



AS

Physical Education

7581/W Factors Affecting Participation in Physical Activity and Sport
Final Mark scheme

7581
June 2017

Version/Stage: v1.0

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 Assessment Writer.

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.

Section A

Applied physiology

0 1

Which **one** of the following statements accurately describes Starling's law of the heart?

[1 mark]

Marks for this question: AO1 = 1

D

0 2

Fitness testing needs to be valid.

Which **one** of the following statements accurately describes validity in relation to fitness testing?

[1 mark]

Marks for this question: AO1 = 1

C

0 3 . 1

Identify the type of joint, the joint action and the main agonist at the ankle, labelled **A**, as the athlete clears the hurdle.

[3 marks]

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

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

Type of joint: Hinge (1)

Joint action: Dorsiflexion (1)

Main agonist: Tibialis anterior (1)

Maximum 3 marks

0 3 . 2

To clear the hurdle, hip flexion occurs.

State the plane **and** the axis around which hip flexion takes place.

[2 marks]

Marks for this question: AO1 = 2

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

Plane: sagittal (plane) (1)

Axis: transverse (axis) (1)

Maximum 2 marks

0 3 . **3**

The ankle operates as a lever as the athlete pushes off the ground.

Identify the class of lever operating at the ankle **and** explain the mechanical advantage of the class of lever for the athlete.

[3 marks]

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

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

Second class lever system (1)

Longer effort / force arm (1)

Therefore, the hurdler provides minimal effort to generate height to clear the hurdle (1)

Accept other appropriate explanations of the mechanical advantage of the class of lever for the athlete.

Maximum 3 marks

0 4 . **1**

State the term used to describe the increase in heart rate labelled **A** **and** name the hormone that causes this increase in heart rate.

[2 marks]

Marks for this question: AO2 = 2

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

Anticipatory rise (1)

Adrenaline / epinephrine (1)

Maximum 2 marks

0 4 . 2

Use **Figure 2** to identify the type of training method each athlete is using in the exercise session. Justify your answers.

[4 marks]

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

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

Training method used by athlete 1

Continuous (training) (1)

Justification

As after initial increase heart rate reaches steady state/remains elevated in order to maintain this intensity for the majority of the exercise period (1).

Training method used by athlete 2

Interval / circuit/ weight / fartlek (training) (1)

Justification

As graph indicates fluctuations in heart rate throughout exercise session/exercise intensity must vary during the session, the increases in heart rate indicating more intense parts of the session/drop in heart rate lower intensity/periods of recovery within session (1).

Justification for athlete 2 must refer to a number of fluctuations in heart rate.

Accept HR for heart rate as this is shown on Figure 2.

Accept justification if training method is incorrect.

Accept other appropriate explanations of the data in heart rate that explain the training method used by each athlete during the exercise session.

Maximum 4 marks

0	5
---	---

Smoking is a poor lifestyle choice because of the negative effect it can have on health and performance.

Identify **one** physiological effect of smoking on the respiratory system **and** explain its impact on performance in endurance events.

[4 marks]

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

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

AO1 (Physiological effects)

Carbon monoxide binds to haemoglobin rather than oxygen (1)

Nicotine constricts the bronchioles (1)

Damaged cilia (1)

Reduction in number / damaged alveoli (1)

Physiological effects must relate specifically to the respiratory system.

Sub-max 1 mark

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

AO2

Reduced gaseous exchange in the lungs / oxygen transport to the muscles (1)

AO3 (Impact on performance)

This decreases the athlete's ability to utilise oxygen in energy production / work aerobically (1). This means they have less energy for their activity / slower time / fatigue quicker (due to working anaerobically) (1).

Accept other appropriate physiological effects of smoking on the respiratory system and explanations of the impact on performance in endurance events.

Maximum 4 marks

0 6

It is important for sprinters to push off the blocks effectively to achieve a fast start.

Using Newton’s first and second laws of linear motion **and** knowledge of the neuromuscular system, analyse how a sprinter is able to achieve a fast start.

