AQA

GCSE
PHYSICAL EDUCATION
8582/1

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

Mark scheme

June 2021

Version: 1.0 Final Mark Scheme

216G8582/1/MS

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.

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	Which **one** of these components of fitness is the **most** important when dribbling a ball around a defender in basketball? **[1 mark]**

Marks for this question: AO2 = 1

Answer A – Agility (1)

0	2	Which **one** of these is the correct pathway of the blood in the cardiac cycle as it returns to the heart from the vena cava? **[1 mark]**

Marks for this question: AO1 = 1

Answer C – Right atrium – right ventricle – left atrium – left ventricle (1)

0	3	Which **one** of these bones is located at the shoulder joint? **[1 mark]**

Marks for this question: AO1 = 1

Answer B – Scapula (1)

0	4	A sprinter includes speed work in their training. Which **one** of these principles of training are they using? **[1 mark]**

Marks for this question: AO1 = 1

Answer C – Specificity (1)

0	5	Mark is a male student who jumps 59 cm What rating is this according to **Table 1**? **[1 mark]**

Marks for this question: AO2 = 1

Answer B – Above average (1)

0 6	Which **one** of these describes muscular hypertrophy? **[1 mark]**

Marks for this question: AO1 = 1

Answer C – Muscles increase in size (1)

0 7	Which **one** of these describes what happens to the digestive system's blood supply during exercise? **[1 mark]**

Marks for this question: AO1 = 1

Answer B – Blood supply reduces (1)

0 8	Andrew is 40-years-old.

0 8 . 1	Calculate Andrew's maximum heart rate. **[1 mark]**

Marks for this question AO2 = 1

Award **one** mark for calculating Andrew's maximum heart rate.

- 180 (1)

Maximum 1 mark

0 8 . 2	State the percentage range of maximal heart rate for the **aerobic** training zone. Calculate Andrew's heart rate range in beats per minute (BPM) for his **aerobic** training zone. **[2 marks]**

Marks for this question AO1 = 1, AO2 = 1

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

- Between 60% and 80% (1)
- Between 108 and 144 (1)

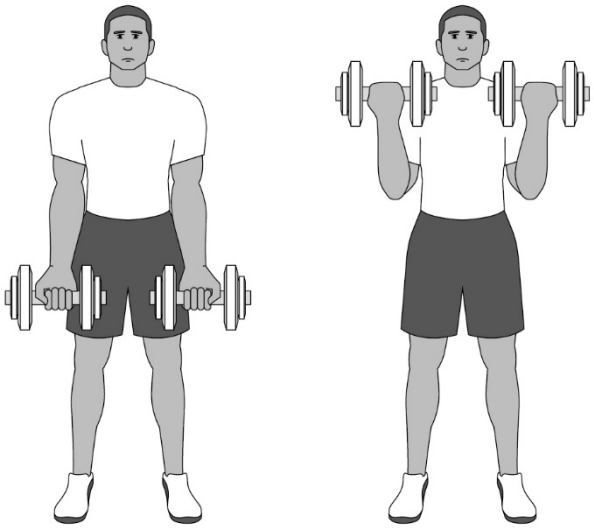
If candidates just record between 108 and 144 = 2 marks as they have used the 60–80% formula.

Maximum 2 marks

0 9 **Figure 1** shows an athlete in two different positions (**A** and **B**) as he performs a bicep curl.

Use **Figure 1** to help you answer **Questions 09.1** to **09.3**.

Figure 1



A **B**

0 9 . 1 Identify the joint action taking place at the **elbow** as the arm moves from **A** to **B**.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the joint action taking place at the elbow as the arm moves from **A** to **B**.

- Flexion (1)

Maximum 1 mark

0 9 . 2 Identify the main antagonist at the **elbow** as the arm moves from **A** to **B**.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the main antagonist at the elbow as the arm moves from **A** to **B**.

- Triceps (1)

Maximum 1 mark

0 9 . 3 Identify the type of muscle contraction that is taking place at the **elbow** as the arm moves from **A** to **B**.

[1 mark]

Marks for this question AO2 = 1

Award **one** mark for identifying the type of muscle contraction that is taking place at the elbow as the arm moves from **A** to **B**.

