Summer Tasks Cambridge Technical- Sport Studies

All of the work must be printed and ready for your first sports lesson.

Unit 1- Body Systems (Examined Unit)

Using a computer, you are to create a power-point on The Skeletal System.

This should cover the following:

Slide 1: Title slide

Slide 2 (The bones) : A labelled picture of the skeleton (you must label this though, it cannot be a photo from the internet which is already labelled.) You can print a photo of the skeleton and label it yourself, then add it in with the other slides once everything is printed, or you can label it on the computer. You must include the following bones:

Axial	Appendicular (upper)	Appendicular (lower)
Cranium	Clavicle	Pelvis
Sternum	Scapula	Ilium
Ribs	Humerus	Ischium
Vertebral Column	Radius	Pubis
Cervical Vertebrae	Ulna	Femur
Thoracic Vertebrae	Carpals	Patella
Lumbar Vertebrae	Metacarpals	Tibia
Sacrum	Phalanges	Fibula
Coccyx		Talus
		Tarsals
		Metatarsals

Slide 3 (The function of the skeleton): Give an explanation of the 6 different functions of the skeleton. Include examples within your explanation to show your understanding of each function. Be sure to include the following: ***Shape, support, protection, movement, blood cell production, mineral storage.***

Slide 4 (Types of bones): Create and complete the table below:

Type of bone	Description	Example of bone(s)
Short	*Bones that are short and almost cubic in shape*	*Carpals*
Long		
Flat		
Irregular		
Sesamoid		

Slide 5 (Joint actions): Create and complete the table below:

Joint action	Description of action	Joint(s) this action occurs at	Sporting example
Flexion	*Increasing the angle at a joint*	*Elbow and knee*	*Upwards phase of a bicep curl*
Extension			
Lateral flexion			
Abduction			
Adduction			
Circumduction			
Horizontal abduction			
Horizontal adduction			
Medial rotation			
Lateral rotation			
Pronation			
Supination			
Dorsiflexion			
Plantarflexion			

Answer the exam questions below:

6. What type of bone is the patella?

(a) Flat ☐

(b) Short ☐

(c) Sesamoid ☐

(d) Irregular ☐

[1]

7. Outline **two** long-term benefits of regular exercise on the skeletal system.

_____
_____
_____

[2]

8. Fig. 12.1 shows a performer doing a tuck jump.

Fig.12.1

Complete the table below to identify the joint types and movements during the tuck jump.

Joint	Joint type	Movement
Hip		Flexion
Elbow		

[3]

9. Fig. 12.1 shows a diagram of the vertebral column.

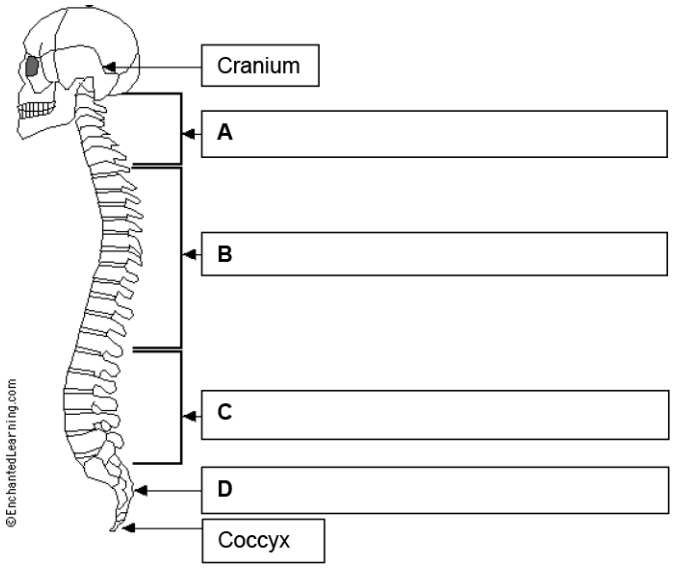


Fig. 12.1

Label the sections of the vertebral column A-D in the boxes provided on **Fig 12.1** above. **[4]**

10. One function of the vertebral column is protection. What is being protected by the vertebral column?

_____

[1]

11. Put a tick (✓) in the box next to the **one** correct answer.

Which of the following bones form the ankle joint?