[8 marks]

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

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

Level	Marks	Description
4	7–8	Knowledge is consistently accurate and well detailed. Application of breadth or depth of knowledge is clearly evident. Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact. Relevant terminology is consistently used. The answer almost always demonstrates substantiated reasoning, clarity, structure and focus.
3	5–6	Knowledge is usually accurate and detailed. Application of breadth or depth of knowledge is often evident. Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent. Relevant terminology is often used. The answer usually demonstrates substantiated reasoning, clarity, structure and focus.
2	3–4	Knowledge is sometimes accurate with some detail. Application of breadth or depth of knowledge is sometimes evident. Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence. Relevant terminology is sometimes used. The answer occasionally demonstrates substantiated reasoning, but may lack clarity, structure and focus.
1	1–2	Knowledge may be limited. Application of breadth or depth of knowledge may be limited or not evident. There may be little or no analysis and/or evaluation between different relevant factors and their impact. Relevant terminology is occasionally used. The answer may lack substantiated reasoning, clarity, structure and focus.
	0	No relevant content

Possible content may include:

AO1 – Knowledge of Newton’s first and second laws of linear motion and the neuromuscular system

Newton’s first and second laws – Eg First law is the law of inertia. Inertia is a body’s reluctance to change its state of motion. A force is required to overcome inertia. Second law is the law of acceleration, the rate of change of momentum of an object is directly proportional to the force causing the change. Any change in momentum takes place in the direction the force was applied. Force = mass x acceleration.

Neuromuscular system – Eg three muscle fibre types, type I, type Ia, type IIx. Muscle contraction brought about by the recruitment of muscle fibres. Spatial summation is when the strength of a contraction changes by altering the number of size of motor units. Wave summation is where there is a repeated nerve impulse with no time to relax so a smooth, sustained contraction occurs. This is a tetanic contraction. Muscle fibres form a motor unit (with motor nerve), each muscle fibre in the unit contracting or relaxing at the same time. This is according to the all-or-none law. There are different sizes of motor unit.

AO2 – Application of Newton’s first and second law and the neuromuscular system to a sprinter

Eg The sprinters current state of inertia is stationary; to alter this state of inertia the sprinter needs to apply a muscular force by contracting his leg muscles in order to overcome his inertia so that he can leave the blocks, moving from a stationary position to begin to run.

By varying the force of his muscles’ contraction and the number of motor units recruited the sprinter can cause a change in momentum from stationary to moving. The sprinter applies a force against the blocks and then the ground to generate the required momentum to move forward down the track.

It would be beneficial to the sprinter to have a high percentage of fast twitch fibres type IIx. The sprinter will recruit large, fast twitch motor units in the leg muscles to generate the force required to overcome inertia, the sprinter will use spatial summation, varying the number of motor units recruited throughout the muscle to allow the fibres in each unit to relax whilst others are contracting to provide the necessary force.

AO3 – Analysis/Evaluation of how the sprinter is able to achieve a fast start

Eg The greater the muscular force that the sprinter can apply against the blocks, the more readily the body will alter its state of inertia, allowing the sprinter to move more quickly out of the blocks. By varying the force of his muscles’ contraction, the greater the force he generates, the greater the acceleration away from the blocks, giving him a better start than his competitors.

If the sprinter increases the frequency of stimulation of the muscle fibres in the motor unit such that the next impulse reaches the muscle before it has completely relaxed from the previous the resulting force is greater, hence the sprinter may use wave summation to increase the force of the muscle contraction further, generating a greater force and therefore greater acceleration according to Newton’s second law.

Accept other appropriate analysis of Newton’s first and second laws of linear motion and the neuromuscular system in enabling a sprinter to achieve a fast start.

Maximum 8 marks

Section B

Skill acquisition and sports psychology

0 7

A swimming teacher may use floats and arm bands with a group of beginners to keep them safe when they are learning to swim.

Identify this type of guidance.

