# Unit 1: Body systems and the effects of physical activity

## Scheme of work

## (90 GLH)

### Introduction

This outline scheme of work (SOW) is to offer a perspective of how to deliver Unit 1 of the Cambridge Technicals in Sport and Physical Activity.
There are many alternative methods and structures that could be used and therefore it is important to explore different methods of delivering the specification, considering different approaches depending on staffing and expertise within your centre and the resources you have available.

Consideration of how the **theoretical content** of the specification can be covered is best delivered in different ways, through:

* A variety of different teacher resources
* Stimulate discussions
* Group work
* Learner activities
* Variety of questions relating to all the different XXX topics

Aiming for quality communication and professional standards of work will help to establish the connections between this qualification and
real world practice.

***DISCLAIMER***

This resource was designed using the most up to date information from the specification at the time it was published. Specifications are updated over time which means there may be contradictions between the resource and the specification, therefore please use the information on the latest specification at all times.If you do notice a discrepancy please contact us on the following email address: resources.feedback@ocr.org.uk

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## Overview of Allocation of GLH per Topic

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| **Learning Objective** |  | **GLH Inc guided study** |
| LO1: Understand the skeletal system in relation to exercise and physical activity |  | 24GLH |
| LO2: Understand the muscular system in relation to exercise and physical activity |  | 18GLH |
| LO3: Understand the cardiovascular system in relation to exercise and physical activity |  | 18GLH |
| LO4: Understand the Respiratory system in relation to exercise and physical activity |  | 18GLH |
| LO5: Understand the Energy systems in relation to exercise and physical activity |  | 12GLH |

## Scheme of Work in Detail

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| **Unit 1: Body systems and the effects of physical activity** |
| **Number of hours** | **Learning Outcomes** | **Unit content to be covered, activities, links to useful resources** |
| 2 | Introduction and unit orientation* Maximising your chances of Distinction
* GBV respect and tolerance
* Links to equality and diversity

Explanation of the order of Delivery and Learning Objectives to be studied.All learning outcomes are best supported by a centre produced work booklet that will support revision. | Establish course expectations and classroom conduct.Requirement of study outside of the class and independent learning such as the ability to develop effective research skills and comprehension skills.* **Activity** (**30 minutes**) Course Introduction
* **Activity (20 minutes):** What skills and resources will you require to achieve a high grade in unit 1 Sports organisations and development.
* **Activity (30 minutes)** Create a spider diagram that includes the 5 body systems to be studied (Skeletal, Muscular, Cardio-Vascular, Respiratory & Energy). Ask learners to brainstorm any knowledge of the systems that may already have. Bring this together after 15 minutes and discuss the different aspects of knowledge that the learners have identified.
* **Activity (40 minutes)** Each learner to come up with 3 questions they would like to ask or things they would like to know about each system (15 in total) Can the students answer any of these queries and if not the Teacher guides the discussions.
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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3 | * 1. **The axial and appendicular skeletons, i.e.**

**Axial skeleton**,* Cranium, sternum, ribs, vertebral column (cervical vertebrae, thoracic vertebrae, lumbar vertebrae, sacrum, coccyx

**Appendicular skeleton**,* Scapula, clavicle, humerus, radius, ulna, carpals, metacarpals, phalanges, ilium, ischium, pubis, femur, patella, tibia, fibula, tarsals, talus, metatarsals
 | * **Activity (20 minutes)** Learners could brainstorm any bones that they have already heard of – Q & A of where these bones are located.
* **Activity (10 minutes**) Learners could complete a word search of all the bones included in the teaching specification followed by a Q and A of where these bones may go.
* **Activity (20 minutes)** In pairs learners are given sticky notes and should attempt to place the notes where the identified bones are on a partner.
* **Activity (30 minutes)** Learners are given an unlabelled diagram of the skeleton and with teacher guidance or online research ensure that all the bones identified in the specification are labelled.
* **Activity (10 minutes)** Learners could colour the axial and appendicular bones in different colours to distinguish them.
* **Activity (30 minutes)** Learners discuss with the teacher the different roles that the appendicular and axial skeletons do. Learners can write a paragraph about the two parts of the skeleton and include the bones that are included in each.
* **Activity (30 minutes)** Learners are given a number of blank diagrams of the skeletal system and should try and label it. Then check their notes for errors. Then attempt another blank one and continue until they can label all bones in the specification.
* **Activity (30 minutes)** Plenary – Teacher could produce a PPT that has the unlabelled skeleton with an arrow pointing to specific bones. Learners attempt to write the answer down to consolidate learning.

