

BRIDGING THE GAP YEAR 11 – 12

GCSE – OCR LEVEL 3 EXTENDED
CERTIFICATE IN SPORT AND PHYSICAL
ACTIVITY

SPORT AND PHYSICAL ACTIVITY



Who is the OCR level 3 Cambridge Technical Extended Certificate in Sport and Physical Activity for?

This qualification is not just about playing sport it will provide learning skills, knowledge and understanding to progress to university on a sport related course such as Sport and Physical Education, Sport Science, Sport Coaching and Development or Sport and Leisure Management.

It is the equivalent to one A level.

- Learners will take five or six units.
- Everybody will study the following mandatory units:
- Body systems and the effects of exercise
- Sports coaching and activity leadership
- Sports organisation and development
- The other units studied can be tailored to meet individual student's needs.

- This qualification is assessed using a combination of:
- External assessment – which is set and marked by OCR, these assessments are exam based and can be sat in January or June.
- Internal assessment – which is set by your teacher who assesses it and then submits it for external moderation.
- Qualifications are graded using a Pass, Merit, Distinction and Distinction* structure.

Unit 1: Body systems and the effects of physical activity

LO1: Understand the skeletal system in relation to exercise and physical activity

Learner Activity

Understanding the skeletal system and the effects of exercise

Activity 1 will help you to consolidate your knowledge of the different types of bone and the functions of the skeleton. It will also enable you to see a clear link between the type of bone (i.e., its structure and where it occurs in the body) and its function.

Activity 2 will require you to use your research skills to investigate a specific topic. It will also need you to work with others to collate information and create a presentation. By the end of the activity, you should have a thorough understanding of the different synovial joints, including their structure, where they are found in the body and how they allow movement.

In Activity 3 you will have to answer questions regarding the short- and long-term effects of exercise and training on the skeletal system.

Activity 1

In the table below fill in the first column with the names of the different types of bones.

Now complete the second column in the table by suggesting which of the identified functions each type of bone is responsible for or involved with.

Finally, complete the third column by explaining how the type of bone carries out the function that has been linked to it.

Type of bone	Function	How this type of bone carries out this function

You may find the following website useful if you want to further explore this topic:

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

Activity 2

Investigate a specific synovial joint. The information you collect should include the joint's:

- Name (type – e.g., ball and socket, gliding etc)
- Structure (including a diagram)
- Function/s
- Movement potential
- Main place/s in the body

Once you have gathered information about your joint you will create a poster or presentation to display the information you have collated about the different synovial joints.

It will be up to you how this information is presented.

Activity 3

Using the table below, list as many of the short- and long-term effects of physical activity on the skeletal system.

Long-term effect of exercise/training	Short-term effect of exercise/training

Both short- and long-term effect of exercise/training	
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To extend this activity you could now write:

- Why these changes happen.
- What the implications of these changes are for the performer
- How these changes support the idea of increasing participation levels in order to improve health and fitness.

Unit 1: Body systems and the effects of physical activity

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Learner Feedback/Self-Assessment

Understanding the skeletal system and the effects of exercise

Activity 1

The functions of the skeleton are:

- Shape
- Support
- Protection
- Movement
- Blood cell production
- Mineral storage

A completed table is provided below:

Type of bone	Function	How this type of bone carries out this function
Long	Movement	Muscles attach to the ends of long bones with the length of the bone making it an ideal lever to facilitate movement.
	Blood cell production	Both yellow and red bone marrow is produced in the marrow cavity of long bones. This is vital for the production of blood cells.
Short	Support	Short bones give support and stability because they are as wide as they are long. They act as small 'jigsaw pieces' that bridge gaps between bones that facilitate movement. Short bones are

Type of bone	Function	How this type of bone carries out this function
		not involved in movement.
Flat	Protection	Flat bones include the skull, sternum, pelvis and ribcage. The large, flat area creates an effective means of protecting the vital organs beneath.
	Movement	The large, flat bones also provide extensive areas for muscular attachment.
Irregular	Support	Irregular bones form support for the pharynx and larynx.
	Movement	The bony prominences make ideal attachment sites for muscles.
	Protection	The vertebrae protect the spinal cord.
Sesamoid	Movement	Sesamoid bones are found in joints where they form a smooth surface for tendons to slide over. This increases the force that the tendon can transmit.

It could be argued that all bones give shape to the body so this function will be acceptable in any/all rows. Likewise mineral storage: all bones contain calcium and phosphorus which the body can withdraw if it is in short supply from other sources. Because of this these functions do not appear in the table.

This website might be useful for learners to research the types of bones and their functions:

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

Activity 2

- Name (type)
- Structure (including a diagram)
- Function/s
- Movement potential
- Main place/s in the body

- A spider diagram – ‘synovial joints’ in the centre, fanning out to the six different synovial joints, each fanning out again to include the other collected information.
- A family tree shape – ‘joints’ at the top, moving down a layer to synovial, fixed and slightly movable, down another layer to the six different synovial joints, down a layer to a diagram of each, followed by the other information requested.
- A pyramid shape – a similar shape to the family tree
- A flow chart – with questions such as – “does the joint move?” Yes/No (leading to fixed or synovial and slightly movable), “is it freely movable?” Yes/No (leading to synovial or slightly movable), “can it move....” (Add the different movement options) or “is it found at....” (add different places in the body) – each answer leading to the appropriate joint, which can then be explained further with a diagram and movement potential/sites.

Learners can find information to support their research on this website:

<https://www.boundless.com/biology/textbooks/boundless-biology-textbook/the-musculoskeletal-system-38/joints-and-skeletal-movement-217/types-of-synovial-joints-822-12066/>

And in these video clips:

<https://www.youtube.com/watch?v=yYEXQbPq5jM>

<https://www.youtube.com/watch?v=DLxYDoN634c>

Activity 3

The following statements can be used (the answers are included in the table for you) but other statements can also be added as you see fit.

- Increased range of movement at joints
- Increase in synovial fluid
- Less likely to be injured
- Increased bone density
- Bones become bigger
- Bones are quicker to heal after injury
- More calcium in the bone
- Increased mineral content
- Increased osteoblast activity
- Ligaments get warmer and are more stretchy
- Bones weigh more

- Reduced chance of osteoporosis
- Stronger ligaments
- Increased thickness of hyaline cartilage
- Bones become more supple.

Long-term effect of exercise/training	Short-term effect of exercise/training
Increased bone density Bones are quicker to heal after injury More calcium in the bone Increased mineral content Reduced chance of osteoporosis Stronger ligaments Increased thickness of hyaline cartilage	Ligaments get warmer and are more stretchy
Both short- and long-term effect of exercise/training	
Increased osteoblast activity Increased range of movement at joints Less likely to be injured	

To extend this activity

- Why these changes happen
- What the implications of these changes are for the performer
- How these changes support the idea of increasing participation levels in order to improve health and fitness.

The effects of exercise are explained in this article <http://www.livestrong.com/article/131711-what-are-effects-exercise-skeletal-system/> whilst this website includes quizzes and tests to check understanding <https://quizlet.com/36967058/long-term-short-term-effects-of-exercise-on-the-skeletal-system-flash-cards/>.

