

A Level Physical Education

Bridging Project

Thank you for choosing A Level Physical Education. By completing this project you will gain an understanding of a range of topics included in the AQA specification. This will both prepare you and show staff that you have the work ethic and skills required to be successful on the course.

If you would like any further information on the A Level PE course please don't hesitate to email Mr Atkinson (t.atkinson@macademy.org.uk) or visit the AQA website page for the course (<https://www.aqa.org.uk/subjects/physical-education/as-and-a-level/physical-education-7582>).

To complete this project you will need access to the 'PE Review' magazines. These can be found at:

<https://my.dynamic-learning.co.uk/>

Your log in details are:

Student username: APEArchive

Student password: student

Centre ID: 15981

Once you are logged in scroll down to select the **PE Review Magazine Archive** finding the volume and issue you require.

If you have any issues gaining access, please contact Mr Atkinson as it is vital for successfully completing the tasks.

The first seven topics/tasks focus on one topic from each unit of the course. They are designed to build up a knowledge base which can then be applied to your final piece of work. The students who complete this project to the highest standard will demonstrate a genuine interest in sports science, and showcase their independent study skills, by going beyond the specified resources for all of the tasks. This may include additional research from,

- Google searches of website (these may or may not be sport related)
- News searches of current stories relating to the topics
- YouTube videos
- Additional articles from the PE Review

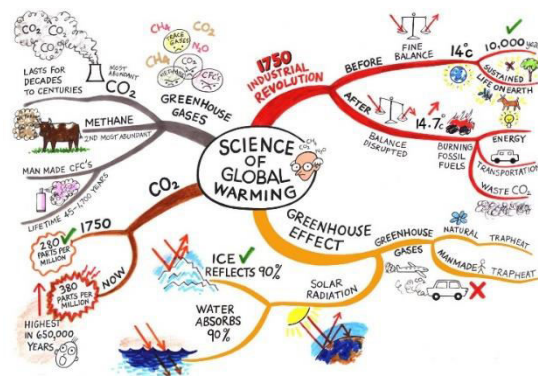
Please complete all work and keep it safe ready to bring into school.

For each topic you must actively read the PE Review article, making notes, and completing any additional research. There are then a couple of review questions which you should answer, mark and correct (mark schemes can be found at the back of the booklet).

In addition to questions you should complete one large mind map which includes information on all 7 topics.

Success criteria....

- Cover all 7 topics in as much detail as possible
- Colour coded for different topics
- Dual coded (pictures and text)
- Be concise with as few words as possible (key terms only)
- Make links to the real life sport where ever possible



There is then a final task which pulls together everything you have learnt during this project; can remember from GCSE PE; or have picked up from additional research. It is in this task that you will have

the chance to show the progress you have made, and the skills you have, which will allow you to succeed as an A level PE student.

Applied Anatomy and Physiology: Muscle Fibre Types

Characteristics and functions of different muscle fibre types for a variety of sporting activities.	Slow twitch (type I). Fast glycolytic (type IIx). Fast oxidative glycolytic (type IIa).
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Reading: PE Review Volume 15; Number 3; Page 12; Exam Focus: Muscle Fibres

Review Questions

Q1.

- (a) Fast twitch glycolytic muscle fibres (type IIx) are used to produce powerful contractions.

Identify **two** characteristics of fast twitch glycolytic muscle fibres (type IIx).

(2)

- (b) Explain how the characteristics of fast twitch glycolytic muscle fibres (type IIx) you identified in **part (a)** are suited to producing ATP anaerobically during powerful contractions.

(2)

(Total 4 marks)

- Q2.** Performers have to improve the capacity of the appropriate muscle fibres for their sport and to recover as quickly as possible following exercise.

Name the muscle fibre type in use during an endurance race **and** identify the physiological characteristics that allow these muscle fibres to work for an extended period of time.

(Total 3 marks)

Skill Acquisition: Skill Continua

Use of skill continua.	Open – closed. Discrete – serial – continuous. Gross – fine. Self-paced – externally paced. High – low. Simple – complex.
Justification of skill placement on each of the continua.	

Reading: PE Review Volume 15; Number 1; Page 31; [Classification of Skill](#)

Review Questions

Q1. Describe the high – low organisation skill continuum.

(Total 2 marks)

Q2. Explain, using a suitable practical example for each, the terms simple skill and complex skill.

(Total 4 marks)

Q3. Skills can be classified on continua as:

- open – closed
- self-paced – externally paced
- discrete – serial – continuous.