**Useful Links**<http://www.bbc.co.uk/science/humanbody/body/factfiles/skeleton_anatomy.shtml> |
| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **The functions of the skeleton and the link to types of bone, i.e.**
* **Functions i.e.**
* Shape
* Support
* Protection
* Movement
* Blood cell production
* Mineral storage
 | * **Activity (30 minutes)** Learners could be given an unlabelled diagram of the skeleton and asked to label as many bones as they remember. Review and discuss any gaps in knowledge.
* **Activity (60 minutes)** Discuss the different functions of the skeleton in the teaching specification and ask students to complete a table that explains how each of the functions can be beneficial to a sportsperson.
* **Activity (30 minutes)** Learners could visit the Visible Body web page – ‘The Long and the Short of It’ – introduces the five types of bone. The website also links to useful articles on the skeletal system, axial and appendicular skeleton and joints and ligaments amongst other things.

<http://learn.visiblebody.com/skeleton/types-of-bones> |

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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **The functions of the skeleton and the link to types of bone**
* **Functions i.e.**
* Shape
* Support
* Protection
* Movement
* Blood cell production
* Mineral storage
* **Types of bone i.e.**
* Long
* Short
* Flat
* Irregular
* Sesamoid

*Learners are expected to understand the links between the type of bone and its function.* | * **Activity (40 minutes**) Introduce the five different types of bone – ask the learners to discuss where these bones might be found. Learners to complete a table that has the different types of bone and examples of each type.
* **Activity (40 minutes)** Group discussion on any links that they can describe between the type of bone and what function that type of bone is mainly responsible for.
* **Activity (40 minutes)** Learners could complete a new table that shows the type of bone, followed by the main function of that bone followed by examples. I.e. Long bone – Movement – Femur, Humerus, Tibia etc. Some bones may have more than one function.

<http://www.just-health.net/Functions-Of-The-Skeleton.html#:~:text=Functions%20of%20Human%20Skeletal%20System%201%20Shape.%202,Endocrine%20Regulation.%208%20Electrolyte%20Balance.%209%20Acid-Base%20Balance>. |
| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **Classifications of joints i.e.**

Fixed/fused (e.g. cranium, pelvis)Slightly movable/cartilaginous (e.g. adjacent vertebrae) Freely movable/synovial  | * **Activity (40 minutes)** Discuss what a joint is – Two or more bones that articulate. Ask learners to identify where this happens. Learners to work in pairs and look at the different joints – how can they move, how are some different from others.
* **Activity (30 minutes)** Learners given a blank skeletal diagram that has the major joints circled. Learners should discuss and label which bones articulate at these joints.
* **Activity (30 minutes)** Reflect on the student’s ideas of what movements the different joints can do (students should demonstrate the movements and try to link these to specific sporting examples. Write the three different types of joint on the whiteboard and ask students to determine which joints should go under what headings.
* **Activity (20 minutes)** Learners should research each type of joint – Fixed, Cartilaginous & Freely moveable and note down the major differences and produce an individual poster**.**
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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **Classifications of joints i.e.**
* Fixed/fused (e.g. cranium, pelvis)
* Slightly movable/cartilaginous (e.g. adjacent vertebrae)
* Freely movable/synovial
 | * **Activity (30 minutes)** Recap the different types of joint. Give learners a table that has the joints that are included in the teaching content. Ask them to use their previous skeletal diagrams to work out which bones articulate at which joints. Ensure that learners have identified and given examples of the three different types of joint.
* **Activity (90 minutes)** Learners should be shown the different structures and the different make-up of the different major joints. This should include Joints such as the Hip, Shoulder, Knee, Elbow, Radio Ulna, Vertebrae and skull should be included and should be gone through in detail including the different structures and the movements possible. When completed learners could produce a fifteen minute PPT presentation on the different joints and some learners could give their presentations to the groups.
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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **The types of synovial joint**
* Hinge i.e. elbow, knee, ankle
* Ball and socket i.e. shoulder, hip
* Pivot i.e. neck, radio-ulnar
* Condyloid i.e. Wrist
* Saddle i.e. thumb
* Gliding i.e. processes of the vertebrae
	1. **Structures and functions of synovial joints**
* Structure
* articular/hyaline cartilage
* ligaments
* synovial membrane
* synovial fluid
* menisci
* pads of fat
* bursae
* joint capsule
* Functions
* Stability
* Mobility
 | * **Activity (40 minutes)** Learners could be given a table that has the different joints on such as Elbow/Knee/Hip/Shoulder/Ankle/Neck/Thumb/Vertebrae/Radio Ulna. Learners are then asked to discuss the different type of movements possible at the different joints. Following on from this the teacher could help the learners classify them under the headings from the specification.
* **Activity (40 minutes)** Learners could be asked to research the structures within a synovial joint – Teacher should inform learners of the list of structures that need to be studied. Students could be given a blank diagram of a knee, shoulder and ankle joint and asked to label the structures defined in the specification.
* **Activity (40 minutes)** Learners should continue their research into these structures by completing a table that explains the main function of each structure in the specification.