[1 mark]

Marks for this question: AO2 = 1

B

0 8

'Feelings of apprehension and worry due to a tendency to view all competitive situations as threatening.'

Identify this type of anxiety.

[1 mark]

Marks for this question: AO1 = 1

C

0 9

In most sports, coaches can give feedback during a break in play.

Identify **and** describe **two** different types of feedback that a coach could give during a break in play. Give a sporting example to support each answer.

[4 marks]

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

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

(AO1) Positive feedback can be given by the coach, praising / recognising what is going well (1)
 (AO2) e.g. taking a quick corner catching the defence out so the goal was scored (1).

(AO1) Negative feedback can be given by the coach providing criticism/ information on what is going wrong/ weaknesses during play (1) (AO2) e.g. the team keep giving away free kicks (1).

(AO1) Knowledge of performance can be given by the coach to explain why a technique is working or not working (1) (AO2) eg if a player's shots were going over the goal the coach would explain the fault in technique causing this, ie weight on the back foot (1).

Only award a maximum of 2 marks for AO1 and AO2.

Do not award marks for identifying the type of feedback only without an appropriate description.

Sporting examples can relate to an individual performer or a team.

Accept other appropriate descriptions and examples of feedback that could be given during a break in play.

Maximum 4 marks

1 0

Figure 3 shows the relationship between arousal and performance for two different theories of arousal, labelled **A** and **B**.

Analyse **Figure 3** to identify when optimal performance occurs for each theory of arousal, labelled **A** and **B**.

[2 marks]

Marks for this question: AO3 = 2

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

A – (Catastrophe theory) – at the top of the curve/ equiv. (1).

B – (Drive theory) – at the top right end of the line / highest level of arousal (1).

Accept a clearly labelled annotated graph.

Maximum 2 marks

1	1
---	---

Vicky is a badminton player. She has recently begun to play tennis.

Explain the impact of negative **and** zero transfer of learning on Vicky's progress in tennis. Give examples from badminton and tennis to support your answer.

[4 marks]

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

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

Negative transfer

sub max 2 marks

The skills Vicky has learnt in badminton will hinder the learning of skills / techniques in tennis (1) for example, in badminton forehand shots are played with a flexible wrist but in tennis the wrist should be firmer (1).

Zero transfer

sub max 2 marks

Zero transfer means that some badminton skills will have no impact on Vicky's tennis performance, due to the differences in the skill (1). For example, in badminton, players serve underarm but the serve is overarm in tennis / no top spin in badminton (1).

Do not accept descriptions / definitions of negative and zero transfer.

Do not accept explanations relating to transfer.

Accept other appropriate explanations with examples, of the impact of negative and zero transfer of learning on Vicky's progress in tennis.

Maximum 4 marks

1 **2** . **1** Classify the corner kick in football using the following continua:

- open – closed
- self-paced – externally paced.

Justify your answers.

[2 marks]

Marks for this question: AO3 = 2

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

Open-closed: closed/towards closed end of continuum because the opposition cannot directly interfere with the player taking the corner (1).

Open-closed: open/ towards open end of continuum because the players are constantly moving around which will affect the player's decisions taking the corner (1).

Self-paced – externally-paced: self-paced/towards self-paced end of continuum because the player decides when they want to kick the ball (1).

Self-paced – externally-paced: externally-paced/towards externally-paced end of continuum because the player has to take the corner when the referee has blown the whistle (1).

Accept identification of classification of skill if appropriately circled/underlined on answer book.

Accept other appropriate justifications for alternative classification of the corner kick on the open/closed and self-paced/externally-paced continua.

Maximum 2 marks

1 **2** . **2** Describe the high – low organisation skill continuum.

[2 marks]

Marks for this question: AO1 = 2

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

This continuum refers to how easily a skill can be broken down / the nature of phases / subroutines that make up a skill (1).

Low organisation skills tend to be made up of discrete phases / subroutines / can easily be broken down / phases can be practiced separately (1)

High organisation skills tend to have phases / subroutines that cannot be easily broken down / the phases of the skill cannot be practiced separately (1).