(i) Classify the skill of taking a penalty in football using these **three** continua.

(1)

(ii) Explain how shooting at goal during general play may alter these classifications.

(2)

(Total 3 marks)

Sport and Society: The Golden Triangle

Characteristics and impact of the Golden Triangle (limited to development of association football, tennis and athletics).	The interrelationship between commercialisation (including sponsorship), media (radio, TV, satellite, internet and social media) and sports and governing bodies.
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Reading: PE Review Volume 15; Number 2; Page 2; [The golden triangle: how television commercialised sport](#)

Review Questions

Q1. Explain the positive effects the media has had on the modern form of association football.

(Total 4 marks)

Q2. Post–World War II commercialisation has impacted on sport.

Discuss the effects of commercialisation on lawn tennis.

(Total 4 marks)

Exercise Physiology: Exercise-Related Function of Food Classes

Understand the exercise-related function of food classes.	Carbohydrate. Fibre. Fat (saturated fat, trans fat and cholesterol), protein, vitamins (C,D, B-12, B-complex), minerals (sodium, iron, calcium), water (hydration before, during and after physical activity).
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Reading: PE Review Volume 13; Number 2; Page 9; [The Exercise-Related functions of food](#)

Review Questions

Q1. To be more effective in physical activity, performers will consider their lifestyle choices. Diet is one lifestyle choice.

(i) What do you understand by the term balanced diet?

(1)

(ii) Briefly explain how **two** different named classes of food in an athlete's diet will aid his / her performance.

(2)

(Total 3 marks)

Q2. When participating in physical activity, it is important to drink water to stay hydrated.

What are the possible physiological effects of a lack of water on a performer?

(Total 3 marks)

Q3. During a training programme to prepare for a marathon, endurance athletes will often supplement their diets to optimise performance.

Explain why a marathon runner may 'glycogen load' in the days leading up to a race.

(Total 3 marks)

Biomechanics: Newton's Laws of Motion

Newton's Three Laws of linear motion applied to sporting movements.	First law (inertia), second law (acceleration), third law (action/reaction). Force.
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Reading: PE Review Volume 10; Number 1; Page 9; [Sprints Starts and Newton's Laws of Motion](#)

Review Questions

Q1.

During the race, a swimmer has to dive off the starting blocks as quickly as possible.

Using 'Newton's First **and** Second Laws of Motion', explain how the swimmer dives off the starting blocks.

(Total 4 marks)

Q2.

The final stage of an endurance race often involves a sprint finish.

Using Newton's Second Law of Motion, explain how an athlete is able to accelerate towards the finish line.

(Total 3 marks)

Sports Psychology: Arousal

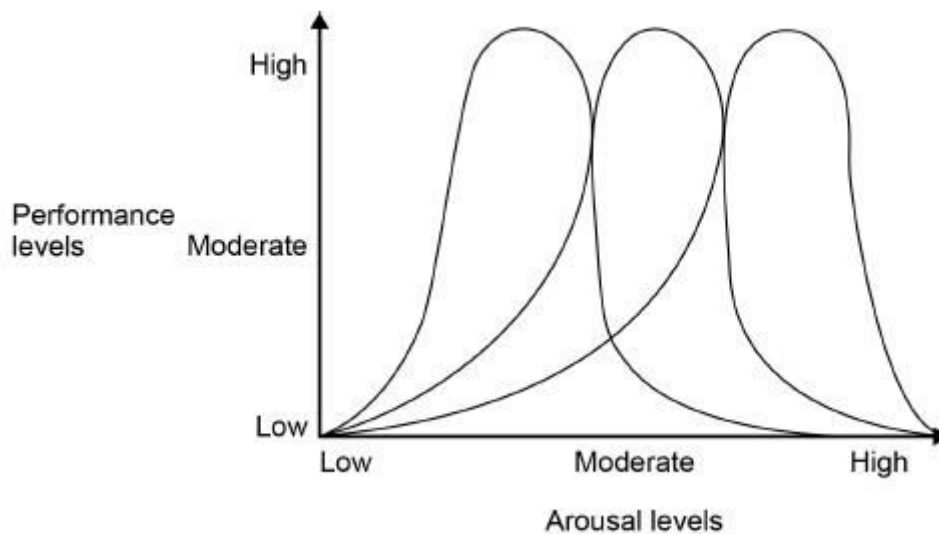
Theories of arousal.	Drive theory, inverted U theory, catastrophe theory and zone of optimal functioning theory.
Practical applications of theories of arousal and their impact on performance.	
Characteristics of peak flow experience.	