- Concentric (1)
- Isotonic concentric (1)

NB Do **not** accept isotonic on its own.

Maximum 1 mark

1 0 **Figure 2** shows Anna performing a running action.

Figure 2

1 0 . 1 Identify the plane and axis when Anna is performing a running action as shown in **Figure 2**.

[2 marks]

Marks for this question AO2 = 2

Award **one** mark for identifying the plane and **one** mark for identifying the axis when Anna is performing a running action.

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

Maximum 2 marks

1 0 . 2 Anna uses explosive strength when running a 400m race.

Define 'explosive strength'.

Justify why explosive strength is important when running a 400m race.

[4 marks]

Marks for this question AO1 = 1, AO3 = 3

Award **one** mark for definition and up to a further **three** marks for the justification.

AO1 (sub-max 1 mark)

- (The product of) strength and speed, ie strength × speed (1)

AO3 (sub-max 3 marks)

- Enables Anna to explode from the blocks to get a head start in a race (1)
- Enables Anna to run faster to gain a quicker time and win the race (1)
- Enables Anna to have a final burst of speed to dip at the finish line to gain a better finishing position (1)
- Enables Anna to accelerate during the race to make a break or counter/defend a break from another athlete (1)

Accept any other suitable response.

Maximum 4 marks

1 1 . 1 Define 'flexibility'.

[1 mark]

Marks for this question AO1 = 1

Award **one** mark for defining 'flexibility'.

- The range of movement possible at a joint (1)

Maximum 1 mark

1 1 . 2 The Sit and Reach Test measures flexibility.

Describe how to carry out this test.

[3 marks]

Marks for this question AO1 = 3

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

- Sit straight legged (1)
- Feet flat against the bench or equivalent (1)
- Reach forward as far as possible placing hands on bench or equivalent (1)
- Measure or record the distance from toes (1)

Maximum 3 marks

1 1 . 3 Justify why flexibility is an important component of fitness needed for a games player to perform effectively.

[3 marks]

Marks for this question AO3 = 3

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

- Increase the elasticity in the muscles so less chance of pulling or tearing a muscle (1)
- Limbs can extend further so more power can be exerted on an object, eg kicking a ball or hitting a tennis stroke (1)
- Limbs have a greater range of movement so a better technique can be achieved, eg higher arm action when bowling a cricket ball (1)
- Limbs have a greater range of movement so more technical or intricate movements can be made, eg reach further to return a tennis serve or lunge further to tackle in football (1)
- Stride length increases so a player can move quicker (1)
- Flexibility decreases stiffness in muscles and tendons and reduces delayed onset of muscular soreness (DOMS) (1)
- An increase in flexibility assists in improving balance and mobility, allowing a games player to stay on their feet (1)

Accept any other suitable response.

Maximum 3 marks

1 2 . 1 State **four** factors other than warming up and stretching that should be considered to help prevent injury **before** and **during** a training session.

[4 marks]

Marks for this question AO1 = 4

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

- Match the type of training to individual needs (1)
- Match the intensity of work to individual levels of fitness (1)
- An individual should not over train (1)
- An individual should wear the appropriate clothing or footwear (1)
- An individual could use taping or bracing (1)
- An individual needs to maintain hydration (1)
- An individual should use the correct technique (1)
- An individual should make time for rest and recovery (1)

Accept any other suitable response.

Maximum 4 marks

1 2 . 2 Explain why it is important to cool down after an intensive training session.

[4 marks]

Marks for this question AO2 = 4

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

- Gradually decrease body temperature to prevent overheating or nausea (1)
- Reduce heart rate or breathing rate slowly to avoid light headedness or fainting (1)
- Stretch or lengthen muscles to allow muscles to relax (1)
- Remove lactic acid (from muscles) to prevent muscle soreness (DOMS) (1)
- Encourage blood flow back to inactive organs and away from the working muscles to prevent blood pooling (1)
- Reduce carbon dioxide in the body/increase oxygen intake to repay oxygen debt or EPOC (1)

Accept any other suitable response.

Maximum 4 marks

1 3 . 1 What is the role of a tendon?

[1 mark]

Marks for this question AO1 = 1

Award **one** mark for stating the role of a tendon.

- To attach muscles to bones (1)

Maximum 1 mark

1 3 . 2 Muscles work in pairs.