Accept other appropriate descriptions of the high-low organisation skill continuum.

Maximum 2 marks

1	2
---	---

 .

3

 Give **one** example of a low organisation skill in football.

[1 mark]

Marks for this question: AO2 = 1

Award **one** mark for an appropriate example of a low-organisation skill.

Taking a penalty/passing the ball/taking a goal kick/making a shot/throw in (1).

Accept any other suitable example of a low-organisation skill in football.

Maximum 1 mark

1	3
---	---

 The Triadic model helps to explain attitudes and how they are formed.

Describe how attitudes can be changed through cognitive dissonance.

[3 marks]

Marks for this question: AO1 = 3

Award **one** mark for any of the following points.

Create a feeling of psychological discomfort/ unease/ conflict/ disharmony (1)
(through) putting pressure/ challenging beliefs (cognitive)/emotions (affective)/behaviour through
new information (1)

Changing one of the components so attitudes are aligned / discomfort is resolved (1)

Accept other appropriate descriptions of how attitudes can be changed through cognitive dissonance
with reference to specific components of the Triadic model (beliefs (cognitive)/emotions
(affective)/behaviour).

Maximum 3 marks

1 4

Coaches need to consider the nature of the skills and the experience of the performers when structuring a practice session.

Evaluate the use of massed **and** distributed practice when coaching a group of beginners, in a game such as basketball.

[8 marks]

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

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

Level	Marks	Description
4	7-8	Knowledge is consistently accurate and well detailed. Application of breadth or depth of knowledge is clearly evident. Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact. Relevant terminology is consistently used. The answer almost always demonstrates substantiated reasoning, clarity, structure and focus.
3	5-6	Knowledge is usually accurate and detailed. Application of breadth or depth of knowledge is often evident. Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent. Relevant terminology is often used. The answer usually demonstrates substantiated reasoning, clarity, structure and focus.
2	3-4	Knowledge is sometimes accurate with some detail. Application of breadth or depth of knowledge is sometimes evident. Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence. Relevant terminology is sometimes used. The answer occasionally demonstrates substantiated reasoning, but may lack clarity, structure and focus.
1	1-2	Knowledge may be limited. Application of breadth or depth of knowledge may be limited or not evident. There may be little or no analysis and/or evaluation between different relevant factors and their impact. Relevant terminology is occasionally used. The answer may lack substantiated reasoning, clarity, structure and focus.
	0	No relevant content.

Possible content may include:

AO1 – Knowledge of massed and distributed practice structures and the advantages and disadvantages in isolation

Eg, Massed practice is a form of continuous practice as there is little if any rest between attempts of the skill so little feedback can be given.

Massed practice should be used with players who are fit enough to continuously practice the skill without a rest. Massed practice is often used to develop fitness and is good as it allows closed skills to become habitual.

Distributed practice has breaks in-between practice blocks or trials. It is often used with beginners, players who are unfit or if the skill being practiced is dangerous or open. If the skill being developed is a gross skill or continuous skill distributed practice would be also used. It is good because it allows for rest.

AO2 – Application of massed and distributed practices to a sport / basketball

Eg, Examples of massed practice would be a continuous session of basketball lay-up shots, without breaks in-between trials. Feedback could still be given but this would be whilst the players were performing the skill.

Massed practice would be used with highly motivated performers due to the constant practice, highly motivated performers tend to be those who are good at a sport, therefore, the clubs first team or senior team may use this type of practice. Massed practice is good when the skill is simple, there are some simple skills in basketball, for example, dribbling, some passes, catching so massed practice could be used for these skills once the basics had been taught. Massed practice is also good for discrete skills, such as shooting.

AO3 – Analysis/Evaluation through discussion of the potential impact of the correct/incorrect practice selection on the players' learning as a beginner

Eg, As the basketball group are beginners the coach should use distributed practice structure rather than massed practice as this will allow time for feedback from the coach about the performance of the skill in basketball, allowing the player opportunity to develop a better understanding of the skill and improve.

