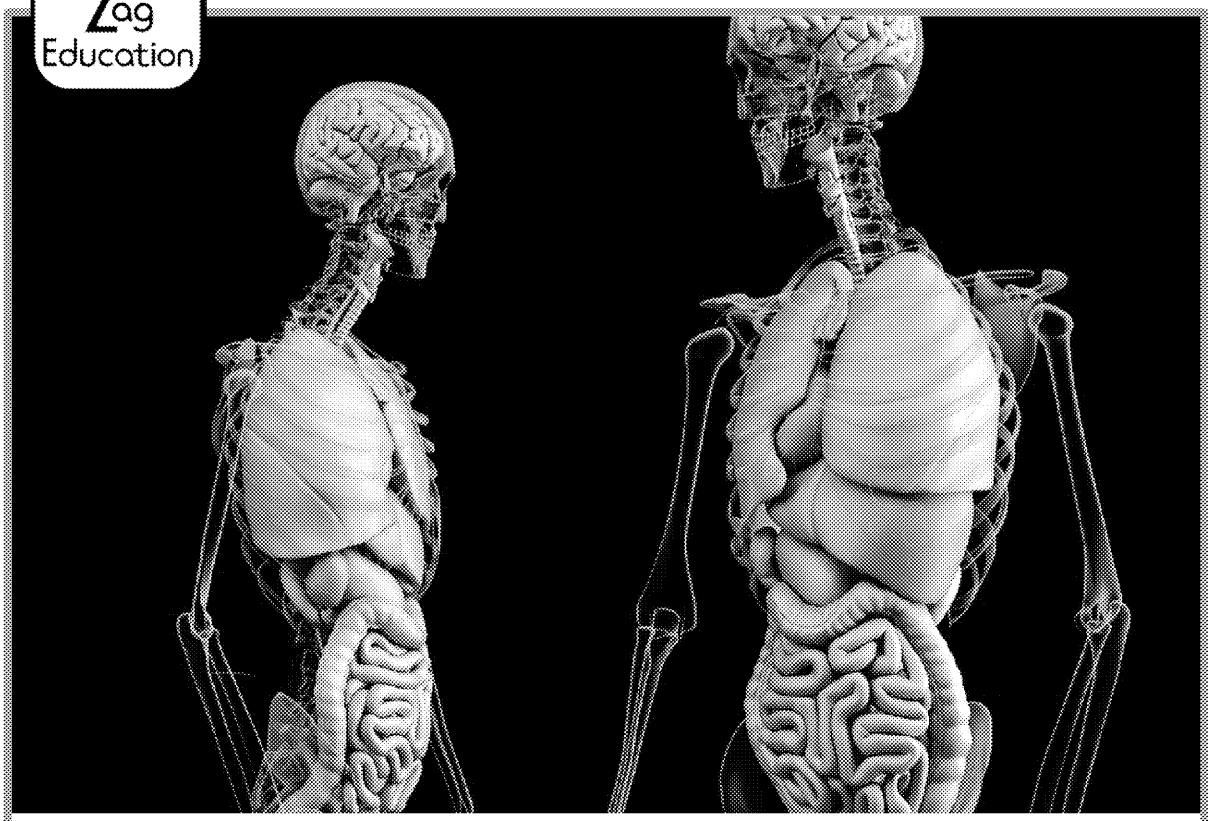


Answers

for Learning Grids for GCSE AQA PE

(Paper 1)

zigzageducation.co.uk

POD 8287b

Contents

3.1.1: Applied Anatomy and Physiology

3.1.1.1 – The structure and function of the musculoskeletal system

Bones, structure and functions of the skeleton, and synovial joints

Questions		Function
1. Name and describe the six functions of the skeleton. For each function, give an example of how it can be applied to sport.	1.	**Support** – The bones provide for the body, keeping it solid. **bones** keeps the body in the
	2.	**Protection** – Bones provide vital organs (e.g. lungs, heart
	3.	**Movement** – The skeleton a point for muscles. The com muscles and bones allows th

Bones, structure and functions of the skeleton, and synovial joints (continued)

Questions

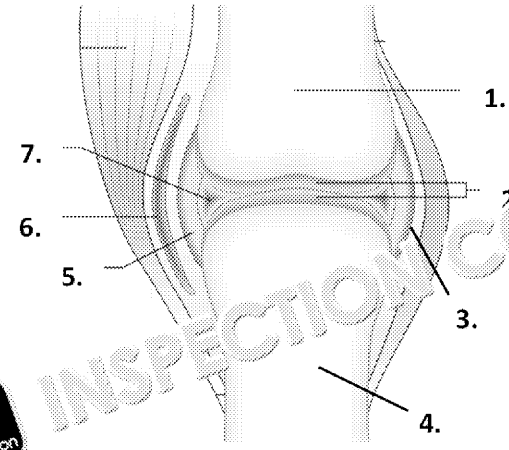
1. **Name and describe the six functions of the skeleton. For each function, give an example of how it can be applied to sport. (Continued)**

2. **Fill in the gaps in the table, identifying either the joint, or the bones that make up a joint.**

4.	**Shape and point of attachm** and length of our bones give shape (i.e. tall or short). The attach to muscles to allow m
5.	**Mineral storage** – Bones are minerals inside them, such as bones then release the mine bloodstream when they are
6.	**Blood cell production** – The bones can produce red bloo blood cells. Red blood cells and carbon dioxide away fro White blood cells fight off in

Joint
Head/Neck
Elbow
Ankle
Chest
Knee
Hip
Shoulder

Questions	
3. Which bone lies in front of the knee joint?	Patella
4. Label the diagram of a synovial joint and suggest how some of them prevent injury.	**Feature** 1. Bone 2. Articular cartilage 3. Synovial membrane 4. Bone 5. Joint capsule 6. Bursa 7. Joint cavity containing synovial
5. Describe the role of ligaments in synovial joints.	Ligaments attach one bone to another
6. What are flat bone provide protection for vital organs? Give a sporting example of specific bones that provide protection.	**Flat bones** e.g. the cranium protects the brain protects the sexual organs and digestive and lungs from being punctured



Bones, structure and functions of the skeleton, and synovial joints (continued)

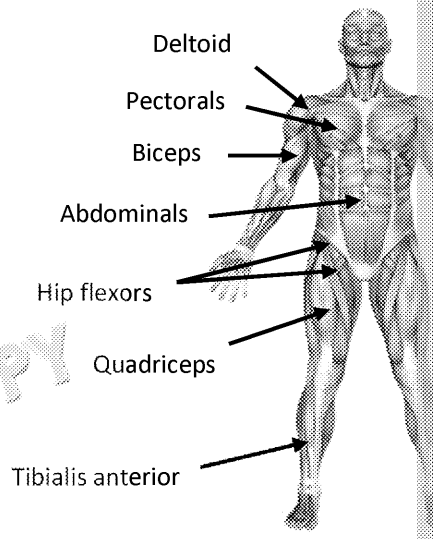
Questions	
7. What types of bone allow gross movements of the skeleton? Give a sporting example of specific bones that allow gross movement.	**Long bones** e.g. the femur, tibia and fibula allo… extension of the knee used in runn… elbow joint to making throwing act…
8. What types of bone allow fine movements of the skeleton? Give a sporting example of specific bones that allow fine movement.	**Short bones** e.g. the carpals in the hand allow a… swing and spin to the ball
9. Describe how the skeleton works with muscles to produce movement	The skeleton provides anchor poin… the skeleton into the required shap…

Type of joint	Moveme…
Hinge	Flexion
	Extensio…
Ball-and-socket	Flexion
	Extensio…
	Rotation
	Adductio…
	Abductio…

10. Name the types of joint found in the body and name the movements that can be performed at each. Then, define each type of movement.