Outline the role of the antagonist.

[2 marks]

Marks for this question AO1 = 2

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

- It relaxes (1)
- It allows the agonist to contract (1)

Maximum 2 marks

1 3 . 3 Name **two** major muscle groups that allow the leg to move at the hip.

[2 marks]

Marks for this question AO1 = 2

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

- Hip flexors or ilio-psoas (1)
- Gluteals (1)
- Adductors (1)
- Abductors (1)

NB Do **not** accept glutes.

Maximum 2 marks

1 4 . 1 Define 'adduction'.

Use a sporting example in your answer.

[2 marks]

Marks for this question AO1 = 1, AO2 = 1

Award **one** mark for the definition and **one** further mark for a sporting example.

AO1 (sub-max 1 mark)

- Movement towards the midline of the body (1)

AO2 (sub-max 1 mark)

- Returning arms and legs to their original position from a star jump (1)
- Returning arms and legs to their original position when swimming the breaststroke (1)

Accept any suitable example.

Maximum 2 marks

1 4 . 2 Name the **type** of joint where adduction can take place.

[1 mark]

Marks for this question AO1 = 1

Award **one** mark for naming the type of joint where adduction takes place.

- Ball and socket (1)
- Ball and socket joint (1)

Do **not** accept shoulder or hip.

Maximum 1 mark

1 4 . 3 Define 'isometric contraction'.

Use a sporting example in your answer.

[2 marks]

Marks for this question AO1 = 1, AO2 = 1

Award **one** mark for the definition and **one** further mark for a **sporting** example.

AO1 (sub-max 1 mark)

- Where the muscle contracts but the length does not alter (1)
- The contraction is constant, ie pushing against a load or where the muscle does not shorten or lengthen (1)

AO2 (sub-max 1 mark)

- Plank (1)
- Crucifix (1)
- Pushing in a scrum (1)

Accept any other suitable response.

NB Sporting examples must relate to where the isometric contraction occurs in the sport.

Maximum 2 marks

1 5 . 1 What is formed when haemoglobin and oxygen combine in the red blood cells?

[1 mark]

Marks for this question AO1 = 1

Award **one** mark for stating what is formed in the red blood cells.

- Oxyhaemoglobin (1)

Maximum 1 mark

1 5 . 2 Identify **four** features of the alveoli that assist in gaseous exchange.

[4 marks]

Marks for this question AO1 = 4

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

- Large surface area (1)
- Moist walls (1)
- Thin walls or one cell thick (1)
- Surrounded by many capillaries (1)
- Large blood supply (1)
- High concentration of oxygen (1)

Maximum 4 marks

1 5 . 3 Explain how air pressure changes occur in the chest cavity allowing exhalation to take place.

Refer to the roles of the intercostal muscles, rib cage and diaphragm.

[4 marks]

Marks for this question AO2 = 4

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

- The diaphragm relaxes and returns to a dome shape (1)
- The intercostal muscles relax moving the rib cage down and back (1)
- The chest cavity decreases in volume (1)
- The pressure in the chest cavity increases (1)
- Pressure gradient (molecules move from high to low pressure) exists and air is pushed out (1)

Accept any other suitable response.

Maximum 4 marks

1 6 . 1 Name **two** bones located at the ankle.

[2 marks]

Marks for this question AO1 = 2

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

- Tibia (1)
- Fibula (1)
- Talus (1)

