



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Learning about this topic is the first theoretical content of the A-Level Physical Education course. It will be examined in the AS/A-Level Paper 1 examination. Physiological factors affecting performance, focuses on developing the student's knowledge of the science behind physical activity. Through the study of this section, students will gain a deeper understanding of the forces and its involvement in human movement and physical activity.

This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of forces, speed, velocity, acceleration and momentum and its effects on sport and practical situations.

We will learn:

Definitions

Calculations

Working example

Distance

Displacement

Speed

Velocity

Force

Acceleration

Deceleration

Momentum

Understanding of distance- time graphs, speed-time graphs, velocity – time graphs.

Understanding and application of balanced and unbalanced forces

Be able to label and explain free body diagrams

We will develop/practise skills including:

Develop knowledge and understanding of distance- time graphs, speed-time graphs, velocity – time graphs.

Interpret the graphs and draw the graphs correctly

Calculate and define distance, displacement average speed, velocity, acceleration, force, momentum for a range of data examples.

Be able to draw and explain free body diagrams.

Be able to explain the differences between balanced and unbalanced forces

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Distance

You could learn more about this topic by:





A-LEVEL PE – Physiological factors affecting performance (H555/01)

Displacement Speed Velocity Force Acceleration Deceleration Momentum Free body diagrams Balanced and unbalanced forces Vertical and horizontal forces Weight Friction Reaction Air resistance	Watching YouTube Clips e.g. Everlearner Reading PE Review articles Researching topic and independent reading Completing all homework tasks Effective revision for assessments Practise of examination style questions
Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: End of topic assessments Half term assessments Teacher questioning Exam question answers Quick quizzes Mock examinations	



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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of Fluid Mechanics (Drag and Air resistance) and its effects on sport and practical situations.

We will learn:

Definitions of air resistance and drag

Factors that affect air resistance and drag

Application of sporting examples

We will develop/practise skills including:

Knowledge of the definitions of air resistance and drag.

Be able to explain and understand how the 4 main factors that affect air resistance and drag – velocity, frontal cross sectional area, streamlining/shape and surface characteristics.

Be able to apply practical example and methods of reducing the negative affects of AR and drag in sporting situations (swimming, cycling, skiing etc).

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Drag
Air resistance
Fluid mechanics
Velocity
Streamlining
Surface characteristics
Aerodynamic shape
Frontal cross-sectional area

You could learn more about this topic by:
Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
Researching topic and independent reading
Completing all home learning tasks
Effective revision for assessments
Practise of examination style questions
Retrieval practise





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Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

- End of topic assessments
- Half term assessments
- Teacher questioning
- Exam question answers
- Quick quizzes
- Mock examinations



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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of Projectile motion and its effects on sport and practical situations.

We will learn:

Factors affecting the horizontal distance travelled by a projectile.

Flight paths of projectiles

Free body diagrams of the forces acting on projectiles

Parallelogram of forces diagrams

Lift and the Bernoulli principle

Spin and the effect of Magnus forces

Application of sporting examples

We will develop/practise skills including:

Be able to explain, understand and apply the main factors affecting the horizontal distance travelled by a projectile – speed of release, angle of release, height of release and aerodynamic factors

Be able to identify and explain the flight path and forces acting on a projectile in flight (including drawing accurate free body diagrams).

Understand and be able to draw and explain parallelogram of forces/resultant force diagrams.

Understand the Bernoulli principle of lift and apply it to explain sporting situations (e.g. discus throw, ski jumping and formula one cars)

Be able to explain types of spin and how spin is created (Magnus forces). Including how spin is used to advantage in sporting situations (e.g. tennis, table tennis, golf and football)

Apply to EAP1 and practical performance where required.

Apply knowledge and application to examination questions.