<https://www.bbc.co.uk/bitesize/guides/zxc34j6/revision/3> |

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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO1 – 1.1 – 1.5 Knowledge Test****Knowledge and understanding**LO1 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test on the LO content covered so far using exam questions from previous exam series.

<https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3> or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **Joint movements**
* Flexion and extension
* Lateral flexion
* Abduction and adduction
* Horizontal abduction and adduction
* Medial and lateral rotation
* Circumduction
* Pronation and supination
* Dorsi flexion and plantar flexion
 | * **Activity (40 minutes)** Learners have a list of the synovial joints in the specification and should work in pairs or small groups to once again discover and discuss how these joints move – Can learners come up with their own terminology of the movements?
* **Activity (40 minutes)** Learners may now be given a table that has the joint and columns for the type of movement and a column for sporting examples of when that movement may be used. Teacher will direct students and explain the correct terminology for the different movements – Learners should try and apply this to different sporting situations.
* **Activity (40 minutes)** Teacher could display different sportspeople completing activities with different joints identified. Learners can use their table to discuss and decide what movements are occurring at the identified joints. Teacher should ensure the discussions come to the right conclusions.

<https://www.bbc.co.uk/bitesize/guides/zxc34j6/revision/1> |
| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **1.7 Structure and function of the vertebral column** | * **Activity (30 minutes)** Learners are given diagrams of sportspeople and asked to identify the movements occurring at specific joints identified by the teacher – This could be in a table format.
* **Activity (40 minutes)** Learners are given a diagram of the vertebral column and the different sections should be discussed and identified. Teacher should lead this discussion and could include the different sections and link this to the type of joint in the vertebrae (Atlas axis freely moveable, Cervical/Lumbar slightly moveable and Sacrum/Coccyx as fixed).
* **Activity (30 minutes**) Learners should discuss the different functions of the different areas of the vertebral column and record this on the diagram.
* **Activity (20 minutes)** Learners should try and invent a useable acronym to help them remember the order of the sections of the vertebral column.

[vertebral column | Anatomy & Function | Britannica](https://www.britannica.com/science/vertebral-column) |

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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | * 1. **The impact of physical activity, training and lifestyle on the skeletal system**
* Short-term effects
* Long-term effects
* Effects of warmups and cool downs
 | * **Activity (30 minutes)** Review the previous lesson with a question regarding the different structures and functions of the vertebral column to include the different regions, joints and movements.
* **Activity (90 minutes)** Learners could research the short- and long-term effects of exercise on the skeletal system (positive and negative) and the effect of warmups and cool downs producing a poster or power-point presentation to display their knowledge and understanding.

<https://www.livestrong.com/article/131711-what-are-effects-exercise-skeletal-system/>  |
| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **End of LO Test: LO1 Understand the skeletal system in relation to exercise and physical activity** **Knowledge and understanding**LO1 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test covering all of LO1 using exam questions from previous exam series.