Distributed practice will also give the players opportunity to rest so that they can focus more on the instruction and the skill being developed rather than being concerned about being fatigued. This type of practice also allows the coach to vary the activities so that the beginners do not become bored, therefore reducing the chances that they will wish to drop out.

As the beginners develop their fitness and skill level they could use massed practice as basketball is not a dangerous game/doesn't involve dangerous skills therefore as the players' fatigue this will not impact on their safety. Massed practice could also be used if there was limited time available to learn the skill, as time would not be lost with breaks or alternate activities and of course massed practice best reflects the fast pace of the game of basketball so would be good preparation for this.

Accept other appropriate evaluations of the use of massed and distributed practice when coaching a group of beginners, in any stated sport.

Maximum 8 marks

Section C

Sport and society and technology in sport

1 5

Which **one** of the following statements accurately describes the term urbanisation?

[1 mark]

Marks for this question: AO1 = 1

B

1 6

Which **one** of the following areas of fitness can be measured using indirect calorimetry?

[1 mark]

Marks for this question: AO1 = 1

A

1 7

Explain how the two-tier class system influenced the nature of sporting recreation in pre-industrial society.

[4 marks]

Marks for this question: AO1 = 2 and AO2 = 2

(AO1) The class system determined an individual's status, (1) (AO2) and therefore the type of activity that would be appropriate for them to engage in (1).

(AO1) The upper class / gentry would participate in real tennis / rational recreation (1) (AO2) because they had the land / more time / money / facilities / could afford equipment / were educated so could understand the rules (1).

The lower class / peasants would play mob football / popular recreation (1) because this reflected their harsh living conditions / they did not have access to land and resources enjoyed by the gentry / were illiterate and so could not understand rules (1).

(AO1) (Different classes had different roles within the same activity) upper class would wager on lower class in activities such as pedestrian activities (1) (AO2) because upper class had money / was form of entertainment / for high status (1).

Only award a maximum of 2 marks for AO1 and AO2.

Do not accept characteristics of popular and rational recreation without linkage to the two tier class system and how it influenced recreation.

Accept other appropriate explanations of how the two-tier class system impacted on sporting recreation in pre-industrial society.

Do not accept any reference to the middle classes.

Maximum 4 marks

1	8
---	---

Define the terms discrimination and stereotyping **and** explain how each can cause low participation rates amongst underrepresented groups in sport. Give sporting examples to support your answer.

[6 marks]

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

Discrimination

sub max 3 marks

AO1 (Definition) - Discrimination is unfair treatment of a person based on a stereotype or prejudice (1)

AO2 (Sporting example) - A person with a disability would be discriminated against if they were denied access to a club because they were a wheelchair user (1).

AO3 (Explanation of impact of unfair treatment) - Without the same level of access as other groups of users / With reduced confidence / As a result of feeling excluded those with a disability will be less likely to take part in sport (1).

Stereotyping

sub max 3 marks

AO1 (Definition) - A stereotype is a preconceived idea about a group (1)

AO2 (Sporting example) - Some people may believe that women should not play sport / certain sports (1).

AO3 (Explanation of impact of stereotyping) – If women / others in positions of power believe these stereotypes then they may feel they cannot participate leading to under-representation of women in sport (1).

All examples should relate to how discrimination and stereotyping cause low participation rates amongst underrepresented groups in sport.

The explanation of how discrimination and stereotyping can cause low participation rates amongst underrepresented groups in sport should relate to an individual and so the impact of fewer role models, media coverage etc.. is not creditworthy.

Accept other appropriate definitions/explanations of how discrimination and stereotyping can cause low participation rates amongst underrepresented groups in sport.

Maximum 6 marks

1	9
---	---

Explain how **two** characteristics of sport are evident in the game of tennis.