(a) Femur, tibia and fibula ☐

(b) Talus, tarsals and metatarsals ☐

(c) Talus, tibia and fibula ☐

(d) Tibia, talus and tarsals ☐

[1]

12. An active, healthy lifestyle has positive effects on the skeletal system but can also be potentially damaging.

Describe the benefits and drawbacks of exercise on the skeletal system.

[5]

13. Describe the following functions of the skeleton. Give an example of each.

Protection

Movement

Blood cell production

[6]

Unit 2- Sports Coaching and Activity Leadership

Scenario-

Sportasaurus Ltd. Sportasaurus Ltd. is a privately owned sports company looking to develop the skills of children and young people through sports or physical activity sessions and programmes. The company focuses on providing high quality sports and physical activity sessions and programmes to primary schools and leisure centres, with the emphasis on the personal development of each individual taking part.

The company is currently looking to expand its provision across a greater range of sports and age groups. They are looking for talented coaches and leaders to join the company and deliver fun, exciting and safe sports and physical activity sessions to different people and organisations in the local area.

Your task is to:

Prepare for an interview at Sportasaurus Ltd. in which you will be asked questions about the roles and responsibilities of sports coaches and leaders, how they differ from each other and from those of Physical Education teachers, as well as how sports coaches and leaders can help support healthy, active lifestyles.

As part of the interview process you will have to deliver a presentation on the principles that underpin coaching and leading. These should include the principles of leadership, group dynamics and the attributes of coaches and leaders.

On a PowerPoint document title your slides the following/ word document- use the following subtitles-

1- The roles and responsibilities of sports coaches and activity leaders
2- How sports coaches and activity leaders support a healthy active lifestyle
3- The different roles and responsibilities of those involved in teaching and delivering sport
4- How different leadership styles and personalities can support different stages of group development. 5- The importance of different attributes in supporting the principles of leadership and group dynamics.

Please try and complete each section to the best of your ability.

Use the notes below to research the information needed.

Grading criteria			
LO	Pass	Merit	Distinction
7 Be able to review sports and activity sessions	**P12** Evaluate the delivery of a sports/activity session compared to the plan and using the feedback obtained from participants	**M5** Suggest changes to future sports/activity sessions with justifications	

LO1 Know the roles and responsibilities of sports coaches and activity leaders *P1 P2 P3*

GETTING STARTED

(10 minutes)

List as many good leaders as you can. Discuss your list with the class. What makes them a good leader?

KEY WORDS

Characteristics – A feature or quality belonging to a person.

Duty of care – The legal obligation to safeguard others from harm while they are using your services, or exposed to your activities.

Leadership – The ability of an individual to lead or guide others.

1.1 Roles of sports coaches and activity leaders

A leader must have a number of key characteristics, and be able to use them in the correct way if they are to be successful. The characteristics are:

- *Role model:* Setting the right example is crucial if a leader is to be effective. The leader must empower the people around them through their own actions and should act as a positive role model.
- *Motivator:* A good leader must be able to motivate others. Without motivation, the chances of success are reduced. Motivation is particularly important if there are barriers in the way of success, for example returning from injury or falling behind in a sports match.
- *Planner:* Success as a coach or leader does not happen by accident. All success is the result of careful planning to reach a number of goals. A successful leader must be able to plan realistically in order to achieve.
- *Instructor:* Communication is a vital part of being an effective leader. Giving instructions to others at the right time and in the right manner is crucial. Instructing in the wrong way or at the wrong time can cause confusion and lead to errors.
- *Mentor:* A good coach or leader will also take on the role of a mentor to those around them, providing advice and guidance as and when necessary, often based on their own experiences.
- *Facilitator:* The ability to 'make things happen' is a characteristic of a good leader. Being the driving force behind change can instil belief in others and inspire those around them to succeed.
- *Demonstrator:* Being able to visually show others what you want them to do is a key skill for coaches and leaders. Demonstration allows for clarity and limits the opportunity for misunderstanding. For example, if a gymnastics coach can visually demonstrate the techniques required for a handspring, the athletes will have a much greater understanding, therefore a greater chance of success.
- *Adviser:* Similar to a mentor, the leader or coach must be able to advise those around them accordingly. In team sports, they may advise on positional play and offer solutions to the player such as slightly adjusting their position.
- *Supporter:* Offering support to those that you are working with is crucial for a leader to be able to demonstrate. If they do not feel supported, the athletes are less likely to give their full performance for the coach.

CLASS DISCUSSION

(20 minutes)

Watch the extract of the PE lesson from the film *Kes*. Discuss with the class whether the PE teacher was a successful coach/leader and why. Relate your discussion to the characteristics above.