<https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3> or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
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| **Number of hours** | **LO1 Understand the skeletal system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO1 Unit test Review** | * **Activity (60 minutes)** Teacher should take the learners through the previous lesson examination and address any areas of strength and areas that learners may need to develop.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3 | **2.1 Main muscles acting at synovial joints**Shoulder – deltoid, latissimus dorsi, pectoralis major, trapezius, teres majorElbow - biceps brachii, triceps brachiiRadio-ulnar - pronator teres, supinator muscleWrist - wrist flexors, wrist extensorsVertebral column - rectus abdominus, erector Spinae group, internal and external obliquesHip – iliopsoas, gluteus maximus, gluteus medius, gluteus minimus, adductor longus, adductor brevis, adductor magnusKnee - rectus femoris, vastus medialis, vastus intermedius, vastus lateralis, biceps femoris, semimembranosus, semitendinosusAnkle - tibialis anterior, gastrocnemius, soleus | * **Activity (30 minutes)** Learners should brainstorm any muscles that they may already know. These should be recorded. Learners may then be given a list of all the muscles included in the specification.
* Learners could now work in pairs or small groups and use sticky notes to write the names of the muscles down and stick them onto one volunteer. This could be done as a competition.
* **Activity (30 minutes)** Once learners have completed this they can be given a blank muscular diagram (posterior and exterior) and use their knowledge and the Internet to locate where the muscles are and label them on the diagram, so they have an accurate record.
* **Activity (30 minutes)** Learners should work in pairs with several blank muscular diagrams. They should label as many muscles as possible and then fill blanks in using their notes, they should repeat this exercise until they are confident of labelling all muscles correctly.
* **Activity (30 minutes)** Learners could try and create acronyms for each joint to try and make it easier to remember the muscles around the joint – They could share these with the rest of the group.
* **Activity (60 minutes)** Learners are given a table with all the muscles from the specification included. The teacher can lead a discussion on what the **key role** or function of each muscle is (what movement it produces) Learners can include sporting examples of when the action would be used.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2.5 | **2.2 Types of muscle function*** Agonist
* Antagonist
* Fixator
 | * **Activity (60 minutes)** Learners could be given a table that has all the muscles identified in the specification. This table should have headings which are the main joints. There should be a column where learners can record what type of movement the muscle is responsible for.
* **Activity (30 minutes)** A discussion can now take place in regards Antagonistic pairs and how they work – Learners can now include the antagonist muscle on their table.
* **Activity (60 minutes)** In pairs students should complete the following simple activities, press Up (Elbow Joint), sit up (Vertebrae) Squat (Knee Joint) Calf Raise (Ankle Joint) Learners should complete a movement analysis discussing the different phases of the movements (up/down) and the movements occurring along with the Agonist and Antagonist.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **2.2 Types of muscle function**AgonistAntagonistFixator | * **Activity (60 minutes)** Learners should be a given diagrams of a wide range of sporting movement examples (i.e. A footballer kicking a ball or a gymnast on the beam) Specific joints could be circled on each diagram. Learners should complete joint analysis type questions that describe the movement happening, the agonist and the antagonist at each identified joint on each diagram.
* After 30 minutes learners could discuss the role of fixator muscles around joints not involved in the direct movement. The learners can then include fixator muscles to their examples. Learners can work individually, pairs or small groups. Learners may wish to refer to previous work completed.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **2.3 Types of muscle contraction*** Isometric
* Concentric
* Eccentric
 | * **Activity (30 minutes)** The teacher should discuss with students the examples of the different type of muscular contraction.
* **Activity (30 minutes)** Quickfire Q and A with teacher giving movements and muscle and students having to identify the type of contraction occurring.
* **Activity (60 minutes)** In pairs students should complete the following simple activities, press up (Elbow Joint), sit up (Vertebrae) Squat (Knee Joint) Calf Raise (Ankle Joint). Learners should complete a movement analysis discussing the different phases of the movements (up/down) and the movements occurring along with the Agonist, Antagonist and now include the type of contraction including the identification of a Fixator.

