GCSE
PHYSICAL EDUCATION
8582/1

Paper 1 The human body and movement in physical activity and sport

Mark scheme

June 2024

Version: 1.0 Final

2 4 6 G 8 5 8 2 / 1 / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

0	**1**	What happens to the diaphragm during inhalation? **[1 mark]**

Marks for this question: AO1 = 1

Answer A – It contracts (1)

0	**2**	Which **one** of the following is the correct unit of measurement for the Illinois Agility Test? **[1 mark]**

Marks for this question: AO1 = 1

Answer D – Seconds (1)

0	**3**	Which **one** of these will air pass through immediately before entering the alveoli? **[1 mark]**

Marks for this question: AO1 = 1

Answer B – Bronchioles (1)

0	**4**	Which **one** of these is the maximum heart rate for a 14-year-old girl? **[1 mark]**

Marks for this question: AO2 = 1

Answer B – 206 (1)

0	**5**	Which **one** of the following would a netballer be **most** likely to take part in during the post-season? **[1 mark]**

Marks for this question: AO2 = 1

Answer B – Light jogging (1)

0	6	Define health **and** fitness. **[2 marks]**

Marks for this question AO1 = 2

Award **one** mark for each correct definition.

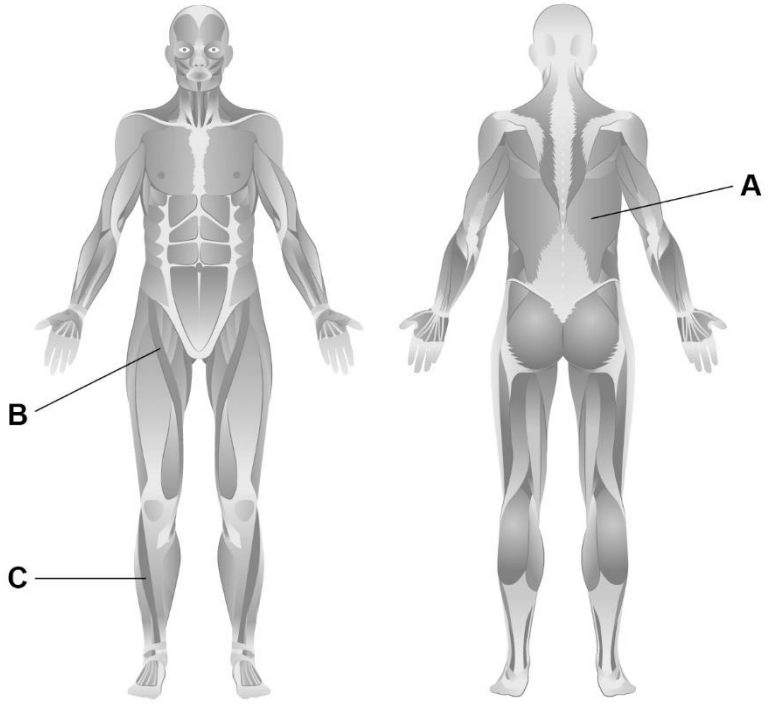
- (Health) The state of complete physical, mental and social well-being, (and not merely the absence of disease or infirmity) (1)
- (Fitness) The ability to meet/cope with the demands of the environment (1)

Accept any other suitable explanation of health and fitness.

Maximum 2 marks

0 7 **Figure 1** shows muscles in the body.

Figure 1



0 7 . 1 Identify the muscles labelled **A**, **B** and **C** in **Figure 1**.

[3 marks]

Marks for this question AO1 = 3

Award **one** mark for each of the following up to a maximum of **three** marks.

- A = Latissimus dorsi (1)
- B = Hip flexors / iliopsoas (1)
- C = Tibialis anterior (1)

Maximum 3 marks

0 7 . 2 Name **two** bones located at the head/neck.

[2 marks]

Marks for this question AO1 = 2

Award **one** mark for each of the following up to a maximum of **two** marks.