Reading: PE Review Volume 2; Number 1; Page 2; [Arousal](#)

Review Questions

Q1. To maximise the chance of success an elite performer must reach their optimum level of arousal.

The graph shows the inverted U theory illustrating different levels of arousal.



Describe how the nature of a task may affect the optimum level of arousal **and** outline the possible impact of under-arousal on performance.

(Total 4 marks)

Q2. During a tennis match, a player may display signs of anxiety and become over-aroused.

Using the 'catastrophe theory', describe how over-arousal may affect a player's performance.

(Total 4 marks)

Sport and Technology: Sports Analytics

Understanding of technology for sports analytics.	Use of technology in data collection (quantitative and qualitative, objective and subjective, validity and reliability of data). Video and analysis programmes. Testing and recording equipment (metabolic cart for indirect calorimetry). Use of GPS and motion tracking software and hardware. Maintaining data integrity.
Functions of sports analytics.	Monitor fitness for performance. Skill and technique development. Injury prevention. Game analysis. Talent ID/scouting.

Reading: PE Review Volume 14; Number 2; Page 2; [Technology in professional sport: an interview with Jack Riley](#)

Review Questions

Q1. Satellite based navigation is often carried out using GPS.

What does GPS stand for?

- A Geographic positioning software
- B Geographic positioning system
- C Global positioning software
- D Global positioning system

(Total 1 mark)

Q2. Explain **two** ways in which analytics may be beneficial for a performer. Use a named game of your choice (e.g. netball) in your answer.

(Total 2 marks)

Q3. Describe ways that a coach can benefit from the use of technology.

(Total 3 marks)

Final Project

Your final piece of work can take whatever form you like e.g. an essay; a book chapter; an audio book chapter; a podcast; a newspaper article; a PowerPoint, a YouTube video; a PE Review article etc. The more creative the better.

The aim is to demonstrate your ability to apply the knowledge you have developed from the previous tasks and your independent study.

To do this you must analyse the differences between,

Zoe Smith and the skill of weightlifting



Kerri Ann Payne and the skill of marathon open water swimming



After researching each athlete and their sport ensure you consider muscle fibre types; classification of skill; the golden triangle; diet; Newton's laws of motion; arousal; and technology in sport.

If you look at the specification what other differences could you highlight?

This work should take a considerable amount of time and be produced at an A Level standard. This piece of work will be the primary determining factor as to how well suited you are to study A Level PE.

Mark schemes

Applied anatomy and physiology: Muscle Fibres

Q1.

[AO1 = 2]

(a) Award **one** mark for each of the following points.

- Fast motor neurone conduction velocity (1).
- Large muscle fibre diameter (1).
- More sarcoplasmic reticulum development (1).
- High PC stores (1).
- High glycogen stores (1).
- High myosin ATPase/glycolytic enzyme activity (1).

Do **not** accept produce powerful contraction (in the stem).

Accept other appropriate characteristics of fast twitch glycolytic muscle fibres (type IIx).

Max 2 marks

[AO2 = 2]

(b) Award **one** mark for each of the following points.

- High PC stores – increased energy source for ATP production via the ATP-PC system (1).
- High glycogen stores – increased energy source for ATP production via the lactate anaerobic system (1).
- High myosin ATPase activity – increased enzyme activity for ATP production within the ATP-PC system (1).
- High glycolytic enzyme activity – increased enzyme activity or ATP production within the lactate anaerobic system (1).

Max 2 marks

[4]

Q2.

3 marks for 3 of:

Slow twitch fibres / type 1 / slow oxidative fibres
High number of / larger mitochondria

High level of myoglobin

High capillary density

High levels of triglyceride

High levels of oxidative enzymes

[3]

Skill Acquisition: Skill Continua

Q1.

[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.

Max 2 marks

[2]

Q2.

Award **one** mark for each of the following points (max 4 marks):

Credit suitable practical examples

Simple Skill

- One or few stimuli to process / limited information to process / one or few decisions to make / skill with few subroutines / limited cognitive demand / limited perceptual requirements / less feedback / limited decision making / one movement
- e.g. running / sprinting / sprint start / throwing / kicking / jumping

Complex Skill

- Many stimuli to process / lots of information to process / many decisions to make / increased perceptual requirements / more feedback / skill with more or many subroutines / several movements
- e.g. batting or bowling in cricket / basketball dribble / tennis serve / hitting a ball / gymnastics routine / somersault / high jump / triple jump / golf swing / receiving a ball in a game / delivering a pass in a game

[4]

Q3.