Bones, structure and functions of the skeleton, and synovial joints (continued)	Questions	
	11. What type of joint is found at the shoulder and hip?	Ball-and-socket joint
	12. What type of joint is found at the knee and elbow?	Hinge joint
	13. Name and define the movements that can be performed at the ankle.	**Type of Joints**
		Plantar flexion — Increasing the angle between the foot and the lower leg
		Dorsiflexion — Decreasing the angle between the foot and the lower leg

Muscles, movement and antagonistic pairs

Questions	
1. **Label the muscles of the body to the right.**	
2. **…t role to tendons play in the musculoskeletal system?**	Tendons attach muscles to bones, allowing … joints.
3. **Provide a sporting example for each … the types of movement at … joints.**	

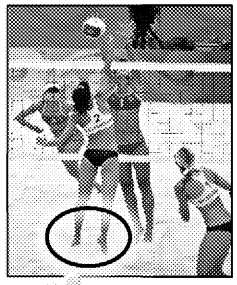
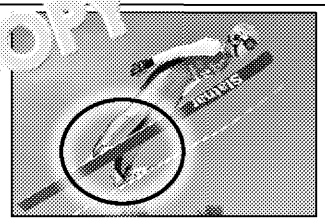
Joint	Movement	
…	**Flexion**	e.g. … bask…
…	**Extension**	e.g. …
Knee	**Flexion**	e.g. … body)
	Extension	e.g. … kick

Questions

4. **Provide a sporting example for each of the types of movement at the named joints. (Continued)**

Joint	Movement	
Hip	Flexion	e.g. Bringing the 100 m.
	Extension	e.g. As a lon leg away fro
Shoulder	Flexion	e.g. Executio
	Extension	e.g. Prepara cricket.
	Abduction	e.g. Prepara
	Adduction	e.g. Executio
	Rotation	e.g. A tennis

5. **Identify the movements shown at the ankle and provide the agonist that causes this movement.**

Example	Mo
	Plantarflex
	Dorsiflexio

Muscles, movement and antagonistic pairs (continued)

Questions	
6. Name and describe the two types of isotonic contraction.	Concentric – the muscle shortens during a c Eccentric – the muscle lengthens under ten
7. Describe an isometric contraction.	The length of the muscle does not change a
8. Muscles work in pairs to cause movement at a joint. What are the roles of the agonist and antagonist muscles in movement at a joint?	Agonist muscles are the main muscles that c direction Antagonist muscles oppose the agonist mu relaxes
9. Give an example of an agonist/antagonist pair of muscles used as part of your chosen	Accept all suitable answers e.g. The hamstrings and quadriceps used to triceps used to extend the elbow to throw a
10. Identify the agonistic muscle(s) that cause movement at the shoulder.	**Movement** **Abduction** **Adduction** **Flexion** **Extension**
11. Identify the agonistic muscle(s) that cause movement at the elbow.	**Movement** **Flexion** **Extension**

Questions

12. Identify the agonistic muscle(s) that cause movement at the hip.

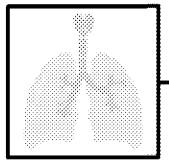
Movement
Abduction
Rotation
Extension

13. Identify the agonistic muscle(s) that cause movement at the knee.

Movement
Flexion
Extension

14. For each of the following scenarios, justify whether the muscles are working eccentrically, concentrically or isometrically.

Scenario
A rugby prop pushing against his opponent in the scrum. The scrum is stable and not moving.
A gym member slowly lowering themselves from a pull-up
A swimmer pulling back their arms, under the water during the front crawl



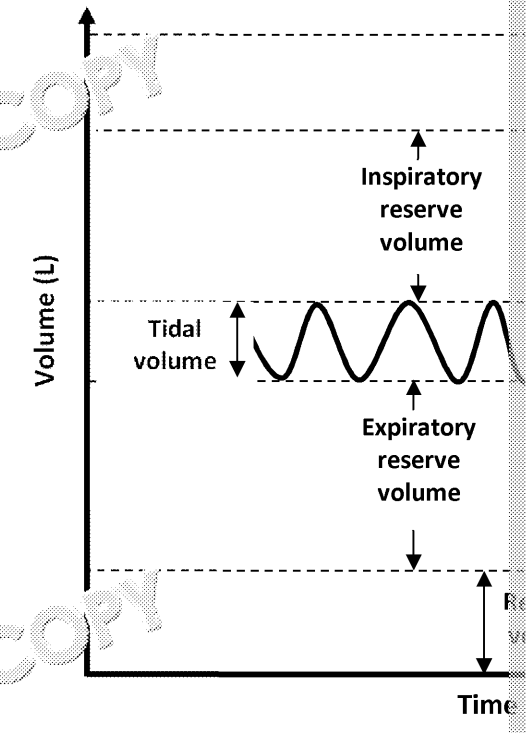
3.1.1: Applied Anatomy and Physiology

3.1.1.2 – The structure and function of the cardiorespiratory system

The respiratory system

Questions	
1. Identify the pathway of air in order from the atmosphere to the blood.	**1.** Mouth / nose (air is inhaled through the **2.** Trachea **3.** Bronchi **4.** Bronchioles **5.** Lungs Alveoli (oxygen enters the bloodstream
2. Describe the roles of the *intercostals*, *rib cage* and *diaphragm* when a person inhales at rest.	**Intercostals:** The intercostal muscles contr **Ribcage:** The actions of the intercostal increasing the thoracic capaci **Diaphragm:** The diaphragm contracts, cau capacity.
3. Describe the roles of the *intercostals*, *rib cage* and *diaphragm* when a person exhales at rest.	**Intercostals:** The intercostal muscles relax, capacity. **Ribcage:** The actions of the intercostal inwards, decreasing the thora **Diaphragm:** The diaphragm relaxes, causin

Questions	
4. **…e exercise our breathing rate in…eases and our lungs expand more.** **Explain how additional skeletal muscles are recruited to allow this to happen.**	Three key muscles are used during forced res… pectorals. The sternocleidomastoid contracts, causing th… the lungs and the atmosphere, and allows mo… The pectorals contract, causing the thoracic c… The abdominals aid expiration during exercise… lungs at a faster rate.
5. **Expl…in h… …essure causes …ion and exhalation of air.**	…ir travels from an area of high concentration… During inspiration, the size of the lung cavity i… lungs. Therefore, oxygen moves down the pre… pressure, into the lungs. During expiration, the size of the lung cavity d… lungs. Therefore, oxygen moves down the pre… pressure, expelling air.
6. **Define each of the following lung volumes.**	**Volume** |
	Tid…ume | the volume of air that …
	…spiratory reserve volume | the amount of air that …
	Expiratory reserve volume | the amount of air that …
	Residual volume | the amount of air left i…

Questions	An
7. Identify each of the lung volumes on the spirometer trace.	
8. When exercise begins, explain what happens to the following volumes.	**Inspiratory reserve volume** — Inspiratory reserve volume decreases be… a limited amount of extra air that can be… reserve volume). **Expiratory reserve volume** — Expiratory reserve volume decreases du… during exercise; therefore, it becomes h… **Tidal volu…** — T…olume increases because the bod… …refore, the body inhales and exhales …
9. Give a definition of diffusi…	Diffusion is the movement of gas from an area of high c…