<https://yourlivingbody.com/2015/07/06/three-types-of-muscle-contractions-and-why-they-matter/> |
| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1.5 | **2.3 Types of muscle contraction**IsometricConcentricEccentric | * **Activity (90 minutes)** The teacher could prepare a carousel lesson with 10-15 stations around the classroom. This could have stations that include:

Worksheets where muscles must be labelled or identified.Diagrams showing specific movements where joints are labelled and learners must identify the agonist.Diagrams of specific movements where learners must identify the type of contraction taking place.Diagrams where the movement occurring at a specific joint can be identified.All of the above can be differentiated to include what is expected (i.e. Movement or movement and agonist or movement, agonist and antagonist etc.) |
| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2.5 | **2.4 Structure and function of muscle fibre types**Slow oxidativeFast oxidativeFast glycolytic | * **Activity (60 minutes)** Learners could be given a pre-populated table that included the different fibre types and the specific functional and structural characteristics they are required to know – Learners could research on the Internet and complete the table recording the differences.
* **Activity (30 minutes)** A group discussion could take place where the benefits and drawbacks of the different fibre types are discussed.
* **Activity (60 minutes)** Learners should pair up. For this activity learners are given a small amount of time to read Information on the structure and function of one type of muscle fibre type. Then one person should play the interviewer and one play the part of the muscle fibre! They should be questioned about their structure and function as if they are on trial, this should be repeated until all fibre types are completed.

<https://www.teachpe.com/anatomy-physiology/muscle-fibre-types>  |
| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1.5 | **2.5 Link between mix of fibre types and performance**In different types of physical activityIn different intensities of exercise | * **Activity 1 (30 minutes)** Discuss the functional differences between the fibres and how they are suited to different activities. Learners could record the structures and functions that make SO more use in aerobic activities and which structures and functions make FG more use in anaerobic activities.
* **Activity 2 (30 minutes)** Learners should be given a wide range of different activities and asked to discuss which fibre type would be most suitable. Some past exam questions may be useful.
* **Activity 3 (30 minutes**) Give the learners some situations and ask them to discuss where the different fibre types would be used (i.e. A 1500m run or different situations during a football match).
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **2.6 The impact of physical activity, training and lifestyle** Short-term effects (include during and immediately after exercise and physical activity. Learners should consider both positive and negative impacts).Long long-termEffects of warmups and cool downs | * **Activity (30 minutes)** Learners would be led in a discussion regarding the short term effects of exercise on muscles – both positive and negative effects should be discussed.
* **Activity (30 minutes)** Learners could design a poster to show the positive and negative effects of exercise short term.
* **Activity (30 minutes)** Learners research Hypertrophy/Hyperplasia and other long term effects of exercise on the muscular system and record a pod cast to explain the long term features that lasts five minutes.
* **Activity (30 minutes)** Learners should use their knowledge to plan a fifteen minute presentation that can be used as an assembly for year 7 students.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **End of LO Test: LO2 Understand the muscular system in relation to exercise and physical activity****Knowledge and understanding**LO2 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test covering all of LO2 using exam questions from previous exam series.

<https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3> or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
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| **Number of hours** | **LO2 Understand the muscular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO2 Unit test Review** | * **Activity (60 minutes)** Teacher should take the learners through the previous lesson examination and address any areas of strength and areas that learners may need to develop.
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| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 4 | **3.1 The structures of the heart and their roles, i.e.*** Atria
* Ventricles
* Bicuspid and tricuspid valves,
* Pulmonary and aortic valves
* Aorta
* Vena cavae
* Pulmonary artery
* Pulmonary vein
 | * **Activity (60 minutes)** Using red and blue cones for different sides of the heart and white ones for the valves with teacher guidance the learners could create a large heart on the floor outside. Learners would be walked through the heart discussing which structures they were passing through and the function of that structure pretending they were a drop of blood. Learners then take in turns to walk through the heart explaining what is happening.
* **Activity (60 minutes)** Learners are given an unlabelled diagram of the heart and label the main structures. They could be given a centre produced workbook that asks them to explain the passage of blood through the heart, the structures it would pass through and the changes that happen to the blood during the process.

