



Physiology (24-25)

Topic Name	Term	Skills Developed	Next link in curriculum	Other Notes/Links to Prior Learning
Adenosine triphosphate (ATP) and energy transfer	Autumn	<ul style="list-style-type: none"> • ATP as 'energy currency • Principle of energetically coupled reactions. • Breakdown of ATP to ADP (Adenosine Diphosphate) + P (phosphate). • Resynthesis of ATP from ADP + P. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Cross-curricular links – biology.</p> <p>Extension of any prior learning from biology.</p> <p>New topics related to sport and exercise physiology</p>
Energy system and ATP resynthesis	Autumn	<ul style="list-style-type: none"> • Energy systems: • ATP-PC (Phosphocreatine) system • Glycolytic system & Aerobic system. • For each system: type of reaction (aerobic or anaerobic), chemical or food fuel used, specific site of the reaction, controlling enzyme, ATP yield, specific stages. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Cross-curricular links – biology.</p> <p>Extension of any prior learning from biology.</p> <p>New topics related to sport and exercise physiology</p>
ATP resynthesis during exercise of differing intensities and durations	Autumn	<ul style="list-style-type: none"> • The energy continuum. • Predominant energy system used during exercise. • Interpretation of figures relating to the contribution of the three energy systems to exercise of different intensities and durations. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Cross-curricular links – biology.</p> <p>Extension of any prior learning from biology.</p> <p>New topics related to sport and exercise physiology</p>
Recovery process	Autumn	<ul style="list-style-type: none"> • How the body returns to its pre-exercise state - Excess Post exercise Oxygen Consumption (EPOC). • Fast components of EPOC, the processes that occur and the duration: replenishment of blood and muscle oxygen stores. • Re-synthesis of ATP and PC. 	<ul style="list-style-type: none"> • Links with ATP and the Energy Systems. • Used in the EAPI assessment. • Tracker test, End of year examination. 	<p>Cross-curricular links – biology.</p> <p>Recovery and cool down discussed in practical lessons and in the GCSE PE syllabus</p>



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		<ul style="list-style-type: none"> • Slow components of EPOC, the processes that occur and the duration. 		
Exercise at altitude	Autumn	<ul style="list-style-type: none"> • Effect of altitude on the cardiovascular and respiratory systems. • Acclimatisation, including the importance of timing arrival, at altitude (above 2400m). 	<ul style="list-style-type: none"> • Links with the cardiovascular and respiratory systems. • Used in the EAPI assessment. • Tracker test, End of year examination. 	<p>Cross-curricular links –Geography.</p> <p>New topic for students</p>
Exercise in the heat	Autumn	<ul style="list-style-type: none"> • Effect of heat on the cardiovascular and respiratory systems. • Temperature regulation. • Cardiovascular drift. 	<ul style="list-style-type: none"> • Links with the cardiovascular and respiratory systems. • Used in the EAPI assessment. • Tracker test, End of year examination. 	<p>New topic for students</p>
Acute and chronic injuries	Spring	<ul style="list-style-type: none"> • Acute injuries resulting from a sudden stress to the body: hard tissue injuries, soft tissue injuries, concussion. • Chronic injuries resulting from continuous stress to the body: soft tissue injuries, hard tissue injuries. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Extension from work covered in OCR GCSE theory.</p> <p>Some sports injuries covered in GCSE PE theory course</p>
Injury prevention	Spring	<ul style="list-style-type: none"> • Intrinsic risk factors: individual variables, training effects. • Extrinsic risk factors: poor technique/training, incorrect equipment/clothing, inappropriate intensity, duration or frequency of activity • Debate surrounding effective warm up and cool down. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Extension from work covered in OCR GCSE theory.</p> <p>Some injury prevention covered in GCSE PE theory course</p>