Speed of release

Angle of release

Angle of attack

Height of release

Aerodynamic factors – Bernoulli and Magnus effects)

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner

Reading PE Review articles

Researching topic and independent reading

Completing all home learning tasks





A-LEVEL PE – Physiological factors affecting performance (H555/01)

Parabolic and non-parabolic flight paths

Resultant Forces

Flight Path

Aerofoil shape

Lift force

Parallelogram of forces

Hook/Slice

Magnus effects

Effective revision for assessments

Practise of examination style questions

Retrieval practise

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

End of topic assessments

Half term assessments

Teacher questioning

Exam question answers

Quick quizzes

Mock examinations



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Respiratory System

Learning about this topic is the third theoretical content of the A-Level Physical Education course. It will be examined in the AS/A-Level Paper 1 examination. Physiological factors affecting performance, focuses on developing the student's knowledge of the science behind physical activity. Through the study of this section, students will gain a deeper understanding of the respiratory system and its involvement in human movement and physical activity.

This builds on: Builds on knowledge from the OCR GCSE theory content.

This leads to: More in-depth knowledge and understanding of the respiratory system, the anatomy and physiology of the respiratory system at rest, during exercise and during recovery from exercise.

We will learn:

- Anatomy of the respiratory system
- Mechanics of breathing at rest
- Mechanics of breathing during exercise
- Breathing frequency, tidal volume and minute ventilation at rest and effects of exercise at different intensities
- Regulation of breathing - neural and chemical control
- Internal and external respiration – gaseous exchange during rest and during exercise at the lungs and at the muscle site

We will develop/practise skills including:

Develop knowledge and understanding of the anatomy and physiology of the respiratory system at rest to include:

- Mechanics of breathing at rest and during exercise, to include the respiratory muscles involved, volume and pressure changes during inspiration and expiration.

Develop knowledge of the respiratory system during exercise of different intensities and during recovery, to include:

- The effects of different exercise intensities and recovery on breathing rate, tidal volume and minute ventilation. Knowledge of methods of calculating them. Be able to draw and interpret the data on graphs.
- Regulation of breathing (neural control and chemical control).

Develop knowledge and understanding of gaseous exchange at the alveoli and at the muscles, to include:

- Changes in pressure gradient
- Changes in dissociation of oxyhaemoglobin

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Respiratory System

Some of the vocabulary that we will use includes: Scientific names of the anatomy of the respiratory system and respiratory muscles e.g. sternocleidomastoid etc Mechanics of breathing terminology – thoracic pressure, internal intercostal muscles etc Regulation and control of breathing terminology – medulla oblongata, phrenic nerve, inspiratory centre etc Types of exercise terminology – maximal, sub-maximal etc Gaseous exchange terminology – diffusion gradient, Bohr shift, dissociation etc Breathing frequency, tidal volume and minute ventilation	You could learn more about this topic by: Watching YouTube Clips e.g. Everlearner Reading PE Review articles Researching topic and independent reading Completing all homework tasks Effective revision for assessments Practise of examination style questions 
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A-LEVEL PE – Physiological factors affecting performance (H555/01)

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This builds on: Builds on knowledge from the OCR GCSE theory content. New content included.

This leads to: More in-depth knowledge and understanding of the effects of ergogenic aids on sports performance.

We will learn:

- Pharmacological aids
- Physiological aids
- Nutritional aids

We will develop/practise skills including:

Develop knowledge and understanding of

- Type of aid
- Legal status
- Performance benefits
- Risks
- Practical application

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Some of the vocabulary that we will use includes:

Anabolic steroids
Human growth hormone
Erythropoietin
Blood doping
Intermittent hypoxic training
Cooling aids
Timing of meals
Glycogen loading
Hydration
Creatine supplementation
Bicarbonate
Nitrates

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
Researching topic and independent reading -
Completing all homework tasks
Effective revision for assessments/producing revision resources
Practise of examination style questions





A-LEVEL PE – Physiological factors affecting performance (H555/01)

caffeine

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End of topic assessments

Half term assessments

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Exam question answers

Quick quizzes

Mock examinations



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Learning about this topic includes the theoretical content of the A-Level Physical Education course. It will be examined in the AS/A-Level Paper 1 examination.