The respiratory system (continued)	Questions	
	10. Explain how gaseous exchange takes place at the alveoli.	The alveoli of the lungs have a high volume of o capillary network. At the same time, the red bl therefore, diffuses this back into the alveoli.
	11. Which physiological factors aid gaseous exchange?	• Large numbers of alveoli provide a large su • Large capillary network increases surface a • Capillary walls are very thin, slowing the m • Thin membrane between alveoli and capill • Large blood flow increases the opportunity
	12. What role does haemoglobin play in gaseous exchange?	Haemoglobin is the protein found in red blood creating the compound oxyhaemoglobin. Oxyh muscle cells during exercise and movement. Haemoglobin can also bind to carbon dioxide. cells as a waste product, back to the lungs to be

The cardiovascular system

Structures

1. **What are the roles of veins, arteries and capillaries?**

Veins:	Carry deoxygenated b
Arteries:	Carry oxygenated blo artery)
Capillaries:	Aid gaseous exchang nutrients to transfer lungs

2. **Identify the structures and characteristics of veins and arteries, and describe how these characteristics aid the transportation of blood.**

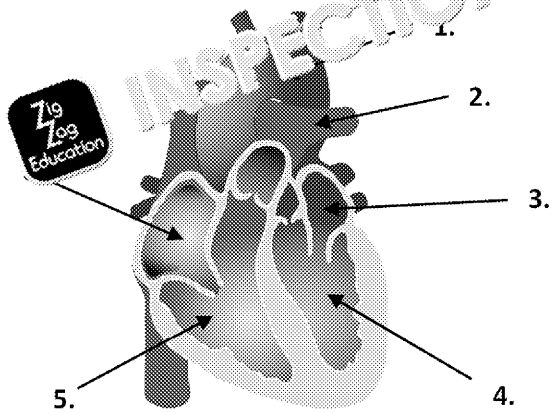
	Structure/Characteristic
Veins	Thin walls
	Large internal diameter (lumen)
	Valves
	Low blood pressure

The cardiovascular system (continued)

Questions	Structure/Characteristic	
3. [illegible] structures and characteristics of [illegible]nd arteries and describe how the characteristics aid in the transportation of blood. (Continued)	Arteries	Small lumen
		Thick muscular outer walls
		Elastic walls
		High blood pressure
4. Describe the structure or charact[illegible]ic[illegible] capillaries and how the [illegible] aids gaseous exchange.		• Very small in diameter (one red b[illegible] maximising the time they can pe[illegible] • Thin walls – aids gaseous exchan[illegible] destination (to or from the red bl[illegible] • Lots of capillaries surround the lu[illegible] possible to occur as possible as t[illegible]
5. [illegible]s the name of the vein that receives oxygenated blood from the lungs and transports it to the left atrium of the heart?		Pulmonary vein
6. Name two other major veins that supply the heart, and state where each carries blood to and from.		Superior vena cava – returns deoxyg[illegible] Inferior vena cava – returns deoxyge[illegible]

Questions

7. Label the diagram of the heart.



8. Describe the cardiac cycle and the pathway of blood through the heart as deoxygenated blood returns from the body.

1. Aorta
2. Pulmonary artery
3. Left atrium
4. Left ventricle
5. Right ventricle
6. Right atrium

Deoxygenated blood from the body t
atrium.

Deoxygenated blood then flows from
relaxed.

The right atrium contracts, forcing bl
ventricle causes the atrioventricular v

The ventricles then contract (diastole
blood from the right ventricle to the l

Gaseous exchange occurs at the lung

Oxygenated blood travels through th

The left atrium contracts (systole) for
ventricle. The atrioventricular valves

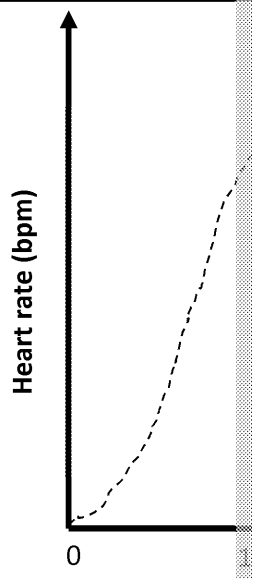
Oxygenated blood is ejected from the
tissues.

The cardiovascular system (continued)

Questions	
9. Describe what is meant by the term diastole.	The ventricles and atria relax and the [illegible] backflow of blood.
10. Describe the process of systole.	The ventricles contract, increasing the [illegible] valves to prevent backflow of blood. [illegible] the aorta and pulmonary artery.
11. Define the terms 'heart rate', 'stroke volume' and 'cardiac' output.	**Heart rate**: The number of ti[illegible] **Stroke volume**: The amount of bl[illegible] **Cardiac output**: The amount of bl[illegible]
12. Write an equation to calculate cardiac output.	Cardiac output (ml/min) = heart rate [illegible]
13. What is anticipatory rise?	An increase in heart rate as the perfo[illegible]
14. Explain how the body redistributes blood to aid exercise.	• Blood vessels have the ability to [illegible] • During exercise, there is an incre[illegible] • The body responds by vasodilati[illegible] • The body vasoconstricts blood ve[illegible] important during exercise (e.g. t[illegible] • The effect of this is that more blo[illegible] energy, to the muscles.

Questions

15. Complete the graph by plotting th[illegible] you would expect an ath[illegible] during steady-st[illegible] then, justify wh[illegible] heart rate as you did.



- The athlete would experience a s[illegible] demand for blood and oxygen at [illegible]
- Following the sudden increase, th[illegible] plateau on the heart rate graph. [illegible] maintained.

3.1.1: Applied Anatomy and Physiology

3.1.1.3 – Aerobic and anaerobic exercise

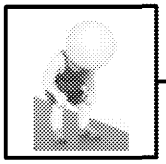
	Questions	
Aerobic and anaerobic exercise	1. Define 'aerobic exercise'.	Exercise that requires the presence of
	2. Write an equation to show aerobic exercise.	Aerobic exercise = glucose + oxygen →
	3. Define 'anaerobic exercise'.	Exercise that is completed without the
	4. Write an equation to show anaerobic exercise.	Anaerobic exercise = glucose → energy
	5. Give a sporting example of an athlete who competes aerobically Justify your answer.	e.g. marathon runner, long-distance cy The athlete is working for a prolonged the work rate. This is achieved by usin
	6. Give a sporting example of an athlete who competes anaerobically. Justify your answer.	e.g. sprinter (running, cycling, swimmi The athlete is working for short period energy already stored in the muscles t

Aerobic and anaerobic exercise (continued)

Questions	
7. Give an example of a sport that requires the to use both the aerobic and anaerobic ms. Justify your choice.	e.g. squash, tennis, boxing, games spo Squash players use both their anaerob time, with individual rallies lasting for However, in short rallies or movement their anaerobic system to provide the
8. Define 'EPOC'.	Excess post-oxygen consumption (oxy high-intensity (anaerobic) exercise.
9. Why does EPOC	• During high-intensity exercise, th therefore 'owes' this back to the • To do so, the body breathes heav • The increased uptake of oxygen a anaerobic exercise.
10. What are the three main parts of a cool-down?	1. An activity to maintain elevated b 2. A gradual reduction in intensity o 3. A series of static stretches
11. Give reasons wh te perform a cool-down fo ercise.	• Helps to remove lactic acid • Reduces chance of DOMS occurri • Allows heart rate and breathing r cardiovascular systems) • Redistributes blood that may hav

