The Sutton Academy

Knowledge Rich Curriculum Plan

Level 3 BTEC sport – Topic B Muscular System

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
Lesson 1: Types of muscles and locations of muscles	Students will know that there are 3 types of muscle in the human body: Cardiac (heart), skeletal (attached to our skeleton), smooth (digestive system) Students will know the location, function and key characteristics of the different muscle types Students will know that a characteristic means a feature or quality belonging to something Students will know that a function is a specific role something does. Students will know that striated means a stripey appearance Students will know that fatigue means to tire Students will know the names and locations of the major muscles in the human body Student will know how to identify major muscles when presented with different sporting actions	Characteristics Function Striated Voluntary Involuntary Fatigue	• Students need to already know the areas and anatomical positions within the body • Students need to already know the names and locations of major muscles in the body	•
Lesson 2: Origin and insertion of major muscles	Students will know that Origin means the fixed end of the muscle that remains stationary during a contraction. Students will know that contraction means to become shorter and tighter. Students will know that stationary means to remain still. Students will know that Insertion means the end of the muscle that moves. The insertion normally crosses over a joint to allow movement. Students will know the origin and insertion for the major muscles in the body	Contraction Stationary Origin Insertion	• Students need to already know that areas anatomical positions within the body • Students need to already know the names and locations of major muscles in the body • Students already need to know the location and names of the major bones within the body	•
Lesson 3: Antagonistic muscle pairs	Students will know that antagonistic muscles means two muscles that work together to create movement. Students will know that an agonist is the muscle that contracts to bring about movement at a joint Students will know that an antagonist is the muscle that relaxes during movement at a joint Students will know that a fixator is a muscle that stops any unwanted movement as the agonist contracts	Antagonist muscles Agonist Antagonist Fixator Synergist	• Students need to already know that muscles work in pairs • Students need to already know how muscles contract • Students need to already know the characteristics of the different muscles	•

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	Students will know that synergists are muscles that work together to control and direct movement by supporting the agonist. Students will know how to explain antagonistic muscle action for a range of different movements at joints			
Lesson 4: Different types of muscle contraction & synoptic question	Students will know that there are different types of muscle contraction which will be used depending on the sporting technique or exercise action Students will know that an isometric muscle contraction means that the length of the muscle does not change Students will know that a concentric muscle contraction is when the muscle shortens (positive phase) Students will know that an eccentric muscle contraction is when a muscle lengthens during a movement (negative phase) Students will know the impact these muscle contractions can have on performance Students will know how to apply these types of muscle contraction to different sporting movements	Isometric Concentric Eccentric	• Students need to already know that muscles change size during a contraction by getting bigger (shorter) or longer	•
Lesson 6: Synoptic question feedback				
Lesson 7 : Muscle fibre types and all or none law	Students will know that Impulses are a pulse of electrical energy; a brief current. Students will know that Mitochondria are the organelles (parts of cells) in the body where aerobic respiration takes place. Students will know that for the muscle to contract all motor neurones in a muscle must contract at the same time for a muscle to work – all or none law	Impulses Mitochondria Aerobic Anaerobic	• Students will need to already know that muscles create movement at joints • Students will already need to know different types of movements at joints	•

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	Students will know that there are three different types of muscle fibres and the characteristics of each one (Type 1, Type 2a, type 2x) Students will know that aerobic means with oxygen Students will know that anaerobic means without oxygen			
Lesson 8: Responses of exercise to the muscular system	Students will know the short term responses of the muscular system to exercise: • Increased blood supply • Increased muscle temperature • Increased muscle pliability - pliability means the ease at which something can be bent; flexibility • Increased lactate - Lactic acid is a waste product that is produced during anaerobic exercise • Microtears • Delayed onset of muscle soreness - is the pain felt in muscles 24-48 hours after strenuous exercise.	Pliability Lactate DOMs	•	•
Lesson 9: Adaptation of the muscular system to exercise	Students will know the long term adaptations of the muscular system to exercise: • Hypertrophy – when a muscle increases in size and strength • Increased tendon strength • Increase in number and size of mitochondria • Increased myoglobin stores • Increased storage of glycogen and fat • Increased tolerance to lactate – Tolerance means to be able to withstand something for a longer time	Hypertrophy Tolerance	• Students will already need to know what mitochondria are • Students will already need to know where glycogen comes from (Unit 2) • Students will already need to know that lactic acid inhibits muscular performance	•

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Lesson 10: EOU assessment				