1.2 Responsibilities of sports coaches and activity leaders

Whatever the type of leader or coach, there are basic responsibilities that are attached to leadership that apply.

An effective leader must always ensure that they establish their own set of ground rules. These relate to the basic standards that the coach expects from those they work with. A good leader should always approach things in a fair and consistent way, so as not to be accused of favouritism or of inconsistencies in their practice.

High moral and ethical standards are crucial as a leader, because it is important to give a positive impression to those around you who may look up to you and see you as a role model.

A coach has a responsibility relating to a duty of care. This means that they are fully responsible for others' safety during training sessions. Furthermore, it is the coach's responsibility to ensure the safety of participants and to assess any risks, and to adhere to the rules and regulations of the sport or activity.

Finally, it is important that the coach or leader actively promotes the health and wellbeing of their participants. This ties in with being a role model and setting appropriate standards and codes of conduct for others to adhere to.

PAIRS ACTIVITY

(20 minutes)

Select three people from different sports who you feel are successful coaches or leaders. Discuss with a partner which of the roles or responsibilities each person demonstrates.

1.3 How the role and responsibilities involved in teaching and delivering sport differ

Although the principles discussed above are relevant to sports coaches and sports leaders, there are some key differences between the main focus of a sports coach and sports leader.

- *Sports coach:* The job of the sports coach is to focus on the performance side of things, and to adapt training so that athletes can reach their peak at the right time. Sports coaches are usually focused on just one sport, and may work with a broad range of abilities from beginners to elite performers. Sports coaches often use a range of analysis techniques to watch performances again and pick out areas to improve.
- *Sports leader:* Mainly concerned with 'sport for all', sports/activity leaders usually deliver activities across a wide range of sports, with the main focus being taking part and being active rather than developing specific sports skills. The activities can often focus on things such as developing basic coordination, balance or general fitness.
- *PE teacher:* This role has a dual purpose. While the PE teacher is able to use PE lessons in school to focus on promoting health and wellbeing, they do this through the medium of multiple sports/activities. Many of the skills learned in a particular sport can be transferred into others, for example, spatial awareness in game situations can be used in any team sport. Likewise, outwitting your opponent in badminton can also be applied into other net games such as tennis and volleyball.

KNOW IT

1 What is a duty of care?
2 List three roles of a sports coach.
3 List two responsibilities of a sports coach.

LO1 Assessment activities

Activity 1 *P1 P2*

Create a leaflet describing the roles and responsibilities of sports coaches and activity leaders and how they support a healthy active lifestyle. Use examples from different sports/activities to support your work.

Activity 2 *P3*

Compare the roles and responsibilities of a sports coach with that of a sports leader and PE teacher, discussing the similarities and differences.

You will benefit from drawing on the following Units: Unit 1, *Body systems and the effects of physical activity*; Unit 7, *Improving fitness for sport and physical activity*; and Unit 12, *Nutrition and diet for sport and exercise*.

Unit 10- Biomechanics and Movement Analysis

Scenario-

Biomechanics in Sport Biomechanics is a key part of success in elite sport and has been crucial in the development of both athletes and equipment to enable performance at an elite level.

Biomechanics in Sport (BiS) are a company who work with elite athletes providing them with analysis of mechanics of their sporting actions.

The following are the some examples of the areas where BiS offer athletes support:

- The identification of the optimal technique for enhancing sports performance
- The analysis of sport and exercise equipment e.g. racquets and their optimum length for performance
  The impact of motion and forces on sporting performance.

They have recently been given funding to employ a trainee. You have decided to apply for this position and will be asked to complete a number of tasks in order to be shortlisted for interviews taking place later in the month.

Your Task is to:

Your task: As part of the application process you have been asked to prepare a presentation to demonstrate your understanding of the planes and axes of movement in different sporting activities. Your potential new employer will want to be sure that you understand how the human body moves in sport and physical activity, and have asked for you to explain the movements on each plane using at least two examples from complex sporting actions in the presentation. In order to mark yourself out as a strong candidate, you should be able to provide information about how different sporting actions could gain a mechanical advantage, the classification of different types of levers in human anatomy and how they produce movement in a different range of sporting activities.

