

Science

Year 8: Skeletal and Muscular system

| Assessment Opportunities | Literacy/Reading opportunities | CEIAG Links |
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| <ul style="list-style-type: none">Regular low stakes quizzing of AO1- self marked.In class past paper questions where – self / peer markedExtended writing is teacher marked with personalised feedback provided.End of unit assessment self & teacher marked with collective feedback provided. | <p>Reciprocal reading: Giovanni Alfonso Borelli: Applying physics to the body.</p> <p>Key vocab is highlighted in the SOL.</p> | <p>Spotlight on careers: Orthopedic Surgeon</p> <p>Other careers:</p> <ul style="list-style-type: none">Physical TherapistSports Medicine PhysicianExercise PhysiologistOccupational TherapistChiropractorOrthotist/ProsthetistRadiologic TechnologistPersonal TrainerBiomedical Engineer |

Curriculum vision:

“Our aim is to deliver a curriculum that is inclusive, relevant and progressive for all learners.”

KS3 skeletal and muscular system

Big Picture: KS3 skeletal and muscular system encompasses an integrated understanding of how these systems work individually and together to support and enable human movement, provide structural support, protect vital organs, and maintain overall health and homeostasis. This holistic view ties together the detailed knowledge and skills students will acquire throughout their studies in KS3.

| Lesson sequence | Learning outcomes / Key knowledge (including NC KS3) Interleave / review. | Skills development | Spec / book reference |
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| <p>1. TBAT: Identify the main body systems in the human body.</p> | <ul style="list-style-type: none"> • Structure and function of the human body: Understanding how the body's systems interact to perform functions. • Identify and Name Main Body Systems: Students should be able to identify and name the main body systems: circulatory, respiratory, digestive, nervous, skeletal, muscular, and reproductive systems. • Understand the Function of Each System: Students should understand the primary function of each body system and how they contribute to the overall functioning of the human body. • Recognize Key Organs and Their Roles: Students should be able to recognize the key organs associated with each body system and describe their specific roles. • Explain the Interdependence of Body Systems: Students should explain how the different body systems interact and depend on each other to maintain homeostasis and overall health. | <ul style="list-style-type: none"> • Identify: The human body systems, and organs associated with each system. • Evaluate: The hierarchy of cells, tissues, organs, organ systems, and organism. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |
| <p>2. TBAT: Describe the structure and function of the skeletal system.</p> | <ul style="list-style-type: none"> • Identify Major Components: Students should be able to identify the major components of the skeletal system, including bones, cartilage, and ligaments. • Understand the Structure of Bones: Students should understand the basic structure of bones, including the different types of bones (long, short, flat, irregular) and their internal structure (compact bone, spongy bone, bone marrow). | <ul style="list-style-type: none"> • Describe: The key role of the human skeleton and bone characteristics. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |