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Responding to injuries and medical conditions in a sporting context	Spring	<ul style="list-style-type: none">Assessing sporting injuries using 'SALTAPS'.Acute management of soft tissue injuries using 'PRICE'.Recognising concussion: IRB's 'Recognise and Remove' 6 R's.	<ul style="list-style-type: none">Tracker test, End of year examination.Used in the EAPI assessment.	Extension from work covered in OCR GCSE theory.
Rehabilitation of injury	Spring	<ul style="list-style-type: none">Treatment of common sporting injuries: fractures, dislocation, sprain, torn cartilage, exercise-induced muscle damageTreatments: stretching, massage, cold and contrast therapies, anti-inflammatory drugs, physiotherapy, surgery.	<ul style="list-style-type: none">Tracker test, End of year examination.Used in the EAPI assessment.	Extension from work covered in OCR GCSE theory.
Linear motion	Spring	<ul style="list-style-type: none">Definition of linear motion.Creation of linear motion by the application of a direct force through the centre of mass.Definitions, calculations and units of measurement for each of the following quantities of linear motion: distance displacement speed velocity acceleration/deceleration Plot and interpret graphs of linear motion: distance/time graphs, speed/time graphs, velocity/time graphs.	<ul style="list-style-type: none">Tracker test, End of year examination.Used in the EAPI assessment.Links with the biomechanics covered in Year 12.	Cross-curricular links –Physics. Some new topics relating and extending previous knowledge to sport/biomechanics/movement analysis.



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Angular Motion	Spring	<ul style="list-style-type: none"> • Definition of angular motion. • Creation of angular motion through the application of an eccentric force about one (or more) of the three axes of rotation. • Definitions, calculations and units of measurement for each quantity of angular motion: moment of inertia, angular velocity, angular momentum. • Factors affecting the size of the moment of inertia of a rotating body. • The relationship between moment of inertia and angular velocity. • The conservation of angular momentum during flight in relation to the angular analogue of Newton’s first law of motion. • Interpret graphs of angular velocity, moment of inertia and angular momentum. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. • Links with the biomechanics covered in Year 12. 	<p>Cross-curricular links –Physics.</p> <p>Basic knowledge on types of rotation developed in the GCSE PE syllabus.</p> <p>Prior learning from GCSE Physics syllabus</p> <p>Some new topics for students</p>
Fluid mechanics	Summer	<ul style="list-style-type: none"> • Factors that impact the magnitude of air resistance (on land) or drag (in water) on a body or object: <ul style="list-style-type: none"> ➢ Velocity ➢ Mass ➢ Frontal cross-sectional area ➢ Streamlining and shape ➢ Surface characteristics. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Possible prior learning from the GCSE Physics syllabus</p> <p>New topics relating to sport/biomechanics and physical activity/movement.</p>



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<p>Projectile motion</p>	<p>Summer</p>	<ul style="list-style-type: none"> • Factors affecting the horizontal distance travelled by a projectile: <ul style="list-style-type: none"> ➤ Height of release ➤ speed of release ➤ angle of release ➤ free body diagrams showing the forces acting on a projectile once in flight: <ul style="list-style-type: none"> ➤ weight ➤ air resistance • Resolution of forces acting on a projectile in flight using the parallelogram of forces. • Patterns of flight paths as a consequence of the relative size of air resistance and weight. • Parabolic (symmetrical) flight path – shot put. • Non-parabolic (asymmetric) flight path – badminton shuttle. • The addition of lift to a projectile through the application of Bernoulli’s principle: <ul style="list-style-type: none"> ➤ angle of attack to create an upwards lift force on a projectile: <ul style="list-style-type: none"> – discus – javelin – ski jumper ➤ design of equipment to create a downwards lift force: F1 racing cars & track cycling. • Use of spin in sport to create a Magnus force, causing deviations to expected flight paths. 	<ul style="list-style-type: none"> • Tracker test, End of year examination. • Used in the EAPI assessment. 	<p>Possible prior learning from the GCSE Physics syllabus</p> <p>New topics relating to sport/biomechanics and physical activity/movement.</p> <p>Discussion of spin tennis practical lessons.</p> <p>Discussion of speed and angle of release in throwing events in athletics practical lessons.</p>
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