On a PowerPoint document title your slides the following/ word document- use the following subtitles-

1- The planes and axes of movement used in different sporting activities as examples
2- The mechanical advantage with reference to levers and their use in sport and physical activity
3- The different types of levers and give examples of how they produce movement in different sporting activities. 4- Movements on each plane using examples from different sporting activities

Use the notes below to research the information needed.

LO1 Understand movement in relation to sport and physical activity

P1 P2 M1 D1

The ability to analyse a performance and identify the strengths and weaknesses of a participant are critical skills when looking to develop and improve skills and techniques.

GETTING STARTED

(15 minutes)

Using your phone or other suitable camera, work with a partner to record a participant performing a skill you are familiar with. Play the recording back several times. Working with your partner, identify:

- What was good about the skill? Why?
- Were there the problems with the skill? Why?
- Could you identify any forces acting on the participant?
- Could you identify any objects used in the skill?

Come back to this task after reading the unit. Can you expand on your answers?

1.1 Planes and axes of movement in sport and physical activity

KEY WORDS

Planes – Imaginary 'slices' through the body that divide it into two parts.

Axes – Imaginary 'poles' through which the body moves or pivots around.

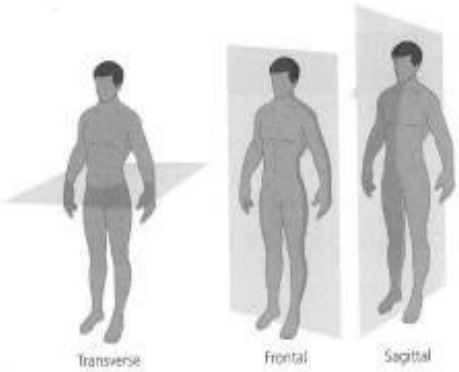
Transverse – A right angle to a standing body.

Frontal – Across the front of the body.

Sagittal – Through the middle of the body.

In order to describe how the body moves, we use the words *planes* and *axes of movement*. These words describe the direction the body is moving in and the body parts that are moving within it.

Planes of motion



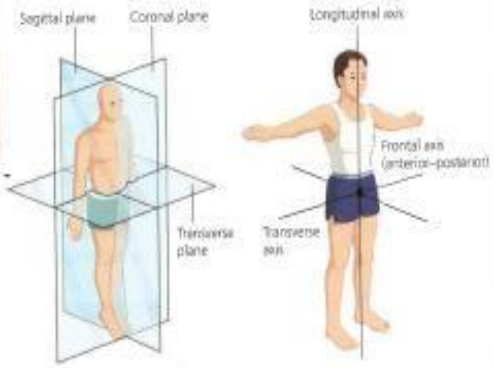
▲ **Figure 10.1** Planes of motion

Just as planes are lines that pass through the body, axes are like poles that pass through the body and allow us to describe how the body moves around that imaginary pole.

Planes of movement are described in three ways:

- *Transverse*: Dissects the body in half through your belly button, splitting it into top and bottom.
- *Frontal*: Dissects the body in half, splitting your body into front and back.
- *Sagittal*: Dissects the body in half through the nose, splitting the body into left and right.

Axes of movement



▲ **Figure 10.2** Axes of movement

Movement can be described through the axes of movement. Imagine a pole running through your body: these are the axes of movement. They are described in three ways:

- *Transverse*: These run through the middle of the body from left to right at belly button height. A somersault is an example of a movement through this axis.
- *Longitudinal*: These run through the centre of the body from top to bottom. A 180-degree jump is an example of a movement through this axis.
- *Frontal*: These run through the middle of the body in a similar way to the transverse axes, but rather than running left to right they run front to back through the belly button. A cartwheel is a good example of a movement through this axis.

1.2 Movements on each plane in sport and physical activity

In Unit 1, *Body systems and the effects of physical activity*, the movement of joints was discussed. Using the planes of movement it is possible to relate the movements to the planes in which they act. This helps to give a better description of how the body is positioned relative to the limbs. The starting point for many descriptions of movement starts from the *neutral anatomical position*. The neutral anatomical position is: standing, legs adducted, knees extended, toes pointing forward, arms adducted and by the side of the body and hands supinated with palms facing forward.

The movements of the body are detailed further in Unit 1, *Body systems and the effects of physical activity*. Table 10.1 summarises the movements that each joint is capable of.

