

**YEAR 13 – Scientific Principles**

	<b>SCIENTIFIC PRINCIPLES HOUR 1</b>	<b>SCIENTIFIC PRINCIPLES HOUR 2</b>	5 <sup>th</sup> Hour Learning	Extended Learning
1	Year 13 Not In School			
2	<p>1.4.1 Knowledge and understanding of the concepts of energy, with specific reference to physical activity and sport.</p> <p>1.4.3 Forms of energy to include: mechanical, electrical, potential, chemical and kinetic. The role of energy as adenosine triphosphate (ATP) in muscular contraction and the use of phosphocreatine (PC), glycogen and fat as sources for ATP re-synthesis.</p>	<p>1.4.2 Understanding of the forms of energy, processes by which it is regenerated, how depletion occurs and the recovery process.</p> <p>1.4.4 The characteristics and physiology of the three energy pathways (ATP-PC, glycolytic and aerobic).</p>	<b>COURSEWORK: PEP PLANNING - METHODS OF TRAINING:</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: DIET AND NUTRITION – HYDRATION, ELECTROLYTES, HYPO, ISO AND HYPERTONIC SOLUTIONS</b>
3	<p>1.4.4 The characteristics and physiology of the three energy pathways (ATP-PC, glycolytic and aerobic).</p> <p>1.4.5 The characteristics of the three pathways with regards to ease and speed of ATP production, the force of contraction that each will support, the intensity and duration of exercise supported by each as the dominant energy provider and the regeneration of ATP for each pathway.</p>	<p>1.4.5 The characteristics of the three pathways with regards to ease and speed of ATP production, the force of contraction that each will support, the intensity and duration of exercise supported by each as the dominant energy provider and the regeneration of ATP for each pathway.</p>	<b>COURSEWORK: PEP PLANNING - GOAL SETTING:</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: DIET AND NUTRITION – USE OF SUPPLEMENTATION TO ENHANCE ENERGY STORES, RECOVERY, METABOLIC PROCESSES AND DELAY FATIGUE</b>

	energy provider and the regeneration of ATP for each pathway.			
4	<p>1.4.6 The principle of the energy continuum when based around athletic running events.</p> <p>1.4.7 Use of the continuum as a medium to support understanding of the joint and collaborative role of the three energy pathways in physical activity.</p> <p>1.4.8 Positioning of athletic running events on the energy continuum.</p>	<p>1.4.6 The principle of the energy continuum when based around athletic running events.</p> <p>1.4.7 Use of the continuum as a medium to support understanding of the joint and collaborative role of the three energy pathways in physical activity.</p> <p>1.4.8 Positioning of athletic running events on the energy continuum.</p>	<b>COURSEWORK: PEP PLANNING - PRINCIPLES OF TRAINING:</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: DIET AND NUTRITION – SUPPLEMENTATION CONTINUED</b>
5	<p>1.4.9 The concept of fatigue and factors that contribute to fatigue: energy depletion, dehydration and the build-up of waste products (which should include an exploration of the role of lactic acid in performance).</p> <p>1.4.10 Stages of recovery and their application to specific physical and sporting contexts.</p>	<p>1.4.11 The fast component of recovery and re-phosphorylation; the speed and rate of phosphogen replenishment.</p> <p>1.4.12 The slow component of recovery; the oxidation of lactate (removal of lactate and H<sup>+</sup>), replenishment of energy stores and the two hour window of opportunity: re-hydration, physical cooling and thermoregulation; the 48-hour window of opportunity: resaturation of myoglobin, re-synthesis of protein, glycogen and carbohydrate (CHO),</p>	<b>COURSEWORK: PEP PLANNING - SESSION PLANNING 1</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: DIET AND NUTRITION – STRATEGIES FOR OPTIMAL PERFORMANCE – PRE, DURING AND POST EXERCISE</b>