- Cranium (1)
- Vertebrae OR atlas OR axis (1)
- Mandible (1)

NB Do not credit skull, jaw or spine.

Maximum 2 marks

0 7 . 3 Explain how muscles **and** bones work to produce movement.

[3 mark]

Marks for this question AO1 = 3

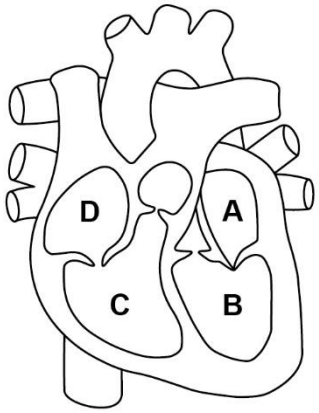
Award **one** mark for each of the following points up to a maximum of **three** marks.

- Muscles are attached to bones by tendons (1)
- When muscles contract they pull on the bones to create movement (1)
- Muscles work in (antagonistic) pairs (1)
- When one muscle in the pair is contracting (agonist) the other is relaxing (antagonist) (1).

Maximum 3 marks

0	8	**Figure** 2 shows a diagram of the heart.

Figure 2



Name the **four** chambers labelled **A**, **B**, **C** and **D in Figure 2**.

[4 marks]

Marks for this question AO1 = 4

Award **one** mark for each of the following up to a maximum of **four** marks.

- A = Left atria (1)
- B = Left ventricle (1)
- C = Right ventricle (1)
- D = Right atria (1)

Maximum 4 marks

0 9	Explain how the function of arteries **and** veins in the cardiovascular system allow an athlete to complete a marathon. **[4 marks]**

Marks for this question AO2 = 4

Award **one** mark for each of the following up to a maximum of four marks.

Arteries (sub-max 2 marks)

- Vasodilation (widening of the arteries) allows more oxygenated blood to flow to the working muscles (1)
- This allows energy production for muscular contractions OR to delay fatigue (1)

Veins (sub-max 2 marks)

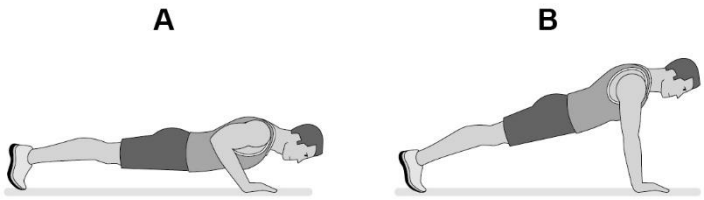
- They carry carbon dioxide OR lactic acid or waste products back to the heart and lungs so that it can be breathed out or removed (1)
- If the carbon dioxide OR lactic acid OR waste products were not removed, the blood would be too acidic and they would have to stop running due to muscle fatigue (1)

Accept any other suitable response.

Maximum 4 marks

1 0 **Figure 3** shows an individual performing a push-up.

Figure 3



Use **Figure 3** to help you answer **Questions 10.1 to 10.3**.

1 0 . 1 Identify the joint action taking place at the **elbow** during the **upward** phase (**A** to **B**) of the push-up.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the joint action at the **elbow** during the **upward** phase of the push-up.

- Extension (1)

Maximum 1 mark

1 0 . 2 Identify the main agonist at the **elbow** during the **upward** phase (**A** to **B**) of the push-up.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the main agonist at the **elbow** during the **upward** phase of the push-up.

- Triceps (1)

Maximum 1 mark

1 0 . 3 Identify the type of isotonic muscle contraction that is at the **elbow** during the **upward** phase (**A** to **B**) of the push-up.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the type of isotonic muscle contraction at the **elbow** during the **upward** phase of the push-up.

- Concentric (1)

Maximum 1 mark

1 1 Rizwan is aiming to perform 40 push-ups.

Identify the type of muscular strength that Rizwan uses to perform 40 push-ups.

Justify your answer.

[3 marks]

Marks for this question AO2 = 1, AO3 = 2

Award **one** mark for identifying the muscular strength and a further two marks for the justification.