Students should be able to demonstrate knowledge and understanding of the key components of fitness and the role training plays to improve and maintain physical activity and sports performance. Students should understand the principles of training, including periodisation cycles.

This builds on: Builds on knowledge from the OCR GCSE theory content. New content included.

This leads to: More in-depth knowledge and understanding of the key components of fitness, training and principles of training on sports performance/developing sports performance.

We will learn:

- Periodisation cycles (macrocycle, mesocycle, microcycle, tapering, phases of training)
- Aerobic capacity/VO2 max – affecting factors, evaluation methods, types of training and physiological adaptations
- Types of strength (static, dynamic, maximum, explosive/elastic, strength endurance) – affecting factors, evaluation methods, types of training and physiological adaptations
- Flexibility (static and dynamic) – affecting factors, evaluation methods, types of training and physiological adaptations
- Lifestyle diseases of the cardiovascular and respiratory systems (CHD, stroke, atherosclerosis, heart attack, asthma and COPD)

We will develop/practise skills including:

Develop knowledge and understanding of

- Definition of each component of fitness
- Methodology of fitness testing
- Understanding of fitness test results/graph analysis/data analysis
- Planning of training/training guidelines/training plan design
- Understanding the physiological adaptations and effects on performance

Apply to EAPI (development plan) and practical performance where required.

Apply knowledge and application to examination questions.

Some of the vocabulary that we will use includes:

Reps/Sets/work to relief ratio
HIIT training
Tapering
Periodisation
Blood viscosity
Training zones – Karvonen's principle
Chronic obstructive pulmonary disease
Atherosclerosis
Hypertension

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
Researching topic and independent reading -
Completing all homework tasks
Effective revision for assessments/producing revision resources
Practise of examination style questions





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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of Angular motion and its effects on sport and practical situations.

We will learn: definitions, calculations, units

Definitions of angular motion (AM)

Creation of AM

Examples of AM in sport

Axis of Rotation

Angular Velocity

Moment of Inertia

Conservation of angular momentum

Application of sporting examples

We will develop/practise skills including:.

Calculate angular velocity and moment of inertia

Explain factors that affect moment of inertia

Be able to give practical sporting examples to explain angular motion

Explain how AM is created

Explain the effects of angular momentum on sporting examples

Explain how to increase and decrease spin

Apply to EAP1 and practical performance where required.

Apply knowledge and application to examination questions.

Angular velocity

Radians

Moment of inertia

Conservation of angular momentum

Longitudinal, frontal and transverse axis of rotation

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner

Reading PE Review articles

Researching topic and independent reading

Completing all homework tasks

Effective revision for assessments

Practise of examination style questions





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This builds on: Builds on knowledge from the OCR GCSE theory content.

This leads to: More in-depth knowledge and understanding of the concept of centre of mass, stability and its importance and uses in sporting movements and physical activity. Students will be able to confidently answer examination style questions related to this topic.

We will learn:

- Definition of centre of mass
- Factors affecting the position of centre of mass
- The relationship between centre of mass and stability

We will develop/practise skills including:

Develop knowledge and understanding of concept of centre of mass and stability:

- Students will learn the correct definition of centre of mass.
- Students will be able to locate the COM if differing sporting examples, understanding that COM can be inside or outside the body.
- How COM can be manipulated to improve sporting performance (Fosbury flop high jump technique).
- What factors can affect stability e.g. mass of the body, height of centre of mass etc.
- How we can maximise stability in sport/physical activity, providing and explaining practical examples.

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Some of the vocabulary that we will use includes:

Centre of mass
Stability
Line of gravity
Base of support

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
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This builds on: Builds on knowledge from the OCR GCSE theory content.

This leads to: More in-depth knowledge and understanding of the cardio-vascular system, the anatomy and physiology of the cardio-vascular system at rest, during exercise and during recovery from exercise.

