

## Cambridge National in Sport Science

### Units and guided learning hours

Here is a reminder of the four units. There are two mandatory and two optional units (you must complete one of the optionals) in the redeveloped Cambridge National in Sport Science.

Unit	Unit title	Guided learning hours (GLH)	How are they assessed?	Mandatory or optional?
R180	Reducing the risk of sports injuries and dealing with common medical conditions	48	External examination	Mandatory
R181	Applying the principles of training: fitness and how it affects skill performance	48	Non-examined assessment	Mandatory
<b>R182</b>	<b>The body's response to physical activity and how technology informs this</b>	<b>24</b>	<b>Non-examined assessment</b>	<b>Optional</b>
R183	Nutrition and sports performance	24	Non-examined assessment	Optional

Summary of what you will cover from the <a href="#">curriculum planner</a> :		Topic Area 1: The cardio-respiratory system and how the use of technology supports different types of sports and their intensities				
Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
1-2	<p>1.1 Components, function and role of cardio-respiratory system during exercise</p> <p>1.1.1 Components:</p> <ul style="list-style-type: none"> <li>Heart – ventricles, atria, valves</li> <li>Blood cells and vessels – arteries, veins, capillaries</li> </ul>	<p>You may wish to merge lessons 1 and 2 with each other and choose different activities depending on time available.</p> <p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Use a diagram or a model of the heart to help describe the functions of the heart and circulatory system (you could include differences between a single and double circulatory system).</li> <li>Label a diagram of the heart showing four chambers, vena cava, pulmonary artery, pulmonary vein and aorta.</li> <li>Complete a heart dissection (sheep) or show a model heart and identify the chambers, main blood vessels and valves.</li> <li>Heart jigsaw of different components – could be useful to give to those not wanting to do the dissection.</li> </ul>	<p>Cardio-respiratory</p> <p>Cardio</p> <p>Component</p> <p>Function</p> <p>Ventricles</p> <p>Atria</p> <p>Valves</p> <p>Arteries</p> <p>Veins</p> <p>Capillaries</p>	<p>Identify, describe and explain the role and function of the different components of the heart and blood cells vessels</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The cardiovascular and respiratory systems</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> Structure and function of the cardiovascular system</p> <p><a href="#">Label the heart: interactive</a> (sciencelearn.org.nz)</p> <p><a href="#">Bupa</a> (bupa.co.uk)</p> <p><a href="#">British Heart Foundation</a> (bhf.org.uk)</p> <p><a href="#">The Heart Song</a> (2min 40sec video)</p> <p><a href="#">Blood Flow through the Heart in 2 Minutes</a> (2min 11sec video)</p>	<p>R180 Warm up and cool down routines</p>

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<ul style="list-style-type: none"> <li>• Use a diagram of the heart that can be labelled and coloured in to show oxygenated/deoxygenated blood. Describe the flow of blood from the body, through the heart and lungs and back to the body.</li> <li>• Explain how the heart is adapted for its function.</li> <li>• Use a test tube image of blood that has been through a centrifuge. Describe the different roles for each component of blood.</li> <li>• Produce models of red blood cells, white blood cells and platelets.</li> <li>• Produce a mind map to explain the composition of blood and describe the functions of plasma, red blood cells, white blood cells and platelets.</li> <li>• Use microscopes to look at blood smear slides – ask students to identify the red blood cells and white blood cells and describe the differences in numbers and size.</li> <li>• Use images of the different vessels, or use bio-viewers and compare their size, structure and function.</li> </ul>			<p><a href="#">Circulatory system physiology</a> (7min 50sec video)</p> <p><a href="#">Cardiovascular system – heart, structure and function</a> (21min 32sec video)</p> <p><a href="#">The Heart - GCSE Biology (9-1)</a> (7min 32sec video)</p> <p><a href="#">GCSE Biology: Blood vessels</a> (4min 1sec video)</p> <p><a href="#">Blood vessels - GCSE Biology (9-1)</a> (4min 43sec video)</p> <p><a href="#">The four components of the blood</a> (bbc.co.uk)</p> <p><a href="#">PE: The Components of Blood</a> (5min 29sec video)</p> <p><a href="#">GCSE Biology - What Is Blood Made of? What Does Blood Do?</a> (4min 34sec video)</p> <p><a href="#">Blood - GCSE Biology (9-1)</a> (8min 28sec video)</p>	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<ul style="list-style-type: none"> <li>Explain how the blood vessels are adapted for their function.</li> </ul>			<a href="#">What is blood?</a> (2min 23sec video)	
1-2	<p>1.1 Components, function and role of cardio-respiratory system during exercise</p> <p>1.1.2 Function and role:</p> <ul style="list-style-type: none"> <li>Heart rate / pulse rate</li> <li>Blood pressure – stroke volume and cardiac output</li> </ul>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Recap on the different components of the heart/blood/vessels.</li> <li>Define heart rate and blood pressure including stroke volume and cardiac output and complete a table that matches the terms with the correct definitions.</li> <li>Apply the function and role of heart rate and blood pressure during exercise (use different intensity sports to illustrate changes).</li> <li>You could measure students' pulse rate and blood pressure – lying down, sitting and standing. This could be developed into a practical with students drawing graphs of the results along with the changes that occur during exercise.</li> </ul>	<p>Heart/pulse rate</p> <p>Blood pressure</p> <p>Stroke volume</p> <p>Cardiac output</p>	<p>Identify, describe and explain the role and function of heart/pulse rate and blood pressure including stroke volume and cardiac output</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The cardiovascular and respiratory systems</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> Structure and function of the cardiovascular system</p> <p><a href="#">How does your heart work?</a> (bbc.co.uk)</p> <p><a href="#">What Is A Healthy Heart Rate - What Affects Heart Rate - What Is Maximum Heart Rate</a> (2min 22sec video)</p> <p><a href="#">How to Feel Your Heart Beat</a> (3min 35sec video)</p> <p><a href="#">How blood pressure works</a> (4min 31sec video)</p>	