		<p>exercise induced muscle damage (EIMD) and delayed onset muscular soreness (DOMS).</p> <p>1.4.13 EPOC (excessive post-oxygen consumption), and the stages of recovery.</p>		
6	<p><b>ASSESSMENT FORTNIGHT</b></p> <p>Manage Week 6 + 7 to ensure that in class assessment is sat and feedback provided as appropriate. Flexible</p> <p><b>ASSESSMENT</b></p>	<p><b>ASSESSMENT FORTNIGHT</b></p> <p>Manage Week 6 + 7 to ensure that in class assessment is sat and feedback provided as appropriate. Flexible</p> <p><b>FEEDBACK LESSON</b></p> <p><b>GROUP FEEDBACK SHEET</b></p>	<p><b>COURSEWORK: PEP PLANNING - SESSION PLANNING 2</b></p>	<p><b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIOVASCULAR – ANATOMY OF THE HEART + KEY TERMS</b></p>
7	<p>1.4.11 The fast component of recovery and re-phosphorylation; the speed and rate of phosphogen replenishment.</p> <p>1.4.12 The slow component of recovery; the oxidation of lactate (removal of lactate and H<sup>+</sup>), replenishment of energy stores and the two hour window of opportunity: re-hydration, physical cooling and thermoregulation; the 48-hour window of opportunity: resaturation of myoglobin, re-synthesis of protein,</p>	<p>1.4.14 Understanding of how the energy systems respond acutely, to the stress of warming up/priming exercise.</p>	<p><b>BUFFER LESSON – PRACTICAL APPLICATION OR COURSEWORK</b></p>	<p><b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIOVASCULAR – THE CARDIAC CYCLE, DIASTOLE AND SYSTOLE</b></p>

<p>glycogen and carbohydrate (CHO), exercise induced muscle damage (EIMD) and delayed onset muscular soreness (DOMS).</p> <p>1.4.13 EPOC (excessive post-oxygen consumption), and the stages of recovery.</p>				
<b>HALF TERM</b>				
8	<p>INJURIES APPLICATION: FLEXIBLE LESSONS THAT CAN BE FILTERED IN ACROSS THIS AREA. DO NOT NEED TO BE STAND ALONE LESSONS - PORTIONS COULD BE FILTERED INTO OTHER LESSONS, IN WHICH CASE THESE LESSONS ALLOW FOR CONTENT TO BE DELIVERED TO ALLOW FOR MORE ACTIVITIES</p> <p>PRACTICAL APPLICATION LEARNING WHEEL TASKS LONG ANSWER QUESTIONS EXAM TECHNIQUE TECHNOLOGY IN SPORT FEEDBACK</p>	<p>INJURIES APPLICATION: FLEXIBLE LESSONS THAT CAN BE FILTERED IN ACROSS THIS AREA. DO NOT NEED TO BE STAND ALONE LESSONS - PORTIONS COULD BE FILTERED INTO OTHER LESSONS, IN WHICH CASE THESE LESSONS ALLOW FOR CONTENT TO BE DELIVERED TO ALLOW FOR MORE ACTIVITIES</p> <p>PRACTICAL APPLICATION LEARNING WHEEL TASKS LONG ANSWER QUESTIONS EXAM TECHNIQUE TECHNOLOGY IN SPORT FEEDBACK</p>	<p><b>PRACTICAL: PEP SESSION 1</b></p>	<p><b>YEAR 12 REVISITED – DELIVERED VIA TEAMS:</b> CARDIOVASCULAR – STROKE VOLUME, HEART RATE, CARDIAC OUTPUT, VENOUS RETURN + VASCULAR SHUNTING</p>