[4 marks]

Marks for this question: AO2 = 2 and AO3 = 2

(AO2) Tennis is highly structured / organised / has (codified) rules (1) (AO3) e.g. court size/how many times the ball can bounce / leagues and fixtures (1).

(AO2) Tennis is institutionalised / has a national governing body (1), (AO3) e.g. who decide on rule changes / regulates rules / organise competitions (1).

(AO2) Tennis has officials (1), (AO3) e.g. there is a line judge / umpire (1).

(AO2) Tennis you play for extrinsic rewards (1), (AO3) e.g. you can win prize money / trophies / titles (1).

(AO2) Tennis is competitive/serious (1), (AO3) e.g. the aim is to win games / sets (1).

(AO2) Tennis is skilful / involves tactics and strategies (1), (AO3) e.g. there are lots of different types of shots you can play (1).

Only award a maximum of 2 marks for AO2 and AO3.

Accept other appropriate explanations of how tennis reflects the characteristics of sport.

Maximum 4 marks

2	0
---	---

Sport England's aim is to increase the number of people participating in sport and physical activity.

Explain **one** physical health benefit **and one** social health benefit to an individual who has increased their levels of physical activity.

[4 marks]

Marks for this question: AO1 = 2 and AO3 = 2

Physical health benefit

(AO1) Increased bone density (through regular weight bearing exercise) (1) (AO3) will reduce the risk of osteoporosis in later life (1).

(AO1) Increased physical fitness / cardiovascular endurance / reduction in blood pressure / reduction in cholesterol / achieving a healthy body weight / achieve correct blood glucose levels (through aerobic exercise) (1) (AO3) will reduce the risk of a heart attack / heart disease / stroke / type 2 diabetes (1).

(AO1) Increased joint flexibility (through stretching exercises / activities) (1) (AO3) will reduce the risk of arthritis / will maintain joint mobility in later life (1).

Social health benefit

(AO1) Acceptance of rules/decisions of others/working with others/make friends (1) (AO3) will develop a sense of fair play/teamwork/improve social/communication skills (1).

Losing weight will only be accepted if it is justified that an individual would need to lose weight due to being overweight prior to increasing levels of physical activity.

Do not accept reference to mental health benefits.

Accept other appropriate explanations of physical and social health benefits to an individual who has increased their levels of physical activity.

Maximum 4 marks

2	1
---	---

Table 1 shows the winning times for the men’s 100 metres final from previous Olympic Games.

Consider how commercialisation **and** the improvement in technology for sports analytics have affected performance in the 100 metres at the Olympic Games. Use the data in **Table 1** to support your answer.

[8 marks]

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

Students are expected to answer in continuous prose, use good English, organise information clearly and use specialist vocabulary where appropriate.

Level	Marks	Description
4	7-8	Knowledge is consistently accurate and well detailed. Application of breadth or depth of knowledge is clearly evident. Analysis and/or evaluation is coherently and consistently made between different relevant factors and their impact. Relevant terminology is consistently used. The answer almost always demonstrates substantiated reasoning, clarity, structure and focus.
3	5-6	Knowledge is usually accurate and detailed. Application of breadth or depth of knowledge is often evident. Analysis and/or evaluation is often made between different relevant factors and their impact, and is usually coherent. Relevant terminology is often used. The answer usually demonstrates substantiated reasoning, clarity, structure and focus.
2	3-4	Knowledge is sometimes accurate with some detail. Application of breadth or depth of knowledge is sometimes evident. Analysis and/or evaluation is sometimes made between different relevant factors and their impact, but may lack coherence. Relevant terminology is sometimes used. The answer occasionally demonstrates substantiated reasoning, but may lack clarity, structure and focus.
1	1-2	Knowledge may be limited. Application of breadth or depth of knowledge may be limited or not evident. There may be little or no analysis and/or evaluation between different relevant factors and their impact. Relevant terminology is occasionally used. The answer may lack substantiated reasoning, clarity, structure and focus.
	0	No relevant content.