AO2 (sub-max 1 mark)

- Dynamic strength (1)
- Muscular endurance (1)

AO3 (sub-max 2 marks)

- Dynamic strength/muscular endurance allows Rizwan to perform repeated muscle contractions (1)
- Dynamic strength/muscular endurance allows Rizwan to delay of the onset of muscular fatigue (1)

NB No marks can be awarded for the justification if the type of strength is not identified correctly.

Maximum 3 marks

1 2 . 1 Identify **three** components of fitness which can be improved using weight training.

[3 marks]

Marks for this question AO2 = 3

Award **one** mark for each of the following points up to a maximum of **three** marks.

- Strength / maximal strength / static strength (1)
- Muscular endurance / dynamic strength (1)
- Power / explosive strength (1)
- Speed (1)
- Flexibility (1)
- Co-ordination (1)
- Balance (1)

Maximum 3 marks

1 2 . 2 State **three** ways to minimise the risk of injury when weight training.

[3 marks]

Marks for this question AO1 = 3

Award one **mark** for each of the following points up to a maximum of **three** marks.

- Warm up (1)
- Cool down (1)
- Hydration (1)
- Lift the appropriate weight (1)
- Use the correct technique (1)
- Use spotters (1)
- Ensure a safe working environment (no loose weights on the floor, no water spillages etc) (1)
- Use correct/appropriate kit OR equipment (weight lifting belt to protect back or gloves to prevent blisters or equivalent (1)

Accept any other suitable response.

Maximum 3 marks

1 2 . 3 Discuss whether weight training is an effective type of training for games players.

[5 marks]

Marks for this question AO3 = 5

Award **one** mark for each of the following points up to a maximum of **five** marks.

Agree (sub-max 3 marks)

- Weight training can be tailored to train specific muscle groups which are necessary to perform effectively in all games (1)
- Weight training can be used to develop explosive power to accelerate more quickly in a fast counter attack (1)
- Weight training can be used to develop maximal strength to lift a player in a line out (1)
- Weight training can be used to develop static strength to hold a scrum stable (1)
- Weight training can be used to develop muscular endurance to perform repeated tackles, rucks and mauls (1)
- Weight training can be used by large groups and is easily set up, therefore can accommodate team training sessions (1)

Disagree (sub-max 3 marks)

- Weight training is not totally sports specific as they tend to be isolated exercises (1)
- Weight training does not replicate 'real time' match situations as no opposition are present during training (1)
- Weight training does not involve any skill development which may be more important than developing strength (1)
- Strength is not the most important component of fitness for a number of games players so may benefit more from other types of training eg fartlek to improve stamina for a central midfielder (1)
- Technique can be affected by fatigue when performing too many repetitions which can increase the risk of injury which can be detrimental to team and individual performances (1)
- Weight training generally uses expensive equipment, which means it is not accessible to everyone (1)

Any other discursive point as to whether weight training is an effective type of training for a games player.
NB A comparison with another type of training, which may be more appropriate for a games player, can be credited.

Maximum 5 marks

1 3 . 1 Define plantar flexion.

Give a sporting example.

[2 marks]

Marks for this question AO1 = 1, AO2 = 1

Award **one** mark for a definition and **one** further mark for an example.

Definition

- Extension at the ankle (1)
- Increasing the angle at the ankle joint (1)
- Movement at the ankle where the toes are pointed (1)

Example

- Standing on tip toes (1)
- Driving off the floor (1)
- Kicking a ball out of the hands (1)

Accept any other suitable response.

Maximum 2 marks

1 3 . 2 Define adduction.

Give a sporting example.

[2 marks]

Marks for this question AO1 = 1, AO2 = 1

Award **one** mark for a definition and **one** further mark for an example.

AO1 (sub-max 1 mark)

- Movement towards to the midline of the body (1)

AO2 (sub-max 1 mark)

- Downward phase of a jumping jack or star jump (1)
- Bringing arms into body when swimming breaststroke (1)

Accept any other suitable definition of adduction. Sporting examples must relate to where adduction occurs with the performer in that sport.