(i) Closed – self-paced – discrete

1

(ii) Closed becomes open – (affected by the environment) need to make decisions due to opponents or team mates or environmental factor

Self-paced becomes externally paced – environment decides when player shoots.

Answers must be in relation to the game, not just a definition

2

[3]

Sport and Society: The Golden Triangle

Q1.

[AO2 = 4]

- Due to increased media coverage of association football there has been an increase in positive role models for the public to identify with, for example Cristiano Ronaldo, Lionel Messi.
- This has also meant that there is a huge amount of funding and sponsorship opportunities / advertising income to football due to the TV rights from Sky and BT.
- Due to increase in media coverage of women playing, football myths and stereotypes can be broken associated with the ability of women to play sports such as football to a high level.
- The positive impact of the introduction of technology via advances in media, for example, referees being miked up has been positive due to the audience being able to hear decisions / discussions.

[4]

Q2.

[AO3 = 4]

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

Advantages (Sub max 3 marks)

- Increases in funding that comes with commercialisation have led to better facilities / technology, coaching and opportunities (1)
- Increased funding leading to increased prize funds / salaries and opportunities for women players (1)
- Increased funding has led to increases in coverage of lawn tennis on TV – leading to increased media involvement, which can lead to increased rights / contracts generating more income for lawn tennis (1)
- Lawn tennis can become commodity of business, which supports the endorsement of products, bringing increased sales and subsequently increased sponsorship of sport (1)
- Supports and encourages professionalism, whereby higher standard of play / higher skill levels which can increase spectator appeal (1)
- More opportunity for grass-roots development / participation (1)
- Lawn tennis may see alterations to competition structures to create more excitement (1).

Disadvantages (Sub max 3 marks)

- Viewing times and the game structure interrupted by media advertising which may not suit (1)
- Rules of the game may change losing traditional nature / competition formats may change (1)
- Increased usage of technology, hawk-eye and appeals methods during game, reducing the flow of the game (1)
- Money involved means that performers develop a win at all costs mentality which could ruin the reputation of lawn tennis / match fixing / cheating (1)
- Pressure to keep performing, making them anxious / fatigued / play when injured (1).

Accept any other effects of commercialisation on lawn tennis.

Max 4 marks

[4]

Exercise Physiology: Exercise-Related Function of Food Classes

Q1.

- (i) Sufficient / enough / correct amount of each component
Idea of correct rather than lots
- (ii) Sufficient carbohydrates for energy
Sufficient fats for energy
Sufficient protein – (muscle) growth / repair development
Sufficient minerals – bone formation / muscle function / increased (energy) metabolism / electrolyte balance / blood formation / equiv
Sufficient vitamins – increased (energy) metabolism / blood formation / equiv;
Sufficient water – medium for reactions / lubricant / regulate temperature / avoid dehydration

1

2

[3]

Q2.

Increased body temperature / overheating
Reduced sweating / reduce blood flow to skin
Increased blood viscosity / blood becomes thicker / reduction in blood plasma
Increased heart rate / cardiovascular drift
Lower blood pressure
Lower cardiac output / stroke volume / venous return
Transportation of oxygen / carbon dioxide less efficient
Loss of electrolytes / possible cramp
Headaches / dizziness / fainting

*Do **not** accept dehydrated as hydration is in the question stem*

[3]

Q3.

[AO1 = 1 AO2 = 2]

AO1 (sub-max 1 mark)

- Reduce glycogen levels by endurance training / exercise / explanation of tapering down of exercise and tapering up of carbohydrate (1).
- Day before competition complete three minutes of high intensity exercise / high carbohydrate diet to make use of opening of 'carbo window' (1).
- Non-depletion protocol / reduce training intensity the week before competition / three days before competition follow high carbohydrate diet / light training (1).

AO2 (sub-max 2 marks)

- Used to 'supercompensate' for high glycogen demand (1).
- Potential to run out of carbohydrate / hit the wall / reduced performance (1).
- Glyco-loading delays the onset of fatigue / delays hitting the wall (1).
- Depletion of carbohydrate / glycogen would result in an inability to

maintain intensity / affects muscle function, etc (1).