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					<a href="#">Cardiovascular System Physiology - Cardiac Output (stroke volume, heart rate, preload and afterload)</a> (5min 12sec video)  <a href="#">Exercise &amp; Blood Pressure</a> (10min 16sec video)  <a href="#">Blood Pressure Response to Exercise</a> (2min 30sec video)	
3	<p>1.1 Components, function and role of cardio-respiratory system during exercise</p> <p>1.1.1 Components:</p> <ul style="list-style-type: none"> <li>Respiratory system – trachea, lungs, alveoli, diaphragm</li> </ul> <p>1.1.2 Function and role:</p> <ul style="list-style-type: none"> <li>Gaseous exchange – inhalation and exhalation</li> </ul>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Recap on the heart showing the double circulatory system with focus on lungs.</li> <li>Get students to write everything they can remember from KS3 Science on the respiratory system on a whiteboard – share answers (can go back to this at the end and see what else they can add to the boards – use another colour if available).</li> <li>Show a video on the lungs that describes the different components including trachea, lungs, alveoli, diaphragm.</li> <li>Label a diagram and discuss the different role for each component.</li> </ul>	Respiratory Trachea Lungs Alveoli Diaphragm Gaseous exchange Inhalation Exhalation	Identify, describe and explain the role and function of the components of the respiratory system and gaseous exchange during exercise	<a href="#">OCR Online: Anatomy and Physiology</a> Structure and function of the cardiovascular system  <a href="#">Respiratory System - Introduction   Physiology   Biology</a> (3min 7sec video)  <a href="#">The Respiratory System</a> (8min 50sec video)  <a href="#">Respiration Experiments - GCSE Biology (9-1)</a> (2min 32sec video)  <a href="#">Respiratory System</a> (getbodysmart.com)	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<ul style="list-style-type: none"> <li>• Show a blank diagram of the lungs and students need to label each of the different components.</li> <li>• Use a balloon to model how we breathe inhale/exhale. Focus on ribs, lungs, respiratory muscles.</li> <li>• Use a video clip to demonstrate gaseous exchange and inhalation and exhalation.</li> <li>• Describe how the respiratory system and the circulatory system work together.</li> <li>• Describe the heart as a double pump and explain why this is efficient.</li> <li>• Explain how the alveoli are adapted for efficient gas exchange.</li> </ul>			<p><a href="#">Gas exchange</a> (8min 50sec video)</p> <p><a href="#">Gaseous exchange in lungs</a> (1min 52sec video)</p> <p><a href="#">Biology Help: The Respiratory System - Gas Exchange In The Alveoli Explained In 2 Minutes</a> (1min 53sec video)</p> <p>Make a lung model. Select one of the videos below <a href="#">Video 1</a> <a href="#">Video 2</a></p> <p>How do we breathe? Select one of the videos below <a href="#">Video 1</a> <a href="#">Video 2</a></p> <p>Respiratory and circulatory systems working together. Select one of the videos below <a href="#">Video 1</a> <a href="#">Video 2</a></p> <p><a href="#">Alveoli: Gas Exchange</a> (3min 24sec video)</p>	