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| | <ul style="list-style-type: none"> • Explain the Functions of the Skeletal System: Students should be able to explain the main functions of the skeletal system: support, protection, movement, mineral storage, and blood cell production. | | |
| 3. TBAT: Describe the structure and function of joints. | <ul style="list-style-type: none"> • Biomechanics: The interaction between the skeleton and muscles, including the analysis of how skeletal structures (joints) facilitate movement • Identify and Describe Types of Joints: Identify different types of joints in the human body and describe their structure. • Explain the Function of Different Joints: Explain how different types of joints facilitate movement and provide stability. • Understand the Role of Cartilage, Ligaments, and Synovial Fluid: Describe the roles of cartilage, ligaments, and synovial fluid in joint function and health. | <ul style="list-style-type: none"> • Reading: Identifying key information provided and answering questions in relation to the text. • Identify: Different joints in the human body • Describe: the roles of cartilage. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |
| 4. TBAT: Use our knowledge of the skeleton to produce a model of the finger joint | <ul style="list-style-type: none"> • Scientific Enquiry: Developing models to represent scientific concepts and structures. • Identify the Key Components of a Finger Joint: Name and describe the bones, cartilage, ligaments, and tendons involved in a finger joint. • Explain the Function of the Finger Joint: Explain how the finger joint allows movement and the types of movements possible (e.g., flexion and extension). • Create an Accurate Model of the Finger Joint: Use various materials to construct a model of the finger joint that accurately represents its structure and function. | <ul style="list-style-type: none"> • Investigate: the relationship between muscle and bone to move the finger. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |
| 5. TBAT: Explain the function of different muscles within the body. | <ul style="list-style-type: none"> • Identify and Locate the Three Muscle Types Students will be able to identify and differentiate between skeletal, cardiac, and smooth muscles, understanding where they are found in the body. • Explain the Function of Each Muscle Type Students will understand the specific functions of skeletal, cardiac, and smooth muscles, including their roles in body movements, heart function, and internal organ control. • Describe the Characteristics and Actions of Each Muscle Type Students will describe the structural characteristics and actions performed by skeletal, cardiac, and smooth muscles, including voluntary and involuntary control. • Understand the Process of Muscle Contraction in Each Muscle Type | <ul style="list-style-type: none"> • Name: The three main muscles found in the human body. • State: The function of each of the muscle groups. • Explain: The importance of exercise on the body. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |

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| | <p>Students will explain how muscle contraction occurs in skeletal, cardiac, and smooth muscles, focusing on the role of muscle fibers, the neuromuscular junction, and the autonomic nervous system.</p> <ul style="list-style-type: none"> • Analyze the Importance of Each Muscle Type in Everyday Functions Students will analyze how skeletal, cardiac, and smooth muscles contribute to daily activities, heart function, and the functioning of internal organs. • Discuss the Health and Maintenance of Different Muscle Types Students will discuss the importance of maintaining the health of skeletal, cardiac, and smooth muscles through exercise, diet, and lifestyle choices. | | |
| <p>6. TBAT: Describe how muscles work in antagonistic pairs.</p> | <ul style="list-style-type: none"> • Identify Antagonistic Muscle Pairs Students will be able to identify examples of antagonistic muscle pairs in the human body, such as the biceps and triceps or the quadriceps and hamstrings. • Explain the Concept of Antagonistic Muscle Pairs Students will understand the concept of antagonistic muscle pairs and how these pairs work together to produce coordinated movement. • Describe the Actions of Antagonistic Pairs Students will describe the actions performed by each muscle in an antagonistic pair during movement, including how one muscle contracts while the other relaxes. • Understand the Role of Antagonistic Pairs in Joint Movement Students will explain how antagonistic muscle pairs contribute to the movement and stability of joints. • Analyze Specific Movements Involving Antagonistic Pairs Students will analyze specific movements, such as bending and straightening the elbow or knee, to understand the role of antagonistic muscle pairs in these actions. • Discuss the Importance of Muscle Balance Students will discuss the importance of maintaining muscle balance between antagonistic pairs to prevent injury and ensure efficient movement. | <ul style="list-style-type: none"> • Identify muscles in the human body that work together antagonistically. • ASTN Writing: Evaluate a model answer of how antagonistic muscles work. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |
| <p>7. TBAT: Describe how muscles are in antagonistic muscle pairs.</p> | <ul style="list-style-type: none"> • Discuss the role of antagonistic muscle pairs Students will discuss the importance of antagonistic muscles and how we use them for movement. • Identify the key aspects of writing scientifically Students will identify the key skills to write scientifically using key words and | <ul style="list-style-type: none"> • Describe how antagonistic muscles work. | <p>Spec NC pos here pg5</p> |