Aerobic and anaerobic exercise (continued)

Questions	
12. **…be …w an athlete's diet can be …lated to aid recovery, and suggest how each component of the diet aids recovery.**	**Hydration:** • Athletes need to replace the flui… • Fluids with carbohydrates can re… • Fluids should also include any nu… **Carbohydrates:** • Any energy stores used by the bo… • Intake of carbohydrates aids reco… effects of fatigue **Proteins:** • Consumption of protein followin… • Protein synthesises is the proces… the diet provided the body with …
13. **What does DOMS stand for?**	…ed onset muscle soreness
14. **What causes DOMS?**	Delayed onset muscle soreness (DOMS… cause microtears on a cellular level. T… attempts to repair the muscle, causing …
15. **…do… …OMS Occur?**	DOMS typically occurs 24–72 hours aft…
16. **Using a specific example, explain one recovery method that helps to prevent DOMS following high-intensity exercise.**	One of the following: **Ice bath** • An ice bath aims to reduce swell… muscles, contributing towards D… • The cold temperature of the ice … to the damaged muscle, reducin… • Once the body is removed from … flow to the muscles, providing th… from the muscles. **Massage** • Tiny tears in the muscles followi… soreness. • Massage helps to break down th… • Massage also promotes blood flo… muscle tissue.



3.1.1: Applied Anatomy and Physiology

3.1.1.4 – The short-term and long-term effects of exercise

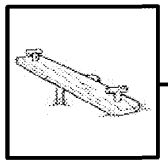
Short-term and long-term effects of exercise

Questions		
1. **Describe the immediate effects of exercise on the cardiovascular and respiratory systems.**	**Cardiovascular respons**	• Heart rate increases to meet the o of the working muscles • The heart contracts more powerfu more blood out with each contrac stroke volume) • Cardiac output increases due to in rate and stroke volume • Greater cardiac output means mo carrying oxygen, can reach the mu • Vasodilation of capillaries at surfa occurs to aid thermoregulation
2. **Explain why the following two immediate effects happen as you start to exercise.**	**Increased body temperature**	During exercise, heat the muscles create h increase in overall bo
	Increased sweating	In response to an inc body temperature th evaporation.

Short-term and long-term effects of exercise (continued)

Questions	
3. **as just completed a high-intensity circuit training session.** **Describe the short-term effects Jack may experience in the 36 hours after the exercise.**	• Fatigue – caused by working the m and become 'heavy' or lethargic • DOMS – intense exercise can caus exercise • Nausea – caused by a lack of nutri • Light-headedness – caused by a lo • Cramping – an intense pain in the m This is caused by general fatigue o
4. **How does long-term exercise help to improve body shape?**	Body shape changes over time to mee people will experience a loss of body f 'toned'. Aerobic exercise tends to cau lifting weights) will cause an increase i

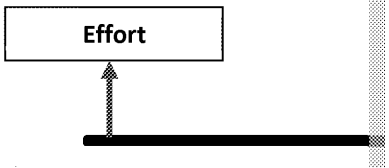
Short-term and long-term effects of exercise (continued)	Questions	
	5. **Explain the long-term effects of exerise on the fitness of an individual.**	• Increased stamina / cardiorespirat the exercise being undertaken. Th through the body, and the cardiov blood around the body, as a result • Increased speed – this is due to inc more powerful muscle contraction of time. • Increased flexibility – when an ath more pliable. This means their joi Increased strength – prolonged ex size, number and strength of musc produce more powerful muscle co • Increased muscular endurance – a the efficiency of slow-twitch musc muscle cells, allowing muscular co
	6. **What is the term used to explain a resting heart rate of less than 60 bpm?**	Bradycardia

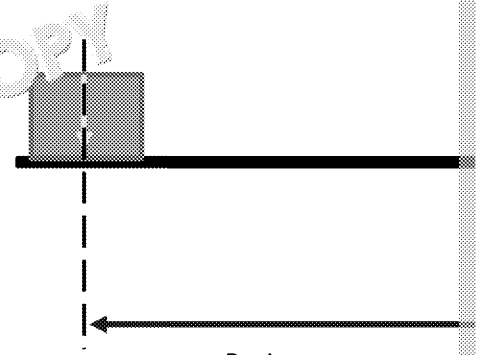


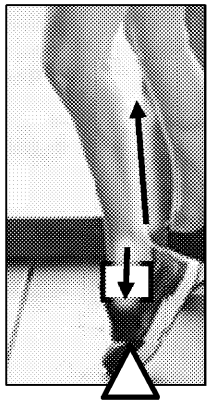
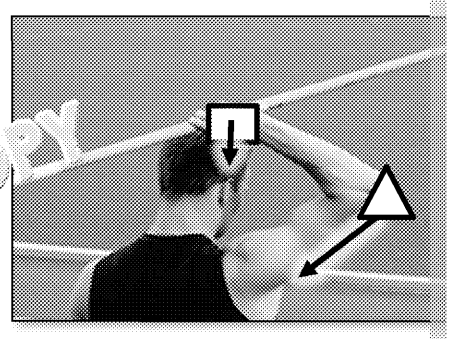
3.1.2: Movement Analysis

3.1.2.1 Lever systems and [illegible] analysis and 3.1.2.2 Planes and [illegible]

Lever systems

Questions	
1. **Define the 'fulcrum' in a lever system.**	The fulcrum is the point in a lever syst… balanced.
2. **What is an 'effort' in a lever system?**	The effort is the point at which a direc…
3. **Define a 'load', or 'resistance', in a lever system.**	T… oad/resistance is the force applie…
4. **Give an example of e… … lever system.**	**Fulcrum**: The joints of the body **Effort**: The muscles of the bo… **Load**: The weight or object l…
5. **Draw and label the fulcrum, effort and load in a second-class lever system.**	

Lever systems (continued)	Questions	
	6. Draw a first-class lever system and label the resistance arm and the effort arm.	
	7. Draw a third-class lever system.	

Lever systems (continued)	Questions	
	8. To the right are two images of sporting movement. Identify the lever system being used in each image, and label the components of the lever on the image.	 
	9. Write an equation to represent mechanical advantage.	Mechanical advantage = effort arm ÷ resistance
	10. Why does a first-class lever system have a mechanical advantage? What effect does this have on movement?	• Movements can be balanced because the • This means a wider range of movements
	11. Why does a second-class lever system have a mechanical advantage? What effect does this have on movement?	• Large loads can be moved with little effort The large loads can be displaced, but only

Lever systems (continued)	Questions		
	12. Why are third-class lever systems considered to have a mechanical disadvantage?	In third class lever systems, the resistance a used to displace an object. However, speed some movements can be completed quickly	
	13. Give sporting examples of a first-, second- and third-class lever system. (Use different examples from those given in Question 8.)	**First-class:**	e.g. rugby line-out/throw
		Second-class:	e.g. dorsiflexion of the a
		Third-class:	e.g. flexion of the knee (

Planes and axes of movement

Questions

1. Describe the 'sagittal', 'frontal' and 'transverse' planes of movement.

Sagittal:	Divides the body into left ar
Frontal:	Divides the body into front a
Transverse:	Divides the body into upper

2. Label the three planes of movement on the diagram.

3. Name and define the three axes of rotation a body can move in.

Longitudinal	Travels through the axis.
Transverse	Travels through the place on this axis.
Sagittal	Travels through the occurs on this axis.