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4	1.1 Components, function and role of cardio-respiratory system during exercise  1.1.1 Components  1.1.2 Function and role	At the start of this lesson, you could: <ul style="list-style-type: none"> <li>• Create a mind map based on: What does exercise do to us and how are the different components of the cardio-respiratory system involved during physical activity? Develop this by introducing reference to different stages of a warm up and different intensities of performance – short/high intensity, endurance, and strength based – use video clips showing different activities to help discussion.</li> <li>• Mini-practical: star jumps, jog on spot for 1 minute – what do you notice? Why have these changes happened? Use the video BBC Bitesize: Workouts for other exercise ideas.</li> <li>• Describe and explain the changes that occur in the body during exercise.</li> <li>• Design and carry out an investigation about the effects of exercise on the body. This could include a presentation that also includes interpretation of data about heart rate, breathing rate and breath volume, e.g. heart rate / spirometer tracings.</li> <li>• Describe the effects of long periods of vigorous exercise on the body.</li> </ul>	Intensities  Short/high  Endurance  Strength	Identify, describe and explain how the cardio-respiratory systems are involved during different intensities of physical activity	<a href="#">OCR Online: Anatomy and Physiology</a> Structure and function of the cardiovascular system  Discuss causes and effects of muscle fatigue and relate these to lactic acid build up. Watch a video showing sprinters and discuss how the body reacts at the end of the race – paying back the oxygen debt. <ul style="list-style-type: none"> <li>• Investigate the effect of exercise on heart rate, breathing rate, depth of breathing and temperature.</li> <li>• Investigate effect of muscle fatigue on muscle strength.</li> <li>• Investigate how long it takes muscles to fatigue – repetitive actions, e.g. step ups or holding masses at arm's length.</li> </ul> YouTube has a variety of videos of marathon runners struggling over the finish line – use them as a discussion starter, e.g.:	

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		<ul style="list-style-type: none"> <li>Describe 'oxygen debt'.</li> </ul>			<p><a href="#">Fantastic Marathon finishes and the agony of the feet</a> (1min 54sec video) or <a href="#">Extraordinary Human Beings in Slow Motion at the Twin Cities Marathon Finish Line</a> (4 min 13sec video)</p> <p><a href="#">BBC Bitesize: Workouts</a> (bbc.co.uk)</p> <p><a href="#">Aerobic Respiration - GCSE Biology (9-1)</a> (2min 20sec video)</p> <p><a href="#">Anaerobic Respiration - GCSE Biology (9-1)</a> (2min 20sec video)</p>	
5	<p>1.2 Cardio-respiratory sports technology</p> <p>1.2.1 Technology that can inform how the cardio-respiratory system is responding whilst performing in sport during warm up and performance</p>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Recap on the components of a warm up. Which parts of the warm up will bring about the biggest changes with the cardio-respiratory system? Why?</li> <li>Discuss different types of technology worn by performers during physical activity – this could include labelling a diagram of a sports performer.</li> </ul>	<p>Cardio-respiratory</p> <p>Sport technology</p> <p>Warm up</p> <p>Performance</p> <p>Long-term participation</p>	<p>Identify, describe and explain the use of cardio-respiratory sports technology can inform how the cardio-respiratory system is responding to short- and long-term participation in physical activity</p>	<p><a href="#">Physical activity guidelines</a> (gov.uk)</p> <p><a href="#">Medical training and technological devices are the key to a healthy heart</a> (technogym.com)</p> <p><a href="#">A Sport Science Approach to Heart Rate Monitoring</a> (simplifaster.com)</p> <p><a href="#">How Wearable Technology Has Revolutionised Training</a></p>	



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	1.2.2 Information that technology can give sports performers on their long-term participation in physical activity	<ul style="list-style-type: none"> <li>Discuss what is meant by long-term participation.</li> <li>Discuss the different types of technology that can inform how the cardio-respiratory system is responding during warm up and performance and long-term participation.</li> <li>Look at a range of different sports including individual and team sports with different intensities such as golf and basketball.</li> <li>Discuss different types of technology worn by professional players. When do they use this type of technology? Why? Is there a difference between technology used by amateurs and professionals?</li> <li>Discuss different types of technology that performers use to provide them with the necessary information about their long-term participation in physical activity.</li> </ul>			<p>(4min 15sec video)</p> <p><a href="#">The Wearable Device That Avoids Injuries Through Technology</a> (5min 31sec video)</p> <p><a href="#">Why do footballers wear GPS vests?</a> (2min 14sec video)</p> <p><a href="#">Football GPS Talk: The Modern Day Footballer X Pro:Direct Soccer</a> (4min 39sec video)</p> <p><a href="#">How to use a heart rate monitor</a> (2min 6sec video)</p> <p><a href="#">APEX athlete</a> (statsports.com)</p>	
6	1.2 Cardio-respiratory sports technology  1.2.3 The benefits and drawbacks of sports technology to the sports performer	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Recap on the different types of technology used during performance and long-term participation.</li> <li>Link each type of technology towards being used by professionals or available</li> </ul>	Benefits  Drawbacks	Identify, describe and explain the benefits and drawbacks of cardio-respiratory sports technology to the sports performer	<p><a href="#">Precision Science - Technological Advances in Sport</a> (5min 27sec video)</p> <p><a href="#">Sports Science Development at the Australian Institute of Sport</a></p>	