Maximum 2 marks

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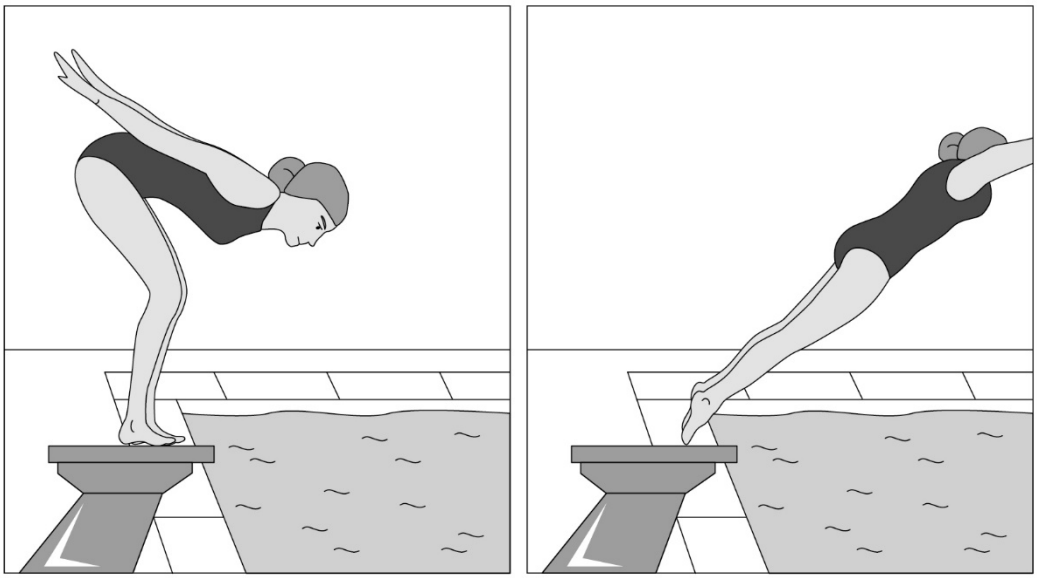
Figure 3 shows a swimmer in two different positions (**A** and **B**) as they perform a dive.

Use **Figure 3** to help you answer **Question 16.2**.

Figure 3



A **B**

1 6 . 2 Identify the class of lever used at the ankle as shown in **Figure 3**.

[1 mark]

Marks for this question AO2 = 1

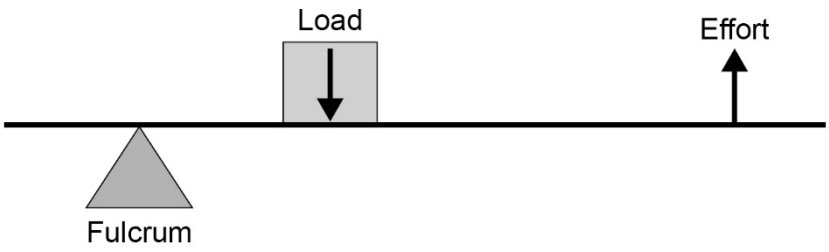
Award **one** mark for identifying the class of lever used at the ankle.

- 2nd class lever (1)

Maximum 1 mark

1 6 . 3 Draw a fully labelled diagram to show the class of lever identified in **Question 16.2**.
[2 marks]

Marks for this question AO2 = 2



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

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

NB Do **not** award marks for drawing a second-class lever if they do not identify it in **Question 16.2**.
Maximum 2 marks

1	7

Performers may train at high altitude. This usually takes place at over 2000 m above sea level for at least 30 days.

Discuss whether altitude training is an effective method of training for a long-distance swimmer.

[5 marks]

Marks for this question AO3 = 5

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

For (sub max 3 marks)

- Increase in the number of red blood cells (haemoglobin) which increases the oxygen carrying capacity of the blood, will enable the swimmer to swim more efficiently and faster for longer, therefore recording a faster time or better position in the race (1)
- Increasing the buffering capacity (ability to cope with build-up of lactic or waste acid) therefore they will not have to slow down in the latter stages of the race (1)
- The swimmer gains a competitive advantage as their aerobic capacity will have increased for a period of a few weeks (1)
- These effects will be the most significant when the swimmer competes at sea level where oxygen levels are higher and the swimmer is able to use the increased number of red blood cells to carry oxygen (1)
- Speeding up gaseous exchange. The swimmer will be able to work at a higher rate for a longer time and record faster times at sea level (1)

Against (sub max 3 marks)

- When training at altitude, detraining can occur due to the lack of oxygen which means the swimmer may not be able to train for as long or as intensely (1)
- Fitness may be lost if the swimmer is unable to swim due to altitude sickness (1)
- Psychological issues associated with training in unfamiliar surroundings/being away from home could mean they underperform whilst training and therefore do not make the necessary improvements (1)
- There are other methods available that give similar results – hypoxic tents/oxygen tents/train high, live low (1)
- Benefits can be lost relatively quickly so increased performance may only be for a short period of time (1)

Accept any other discursive point.