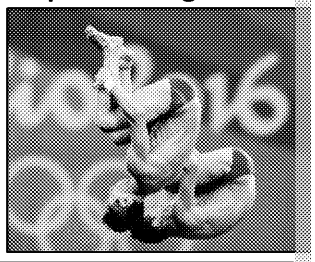
Planes and axes of movement (continued)

Questions

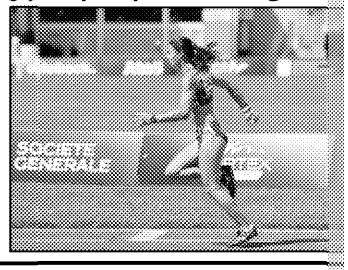
4. Label the axes of rotation on the diagram.

5. For the following sporting movements, state which plane and axis each movement is occurring in.

A diver performing a some



A long jumper performing the



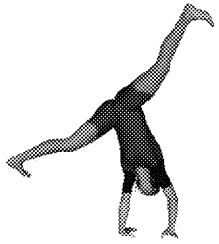
Questions

5. For the following sporting activities, state which plane and axis each movement is occurring in. (continued)

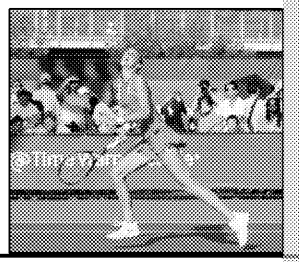
A discus thrower spinning

A footballer performing sidesteps

A cartwheel



A tennis player running backward to hit a lob shot



Movement analysis

Questions

1. What movements are possible at the following joints?

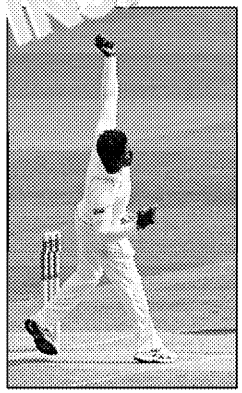
Shoulder	Flexion, extension, abduction,
Elbow	Flexion, extension
Hip	Flexion, extension
Knee	Flexion, extension
Ankle	Plantar flexion, dorsiflexion

2. For each of the following movements, identify the agonist muscle causing the movement.

Movements	
Elbow flexion	Biceps
Shoulder flexion	Pectorals, delto
Plantarflexion	Gastrocnemius
Elbow extension	Triceps
Shoulder adduction	Latissimus dors

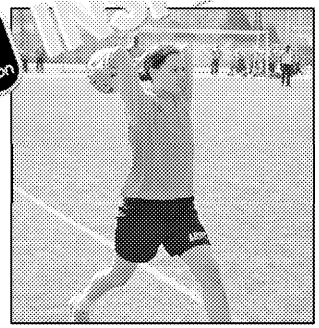
Questions

3. Fill in the answers to the right [illegible] perform movement a[illegible] shoulder of th[illegible]owler below.



	Mov[illegible]
Movements at shoulder, and agonist muscle causing movements:	Rotation (internal ar[illegible]
	Extension
Plane of movement:	Sagittal
[illegible]r[illegible]tation:	Transverse

4. Perform a movement [illegible] a footballer's e[illegible] a throw-in.



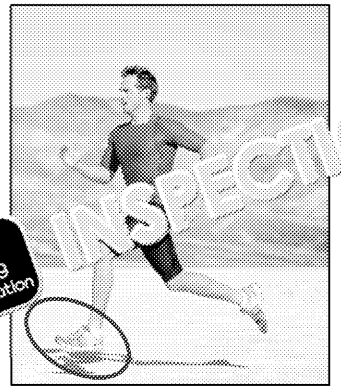
	Mo[illegible]
Movements at elbow, and agonist muscle causing movements:	[illegible]
Plane of movement:	Sagitt[illegible]
[illegible] of movement:	Trans[illegible]

Movement analysis (continued)

Questions	Answers	
5. Fill in the answers to the right, to perform movement analysis of a standing vertical jump at the moment of take-off.	**A**	
	Movement type:	Plantar fle
	Agonist muscle:	Gastrocne
	Contraction type of agonist muscle:	Concentric
	Plane of movement:	Sagittal
	Axis of movement:	Transverse
	K	
	Movement type:	Extension
	Agonist muscle:	Quadricep
	Contraction type of agonist muscle:	Concentric
	Plane of movement:	Sagittal
	Axis of movement:	Transverse
	H	
	Movement type:	Extension
	Agonist muscle:	Gluteals
	Contraction type of agonist muscle:	Concentric
	Plane of movement:	Sagittal
	Axis of movement:	Transverse

Questions

6. **Perform a movement analysis on a runner in the recovery stage of a stride.**



Movement type:	D
Agonist muscle:	T
Contraction type of agonist muscle:	C
Plane of movement:	S
Axis of movement:	T
ovement type:	F
Agonist muscle:	H
Contraction type of agonist muscle:	C
Plane of movement:	S
Axis of movement:	T
Movement type:	F
Agonist muscle:	H
Co type of agonist muscle:	C
Plane of movement:	S
Axis of movement:	T

3.1.3: Physical Training

3.1.3.1 The relationship bet… …ealth and fitness and 3.1.3.2 Compo…

Health and fitness and components of fitness

…ions	
1. **…e 'health'.**	Health is defined as a person possessing social, n…
2. **Define 'fitness'.**	Fitness is the ability of an individual to cope with …
3. **Describe the positive effects improved fitness can have on health.**	Improved fitness can make people less likely to b… Furthermore, training fitness can help to improv… health).
4. **Describe the possible relationship… between ill health and fi… …s.**	…ill health c…n cause a reduction in fitness levels a… …wever, a person can be ill (e.g. have a cold) bu… still be improved.

5. **Fill in the table, naming the component of fitness, or providing a definition of the component of fitness.**

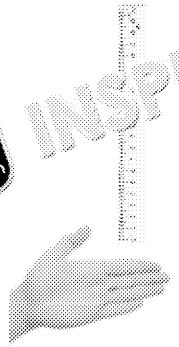
Fitness component		
Muscular endurance	**The ability of mus…**	
Flexibility	**The range of move…**	
Reaction time	The time taken for a h…	
Strength	Maximal	**Larg…**
	Static	Cont…
	Dynamic	**Perf…**
	Power / explosive strength	**The … × sp…**

Questions	Ans
5. Fill in the table, naming the component of fitness [illegible] a definition [illegible] ent of fitness. [illegible] nued)	**Agility** — Being able to change direction a **Sp[illegible]d** — The rate at which a movement is **Balance** — The ability to keep the centre of Coordination — **The ability to use more tha** **Cardiovascular endurance** — The ability of the cardiovascular s continuous period of time
6. For each of the com[illegible]t of fitness [illegible] a s[illegible] that requires that fit[illegible]mponent and justify your ans[illegible].	**Fitness component** / **Sporting example** /
	Muscular end[illegible]ce — e.g. marathon runner — Marathon r very long p
	Flexibility — e.g. synchronised swimmer — A synchron body quick
	Reaction time — e.g. 100 m sprinter — 100 m sprin quickly as p
	Static strength — e.g. prop in a scrum — A prop mus stationary s
	Dynam[illegible]st[illegible] — e.g. basketball player — Basketball perform at