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		<p>to all including beginners. Students to justify responses.</p> <ul style="list-style-type: none"> <li>• Are there any similarities and differences between the type of technology used by a professional and a beginner?</li> <li>• Produce a table that lists the benefits and drawbacks of technology to the performer. Consider how cardio-respiratory sports technology is used. Fitness testing, training aids, equipment, injury medical prevention and recovery.</li> <li>• You will need to make sure you cover: technology that is based in a laboratory and/or needs laboratory equipment and field based technology.</li> </ul>			<p>(4min 46sec video)</p> <p><a href="#">Sports Science and Research at Ghent University</a> (4min 52sec video)</p>	

<p><b>Summary of what you will cover from the <a href="#">curriculum planner</a>:</b></p>	<p><b>Topic Area 2: The musculo-skeletal system and how the use of technology supports different types of sports and their movements</b></p>
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Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
1	<p>2.1 The components and role of the musculo-skeletal system in producing movement</p> <p>2.1.1 Different components:</p> <ul style="list-style-type: none"> <li>• Major bone groups:</li> <li>- Upper body - cranium, scapula, clavicle, humerus, radius, ulna, ribs, vertebrae</li> <li>- Lower body - femur, tibia, fibula, patella</li> </ul>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>• Introduce the different bones using a model skeleton.</li> <li>• Give examples of the musculo-skeletal system such as synovial joint of the knee and the major bones of the femur, tibia, fibula, patella.</li> <li>• The function of ligaments and cartilage could also be introduced here.</li> </ul>	<p>Musculo-skeletal</p> <p>Components</p> <p>Role</p> <p>Movement</p> <p>Bone groups</p> <p>Cranium</p> <p>Scapula</p> <p>Clavicle</p> <p>Humerus</p> <p>Radius</p> <p>Ulna</p> <p>Ribs</p> <p>Vertebrae</p> <p>Femur</p> <p>Tibia</p> <p>Fibula</p> <p>Patella</p>	<p>Identify, describe and explain the use of major bone groups</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The structure and function of the skeletal system</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> The structure and function of the skeletal and muscular systems</p> <p><a href="#">Upper Limb Bones</a> (getbodysmart.com)</p> <p><a href="#">Introduction to the Skeletal System In 7 Minutes</a> (7min 15sec video)</p> <p><a href="#">GCSE PE: Skeletal System (Identification &amp; Location)</a> (10min 28sec video)</p> <p><a href="#">The Long and the Short of It: The Five Types of Bones</a> (visiblebody.com)</p>	<p>R180 Warm up and cool down routines</p>

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2	<p>2.1 The components and role of the musculo-skeletal system in producing movement</p> <p>2.1.1 Different components:</p> <ul style="list-style-type: none"> <li>• Skeletal muscle groups:               <ul style="list-style-type: none"> <li>- Upper body - biceps, triceps, abdominals, pectorals, latissimus dorsi, deltoids, trapezius</li> <li>- Lower body - hamstrings, soleus, gluteals, quadriceps, gastrocnemius</li> </ul> </li> </ul>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>• Recap on the bones using a model skeleton.</li> <li>• Use drawn out muscles on sheets of paper and stick to the model skeleton.</li> <li>• Give examples of the musculo-skeletal system such as muscles connected to the bones in the lower body are the quadriceps that produces extension, this can be seen in running when you straighten/extend your knee to take a step and the hamstring produces flexion, this can be seen in football when you bring your leg back to prepare to kick a ball.</li> <li>• Use a diagram that shows half bones and half muscles and get students to label bones and muscles.</li> </ul>	<p>Skeletal muscle groups</p> <p>Biceps</p> <p>Triceps</p> <p>Abdominals</p> <p>Pectorals</p> <p>Latissimus dorsi</p> <p>Deltoids</p> <p>Trapezius</p> <p>Hamstrings</p> <p>Soleus</p> <p>Gluteals</p> <p>Quadriceps</p> <p>Gastrocnemius</p>	<p>Identify, describe and explain the use of major skeletal muscle groups</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The structure and function of the muscular system</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> The structure and function of the skeletal and muscular systems</p> <p><a href="#">Muscular System</a> (getbodysmart.com)</p> <p><a href="#">The Muscular System Explained In 6 Minutes</a> (5min 50sec video)</p> <p><a href="#">Big Guns: The Muscular System</a> (12min 51sec video)</p> <p><a href="#">The Skeletal System: It's ALIVE!</a> (13min 10sec video)</p> <p><a href="#">Human muscle system</a> (britannica.com)</p> <p><a href="#">Muscular System</a> (innerbody.com)</p>	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
3	<p>2.1 The components and role of the musculo-skeletal system in producing movement</p> <p>2.1.1 Different components:</p> <ul style="list-style-type: none"> <li>Synovial joints - Ball and socket, Hinge, Gliding, Pivot</li> <li>Connective tissue - Ligaments, Tendons, Cartilage</li> </ul>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Use images or model skeleton of the different joints and show range of movement.</li> <li>Describe the functions of ligaments, tendons and cartilage.</li> <li>Students to make their own model synovial joint using resources such as sticky tape, card, elastic bands, etc. Students can then present to the class the different functions of their chosen joint and the connective tissue involved.</li> <li>Give examples of the musculo-skeletal system such as synovial joint of the knee has the major bones of the femur, tibia, fibula, patella which are connected by ligaments and are protected by cartilage and the muscles are connected to the bones by tendons.</li> </ul>	<p>Synovial joint</p> <p>Ball and socket</p> <p>Hinge</p> <p>Gliding</p> <p>Pivot</p> <p>Connective tissue</p> <p>Ligaments</p> <p>Tendons</p> <p>Cartilage</p>	<p>Identify, describe and explain the use of synovial joints and connective tissue</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The structure and function of the skeletal system</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> The structure and function of the skeletal and muscular systems</p> <p><a href="#">Types Of Joints in the Human Body - GCSE PE</a> (2min 35sec video)</p> <p><a href="#">GCSE PE Joint Actions</a> (5min 17sec video)</p> <p><a href="#">Joints   Physiology   Biology</a> (4min 39sec video)</p> <p><a href="#">GCSE PE: The Structure of Synovial Joints</a> (4min 13sec video)</p> <p><a href="#">Skeletal System   Bone, Cartilage, Tendons, Ligaments</a> (7min 16sec video)</p>	
4	2.1.2 The role of the components in	At the start of this lesson, you could:	Flexion	Identify, describe and explain the	<a href="#">OCR GCSE PE Topic exploration pack</a>	