Maximum 2 marks

1 4	Define balance. Justify why balance is important for a football or hockey player. **[5 marks]**

Marks for this question AO1 = 1, AO3 = 4

Award **one** AO1 mark for the definition and up to four AO3 marks for the justification.

AO1 (sub max 1)

- The maintenance of the centre of mass over the base of support (1)

AO3 (sub max 4)

- When marking or jockeying, good balance may prevent your opponent dribbling around you (1)
- Stable position to avoid committing a foul due to being off balance in a challenge (1)
- When shooting OR passing, good balance would allow you to generate more power (1)
- Good balance would allow passes or shots to be more accurate (1)
- Good balance would allow better control whilst dribbling and moving with the ball (1)
- When jumping to perform a header in football, balance would be important when landing so that you do not fall over (1)
- When being challenged for the ball, balance is required to maintain control of the ball or to avoid falling over (1)
- Balance is important to a goalkeeper to enable them to dive off either foot to react to a shot / equivalent (1)
- Balance is essential so that you can react quickly to any movements made by the opposition or the ball (1)

Accept any other suitable justification of why balance is an important component of fitness. Answers must refer to a football or a hockey player.

Maximum 5 marks

1 5 Milo is competing in a 1000m rowing race.

Table 1 shows his cardiac output in litres per minute (l/min) at rest and during the 1000m race.

Table 1

Distance (m)	Cardiac output (l/min)
0	5
200	9
400	16
600	25
800	27
1000	32

Using the graph paper below:

- Draw a line graph to show Milo's cardiac output in litres per minute (l/min) at the start and during the 1000m rowing race.
- Label the axes.

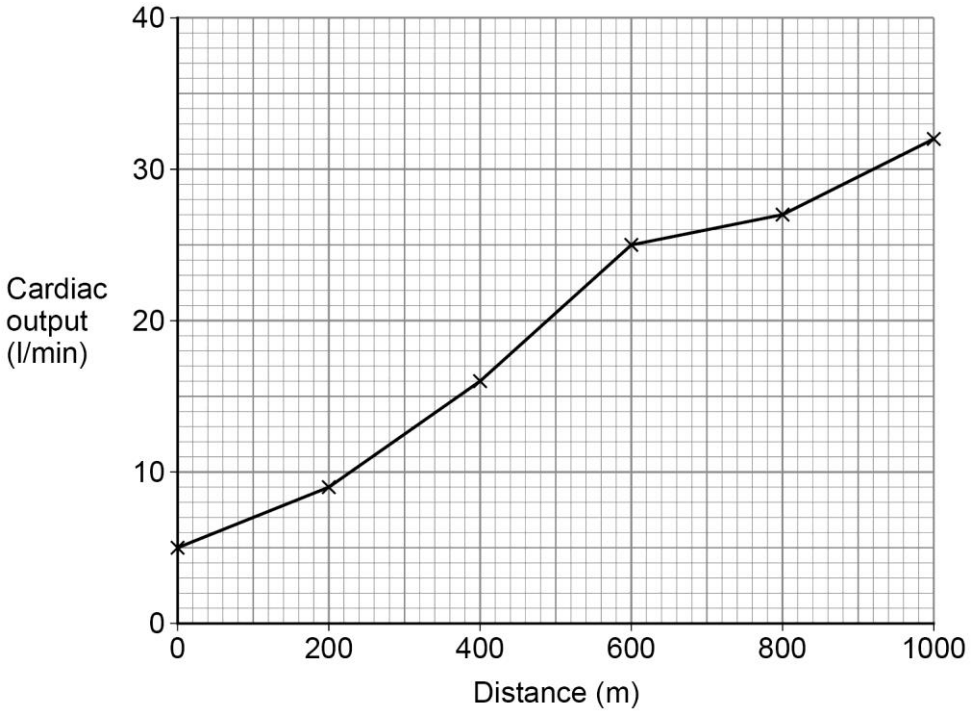
[2 marks]

Marks for this question AO2 = 2

Award **one** mark for each of the following up to a maximum of **two** marks.