Questions			
6. For each of the components of fitness, name a sport that requires that fitness component and justify your answer. Continued.	**Maximal strength**	e.g. shot-putter	A f
	Power / explosive strength	e.g. discus thrower	A a
	Agility	e.g. football player (dribbling)	A d
	Speed	e.g. 200 m sprinter	T p
	Balance	e.g. surfer	A t
	Coordination	e.g. cross-country skier	A r
	Cardiovascular endurance	e.g. long-distance cyclist	A r
7. Would a 50 m sprint swimmer need high levels of muscular endurance? Justify your answer.	No – a 50 m swim sprint is over in a short space o contract mu s over a long period of time woul		
8. Explain whether a long jumper would benefit from having ve good reaction time	ng jumper starts and ends their event in their they would not require good levels of reaction ti		

Fitness testing	Question	
	1. **Describe the benefits of, or reasons for, testing an athlete's fitness**	Fitness testing can be used to: • identify an athlete's performance strengths and • aid goal-setting • motivate an individual • assess the influence of a training programme • establish baseline levels of fitness • The establish end level of fitness (following a tra • To adapt training programmes to the athlete's n • To compare fitness levels to national averages • Tests can pro[illegible]e a variety to an athlete's norma
	2. **Ex[illegible]ain [illegible]ble limitations [illegible]es testing.**	Many tests of fitness are not sport-specific and so d means that the test may not replicate the movemen conditions faced when in a competitive situation as The validity of a fitness test is dependent on correct knowledge of the test and understanding the outco indirect; therefore, the validity and reliability of sub questionable.
	3. **Name and describe the t[illegible]se to measure flexibi[illegible]**	**Test**: Sit-and-reach test **Equipment**: A box with distance ma **Protocol**: The performer sits with box. The performer gra as far as possible along

Fitness testing (continued)

Questions	
4. Name the test that is used to measure speed	The 30 m sprint test
5. This component of fitness can be measured using a hand grip dynamometer. Describe the protocol of this test.	**Fitness component**: Strength **Protocol**: The athlete holds the dynamometer at 90°with the elbow held dynamometer as hard as measurement.
6. Identify the test being shown by the image below. Name what component of fitness the test measures and describe the protocols of this test. 	**Test**: Ruler drop test **Fitness component**: Reaction time **Protocol**: • The tester holds a ru • The performer has t • The assessor drops t • The distance along t
7. Describe the protocol of the stork balance test	An athlete stands upright with their feet firmly on the leg and the lifted foot is placed flat against the inside as long as possible, with the time being recorded.

Fitness testing (continued)

Questions	
8. [illegible] sketch to illustrate how the Illinois Agility test is completed. Below it, describe the protocol.	The athlete begins lying face-down on the floor a • The athlete must get up and run to the second co • The athlete then runs back to the first of the cen must then run around all four of the internal con • Performer runs back to finishing cone
9. An athlete could use the one-rep max (1RM) test to test whic[illegible] component of fitn[illegible]	Maximal strength
10. O[illegible] 1R[illegible] blished, how is [illegible] to assess strength?	• The mass of the one-rep max is divided by body w • The score is compared to previous normative da
11. The multistage fitness test is commonly used as a cheap method of testing cardiovascular endurance. Identify any equipment re[illegible] to complete the m[illegible] stag fitness test, [illegible] be the co[illegible] test.	**Equipment**: Cones, tape measure, CD in **Protocol**: • Two sets of cones are p • The performer must run instructions. • The time between the b distance in time • The performer continue • How far the athlete pro

	Questions		Answ
Fitness testing (continued)	12. Name and describe th… to test a … endura…	Test	Sit-up bleep test
		Protocol	• The athlete sits on the floor with their f… the athlete's foot against the ground. • The CD bleeps twice – once for the upwa… • The performer must keep in time with t… • The bleeps get faster and so the perform… • The athlete continues until exhaustion, or … • The number of completed sit-ups is use…
	13. Provided below is the protocol of a fitness test. Name the fitness test being described and state which component of fitness is assessed using the test. An athlete throws a ball against a wall for … seconds. The ball is thrown … caught using opposite hands. The number of times the ball is thrown and caught is counted and used as a score.	Test:	Wa… …ss test
		Fitness component:	Coordination

Questions	
14. **…n how a vertical jump test is carried out by an athlete to assess their explosive strength.**	An athlete begins by standing side-on to a wall. The … firmly on the ground, they then reach up using the a… chalk mark. This is their standing reach height. The athlete then relaxes and prepares to jump vertic… the athlete should reach up and make another chalk … The distance between the standing reach height and …

15. **…ch of the following tests, …ggest whether it is appropriate / not appropriate for the athlete it has been matched to. Justify your answer.**

…rm… …st	Sport athlete
One-rep max test	Triathlete
Sit-and-reach test	Dancer
…n… …gility test	100 m sprinter

Fitness testing (continued)	Questions		
	16. When taking measurements in fitness tests you must [illegible] you are recording [illegible] type of [illegible]. For each of the following quantities, state the unit it should be measured in.	**Distance:**	Centimetres (cm)
		Time:	Seconds (s)
		Mass:	Kilograms (kg)
	17. What is qualitative data?	Data that is based on opinions, thoughts and observa	
	18. What is quantitative data?	Data tha[illegible]ts of numbered measurements. Fact	
	19. Explain why quantitative data is useful in fitness testing.	Using quantitative data allows accurate and reliable s allows for comparisons to be made between athletes	
	20. Explain why normative data is useful in fitness testing.	• Normative data is data that is representative of a • Normative data originates from a large number o • Therefore, results from a fitness test can be com the sit-and-reach score of a 22-year-old can be co • On the other hand, a 70-year-old's sit-and-reach s • Norm[illegible]e data allows meaningful comparisons t	

3.1.3: Physical Training

3.1.3.3 Principles of training and their application to training

Principles of training and types of training

Questions		
1. Name and describe the principles of SPORT to maximise improvements in sporting performance from training.	**S**	Specific – training should be specific t
	P O	Progressive overload – training shou performance levels plateauing, conti
	R	Reversibility – regular training ensur
	T	Tedium – training should be varied w
2. Give a sporting example		e.g. a marathon runner would not be
principle of SPO	**P O**	e.g. a weightlifter would make sure t basis
implem	**R**	e.g. a basketball player would train t improvements in their endurance wi
	T	e.g. a rugby player would do numero
3. Explain how overload can occur using the FITT principle.	**F**	Frequency – the number of times an regular.
	I	Intensity – how hard the performer i work harder each session.
	T	Time – the duration of the training s
	T	Type – refers to the type of exercise performer participates in.

Questions

Training type	D
1. Continuous	Exercising witho constant intens
2. Fartlek	A combination interval training of exercise
3. [illegible]al	Exercising at hig periods of rest, intensities
4. Plyometric	High-intensity ju activities. The p eccentric contra concentric cont
5. Circuit	Numerous work tailored to suit
6. [illegible]ic stretching	Stretching that muscle constan (isometric contr
7. Weight	Using free weig muscles or mus sets and reps.