Possible content may include:

AO1 – Knowledge of commercialisation and technology for sports analytics

Commercialisation

Eg, This is the selling of a product for profit. In order to sell a product, commercial enterprises need access to as many people as possible; this is achieved through the media. The link between the media and commercialisation and sport is often referred to as the golden triangle, each corner of the triangle impacting on the others.

With improvements in technology sport is now available to a mass audience, increasing the commercial value of sport. Sport is accessible via many different media outlets, for example, radio, TV and the internet.

Technology for sports analytics

Eg, Sports analytics is the use of data to better understand a performance in sport. It can be used to collect different types of data, e.g. athlete performance data, biomechanical data, fitness data. Using technology data becomes objective, providing valid and reliable data on which to base further analysis.

AO2 – Application to the 100 metre sprinter

Eg, Commercialisation makes more money available to the sprinters through sponsorship deals or televised appearances in commercials.

Sprinters can use this money to finance their training. As sport has become more commercial more funding has been available so the athlete can work with the best coaches, sports nutritionists, sports psychologists, and other professionals who can help them achieve and maintain peak performance.

Technology for sports analytics will improve data collection, for example, during training sprinters may wear motion detecting sensors, which capture their performance which can then be analysed to search for any slight weakness, or area for improvement.

AO3 – Analysis/Evaluation through discussion of the potential impact of commercialisation of sport and use of technology on sprint times

Eg, Despite the data anomaly of 1976 (where times increased), the data trend shows an improvement in 100m sprint times, from 10.40 s in 1952 to 9.63 s in 2012. This is a significant improvement in performance over time. If these two performers raced side by side the runner from 2012 would complete the race metres in front of the opposition. The anomaly in 1976 where times dropped could be due to a number of factors, for example, nations boycotting the event, the quality of the running track, the running environment.

Commercialisation

Eg, This increase in performance could be due to the additional time athletes can spend training as a result of the increased funding available due to commercialisation. Even though the Olympics is still an amateur sport there is increased funding available for talented and elite athletes, for example lottery funding, which can be used to finance increased/more targeted levels of training. There is also sponsorship and endorsement possibilities for high profile elite athletes, like those who win the 100m which means they can train full time rather than have to combine training with work. Through increased fitness, from the additional training, performances will improve.

Technology for sports analytics

Eg, Due to increased revenue for the sport as well as the performer through commercialisation money has been available to develop sport technology to further improve sport performance. For example, through improved data collection of performance, e.g. running gait, the biomechanics of the

sprinters running action can be analysed, increasing the efficiency of the sprinter, improving their time. Weaknesses can be more readily identified and corrected, again improving time.

Accept other appropriate considerations of how commercialisation and the use of technology for sports analytics have affected performance in the 100 metres at the Olympic Games.

Maximum 8 marks

Assessment Objective Grid

	AO1	AO2	AO3	Total
Applied physiology				
01	1 Recall			1
02	1 Recall			1
03.1	1	1	1	3
03.2	2			2
03.3	1	1	1	3
04.1		2 Quant		2
04.2		2 Quant	2 Quant	4
05	1	1	2	4
06	2	3	3	8 Synop
Total	9	10	9	28
Skill acquisition and sports psychology				
07		1		1
08	1 Recall			1
09	2	2		4
10			2 Quant	2
11		2	2	4
12.1			2	2
12.2	2 Recall			2
12.3		1		1
13	3 Recall			3
14	2	3	3	8 Synop
Total	10	9	9	28
Sport in society and technology in sport				
15	1 Recall			1
16	1 Recall			1
17	2	2		4
18	2	2	2	6
19		2	2	4
20	2		2	4
21	2	3	3 Quant	8
Total	10	9	9	28
Paper Total	29	28	27	84
AO% for paper	35%	33%	32%	100%
AO% for Qual	24%	23%	22%	

AO1% targeting knowledge in isolation = 10 marks
Quantitative = 11 marks
Synoptic = 16 marks

8.3%
9.2%
13.3%