We will learn:

- Anatomy of the heart
- Cardiac cycle
- Conduction system of the heart
- Heart rate
- Stroke volume
- Cardiac output
- Venous return
- Redistribution of cardiac output
- Regulation of heart rate

We will develop/practise skills including:

Develop knowledge and understanding of the anatomy and physiology of the heart at rest to include:

- Structure of the heart and the phases of the cardiac cycle, linked to the conduction system of the heart.
- The relationship between and resting values for heart rate, stroke volume and cardiac output. Knowledge of methods of calculating them. Be able to draw and interpret the data on graphs.
- Mechanisms of venous return.

Develop knowledge of the cardiovascular system during exercise of different intensities and during recovery, to include:

- The effects of different exercise intensities and recovery on heart rate, stroke volume and cardiac output. Knowledge of methods of calculating them. Be able to draw and interpret the data on graphs.
- Regulation of heart rate (neural, hormonal and intrinsic factors).

Develop knowledge and understanding of the redistribution of cardiac output to include the vascular shunt mechanism, role of the vasomotor control centre, role of arterioles and pre-capillary sphincters.

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Some of the vocabulary that we will use includes:

Scientific names of the anatomy of the heart e.g. tricuspid valve, Aorta etc
Conduction system terminology – sino-atrial node, purkinji fibres etc
Regulation of heart rate terminology – medulla oblongata, vagus nerve, adrenaline etc
Types of exercise terminology – maximal, sub-maximal etc
Vascular system terminology – pre-capillary sphincters, vasomotor control centre, etc
Venous return terminology – muscle pump, pocket valves, blood pooling etc

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
Researching topic and independent reading
Completing all homework tasks
Effective revision for assessments
Practise of examination style questions



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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Biology and Food Technology

This leads to: More in-depth knowledge and understanding of forces, speed, velocity, acceleration and momentum and its effects on sport and practical situations.

We will learn:

- Diet & Nutrition
- 3 types of macro nutrients
- 4 types of micro nutrients
- Energy intake and expenditure
- Metabolic equivalent tasks
- Energy balance

We will develop/practise skills including:

Develop knowledge and understanding of correct diet and nutrition

Be able to identify and describe the difference between macro and micro nutrients and apply specific examples of food groups

Be able to explain the importance of energy balance and how sport can affect intake and expenditure

Be able to describe the different metabolic sporting rates of intensity

Be able to explain why energy balance is important in optimal sporting performance

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Diet, nutrition, carbohydrates, protein, fats, minerals, vitamins, water, fibre, energy, basal metabolic rate, expenditure, calories, amino acids, glycogen, thermic effect

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Watching YouTube Clips e.g. Everlearner
Reading PE Review articles
Researching topic and independent reading





A-LEVEL PE – Physiological factors affecting performance (H555/01)

	Completing all homework tasks Effective revision for assessments Practise of examination style questions
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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Biology

This leads to: More in-depth knowledge and understanding of forces, speed, velocity, acceleration and momentum and its effects on sport and practical situations.

We will learn:

- Location of major bones in the body
- Types of bones
- Structure/function of synovial joints
- Types of joints
- Movement at joints
- Planes of movement
- Movement patterns within the planes
-

We will develop/practise skills including:

Develop knowledge and understanding of the location of major bones

Be able to explain functional and structural characteristics of a synovial joint

Be able to identify different movements at joints and correctly describe different sporting examples

Be able to differentiate between the 3 planes of movement

Be able to correlate correct sporting examples with movements in the correct planes

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Sternum, tibia, Ribs, fibula, Clavicle, scapula, Mandible, pelvis, Vertebrae, sacrum, Cranium, femur, Phalanges, humerus, Metacarpals, radius, Carpals, ulna, Metatarsals, patella, Tarsals, Talus
Ligament, cartilage, bursa, synovial joint, synovial fluid, joint capsule

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner

Reading PE Review articles

Researching topic and independent reading

Completing all homework tasks





A-LEVEL PE – Physiological factors affecting performance (H555/01)

Flexion, extension, abduction, adduction, rotation, dorsi-flexion, plantar-flexion, horizontal flexion, horizontal extension
Sagittal, frontal, transverse

Effective revision for assessments
Practise of examination style questions

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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of Linear motion and its effects on sport and practical situations.