4. **Describe each of the [illegible] of training and [illegible] fitness [illegible] training improves.**

Principles of training and types of training (continued)

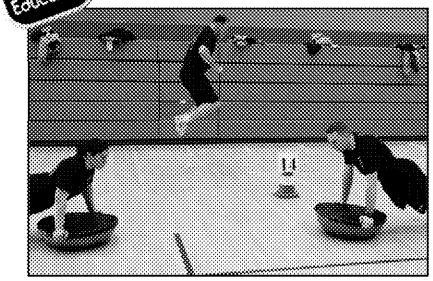
Questions	
5. **What considerations sh[illegible]ade when completi[illegible]us tra[illegible]ing?**	The intensity that the athlete works at should b[illegible] for the length of the training. Also, continuous [illegible] sprinter would not need to complete continuou[illegible]
6. **[illegible] designing a circuit session, the coach should ensure there is enough space to hold all of the circuit stations.** **What else should the coach check in order to design a successful circuit training session?**	They should check that they have all the equipm[illegible] also consider whether the number of circuits in[illegible]
7. **Using specific examples, apply the principles of SPORT and FITT to a circuit training session.**	**Application to a circuit trainin[illegible]** **S** — The circuit session should be specific to [illegible] aim of the individual taking part in the c[illegible] **PO** — Each circuit session should increase in d[illegible] encourage the athlete's body to adapt a[illegible] meet the demands of the exercise. **R** — T[illegible]cuit session should be held regul[illegible] e p[illegible]itive adaptions from the session [illegible] lost. **T** — The circuit session should involve fitnes[illegible] or skills that the athlete actually uses in [illegible]

Questions	Answers
7. **Using specific examples, apply the principles of SPORT and FITT to a circuit training session.**	**Application to a circuit training session** **F** – The sessions should be regular enough for positive adaptions to take place. **I** – The intensity of a circuit session should be high enough that the athlete is being pushed. **T** – The circuit session should be long enough to include all of the stations and for each station to have an impact on the athlete. **S** – The circuit session activities should meet the demands of the aims of the session.
8. **Give tips to a coach who is planning a fartlek training session. (Continued)**	• Intensity should vary • Exercises should be sport-specific (e.g. games players • Ensure both aerobic and anaerobic systems are worke
9. **How should interval training be adapted for a beginner athlete?**	The intensity of exercise should suit the fitness levels of t athlete to recover and continue exercise.
10. **What does HIIT stand for?**	High-int sit in al training
11. **How should an athlete perform t stretching in order to ?**	• The athlete should not 'bounce' when stretching the • Correct technique should be used when stretching, i.e

Questions	Ans
12. Alice is looking to improve her strength by completing weight training. What safety advice would you [illegible] Alice when completing [illegible] training?	• Alice should use correct technique when lifting weigh • Alice should make sure a spotter is with her when lifti
13. Plyome[illegible]ining is often avoided by coac[illegible]d athletes. Why is this?	The injury risk in plyometric training is higher than in othe
14. For each of the types of trainin[illegible] the correct training th[illegible] athletes [illegible]ld [illegible]nd suggest the res[illegible]ery period for each training	

Training type	Training thres
Continuous	Calculated as a percentage heart rate. Aerobic exerci maximum heart rate
Fartlek	Dependent on aerobic/an and training goals
Int[illegible]	2:1 work-to-rest ratio
Plyometric	High intensity, short durat
Circuit	Can be adapted to suit spe components of fitness
Static stretching	
Weight[illegible]n	• Dependent on aim of t • One-rep max = maxim can be lifted in a single • Increased strength = lo weight (~70% 1RM, 4- • Increased muscular en weight, high reps (<70 reps)

Advantages and disadvantages of training

Questi…	
1. Give the advantages and disadvantages of continuous training.	**Advantages** • No equipment needed • Improves aerobic fitness and muscular end… • Simple to complete • Little thought/concentration required
2. Identify the t…g type shown in the … the advantages and …ntages of this type of training? 	**…raining type:** Circuit training **Advantages** • Training can be adapted to make activities s… complex and different in intensities • Adaptable to train different components of … • Can be adapted to suit age and fitness level… • Easy t… …onitor progress

Advantages and disadvantages of training (continued)

Questions	
3. Fartlek training may not be suitable for all athletes depending on the demands of their sport. Describe the advantages of fartlek training for an athlete.	Fartlek training is more varied than continuous training Fartlek training can also be tailored to suit more
4. Assess the use of plyometric training and weight training to improve fitness.	**Advantages** • Can improve power, speed and strength • Little equipment required (boxes of varying **Advantages** • Can be adapted to suit different components of fitness or target specific muscle groups • Relevant to any sport • Relatively simple to complete • Limited equipment required
5. Describe the advantages and disadvantages of dynamic stretching to a rugby player in a warm-up.	**Advantages** • Increases athlete's flexibility and range of m • Can be completed by anyone • Limited risk of injury

Advantages and disadvantages of training (continued)

Questions	Advantages
6. [illegible] the table, listing the advantages and disadvantages of interval training.	• Quick to complete • Helps weight loss by burning body fat • Can be adapted to suit the athlete (e.g. fitn and beginner/experienced status) • Can be used to improve both the aerobic a anaerobic systems

7. [illegible] training type, give an example of an athlete who would benefit from the type of training.	
Co[illegible]nuous	e.g. marathon runner
Fartlek	e.g. football player
Interval	e.g. basketball player
Plyometric	e.g. rugby player
Circuit	e.g. squash player
Static st[illegible]hing	e.g. gymnast
[illegible]veight training	e.g. rower

3.1.3: Physical Training

3.1.3.4 How to optimise training and prevent injury

Optimising training and preventing injury

Questions	
1. What is a training threshold?	A training threshold is the intensity of exercise
2. Training thresholds can be set at percentages of maximum heart rate. How is maximum heart rate calculated?	Maximum heart rate = 220 – age
3. What percentage of maximum heart rate does aerobic training occur in?	60–80%
4. What percentage of maximum heart rate does anaerobic training occur in?	80–90%
5. Dan is 27 years old. He wants to train aerobic fitness. Calculate the heart rate range that Dan should work within to train anaerobically.	220 – 27 = 193 80% of 193 = 154 90% of 193 = 174 Heart rate range = 154 – 174 bpm
6. Calculate the heart rate range that a 22-year-old female should work in to improve her aerobic fitness.	220 – 22 = 198 60% of 198 = 119 80% of 198 = 158 Heart rate range = 119 – 158 bpm

Optimising training and preventing injury (continued)

Questions	
7. Circuit training can be altered [illegible] the needs of the athle[illegible] W[illegible] sh[illegible] [illegible]ltered in a circuit to [illegible]e the fitness aim of a circuit [illegible]n?	• The time of each exercise/station • The activity completed at each station • The amount of rest between stations and ci
8. The intensity/weight used in weight training is determined using one-repetition maximum (1RM). What is 1RM?	One-repetition maximum is the maximum amo
9. What are 'reps' and 'sets'?	**Re[illegible]** (Re[illegible]petitions) are the number of time **Sets:** A set is a collection of a specified nu
10. [illegible] how 1RM can be used to allow an athlete to improve their strength and power.	Strength and power can be improved by lifting w be lifted in a set containing low repetitions (e.g
11. Explain how 1RM can be used to allow an athlete to improve their muscular endurance.	To improv[illegible]uscular endurance, an athlete wo im[illegible]s with low weights and high reps