<https://www.bbc.co.uk/bitesize/guides/zwvn39q/revision/1>* **Activity (30 minutes)** Learners pair up and must try and explain verbally to each other the passage of blood throughout the heart and what happens to the blood.
* **Activity (30 minutes)** Without any notes in front of them Learners should try and sketch a simple version of the heart and the major blood vessels and other structures involved. A partner should check their work for accuracy.
* **Activity (60 minutes)** Learners should use the online [Cahoot](https://cahoot.mn.co/) platform to create a 20 question quiz that the rest of the group can then take part in. 30 minutes to produce the quiz and 30 minutes to take part in some of the quizzes.
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| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3.5 | **3.2 Stroke volume, heart rate and cardiac output**Resting values for trained and untrained individualsChanges during exercise of different intensityInterpret and draw graphsUse of data including calculations | * **Activity (30 minutes)** Learners could discuss the three key terms and the resting values for an average person. The teacher could then lead a discussion on the average resting values for a trained athlete and explain the differences.
* **Activity (60 minutes)** Learners could research the changes that happen to the heart during sub maximal and maximal exercise and bring their findings back to a group discussion.
* **Activity (30 minutes)** Learners could complete a worksheet that covers why Stroke Volume and Cardiac Output increase – Starlings Law, Muscle Pump, Respiratory Pump.
* **Activity (60 minutes)** Learners could be given several different graphs showing the changes in heart rate during different intensities of exercise and be asked to explain why the changes take place (demand for oxygen, supply and demand met, heart rate remaining elevated after exercise etc.)
* **Activity (30 minutes)** Learners given graph paper and a series of heart rate figures and asked to plot them on several graphs and explain the changes.
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| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3.5 | **3.3 Structure of blood vessels, i.e.*** Arteries
* Arterioles
* Capillaries
* Venules
* Veins
 | * **Activity (60 minutes**) Learners could prepare a poster on A1 paper that explains the structures and functions of each type of blood vessel and the type of blood it carries.
* **Activity (60 minutes)** Learners present their findings to the rest of the group.
* **Activity (30 minutes)** Teacher could lead a discussion on the main differences between the three structures.<https://www.thoughtco.com/blood-vessels-373483>
* **Activity (60 minutes)** Learners could take part in a game of Blockbusters with questions being asked by the teacher. Groups have to make their way across the board answering questions correctly. All questions should relate to the structure and function or role of the different vessels.
 |
| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2.5 | **3.4 Components and functions of blood**Red blood cellsWhite blood cellsPlateletsPlasma**3.5 Vascular shunt mechanism and the role of arterioles and pre-capillary sphincters** | * **Activity (60 minutes)** Learners could have a table that is pre populated with the different components and be asked to research the structure and function of the different components. Then complete some exam questions from past papers covering those elements.
* **Activity (60 minutes)** Learners could produce posters on A1 paper to be used as a display in the classroom. This should include the components of blood and the functions of each component
* **Activity (30 minutes)** Learners could read the information from the website below that explains vascular shunt. They could then prepare their own diagram on A3 paper to represent their understanding of the process. This diagram could include the explanations of the role of pre-capillary sphincters in the re-distribution of blood when exercising.

[THE VASCULAR SHUNT MECHANISM (teachnetuk.org.uk)](http://www.teachnetuk.org.uk/2007%20Projects/PE-Heart_Vascular/heart-vascular/Ex15-Vascular%20Shunt%20Cloze.htm) |

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| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2.5 | **3.6 The impact of physical activity, training and lifestyle on the cardiovascular system**Short-term effectsLong-term effectsEffects of warm-ups and cool downs | * **Activity (60 minutes)** Learners are given a mix of effects of exercise on the cardiovascular system and have to discuss and work out which ones are short term and which are long term – They should include the reasons why they have come to those conclusions.
* **Activity (30 minutes)** Learners record the findings and decisions on a table.
* **Activity (60 minutes)** Learners should work as small groups – One group could research and present the effects of a warm up and the other the effects of a cool down.
 |
| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **End of LO Test: LO3 Understand the cardiovascular system in relation to exercise and physical activity****Knowledge and understanding**LO3 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test covering all of LO3 using exam questions from previous exam series.
* <https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3>