Maximum 5 marks

1	8	Evaluate whether the Illinois Agility Test is more relevant to a netball player than to a 200m runner. **[6 marks]**

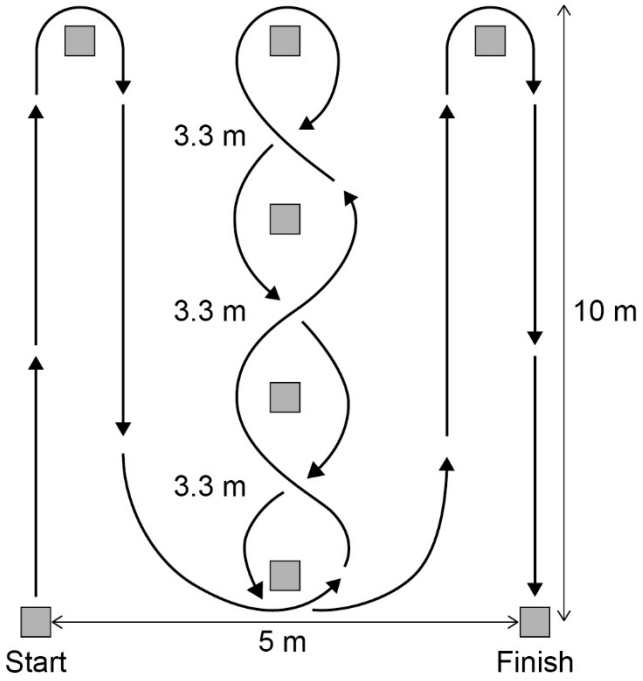
Marks for this question: AO1 = 1, AO2 = 2, AO3 = 3

Level	Marks	Description
3	5–6	Knowledge of the Illinois Agility Test is accurate and generally well detailed. Application to a netball player and to a 200m runner is mostly appropriate, clear and effective. Evaluation is thorough, reaching valid and well-reasoned conclusions as to the effectiveness of the Illinois Agility Test and its relevance to a netball player and to a 200m runner. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	3–4	Knowledge of the Illinois Agility Test is evident. There is some appropriate and effective application to a netball player and to a 200m runner, although not always balanced and presented with clarity. Evaluation is clear but reaches valid and well-reasoned conclusions for one activity more than the other. The answer lacks coherence in places, although terminology is used appropriately on occasions.
1	1–2	Knowledge of the Illinois Agility Test is limited. Application to a netball player or to a 200m runner is either absent or inappropriate. Evaluation is poorly focused or absent, with few or no reasoned conclusions for either activity. 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 the Illinois Agility Test eg

- Illinois Agility Test – a test to measure agility.
- Requires 8 cones and a 10 × 5 rectangle with 4 cones down the middle which the performer weaves in and out of as quickly as possible.



AO2 – Application to a netball player and 200m runner eg

- 200m runner does not need agility as it is a race run in a lane with a bend and a finishing straight.
- The start and finish of the Illinois Agility Test can replicate the start and finish of the 200m race.
- There is no need to change direction at speed, as the bend is a curve.
- Agility is a fundamental skill for a netball player as they continually change direction at speed.
- The test is a valid and reliable test to measure agility.
- There are standardised norms that netball players and 200m runners can compare themselves to others.

AO3 – The importance of the Illinois Agility Test to a netball player and 200m runner eg

- The Illinois Agility Test is performed in isolation. It is a general test and not specific to netball or 200m sprinting.
- The test does not replicate the movements of either activity therefore can only be used as a guide to agility and not to performance.
- 200m runner – any changes in direction could result in leaving the lane and being disqualified.
- 200m runner – no need to change direction other than to run the corner, however the runner may change their positioning within their own lane.
- Netball – agility is needed to dodge or move into space or mark opponents.
- Other tests may be more appropriate to a netball player (cardiovascular endurance) or a 200m runner (30 Metre Sprint Test).

Credit other suitable responses relevant to the question.

Maximum 6 marks

1	9

Zeke is a 15-year-old boy. He represents his local athletics club in the 800m, javelin and long jump. Zeke is about to start a weight training programme to improve his performance in these events.

Discuss the appropriateness of weight training for Zeke **and** any other factors he may need to consider to improve his performance.