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	producing the types of movement: <ul style="list-style-type: none"> <li>• Flexion</li> <li>• Extension</li> <li>• Abduction</li> <li>• Adduction</li> <li>• Rotation</li> <li>• Circumduction</li> </ul>	<ul style="list-style-type: none"> <li>• Recap on the different joints and the range of movement they provide.</li> <li>• Complete simple movement analysis tables for different sporting diagrams such as kicking a football, lifting a dumbbell.</li> <li>• Practical opportunity: students to perform static images of sporting movements such as the tennis serve and label the movements occurring at different body parts using sticky notes or use cut out sporting pictures to complete a simple movement analysis.</li> <li>• Apply practical examples such as in the lower body the quadriceps and hamstrings work together to produce extension and flexion or the hamstring produces flexion, this can be seen in football when you bring your leg back to prepare to kick a ball.</li> </ul>	Extension Abduction Adduction Rotation Circumduction	role of different components in producing different types of movement	Movement analysis <a href="#">OCR Online: Anatomy and Physiology</a> The structure and function of the skeletal and muscular systems  <a href="#">GCSE PE: The Structure of Synovial Joints</a> (4min 13sec video)  <a href="#">Types of Movement at Joints</a> (7min 57sec video)  <a href="#">GCSE PE - Movement Patterns</a> (7min 45sec video)  <a href="#">GCSE PE - Movement Analysis</a> (7min 47sec video)	
5	2.2 Musculo-skeletal sports technology  2.2.1 Technology that can inform how the musculo-skeletal system is responding to short-	At the start of this lesson, you could: <ul style="list-style-type: none"> <li>• Research into different examples of musculo-skeletal technology.</li> <li>• Discuss how it can be used in both short and long term sporting participation.</li> </ul>	Sports technology  Laboratory  Field based	Identify, describe and explain the use of musculo-skeletal sports technology can inform how the musculo-skeletal system is responding to	<a href="#">The Wearable Device That Avoids Injuries Through Technology</a> (5min 31sec video)  <a href="#">Electrical Muscle Stimulation: Five Reasons Why You Need to Adopt</a>	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
	and long-term participation in physical activity	<ul style="list-style-type: none"> <li>Discussion will need to include how technology is based in a laboratory and/or needs laboratory equipment or field based technology.</li> <li>Are there any differences and similarities between technology used by a beginner to that of an elite sports person? Why?</li> </ul>		short- and long-term participation in physical activity	<p><a href="#">This Technology for Your Athletes Now</a> (simplifaster.com)</p> <p><a href="#">New Technology for Muscle Training and Recovery</a> (clubindustry.com)</p> <p><a href="#">Can The EMS Suit Really Make Your Workouts More Efficient?</a> (2min 5sec video)</p> <p><a href="#">Building Better Athletes</a> (liveathos.com)</p>	
6	<p>2.2 Musculo-skeletal sports technology</p> <p>2.2.2 The benefits and drawbacks of this technology to the sports performer</p>	<p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Recap on the different types of musculo-skeletal technology used during performance and long-term participation.</li> <li>Link each type of technology towards being used by professionals or available to all including beginners. Students to justify responses.</li> <li>Are there any similarities and differences between the type of technology used by a professional and a beginner?</li> </ul>		Identify, describe and explain the benefits and drawbacks of musculo-skeletal sports technology to the sports performer	<p><a href="#">High-Tech Sports Lab Helps Athletes Improve Performance</a> (3min 19sec video)</p> <p><a href="#">Athlete Gadgets in 2021   Used By Professional Athletes</a> (14min 48sec video)</p> <p><a href="#">Do Massage Guns Really Help?   Physical Therapist Reviews Achedaway Massage Gun</a> (10min 59sec video)</p>	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<ul style="list-style-type: none"> <li>Produce a table that lists the benefits and drawbacks of technology to the performer. Consider how musculo-skeletal sports technology is used. Fitness testing, training aids, equipment, injury medical prevention and recovery.</li> <li>You will need to make sure you cover: technology that is based in a laboratory and/or needs laboratory equipment and field based technology.</li> </ul>				