- Axes are fully labelled (1)
- Line graph drawn correctly (1)

Maximum 2 marks



1 6 . 1 Identify **three** short term effects of exercise.

[3 marks]

Marks for this question AO1 = 3

Award **one** mark for each of the following points up to a maximum of **three** marks.

- Tiredness / fatigue (1)
- Light headedness (1)
- Nausea (1)
- Aching / delayed onset of muscle soreness (DOMS) / cramp (1)

Maximum 3 marks

1 6 . 2 A cool down and stretching are two ways to recover from vigorous exercise.

Explain **two other** ways to improve recovery from vigorous exercise.

[4 marks]

Marks for this question AO1 = 4

Award **one** mark for each of the following points up to a maximum of **four** marks.

- Replenish fluid levels lost during exercise (1) to prevent dehydration (1)
- Manipulation of diet (1), carbohydrates to restore energy stores OR protein to speed up muscle repair (1)
- Have an Ice bath immediately after exercise (1) to speed up muscle repair OR avoid DOMS OR remove lactic acid (1)
- Have a massage (1) to loosen/relax the muscles OR to prevent muscle soreness (1)
- Rest or recuperation (1) to ensure energy levels are restored (1)

Accept any other suitable response.

Maximum 4 marks

1 7 Javeria is an ice skater.

Figure 4 shows Javeria performing a 360° twist (ice skating spin).

Figure 4

Identify the plane **and** axis of movement when Javeria performs the 360° twist.

[2 marks]

Marks for this question AO2 = 2

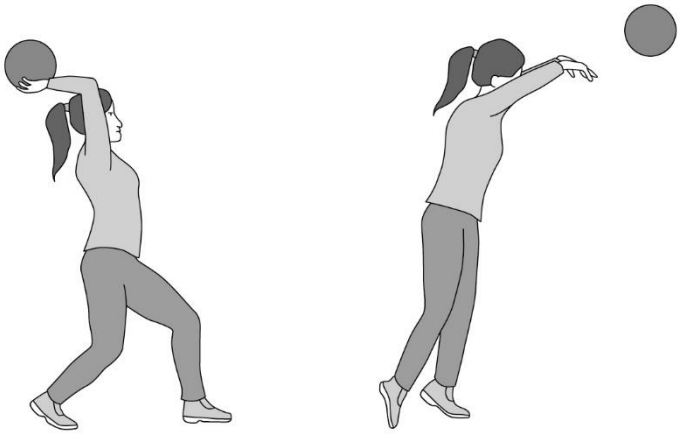
Award **one** mark for identifying the plane and **one** mark for identifying the axis when Javeria is performing a 360° twist.

- Plane – Transverse (1)
- Axis – Longitudinal (1)

Maximum 2 marks

1 8 **Figure 5** shows a netball player in two different positions (**A** and **B**) as they perform a throw.

Figure 5



A **B**

Use **Figure 5** to help answer the following questions.

1 8 . 1 Identify the class of lever system used at the **elbow** as it moves from **A** to **B**.

[1 mark]