Max 3 marks

Biomechanics: Newton's Laws of Motion

Q1.

4 marks for 4 of :

Force is applied by the muscles.

Sub max 2 marks

Newton's First Law of Motion / Law of inertia

Performer will remain on the blocks unless a force is applied.

Do not credit push.

Performer continues to move forwards with constant velocity until another force is applied.

Law has to be identified to be credited marks.

Water slows the swimmer.

Newton's Second Law of Motion / Law of Acceleration

Mass of swimmer is constant.

Stating the law no marks but must be applied to the swimmer.

Greater the force exerted on the blocks, the greater the acceleration / momentum

Force governs direction.

Don't accept velocity.

Not $F=ma$.

[4]

Q2.

3 marks for 3 of :

Mass of runner is constant.

Force = Mass x Acceleration.

Not $f = ma$ – full terms only.

Greater the force exerted on the floor, the greater the acceleration / momentum / proportional.

Force governs direction.

Force provided by muscular contraction.

*Do **not** accept 'legs'.*

Ground reaction force.

must be in context / not GRF.

[3]

Sports Psychology: Arousal

Q1.

[AO1 = 2 AO3 = 2]

4 marks for 4 of:

- A. (Nature of the Task) complex or fine skills need lower levels of arousal
- B. (Nature of the Task) simple or gross skills need higher levels of arousal
- C. (Impact on performance) poor selective attention / cues missed
- D. (Impact on performance) lack of concentration/focus
- E. (Impact on performance) social loafing / social loafer
- F. (Impact on performance) Ringelmann effect
- G. (Impact on performance) slower / poor reaction time / response time/slower decision making
- H. Attentional wastage
- I. Attentional narrowing
- J. Failed to reach zone of optimal functioning / peak flow experience

Sub-max 2 marks points C - J

Max 4 marks

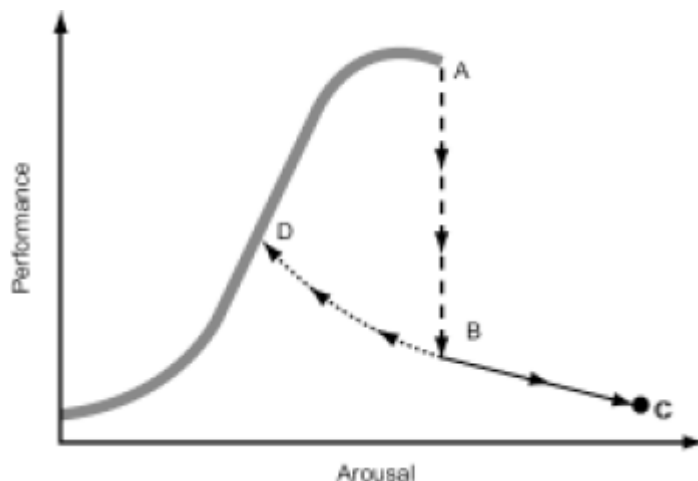
[4]

Q2.

4 marks for 4 of :

Performers need moderate / optimum levels of arousal to perform at their best.

Annotated diagrams can be credited.



Over-arousal causes a decrease in performance;
Performer can recover (if only slight over-arousal);
Caused by cognitive anxiety;
Performance can continue to decrease and not recover;
Caused by cognitive and somatic anxiety;
Recovery time can vary depending on the level of overarousal and the performer / duration of the event.

[4]

Sport and Technology: Sports Analytics

Q1.

[AO1 = 1]

D

[1]

Q2.

[AO2 = 2]

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

Answer for netball (other game activities can be used).

- Can monitor the amount of court covered during a game to ascertain if position is played effectively (1).
- Real-time technical feedback can be given by coach to improve awareness and improve technique (1).
- Small GPS receivers can monitor distance covered, acceleration, speed to provide physiological data for analysis / training plans (1).
- Tactics can be monitored and evaluated, e.g. possession area of the court that results in the most goals being scored (1).

Accept any other explanation of ways in which analytics may be beneficial for a performer. Answers must relate to an example of a game.

Max 2 marks

[2]

Q3.

Award **one** mark for each of the following points (max 3 marks):

- Video analysis of matches to highlight strengths/weaknesses and or tactics/strategies
- Video analysis of technique – dartfish
- Detail analysis of success of nutrition/training programmes
- New training techniques/equipment to improve performance
- Specific/detailed recording of performances/split time

[3]