or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
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| **Number of hours** | **LO3 Understand the cardiovascular system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO3 Unit Test review** | * Activity (60 minutes) Teacher should take the learners through the previous lesson examination and address any areas of strength and areas that learners may need to develop.
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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2.5 | **4.1 The structures of the lungs and their roles, i.e.**Nasal cavityEpiglottisPharynxLarynxTracheaBronchiBronchiolesAlveoli | * **Activity (60 minutes)** Learners should discuss the different structures of the respiratory system with the Teacher. Learners could then label a diagram of the main structures and complete a table that explains the function of each structure.
* **Activity (30 minutes)** Learners should produce a large A1 poster showing the structures for display in the classroom.
* **Activity (60 minutes)** Learners should continue to label blank diagrams until they can confidently label each structure and explain its function. When completed they should be able to write a short essay that describes the pathway of air as it passes through the different structures.
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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3 | **4.2 Respiratory muscles used during exercise, i.e.**SternocleidomastoidScalenePectoralis minorInternal intercostalsRectus abdominusDiaphragm | * **Activity (60 minutes)** Learners should be taught the location and role of each respiratory muscle and label them on a diagram.
* **Activity (60 minutes)** Teacher could lead a discussion on the changes in the mechanics of breathing when exercising and the extra muscles used and what the effect of that is. Learners should produce a diagram and short essay that explains this.
* **Activity (60 minutes)** Learners produce a PowerPoint presentation that shows the mechanics of breathing at rest and what changes take place during exercise and present to the rest of the group.
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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **4.3 The mechanics of breathing**inspirationexpiration | * **Activity (60 minutes)** Using a PPT presentation to show knowledge. The learners should be able to describe the mechanics of breathing including the structures used and the changes in size of thoracic cavity and pressure changes during both inspiration and expiration – This should be presented to the rest of the group.
* **Activity (30 minutes)** In groups of 3 one person reads the mechanics of breathing details to a second person – That learner must then describe the mechanics of breathing to a third person only using what they remember being told by the first person! That learner then goes back to the first learner and describes to them, the first learner can tick off the details that are right! Learners should rotate so they have all done each role.
* **Activity (30 minutes)** Learners could take part in an online quiz such as [Cahoot](https://cahoot.mn.co/) that has been prepared by the teacher in advance.
 |
| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **4.4 Gaseous exchange at the alveoli** | * **Activity (60 minutes)** Teacher leads a discussion on how gaseous exchange takes place within the alveoli. Learners could then produce a large A2 size diagram that shows and describes the process.

<https://www.youtube.com/watch?v=bgTCTwCdIdM>  |

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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 3.5 | **4.5 Tidal volume, breathing frequency and minute Ventilation i.e.**Resting values for trained and untrained individualsChanges during exercise of different intensityInterpret and draw graphsUse of data including calculations | * **Activity (60 minutes)** Learners could be asked to research the three key terms and find resting values for both trained and untrained athletes – They could also be asked to discuss three reasons that make the differences.
* **Activity (30 minutes)** Teacher could engage in discussion with the students and show them on graphs the changes to the three areas during maximal and submaximal exercise.
* **Activity (60 minutes)** Learners could be given data charts and graph paper and asked to plot different data accurately.
* **Activity (60 minutes)** Learners could be shown graphs for maximal and submaximal exercise and explain why the changes occur using knowledge from LO3. Simple calculations of minute ventilation could also be explored.
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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 4 | **4.6 The impact of physical activity, training and lifestyle on the respiratory system i.e.**Short-term effectsLong-term effectsEffects of warm ups and cool downs | * **Activity (60 minutes)** Learners could take part in some short and longer bouts of exercise and record their breathing rate changes and if the right equipment is available could record their tidal volumes. Learners should record the changes.
* **Activity (60 minutes)** Learners could be given some data that shows examples of LT effects of exercise. They could then produce a newspaper article to explain the long term effects of exercise on the respiratory system.
* **Activity (60 minutes)** Learners could be involved in a classroom discussionon the effects of warming up and cooling down on the respiratory system. They could record their notes in a table that has headings such as breathing rate, breathing depth, muscles used etc.
* **Activity (60 minutes)** Learners could be involved in a [Cahoot](https://cahoot.mn.co/) online quiz with questions on the respiratory system.
 |
| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **End of LO Test: LO4 Understand the Respiratory system in relation to exercise and physical activity****Knowledge and understanding**LO4 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test covering all of LO4 using exam questions from previous exam series.