[9 marks]

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

Level	Mark	Description
3	7–9	Knowledge of weight training is accurate and generally well detailed. Application of the appropriateness of weight training and other factors to improve Zeke's performance is mostly appropriate, clear and effective. Discussion is thorough, reaching valid and well-reasoned conclusions for the appropriateness of the training method and other factors. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	4–6	Knowledge of weight training is evident but is more detailed for some factors more than others. There is some appropriate and effective application of the appropriateness of weight training and other factors to improve Zeke's performance, although not always presented with clarity. Any discussion is clear but reaches 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 weight training is limited. Application to the appropriateness of weight training and other factors to improve Zeke's performance is either absent or inappropriate. Discussion is poorly focused or absent, with few or no reasoned conclusions of the appropriateness of weight training and other factors to improve Zeke's 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 weight training and other factors eg

- The use of weights/resistance to cause adaptation of the muscles
- Weight training can be used to develop muscular strength, muscular endurance or power
- Weight training involves sets and repetitions of varying weights
- Diet
- SPORT and FITT
- Rest and recovery.

AO2 – Application to Zeke eg

- Weight training can improve Zeke's muscular strength (high weights, low reps).
- Weight training can improve Zeke's muscular endurance (low weights, high reps).
- Weight training can improve Zeke's power (high weights, quickly).
- Weight training may be inappropriate as Zeke is a 15-year-old and he may suffer injuries if not performed correctly or safety considerations not adhered to.
- Manipulation of diet (carbohydrates for energy, protein for growth and repair, fluids for hydration, vitamins and minerals for effective body function).
- Application of SPORT and FITT to Zeke's weight training programme to ensure safe and effective progression.
- Rest and recovery need to be built into the training programme to prevent over-training, injury, DOMS.

AO3 – Evaluation of the appropriateness of weight training and other factors for Zeke eg

- Weight training can work on muscular endurance which Zeke will need to meet the demands of a race or competition. This component of fitness will also be necessary for when Zeke is either training or performing in an athletics meeting. It is relevant to improve his performance in all athletic events that require repeated muscular contractions such as the 800m.
- Weight training can work on Zeke's muscular strength and power. This will be needed when throwing a javelin or long jumping. This will enable him to throw further or jump higher, increasing his chances of obtaining a personal best score or winning the competition.
- Weight training can help with developing speed which is necessary in all running races/jumps and for movement in the javelin.
- Equally it can reduce speed if Zeke is carrying too much weight due to excess muscles. Zeke should tailor his training and development so that he can work at this optimal performance.
- Weight training can be tailored and adapted for a 15-year-old and can target specific muscles that are required to compete in his range of athletic events. The stronger Zeke is the more effective he should be, resulting in an improvement in performance.
- Although weight training is appropriate, however, there are other methods that can be used:
    - cardiovascular endurance training (fartlek, interval or continuous training) for the 800m
    - plyometric training for power when throwing the javelin and long jumping
    - interval training for short sprint training when sprinting in all his events.
- Zeke could have ice baths/massages to prevent DOMS/recover from weight training so that he will be able to train again quicker.
- Zeke could supplement weight training with manipulation of diet, eg carbohydrates for increased energy/protein for muscle repair and growth to carry out his training programme effectively.
- Zeke could use SPORT and FITT to inform safe and effective training.
    - Training methods need to be specific to his events.
    - Progressive overload (FITT) can be applied or monitored throughout the programme.
    - Might want to do other training methods to avoid tedium

Accept any other discursive point for the appropriateness of weight training and any other factors for Zeke.

Maximum 9 marks

Question	AO1	AO2	AO3
1		1	
2	1		
3	1		
4	1		
5		1	
6	1		
7	1		
8.1		1	
8.2	1	1	
9.1		1	
9.2		1	
9.3		1	
10.1		2	
10.2	1		3
11.1	1		
11.2	3		
11.3			3
12.1	4		
12.2		4	
13.1	1		
13.2	2		
13.3	2		
14.1	1	1	
14.2	1		
14.3	1	1	
15.1	1		
15.2	4		
15.3		4	
16.1	2		
16.2		1	
16.3		2	
17			5
18	1	2	3

19	2	2	5
Total	**33**	**26**	**19**