9	<p>2.3.1 Knowledge and understanding of the different classifications of common sporting injuries.</p> <p>2.3.2 Acute injuries: cruciate ligament injury; soft tissue damage, sprain, Achilles tendon injury, fracture, dislocation.</p>	<p>2.3.2 Acute injuries: cruciate ligament injury; soft tissue damage, sprain, Achilles tendon injury, fracture, dislocation.</p> <p>2.3.3 Overuse injuries: strain, shin splints (periostitis), tendonitis (including tennis elbow and golfer's elbow), stress fractures.</p>	<b>PRACTICAL: PEP SESSION 2</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIORESPIRATORY – PROCESS OF INSPIRATION AND EXPIRATION</b>
10	2.3.3 Overuse injuries: strain, shin splints (periostitis), tendonitis (including tennis elbow and golfer's elbow), stress fractures.	2.3.4 Prevention of injuries Conditioning, muscle balance, technique, protective equipment, managing risks.	<b>PRACTICAL: PEP SESSION 3</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIORESPIRATORY – RESPIRATORY VALUES AND CAPACITIES</b>
11	2.3.4 Prevention of injuries Conditioning, muscle balance, technique, protective equipment, managing risks.	<p>2.3.5 Rehabilitation from injuries Contemporary recovery methods and timescales for return to play for injuries in 11.3.1, e.g. ultrasounds, physiotherapy, hyperbaric chambers, oxygen tents, compression garments, ice baths, nutrition, climate chambers, cryotherapy. POLICE – Protection, Optimal Loading, Ice, Compression, Elevation. RICE – Rest, Ice, Compression, Elevation. Advantages and disadvantages of rehabilitation strategies.</p> <p><b>POLICE vs RICE</b></p>	<b>PRACTICAL: PEP SESSION 4</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIOVASCULAR AND CARDIORESPIRATORY – RESPONSES AND ADAPTATIONS TO EXERCISE</b>

		<b>Rehabilitation – focus on ACL injuries</b>		
12	<p>2.3.5 Rehabilitation from injuries Contemporary recovery methods and timescales for return to play for injuries in 11.3.1, e.g. ultrasounds, physiotherapy, hyperbaric chambers, oxygen tents, compression garments, ice baths, nutrition, climate chambers, cryotherapy. POLICE – Protection, Optimal Loading, Ice, Compression, Elevation. RICE – Rest, Ice, Compression, Elevation. Advantages and disadvantages of rehabilitation strategies.</p> <p><b>ULTRASOUND, PHYSIOTHERAPY, SPORTS MASSAGE, CRYOTHERAPY</b></p>	<p>2.3.5 Rehabilitation from injuries Contemporary recovery methods and timescales for return to play for injuries in 11.3.1, e.g. ultrasounds, physiotherapy, hyperbaric chambers, oxygen tents, compression garments, ice baths, nutrition, climate chambers, cryotherapy. POLICE – Protection, Optimal Loading, Ice, Compression, Elevation. RICE – Rest, Ice, Compression, Elevation. Advantages and disadvantages of rehabilitation strategies.</p> <p><b>OXYGEN TENTS, CLIMATE CHAMBERS, COMPRESSION GARMENTS</b></p>	<b>PRACTICAL: PEP SESSION 5</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: CARDIOVASCULAR AND CARDIORESPIRATORY – UNHEALTHY LIFESTYLES</b>
13	<p>INJURIES APPLICATION: <b>FLEXIBLE LESSONS THAT CAN BE FILTERED IN ACROSS THIS AREA. DO NOT NEED TO BE STAND ALONE LESSONS - PORTIONS COULD BE FILTERED INTO OTHER LESSONS, IN WHICH CASE THESE LESSONS ALLOW FOR CONTENT TO BE DELIVERED TO ALLOW FOR MORE ACTIVITIES</b></p> <p>PRACTICAL APPLICATION LEARNING WHEEL TASKS</p>	<p>INJURIES APPLICATION: <b>FLEXIBLE LESSONS THAT CAN BE FILTERED IN ACROSS THIS AREA. DO NOT NEED TO BE STAND ALONE LESSONS - PORTIONS COULD BE FILTERED INTO OTHER LESSONS, IN WHICH CASE THESE LESSONS ALLOW FOR CONTENT TO BE DELIVERED TO ALLOW FOR MORE ACTIVITIES</b></p> <p>PRACTICAL APPLICATION LEARNING WHEEL TASKS</p>	<b>PRACTICAL: PEP SESSION 6</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: MUSCLES, ANATOMICAL MOVEMENTS AND TYPES OF CONTRACTION</b>