Summary of what you will cover from the <a href="#">curriculum planner</a> :		Topic Area 3: Short-term effects of exercise on the cardio-respiratory and musculo-skeletal systems				
Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
1-6	<p>3.1 The different short-term effects of exercise on the cardio-respiratory and musculo-skeletal systems</p> <p>3.1.1 Changes in the:</p> <ul style="list-style-type: none"> <li>Heart rate, stroke volume, cardiac output</li> <li>Breathing rate, gaseous exchange</li> <li>Range of movement of joints</li> </ul>	<p>Different approaches:</p> <p>Lessons 1-6 can be merged with each other using a combined practical/classroom approach to cover all of the short-term effects of exercise involving different levels of intensity. Students to make notes of all short-term effects in practical lessons to help describe the changes that have occurred when participating in each intensity session. Use the data/information obtained from practical lessons in theory lessons.</p> <p>Lessons 1-2 cover changes in heart rate, stroke volume and cardiac output across different levels of intensity, e.g. 1 = warm up, 2 = sprinting and 3 = weights.</p> <p>Lessons 3-4 cover changes in breathing rate, and gaseous exchange across different levels of intensity, e.g. 1 = warm up, 2 = sprinting and 3 = weights.</p> <p>Lessons 5-6 cover changes in range of movement of joints across different levels of intensity, e.g. 1 = warm up, 2 = sprinting and 3 = weights.</p>	<p>Short-term effect</p> <p>Cardio-respiratory</p> <p>Musculo-skeletal</p> <p>Heart rate</p> <p>Stroke volume</p> <p>Cardiac output</p> <p>Breathing rate</p> <p>Gaseous exchange</p> <p>Range of movement of joints</p>	<p>Identify, describe and explain the different short-term effects and changes in the cardio-respiratory systems</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> Effects of exercise on body systems</p> <p><a href="#">OCR Topic exploration pack*</a></p> <p><a href="#">GCSE PE - Short-Term Effects of Exercise</a> (3min 13sec video)</p> <p><a href="#">Short Term Effects of Exercise</a> (5min 43sec video)</p> <p><a href="#">Short Term Effects of Exercise on the Body Systems</a> (5min 57sec video)</p>	<p>R180 Warm up and cool down routines</p>
<p>* Please note, this resource is for the current specification but is also relevant for this specification. Resources will be updated for J828 in due course.</p>						
OR						

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<p>Lessons 1-2 cover: Heart rate, stroke volume, cardiac output / Breathing rate, gaseous exchange / Range of movement of joints applied to warm up.</p> <p>Lessons 3-4 cover: Heart rate, stroke volume, cardiac output / Breathing rate, gaseous exchange / Range of movement of joints applied to sprinting.</p> <p>Lessons 5-6 cover: Heart rate, stroke volume, cardiac output / Breathing rate, gaseous exchange / Range of movement of joints applied to weights.</p> <p>At the start of the lessons, you could:</p> <ul style="list-style-type: none"> <li>Recap on what is meant by cardio-respiratory and musculo-skeletal systems.</li> <li>Get students to participate in different types of sporting activities that require different intensities.</li> <li>Describe the responses that have occurred due to different intensities including the varying intensities of each stage of a warm up. Why do these responses happen? How can this be a benefit to the sports performer?</li> </ul>				

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
		<ul style="list-style-type: none"><li>In preparation for the next term it could be useful to discuss long term training programmes and gather some measurements such as resting heart rate, muscle sizes, etc.</li></ul>				