<https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3>or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
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| **Number of hours** | **LO4 Understand the Respiratory system in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO4 Unit Test review** | * **Activity (60 minutes)** Teacher should take the learners through the previous lesson examination and address any areas of strength and areas that learners may need to develop.
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| **Number of hours** | **LO5 Understand the Energy systems in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 6 | **5.1 The three energy systems*** ATP-PC/alactic system
* Lactic acid system
* Aerobic system
* Type of reaction (aerobic or anaerobic)
* Chemical or food fuel
* Amount of ATP produced
* By-products
 | * **Activity (60 minutes)** Teacher should lead a discussion on the ATP/PC system and how it works / fuels used / reactions that take place / amount of ATP produced and activities used for. Learners could complete a table with the details on as the discussion takes place.
* **Activity (30 minutes)** Learners could produce a mind map of what they have learned about the ATP/PC system.
* **Activity (30 minutes)** Learners could play ‘bop it’ either in teams or individually with questions based around the ATP/PC system. ‘BOP IT’ is a fast paced, low stakes quiz where candidates should either slap their hand on the desk or shout ‘BOP IT!’ before anyone else to give them the chance to answer the question and score one point for their team or themselves individually.
 |
| * **Activity (60 minutes)** Teacher should lead a discussion on the Lactic Acid system and how it works / fuels used / reactions that take place / amount of ATP produced and activities used for. Learners could complete a table / diagram of how the system works and the reactions that take place.
* **Activity (30 minutes)** Learners could produce a poster of what they have learned about the LA system.
* **Activity (30 minutes)** Learners could complete a multiple choice quiz that covers both the ATP – PC system and the Lactic Acid system.
 |
| * **Activity (60 minutes)** Teacher should lead a discussion on the Aerobic system and how it works / fuels used / reactions that take place / amount of ATP produced and activities used for. Learners should complete a table and diagram of the details and the reactions that are taking place.
* **Activity (30 minutes)** Learners could produce a mind map of what they have learned about the Aerobic System .
* **Activity (30 minutes)** Learners take part in a [Cahoot](https://cahoot.mn.co/) quiz that covers all three systems.<https://www.youtube.com/watch?v=PIrhiSJcapc>
 |
| **Number of hours** | **LO5 Understand the Energy systems in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **5.2 The energy continuum and how intensity and duration of exercise determines which energy system is predominant** | * **Activity (30 minutes**) Learners discuss the energy continuum and place different activities on the continuum depending upon which energy system is the most predominant.
* **Activity (60 minutes)** Learners could be given different scenarios where athletes may use all the energy systems dependent upon what is happening during the activity and be asked to explain when each system would be used.
* **Activity (30 minutes)** Learners should create a display for the classroom with the energy continuum and images / explanations of the different activities with different intensities and systems being used.
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| **Number of hours** | **LO5 Understand the Energy systems in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 2 | **5.3 The recovery process for each energy system**Processes involvedTimescales for full recovery | * **Activity (60 minutes)** Teacher could lead a discussion on how the different energy systems recover after exercise. Learners could be asked to complete a table that shows the different stages and timescales / reactions involved.
* **Activity (60 minutes)** Learners could be asked to produce an information leaflet aimed at college age students that explains the recovery processes of the different systems.
 |
| **Number of hours** | **LO5 Understand the Energy systems in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **End of LO Test: Understand the Energy systems in relation to exercise and physical activity Knowledge and understanding**LO5 content**Skills**Exam techniqueRevision strategies | * **Activity (60 minutes)** Learners should a complete a written test covering all of LO5 using exam questions from previous exam series.

<https://www.ocr.org.uk/qualifications/cambridge-technicals/sport-and-physical-activity/assessment/#level-3> or Practice tests created in ExamBuilder <https://www.ocr.org.uk/Images/599900-practice-tests-created-in-exambuilder-.zip>* This should be completed in exam conditions and marked by the teacher using the matching mark schemes to understand current progress.
 |
| **Number of hours** | **LO5 Understand the Energy systems in relation to exercise and physical activity** | **Unit content to be covered, activities, links to useful resources** |
| 1 | **LO5 Unit Test review** | * **Activity (60 minutes)** Teacher should take the learners through the previous lesson examination and address any areas of strength and areas that learners may need to develop.
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