	LONG ANSWER QUESTIONS EXAM TECHNIQUE TECHNOLOGY IN SPORT FEEDBACK	LONG ANSWER QUESTIONS EXAM TECHNIQUE TECHNOLOGY IN SPORT FEEDBACK		
14	<b>BUFFER WEEK – CAN BE FLEXED INTO CALENDAR FOR ASSESSMENT WEEK, COURSEWORK SUPPORT, PRACTICAL ETC.</b>			
<b>CHRISTMAS HOLIDAYS</b>				
15	<p>2.4.1 Knowledge and understanding of the factors associated with linear motion and the application of definitions, equations, calculations and units of measurement in a sporting context.</p> <p>2.4.2 Calculation of the distance and displacement, speed and average speed, velocity and acceleration. Speed = distance/time (<math>s = d/t</math>) Velocity = displacement/time or distance/time (m/s) Acceleration = (final velocity – initial velocity)/time taken (<math>m/s^2</math>)</p>	<p>2.4.2 Calculation of the distance and displacement, speed and average speed, velocity and acceleration. Speed = distance/time (<math>s = d/t</math>) Velocity = displacement/time or distance/time (m/s) Acceleration = (final velocity – initial velocity)/time taken (<math>m/s^2</math>)</p> <p>2.4.3 Plot, label and interpret graphs of motion. To include distance/time, speed/time graphs and velocity/time graphs.</p>	<b>COURSEWORK: PEP EVALUATION</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: NEUROMUSCULAR – FIBRE TYPES + SLIDING FILAMENT THEORY</b>
16	<p>2.5.1 Knowledge and understanding of how angular motion is applied in a sporting context.</p> <p>2.5.2 Factors affecting moment of inertia: mass and distribution of mass from axis of rotation.</p>	<p>2.5.3 Effects of increasing or decreasing the moment of inertia when rotating about an axes (whole body or specific joint).</p> <p>2.5.4 Conservation of angular momentum during flight, moment of</p>	<b>COURSEWORK: PEP EVALUATION</b>	<b>YEAR 12 REVISITED – DELIVERED VIA TEAMS: NEUROMUSCULAR – WAVE SUMMATION, GRADATION OF CONTRACTION, FIBRE RECRUITMENT</b>

		inertia and its relationship with angular velocity.		
17	<b>YEAR 13 TRIAL EXAM WEEK</b>			
18	<p>2.6.1 Knowledge, understanding and application of projectile motion in refining technique in different sporting contexts.</p> <p>2.6.2 Forces acting during flight that affect projectile motion: gravity, air resistance and lift forces.</p>	<p>2.6.3 Factors that determine the horizontal displacement of a projectile: velocity of release, height of release, angle of release.</p> <p>2.6.4 Technique modification through the application of technology by the performer and coach in order to improve performance</p>		
19	<p>2.7.1 Knowledge, understanding and application of aerodynamics and hydrodynamics to appropriate sports contexts.</p> <p>2.7.2 Factors affecting fluid friction and air resistance: velocity, drag force, mass, streamlining and surface characteristics of body.</p>	<p>2.7.3 Interaction of lift forces with objects: upward and downward lift forces, angle of attack and the Bernoulli effect.</p> <p>2.7.4 Types of spin: topspin, backspin, sidespin. Magnus effect and how they impact on flight path and bounce</p>	<b>COURSEWORK: FULL FIRST DRAFT DEADLINE</b>	
20	2.7.5 Principles of fluid mechanics and how it has influenced technological advancements in technique modification, clothing/suits, equipment/apparatus.			
<b>HALF TERM</b>				
21	REVISION + EXAM TECHNIQUE:	REVISION + EXAM TECHNIQUE:		