Marks for this question AO2 = 1

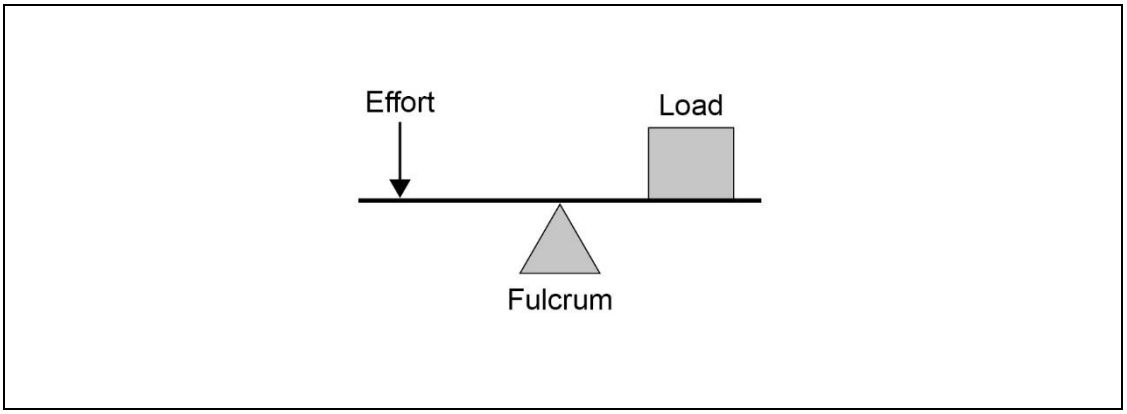
Award **one** mark for identifying the type of lever system used at the elbow as it moves from **A** to **B**.

- First class lever (1)

Maximum 1 mark

1 8 . 2 Draw a fully labelled diagram to show the class of lever identified in **Question 18.1**.
[2 marks]

Marks for this question AO2 = 2



Award **one** mark for each of the following.

- A correctly labelled diagram (1) – accept resistance instead of load and R/L F and E. Fulcrum must be in the middle.
- A correctly drawn diagram (1) – arrow pointing in the correct direction, load above the line, fulcrum below the line, effort above or below the line.

NB Do **not** award marks for drawing a first-class lever if they do not identify it in **Question 18.1**
Maximum 2 marks

1	9	Analyse how different types of bones help an individual taking part in a sporting activity of your choice. **[6 marks]**

Marks for this question: AO1 = 1, AO2 = 2, AO3 = 3

Level	Marks	Description
3	5–6	Knowledge of the types of bones is accurate and generally well detailed. Application to a chosen sport is mostly clear and effective. Analysis is thorough, reaching valid and well-reasoned links to a range of impacts on performance. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	3–4	Knowledge of the types of bones is evident but is more detailed for some more than others. There is some appropriate and effective application to a chosen sport, although not always presented with clarity. Any analysis is clear but reaches valid and well-reasoned links to only some impacts on performance. The answer lacks coherence in places, although terminology is used appropriately on occasions.
1	1–2	Knowledge of the types of bones is limited. Application to a chosen sport is either absent or inappropriate. Analysis is poorly focused or absent, with few or no impacts on performance. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
0	0	No relevant content.

Possible content may include:

AO1 – Knowledge of different types of bones eg

- Long bones allow large/fast/powerful movements.
- Short bones allow fine/precise/accurate movements.
- Flat bones provide protection to vital organs.

AO2 – Application to the sporting activity of choice eg rugby

- An example of a long bone is the humerus which a rugby player would use when passing.
- An example of short bones are the tarsals which the rugby player would use when kicking at goal.
- An example of flat bones are the ribs which would protect the heart and lungs of the rugby player when they are tackled.

AO3 – Analysis of how different types of bones help an individual taking part in a sporting activity of your choice. eg

- Long bones allow the rugby player run fast, avoiding opponents tackles and making them more likely to score a try.

- Long bones allow the rugby player to kick further allowing them to score points when further away from the posts.
- Short bones allow the rugby player to kick accurately making it more likely a conversion will go between the posts.
- Flat bones prevent injuries during a tackle in rugby which means the player can continue to participate in the sport.

Accept any other appropriate analysis of how different types of bones help an individual taking part in a sporting activity of your choice.