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| | <p>following a structured plan.</p> <p>Students will have a writing task to complete</p> | <ul style="list-style-type: none"> • Apply scientific key words to a structured writing plan. | <p>Boost book 1 pg 34-45</p> |
| <p>8. TBAT: Compare models that show how muscles work in antagonistic pairs.</p> | <ul style="list-style-type: none"> • Describe the concept of antagonistic muscle pairs Explain how muscles work in pairs to create movement. • Create physical models Construct two different models demonstrating the action of antagonistic muscle pairs. • Compare and contrast models Identify and describe the similarities and differences between the two models. • Apply critical thinking Evaluate the effectiveness of each model in demonstrating the concept of muscle antagonism. | <ul style="list-style-type: none"> • Troubleshooting: troubleshoot any issues they encounter while constructing their models. • Improving Models: ways to improve the models to better represent the scientific concept. • Group Work: work together to construct models, share ideas, and discuss. • Model Construction: Constructing models to develop fine motor skills through cutting, attaching, and manipulating materials. • Explaining Concepts: Explain the concept of antagonistic muscle pairs and how their models represent this. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |
| <p>9. TBAT: Describe how skeletal muscles move blood through our veins</p> | <ul style="list-style-type: none"> • Explain how skeletal muscles aid in the movement of blood through veins by describing the muscle pump mechanism and its importance in the circulatory system. • Key information: Students should be able to identify the key concepts of the circulatory system and understand the use of muscles to aid the venous circulation of blood back to the | <ul style="list-style-type: none"> • Application: They will apply their knowledge to explain the muscle pump mechanism and its role in the circulatory system. | <p>Spec NC pos here pg5</p> |

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| | <p>heart. Regular physical activity aids in efficient blood circulation. Prolonged inactivity can lead to blood pooling in the veins and potential health issues such as deep vein thrombosis (DVT).</p> | <ul style="list-style-type: none"> • Analysis: Students will analyse how well their models demonstrate the concept of venous return. • Problem-Solving: They will identify potential issues with their models and think of ways to improve them. • Evaluation: Students will evaluate the importance of skeletal muscles and valves in veins in preventing backflow and maintaining efficient blood circulation | <p>Boost book 1 pg 34-45</p> |
| <p>10. TBAT: Explain how bones and muscles work to produce movement</p> | <ul style="list-style-type: none"> • Explain how bones and muscles work together to produce movement, understanding the roles of tendons, joints, and muscle contractions in facilitating movement. | <ul style="list-style-type: none"> • Extracting Information: Identifying key points and main ideas from the reading passage • Analysing Information: Analyse the information from the reading passage to answer comprehension questions. • Synthesizing Knowledge: Synthesise information from the text and diagrams to explain how movement is produced. | <p>Spec NC pos here pg5</p> <p>Boost book 1 pg 34-45</p> |

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| 11. TBA: Engage with a scientific article | | Reciprocal reading: Giovanni Alfonso Borelli: Applying physics to the body. | | | Reciprocal reading | |
| Vocab | | | | Links to previous learning / interleaving | Assessment & homework | |
| L3 Vocab | Metacarpals Phalanges Joint connects. Cartilage Ligament Tendon Skeletal Muscle Smooth Muscle Cardiac Muscle Muscle Fiber Hypertrophy Atrophy Antagonistic Muscles Agonist Muscle | L2 Vocab Exercise Push Pull Rotate Extend Contract | Command words focus Design Predict Identify Estimate Observe Justify | KS3 Structure and Function of Living Organisms: Cells and Organisation KS2 Animals, including humans Living things and their habitats | <ul style="list-style-type: none"> Regular low stakes quizzing of AO1 In class assessment of AO1, AO2, AO3 using past paper questions <p>Homework is set every week and may include online submission, past paper questions and revision for in class assessments.</p> | |
| Independent learning | | | | | Misconceptions / common errors | |
| BBC Bitesize skeletal and muscular system - The skeleton - Skeletal and muscular systems - 3rd level Science Revision - BBC Bitesize | | | | | <ul style="list-style-type: none"> All Joints Move the Same Way Number of Bones Is Fixed from Birth. | |