



Physiology (25-26)

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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