Table 10.1 Movements available at joints

	Movements available at joints											
Joint	Flexion	Extension	Abduction	Adduction	Circumduction	Rotation	Inversion	Eversion	Supination	Pronation	Dorsiflexion	Plantar flexion
Neck	✕	✕	✕	✕	✕	✕						
Spine	✕	✕	✕	✕	✕	✕						
Shoulder	✕	✕	✕	✕	✕	✕						
Elbow	✕	✕										
Radioulnar									✕	✕		
Wrist	✕	✕	✕	✕	✕							
Hip	✕	✕	✕	✕	✕	✕						
Knee	✕	✕										
Ankle											✕	✕

PAIRS ACTIVITY

(10 minutes)

1 In pairs, look at the diagram of a cartwheel below. Identify the plane of movement the figure is moving in and the axes of movement.

▲ **Figure 10.3** Cartwheel analysis

2 With your partner, identify the movements that change from position to position in the joints indicated:

Joint	Position 1	Position 2	Position 3	Position 4	Position 5
Shoulder	90° abduction		Abduction		90° abduction
Spine	None		None		None
Hip	45° abduction		45° abduction		45° abduction
Knee	Extended		Extended		Extended

1.3 Levers and their use in sport and physical activity

KEY WORDS

Mechanical advantage – The ratio of effort (force) that performs the useful work to the force applied. In practice, the mechanical advantage will be affected by friction.

Fulcrum – The point around the lever pivots in your body; in other words, a joint.

Effort – What makes the lever move, also known as *force*. In your body this is often the muscles.

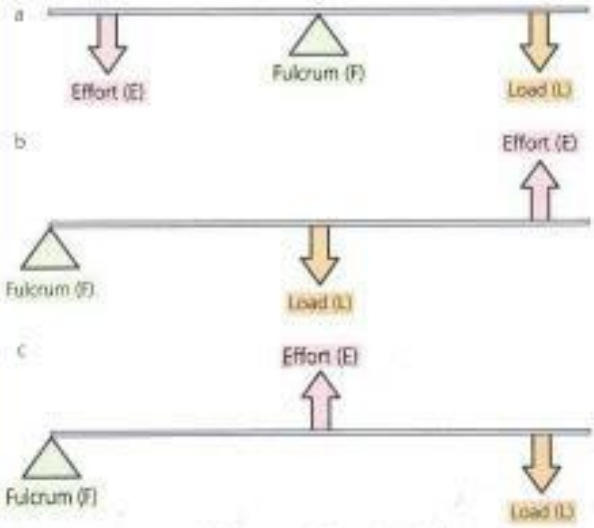
Load – The name for what you are trying to move. In the body this is usually the object you are using your muscles to move.

Lever – This is what connects the fulcrum, effort and load. In your body this is a bone.

Mechanical advantage relates to the amount of effort (force) needed to move or lift an object. If you consider trying to loosen a nut that has been tightly fastened, using a spanner with a small handle (5 cm) can make it very difficult. However, if you use a spanner with a handle twice as long (10 cm), it will be twice as easy to loosen, and will move twice as far for the same effort.

The body uses mechanical advantage to move. In the body they are known as levers. There are three types of levers, known as the *first order* or *first class*, *second order* or *second class* and *third order* or *third class*. Each lever has three component parts: the *fulcrum*, *effort* and *load*.

If we look at a simple lever system and relate it to the body, you can see how each type of lever acts.



▲ **Figure 10.4** First (a), second (b) and third (c) class levers

First class lever

Your head, sitting on your shoulders, is an example of a first class lever, which acts very much like a see-saw. Your head pivots around the atlas and axis bones in your neck, and the axis acts as the fulcrum. The weight of the head tends to move it forwards and the muscles in the back of the neck (such as the trapezius) hold it upright.

Second class lever

In a second class lever, the load lies between the fulcrum and effort. An example of this in the body is when you lift up onto your toes. Here the fulcrum is the ball of your foot. The load is the body weight and the effort is the gastrocnemius muscle contracting, as shown in Figure 10.5.

▲ **Figure 10.5** Levers in the human body

Third class lever

In a third class lever, the load now lies outside of the effort. An example of this in the body is when you are performing a bicep curl. Here the fulcrum is at the elbow and the biceps brachii is providing the effort to lift the weight held in the hand.

PAIRS ACTIVITY

(15 minutes)

Using a partner and some sticky notes, identify the shoulder, elbow, back, knee, hip and ankle.

Then stick on notes that identify the fulcrum, effort and load.

Decide which of these joints acts as a first, second and third class lever.