We will learn:

definitions, calculations, units

Definitions of linear motion (LM)

Creation of LM

Examples of LM in sport

Distance, displacement, speed, force, weight

Velocity and acceleration/deceleration

Momentum

Distance-time, Speed-time, Velocity-time graphs

Application of sporting examples, including free body diagrams

We will develop/practise skills including:.

Calculating linear motion descriptors e.g. average speed etc

Explain and draw: Distance-time, Speed-time, Velocity-time graphs

Be able to give practical sporting examples to explain linear motion

Explain how LM is created

Explain the effects of momentum and force on sporting examples

Draw and explain the effects of forces (F, R, AR and W) on free body diagrams

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Displacement

Distance

Average speed

Average velocity

Acceleration

You could learn more about this topic by:

Watching YouTube Clips e.g. Everlearner

Reading PE Review articles

Researching topic and independent reading

Completing all homework tasks

Effective revision for assessments





A-LEVEL PE – Physiological factors affecting performance (H555/01)

m/s m/s/s Newtons Free body diagrams Weight, reaction forces, Friction forces, air resistance force	Practise of examination style questions
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This builds on: Builds on knowledge from the OCR GCSE theory content.

This leads to: More in-depth knowledge and understanding of the skeletal and muscular systems, the anatomy and physiology of the skeletal and muscular systems. The role and functions of these systems, related to physical activity and sporting performance.

We will learn:

- The structure and function of bones, joints and connective tissues (tendons, ligaments and cartilage).
- Types of joints.
- Movements at joints.
- Planes of motion.
- Location of major skeletal muscles
- Function of major skeletal muscles
- Role of muscles.
- Types of muscular contraction.
- Movement analysis.
- Types of muscle fibres – structure and function.
- Structure and role of motor units and nervous stimulation of the motor unit.

We will develop/practise skills including:

Develop movement analysis skills to include:

- Joint type
- Movements produced e.g. flexion, extension etc
- Agonist and antagonist muscles involved
- Plane of movement involved
- Type of contraction taking place
- Application to sporting examples
- Apply to EAPI

Develop knowledge and understanding of skeletal muscle contraction to include:

- Structure and function of a motor neuron and motor unit
- Action potential
- Neurotransmitter
- All or none law
- Apply this knowledge to explain the nervous stimulation of contraction of muscle fibres

Develop knowledge of muscle contractions during exercise at different intensities to include:

- Slow oxidative, fast oxidative glycolytic and fast glycolytic fibres, their recruitment at different intensities of exercise and during recovery.
- Apply to EAPI



A-LEVEL PE – Physiological factors affecting performance (H555/01)

Some of the vocabulary that we will use includes: Scientific names of muscles e.g. Vastus medialis, rectus femoris etc Acetylcholine Fast oxidative glycolytic muscle fibres Myoglobin Synapse Bone terminology e.g. Talus etc Planes of Movement terminology – Sagittal etc Types of contraction terminology – eccentric, concentric and isometric	Apply knowledge and application to examination questions. You could learn more about this topic by: Watching YouTube Clips e.g. Everlearner Reading PE Review articles Researching topic and independent reading Completing all homework tasks Effective revision for assessments 
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This builds on: Builds on knowledge from the OCR GCSE theory content. Knowledge from GCSE Physics

This leads to: More in-depth knowledge and understanding of Newton's Laws and its effects on sport and practical situations.

We will learn:
Definitions of each law

Be able to apply practical examples to each law.

We will develop/practise skills including:

Know the correct definitions of each law.

Be able to give practical sporting examples to explain each law

Apply to EAPI and practical performance where required.

Apply knowledge and application to examination questions.

Newton's laws

Law of inertia
Law of acceleration
Law of reaction

You could learn more about this topic by:

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Reading PE Review articles

Researching topic and independent reading

Completing all homework tasks

Effective revision for assessments

Practise of examination style questions



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Mock examinations



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