Maximum 6 marks

2 0	Neil is a 52-year-old athlete who has had to overcome knee injuries in his long career. He is due to compete in the over 50s triple jump world championships. Evaluate the appropriateness of plyometric training for Neil. **[9 marks]**

Marks for this question: AO1 = 2, AO2 = 2, AO3 = 5

Level	Mark	Descriptor
3	7–9	Knowledge of plyometric training is accurate and generally well detailed. Application to a triple jumper is mostly appropriate, clear and effective. Evaluation is thorough, reaching valid and well-reasoned conclusions for the appropriateness of plyometric training. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	4–6	Knowledge of plyometric training is evident. There is some appropriate and effective application to a triple jumper, although not always balanced and presented with clarity. Any evaluation is clear reaching valid and well-reasoned conclusions for some points on appropriateness more than others. The answer lacks coherence in places, although terminology is used appropriately on occasions.
1	1–3	Knowledge of plyometric training is limited. Application to a triple jumper is either absent or inappropriate. Evaluation is poorly focused or absent, with few or no reasoned conclusions. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
0	0	No relevant content.

Possible content may include:

AO1 – Knowledge of plyometrics eg

- Plyometric training is a type of training that is used to increase power (strength x speed).
- It usually takes the form of bounding hopping or jumping.
- It uses body weight and gravity to stress the relevant muscles required.

AO2 – Application to Neil as a triple jumper eg

- Plyometrics involves jumping and bounding which mimics the actions required for a triple jump.
- Neil will require power to attain top speed on the triple jump run-way.
- Neil will require power to hop, step and jump as he completes the triple jump.
- Neil will use plyometric training to increase his leg power for jumping.
- Neil is 52 and has previously had knee injuries. Plyometric training is a very stressful type of training for the muscles and joints.

AO3 – Evaluate the appropriateness of plyometric training for Neil. eg

- Plyometrics specifically improves leg power which is vital for Neil. Plyometrics can be specifically tailored for a triple jump training session, eg, bounding to increase stride length, jumping to increase height and distance and resistance work to increase speed.
- Neil's speed will increase to enable him to run faster as he approaches the take-off board.
- Neil's muscular strength and power will increase to enable him to jump further.
- Neil can easily incorporate plyometrics within an athletics training session to complement other forms of training, eg, weight training, speed training etc.
- Neil's body shape may change, being a mesomorph will possibly increase his speed and power enabling him to jump further.
- Plyometrics can assist in developing other components of fitness required by Neil, eg, Strength, speed, balance, flexibility etc.
- Plyometric training burns a lot of calories and will assist in muscle toning and weight loss enabling him to jump further.
- Neil can use plyometrics on his own or as part of a large training group. Plyometrics require little of no specific equipment therefore is easily integrated into an athletics training session.
- Neil is 52 years old therefore his body will not be as resilient as a younger athlete which will increase his likelihood of an injury, resulting in him missing training or the world championships.
- Neil's body will lack the bone density of a younger athlete therefore he is more likely to suffer from stress injuries due to the repetitive nature of the training.
- Neil's cardio-vascular endurance will likely to be less than a younger athlete therefore he may not be able to train for as long which will inhibit his progress.
- Repetitive jumping and bounding may cause stress on Neil's joints, therefore he may have to tape and brace his knees to stabilize them to help prevent further injuries.
- To ensure plyometric training is effective and appropriate, Neil will have to take in other considerations eg, technique / rest to prevent injury.
- Due to Neil's age and history of knee injuries, he will have to manage SPORT and FITT to ensure plyometric training is a safe and effective method of training. This will enable him to optimise his training and improve his chances at the world championships.
- Although plyometric training is the most appropriate method of training, there are other methods of training that can be used, eg, Weight training to increase leg strength, interval training for a faster approach to the take-off board.

Accept any other suitable evaluation for the appropriateness of plyometric training for Neil.

Maximum 9 marks

Question	AO1	AO2	AO3
1	1		
2	1		
3	1		
4		1	
5		1	
6	2		
7.1	3		
7.2	2		
7.3	3		
8	4		
9		4	
10.1		1	
10.2		1	
10.3		1	
11		1	2
12.1		3	
12.2	3		
12.3			5
13.1	1	1	
13.2	1	1	
14	1		4
15		2	
16.1	3		
16.2	4		
17		2	
18.1		1	
18.2		2	
19	1	2	3
20	2	2	5
Total	**33**	**26**	**19**