Questions	
	1. Warm-ups should be completed prior to
	2. Correct clothing should be worn; for exa ankle.
	3. When using weights, the correct technic
	4. When ifting weights, taping and bracing
12. Describe nine injury prevention methods that athletes should adopt in	5. When completing skills and drills, correct of 'golfer's elbow').
	6. Athletes should avoid overtraining as th
	7. Athletes should maintain hydration level
	8. tes should not overstretch muscles ge of motion can cause tears in musc
	9. Athletes should be allowed to fully reco

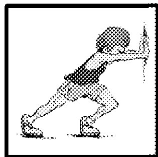
Altitude training and seasonal aspects	Question	
	1. s a ude training?	Altitude training is training in environments hig
	2. Explain the physiological changes that occur to an athlete training at ti e and how these change ir their performance.	At high altitudes, the amount of oxygen in the a there is less oxygen in the air to bind to red blo To begin wi athletes will find it hard to exerc be hlete will struggle to consume e co. sate for the low oxygen levels in the air lood cells means more oxygen can be taken fr muscles. When the athlete returns to sea level, they will percentage of oxygen in the air at sea level. Ha atmosphere means the athlete can utilise great them to exercise aerobically for longer without muscles.
	3. Give two examples of athletes would benefit from alti e i g.	A pt any suitable answers that mention an a e.g. marathon runner / long-distance cyclist / t

Altitude training and seasonal aspects (continued)

Questions	
4. Give two examples of athletes who would not benefit from altitude training.	Accept any suitable answers that mention an ar e.g. sprint cyclist / swimmer / javelin thrower /
5. Assess the use of altitude training by marathon runners.	**Advantages** • Increased red blood cell count in the body • Increased aerobic efficiency once the athle to sea level • Athlete can exercise aerobically for longer w fatigue
6. Name and describe each of the three seasons of training which athletes participate in within a year.	**1.** Pre-season: An athlete will have improve general fit end of pre-season t Individual skills can **2.** Competition: Fitness levels need the highest level po **3.** P season: A period for rest an completed to main
7. Explain why the three seasons of training cannot always be applied to a footballer.	Following pre-season training, footballers have season ends – which, in theory, should be the s the World Cup or European Championships beg their post-season period.

Altitude training and seasonal aspects (continued)

Questions	Season of training	
8. **For the following scenario, give a brief training plan / list of activities that the athlete would complete throughout the year:** **A long jumper who is part of the Olympic team. The Olympics is [illegible] next major event they [illegible] competing in.**	Pre-season	• The long jumpe level • Activities/traini • Once fitness lev concentrating o
	ipe tion	• By the time of t to maintain this • Activities could weightlifting • Skills (stride len
	Post-season	• The long jumpe • They should co as weight traini



3.1.3: Physical Training

3.1.3.5 Effective use of a warm-up and a cool-down

	Questions	
Warm-ups and cool-downs	1. **Name four components that should be part of a warm-up.**	1 An activity that slowly increases the puls 2 Stretching activities 3 Mental preparation for the exercise 4 Performing skills that replicate movemer
	2. **Describe the physiological and psychological benefits of warm-ups to an athlete.**	• Practising sport-specific skills increases focus • Body temperature gradually rises, which prep • The athlete will be physiologically and psychol • More oxygen will be circulating the body due • Stretching increases the range of movement • Reduced chance of injury • Gradually warming up reduces the shock of ex
	3. **Plan a warm-up for a footballer prior to a match.**	Accept any suitable answer. e.g. First, the football should complete light joggi should then complete some static or dynamic stre The footballer should then complete sport-specif A few minutes before a match, the player could t mental preparation.

Warm-ups and cool-downs (continued)	Questions	
	4. Describe the important [illegible] that should be [illegible] cool-down.	• The athlete's breathing rate and heart rate sl • Then, the athlete should gradually reduce the and heart rate) • Finally, stretching should take place
	5. What benefits does a good cool-down give an athlete?	• Reduces the shock on the body from sudden • Allows the body to recover from exercise: ○ removal of lactic acid, carbon dioxide a ○ helps to prevent delayed onset muscle s • Reduced chance of injury/fatigue
	6. Plan an appropriate cool-dow[illegible] hockey player.	[illegible] suitable answer. [illegible] player should go for a run/jog at a relativ intensity as the exercise they completed. The int Once heart rate has been gradually lowered, the helps to reduce DOMS.

3.1.4: Use of Data

3.1.4.1-3 Demonstrating a knowledge of understanding, presenting, a

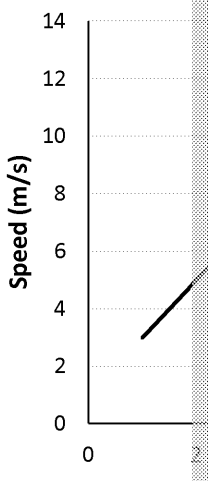
	Questions	
Understanding data	1. **Define 'qualitative data'.**	Qualitative data is data that gives opin
	2. **Define 'quantitative data'.**	Quantitative data is data based upon r objective (with the exception of quest
	3. **Give two examples of how to collect qualitative data.**	Observations Interviews
	4. **Give three ex[illegible]methods used to [illegible]ve data.**	• Questionnaires • Surveys • Measuring devices (e.g. hand gri
	5a. **Below is a question taken from a questionnaire. State whether the answers would be qualitative or quantitative. Give a reason for your answer.** ***Rate your experience of today's lesson, learning how to play lacrosse, with 1 b[illegible] 'not enjoyable at all' and 5 b[illegible] enjoyable'.***	Quantitative – the responses would be

	Questions	
Understanding data (continued)	5b. Below is another question taken from the same questionnaire. Explain whether the answers would be qualitative or quantitative. Give a reason for your answer. *Write any feedback you have for today's lacrosse coach in the space provided below.*	Qualitative – the responses would be t
	5c. What do your answers from 5a and 5b tell you about the use of questionnaires in data collection?	Questionnaires can be used to collect e question(s) asked. The question can a data e.g. rating systems).
	6. On a graph, what data is plotted along the x-axis?	The independent variable
	7. On a graph, what data is plotted along the y-axis?	The dependent variable

Understanding data (continued)

Questions

8. To the right is a graph plotting speed of a 100 m sprinter in a race.



   a) Explain what is happening between 1 second and 8 seconds.

   b) Calculate the distance covered between 8 and 11 seconds.

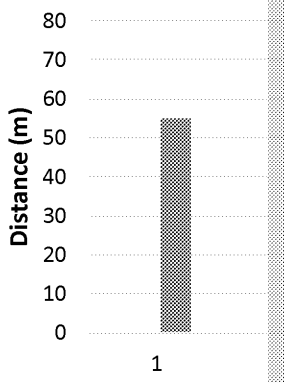
Explanation:	• Between 1 second and 8 seconds the speed is reached at 8 se • This means that b
Calculation:	• Distance = speed • Distance = 12 m/s • Distance = 36 m

Questions

9. Draw a bar chart of the distance thrown by a th[illegible] using the following data:

Attempt	Distance (m)
1	55
2	65
3	65
4	65
5	60
6	70

D[illegible]



10. Below is a graph m[illegible]ng a regarding the average n[illegible]ectators in a football [illegible]d o[illegible]e last 10 years.

[illegible]r the questions to the right using the graph.

a. In what year did the numbe[illegible] spectators hit its lowest?

b. Between what years did the average number of spectato[illegible] remain the same?

Describe the trend of specta[illegible] between the years 2013 and