (sound, light, touch) and internal environment (temperature, pain) through sense organs and receptors
Integration	Processes and interprets sensory information. It involves comparing incoming stimuli with memories and other data to determine the appropriate response
Motor output	Triggers a response by sending signals to muscle and glands. This can be a voluntary action e.g moving your hand. Or involuntary one e.g heart beating faster
Control of involuntary functions	Manages vital, automatic processes like breathing, digestion
Control of voluntary functions	Executes conscious movements through the somatic nervous system which allows us to control our skeletal muscles
Cognitive function	Enables higher level functions like thinking, learning, memory and emotions

Task 2: Describe the principles of muscle contraction. (8.2)

Task

Muscle contraction is governed by the sliding filament theory, where nerve signals trigger the release of calcium, which allows the thin actin filaments to slide over the thick myosin filaments. The principle of cross-bridge cycling is when the myosin heads form cross bridges with actin filaments. By repeatedly binding, pulling and detaching, the myosin heads walk along the actin which shortens the sarcomere and generates tension. At rest, a protein complex prevents myosin from binding to actin. When a signal arrives, calcium ions are released and bind to troponin, which moves tropomyosin out of the way.

Task 3: Explain the 'all or none law'/motor unit recruitment. (8.3)

The principle of the 'all or none law' applies at the level of individual motor unit (a single motor neuron and all the muscle fibres it innervates). The threshold for this is a motor neuron must receive a stimulus of sufficient intensity to fire. The maximal response happens once the threshold is met, where all the muscle fibres in that specific motor unit contract simultaneously and to their maximum capacity for the current conditions. There is no strong or weak contraction of a single motor unit based on stimulus strength. It is as the name is 'all or none'. The motor unit recruitment is that individual motor units only have two states being either fully on or fully off. The body achieves varied muscle force for different tasks through the process of motor unit recruitment. The strength of the muscle contraction is depending on how many motor units are activated. The Henneman's size principle states that motor units are recruited in a specific order based on size which goes from smallest to largest, which is based on the required force. Further on the size principle, the light effort is only done by the small, slow twitch motor units with low thresholds being activated. And that the 'increased effort' is the larger, fast twitching motor units due to more needed.

Task

Task 4: Identify how exercise can enhance neuromuscular connections and improve motor fitness. (8.4)

Exercise boosts the neuromuscular connections by making your nervous system more efficient at recruiting muscle fibres, which improves signals between muscle and brain. Through this it enhances your coordination and increases the strength/speed of nerve impulses. Which causes better balance, power, agility, and reduced injury risk.

Learning outcome 9

Understand the structure and function of the digestive system

Task 1: Describe the function of each section of the digestive system. (9.1)

Table heading	Table heading
Mouth	This section chews the food and mixes it with saliva, starting carbohydrate breakdown
Oesophagus	Transports food and liquids from the pharynx down to your stomach by using rhythmic muscle contractions called peristalsis
Stomach	Mixes food with strong acids and enzymes, breaking down proteins and killing bacteria
Small intestine	The main site for final digestion and nutrient absorption into the bloodstream
Large intestine	Absorbs water and electrolytes from remaining food matter forming faeces

Task 2: Describe how fats, proteins and carbohydrates are digested and absorbed. (9.2)

Macronutrient	Enzymes used	Time scale	Location
Fat	Pancreatic lipase, gastric lipase	3-4 hours	Mouth, stomach, small intestine
Protein	Pepsin, trypsin, chymotrypsin	2-4 hours	Stomach, small intestine
Carbohydrate	Salivary amylase, pancreatic amylase	30-60 minutes	Mouth, small intestine

Task 3: Describe the role of dietary fibre in the maintenance of gut function. (9.3)

Fibre is great for gut health, it feeds good gut bacteria, promotes regular bowel movements by adding bulk and softening stool, it lowers the risk of digestive issues such as constipation, diverticulitis and haemorrhoids. It helps with reducing inflammation. It does all this while supporting a diverse and health gut microbiome.

Task

Task 4: Describe the role of the liver and pancreas in digestion.

The liver produces bile to emulsify fats, while the pancreas produces digestive enzymes to break down carbohydrates, proteins, and fats, along with bicarbonate to neutralize stomach acid. Both organs secrete these substances into the small intestine to aid in chemical digestion

Task 5: Explain the importance of maintaining fluid levels for health and exercise performance.

(9.5)

Level of performance	Explanation	Role of water
Health	Maintaining fluid levels is vital because water is essential for every bodily function, from lubricating joints to delivering nutrients to regulating temperature. Dehydration impairs our cognition, physical performance, mood, and increases infection risk.	Regulate body temperature, removes waste, supports organ function.
Exercise performance	Maintaining fluid levels while exercising is vital for preventing dehydration which impairs your performance levels, negatively impacts the muscles and joints and is unable to regulate which can lead to heat related illness.	Keep body hydrated, keep performance up to the highest standard, regulates body temperature to avoid over heating and heat related illnesses.