Summary of what you will cover from the <a href="#">curriculum planner</a> :		Topic Area 4: Long-term effects of exercise on the cardio-respiratory and musculo-skeletal systems				
Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
1-6	<p>4.1 The long-term effects of exercise on the cardio-respiratory and musculo-skeletal systems</p> <p>4.1.1 Changes:</p> <ul style="list-style-type: none"> <li>In muscle size and strength</li> <li>In resting heart rate/stroke volume/cardiac output</li> <li>In heart rate recovery</li> <li>In flexibility</li> <li>In muscle recovery / DOMs / Lactic acid</li> <li>In lung capacity</li> <li>When participating in to different intensities of sporting</li> </ul>	<p>Lessons 1-6 can be merged with each other to cover all of the long-term effects of exercise:</p> <p>Lesson 1 – muscle size and strength Lesson 2 – resting heart rate/stroke volume/cardiac output Lesson 3 – heart rate recovery Lesson 4 – flexibility Lesson 5 - muscle recovery / DOMs / lactic acid Lesson 6 – lung capacity</p> <p>If students have a baseline of measurements that have been gathered before half term then these can be used to monitor some of the changes as they work through a training programme.</p> <p>At the start of this lesson, you could:</p> <ul style="list-style-type: none"> <li>Introduction: Discuss what is meant by long-term effects.</li> <li>Give students different sporting activities that require different intensities such as sprinting and</li> </ul>	<p>Long-term effects</p> <p>Cardio-respiratory</p> <p>Musculo-skeletal</p> <p>Muscle size</p> <p>Hypertrophy</p> <p>Muscle strength</p> <p>Resting heart rate</p> <p>Stroke volume</p> <p>Cardiac output</p> <p>Heart rate recovery</p> <p>Flexibility</p> <p>Muscle recovery</p>	<p>Identify, describe and explain the different long-term effects and changes in the cardio-respiratory systems when participating in different intensities of sporting activity</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> Effects of exercise on body systems</p> <p><a href="#">OCR Topic exploration pack*</a></p> <p><a href="#">Adaptations to Exercise   Cardiovascular System</a> (11min 21sec video)</p> <p><a href="#">Responses to Exercise   Cardiovascular System</a> (9min 19sec video)</p> <p><a href="#">Adaptations to Exercise   Muscular System</a> (16min 1sec video)</p> <p><a href="#">Responses to Exercise   Respiratory System</a> (6min 47sec video)</p> <p><a href="#">GCSE PE - Long-Term Effects of Exercise</a> (4min 38sec video)</p> <p><a href="#">Long Term Effects of Exercise</a> (6min 18sec video)</p>	<p>R180 Different types and causes of sports injuries</p> <p>R180 Reducing risk, treatment and rehabilitation of sports injuries and medical conditions</p>
* Please note, this resource is for the current curriculum version (relevant for J828 in due course).		Resources will be updated for J828 in due course.				

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
	activities including: - Short high intensity sports - Endurance sports - Strength based sports	and high intensity), marathon running, triathlons, cross country skiing (endurance) and weightlifting (strength). <ul style="list-style-type: none"> <li>Challenge: Discuss the links with different fitness components and compare different playing positions.</li> <li>Recap on previous lesson.</li> <li>Give students a blank storyboard template with boxes for each of the changes, e.g. muscle size and strength, etc. The storyboard should include: What adaptations could occur and why? Describe the benefits and drawbacks on long-term exercise for the participant in that activity.</li> <li>At the end of each lesson students can work in different groups comparing storyboards of other sporting activities of different intensities and performance duration</li> </ul>	DOMs Lactic acid Lung capacity Short high intensity sports Endurance sports Strength based sports		<a href="#">GCSE PE Long Term Effects of Exercise on Muscular System</a> (2min 31sec video)  <a href="#">Long Term Effects of Exercise on the Body Systems</a> (6min 43sec video)  <a href="#">GCSE PE - Flipped Learning - Long-term effects of exercise</a> (5min 16sec video)	

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
Opportunity to submit assessment tasks if in a position to do so. This would then allow a resubmission opportunity in Summer 1.						