	NEUROMUSCULAR 1	NEUROMUSCULAR 2		
22	REVISION + EXAM TECHNIQUE: CARDIORESPIRATORY 1	REVISION + EXAM TECHNIQUE: CARDIORESPIRATORY 2	<b>COURSEWORK: FINAL DEADLINE</b>	
23	REVISION + EXAM TECHNIQUE: CARDIOVASCULAR 1	REVISION + EXAM TECHNIQUE: CARDIOVASCULAR 2	REVISION – TBC WHICH SIDE OF THE COURSE TO TARGET. DISCUSSED BY SUBJECT TEACHERS. ONE TEACHER TO DELIVER, OTHER TEACHER TO DELVIER TARGETTED COURSEWORK SUPPORT FOR STUDENTS WHO HAVE FAILED TO MEET PREDICTED COURSEWORK GRADE	
24	REVISION + EXAM TECHNIQUE: TRAINING METHODS – METHODS OF TRAINING, VALIDITY + RELIABILITY	REVISION + EXAM TECHNIQUE: TRAINING METHODS 2 – MEASURING INTENSITY + DETERMINANTS OF PERFORMANCE		
25	REVISION + EXAM TECHNIQUE: TRAINING METHODS 3 – PERIODISATION + PRINCIPLES OF TRAINING	REVISION + EXAM TECHNIQUE: TRAINING METHODS 4 – HEAT, HUMIDITY + ALTITUDE		
26	REVISION + EXAM TECHNIQUE: TRAINING METHODS 5 – STRATEGIES FOR SPEEDING UP RECOVERY	REVISION + EXAM TECHNIQUE: TRAINING METHODS 6 – LONG ANSWER QUESTIONS		
<b>EASTER HOLIDAYS</b>				
27	REVISION + EXAM TECHNIQUE: MUSCULAR SKELETAL	REVISION + EXAM TECHNIQUE: ENERGY SYTEMS	REVISION – TBC WHICH SIDE OF THE COURSE TO TARGET. DISCUSSED BY SUBJECT TEACHERS. SUGGEST PHYSIOLOGY AS EXAM TENDS TO COME FIRST	
28	REVISION + EXAM TECHNIQUE: NEUROMUSCULAR	REVISION + EXAM TECHNIQUE: INJURIES		
29	REVISION + EXAM TECHNIQUE: BIOMECHANICS	REVISION + EXAM TECHNIQUE: CARDIOVASCULAR + CARDIORESPIRATORY		
30	<b>STUDY LEAVE/REVISION DEPENDING ON SCHOOL SCHEDULE</b>			
31				

### Year 13 - psychological and social principles

Week 1		3.1 Coach and Performer	Coaching styles Tactics and strategies	
Week 2	Topic 3: Skill Acquisition	3.2 Classification and Transfer of Skill	Analysis of skill Skill classification	
Week 3			Transfer of skill	
Week 4		3.3 Learning Theories	Learning theories	
Week 5		3.4 Practices 3.5 Guidance 3.6 Guidance	Practices Guidance Feedback	
Week 6	Topic 4: Sport Psychology	4.1 Factors that can influence an individual in physical activities	Personality Attitudes Arousal	
Half term				
Week 7	Topic 4: Sport Psychology	4.1 Factors that can influence an individual in physical activities	Anxiety Aggression Motivation Social Facilitation	
Week 8			4.2 Group Dynamics 4.3 Goalsetting	Group Dynamics Goal Setting
Week 9				
Week 10	Topic 5: Sport and Society	5.1 The factors leading to the emergence and development of modern day sport	Popular Recreation Public Schools Oxbridge Industrial revolution National Governing Bodies	
Week 11				

Week 12			International Governing Bodies
Week 13		5.2 Globalisation of sport	Migration patterns Globalisation
		Christmas	
Week 14	Topic 5: Sport and Society	5.2 Globalisation of sport	Olympic ideals
Week 15			Barriers to participation
Week 16			Mass participation
Week 17	Topic 3: Skill Acquisition	3.7 Memory Models	Wearable tech
Week 18			Information processing
Week 19			DCR - sensory input
Week 20			Memory
Week 21			Reaction Time
Week 22			Hicks Law
Week 23			Psychological Refractory period
Week 24			Schema Theory
Week 25			Schema Theory
		Half term	
Week 26		4.4 Attribution Theory	Attribution Theory
Week 27	Topic 4: Sport Psychology	4.5 Self confidence and self efficacy	attribution Theory
Week 28			Self confidence
Week 29			Self Efficacy
Week 30		4.6 Leadership	Self Efficacy
Week 31			Leadership
Week 32			Leadership

Week 23			Commercialisation
Week 24	Topic 5: Sport and Society	5.3 Commercialisation of Sport	Commercialisation
Week 25			Olympics
			Americanisation of sport
			Ethics and deviance
		Easter	
Week 26		5.4 Ethics and deviance in sport	Ethics and deviance WADA
Week 27	Topic 5: Sport and Society	5.5 The relationship between the media and sport	Sport and the media
			Sport and the media
Week 28		5.6 Development routes from talent identification to elite performance	talent ID routes
Week 29			