Summary of what you will cover from the <a href="#">curriculum planner</a> :		Working on NEA assessment (supervised)				
Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
1	Working on NEA assessment tasks	<p>You could reserve a block of lessons for students to work on the tasks within the set assignment.</p> <p>Alternatively, students could use this time to complete relevant assessment tasks interleaved with other taught and practice lessons.</p> <p>Time allowed for working on the NEA set assignment is typically 10-12 hours.</p> <p>Students <u>must</u> be supervised for safety purposes when undertaking any practical assessment work.</p> <p>In an early lesson you could:</p> <ul style="list-style-type: none"> <li>• introduce students to the set assignment brief and associated tasks</li> <li>• explain the marking criteria and how students will be assessed</li> <li>• hold a class discussion to confirm the exact requirements for each task</li> <li>• ask students, working in small groups, to review and discuss the set assignment brief and confirm how they will produce and present evidence for assessment.</li> </ul>	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>	
2	Working on NEA assessment tasks	Working on NEA tasks continues.	NEA assessment	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>

Lesson no.	Topic areas/sub topic areas	Lesson ideas and activities	Lesson key words	Lesson outcome(s) At the end of the lesson, students will be able to:	Useful links/resources	How does this link to other units?
3	Working on NEA assessment tasks	Working on NEA tasks continues.	NEA assessment	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>
4	Working on NEA assessment tasks	Working on NEA tasks continues.	NEA assessment	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>
5	Working on NEA assessment tasks	Working on NEA tasks continues.	NEA assessment	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>
6	Working on NEA assessment tasks	Working on NEA tasks continues.	NEA assessment	As stated in previous units	Work towards completion of assessment tasks	<a href="#">OCR Sample assessment materials R182</a>

If assessment tasks are submitted at the end of Spring 2 then this allows a resubmission opportunity in Summer 1.



## Teaching over three years

Some centres may choose to start their delivery of the qualification earlier in Year 9, and so deliver over three years. The following topic areas are suggestions of what could form part of early delivery.

Topic area	Warm up / introductory activities	Length of time activity may take	Useful resources
Topic Area 1: The cardio-respiratory system and how the use of technology supports different types of sports and their intensities	<p>Students could start to become familiar with the different components, functions and roles of the cardio-respiratory system.</p> <p>Students could also start to gain an understanding of the benefits and drawbacks in the use of cardio-respiratory technology. This can include the information it provides during performance and long-term participation in physical activity.</p>	<p>3-4 hours with additional time for working in small groups to create a poster (cut out of a performer) that details the changes that occur in the cardio-respiratory system during exercise. Students could insert flaps that open up to reveal the different components such as the heart and lungs.</p> <p>Students can research and use different types of cardio-respiratory technology such as SMART watches and review what information it can provide to the user.</p> <p>3-4 hours with additional time for practical investigations and working in small groups to create a presentation on their research into cardio-respiratory technology. This can include their own actual results.</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The cardiovascular and respiratory systems</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> Structure and function of the cardiovascular system</p>
Topic Area 2: The musculo-skeletal system and how the use of technology supports different types of sports and their movements	<p>Students could start to become familiar with the different components, functions and roles of the musculo-skeletal system.</p> <p>Students could also start to gain an understanding of the benefits and drawbacks in the use of musculo-skeletal technology. This can include the information it provides during</p>	<p>3-4 hours with additional time for working in small groups to create a poster (cut out of a performer) that details the changes that occur in the musculo-skeletal system during exercise. Students could insert flaps that open up to reveal the different components such as joints and muscles. The cut out could also be designed to</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> The structure and function of the skeletal system</p> <p><a href="#">OCR Online: Anatomy and Physiology</a> The structure and function of the skeletal and muscular systems</p>

Topic area	Warm up / introductory activities	Length of time activity may take	Useful resources
	performance and long-term participation in physical activity.	<p>demonstrate the types of movement available at different joints.</p> <p>Students can research and use different types of musculo-skeletal technology.</p> <p>3-4 hours with additional time for practical investigations and working in small groups to create a presentation on their research into musculo-skeletal technology.</p>	
Topic Area 3: Short-term effects of exercise on the cardio-respiratory and musculo-skeletal systems	Students could start to become familiar with short-term effects of exercise on the cardio-respiratory such as changes in heart rate and musculo-skeletal systems such as muscle fatigue.	<p>This can be a mainly practical delivery that allows students to participate in a range of activities that require different intensities such as sprinting and 12 minute run as well as playing different sports and positions. Students to record their findings each week.</p> <p>5-6 hours with additional time for working in small groups to create a PowerPoint presentation showing their results (with explanation).</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> Effects of exercise on body systems</p> <p><a href="#">OCR Topic exploration pack*</a></p>
Topic Area 4: Long-term effects of exercise on the cardio-respiratory and musculo-skeletal systems	Students could start to become familiar with long-term effects of exercise on the cardio-respiratory such as changes in resting heart rate and musculo-skeletal systems such as muscle size.	<p>This can be a mainly practical delivery that allows students to participate in a planned 6+ week training programme. Students to record their findings each week.</p> <p>5-6 hours with additional time for working in small groups to create a PowerPoint presentation showing their results (with explanation).</p>	<p><a href="#">OCR GCSE PE Topic exploration pack</a> Effects of exercise on body systems</p> <p><a href="#">OCR Topic exploration pack*</a></p>

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