TCOLC Sixth Form

Yr11 – 12 Transition Activities

Subject: Cambridge Technical Sport and Physical Activity

THE CITY OF LEICESTER COLLEGE

Cambridge Technical Level 3 in Sport and Physical Activity - Extended Certificate

(Equivalent to 1 A Level)

Course Breakdown:

Year 12:

Unit 1 – Body Systems (assessed via external exam)

Unit 2 – Sports Coaching (assessed via coursework)

Year 13:

Unit 3 – Sport Organisation and Development (assessed via external exam)

Unit 17 – Sports Injury and Rehabilitation (assessed via coursework)

Unit 19 – Sport and Exercise Psychology (assessed via coursework)

Year 12/13 Teachers:

Mr McGeehan: SMcGeehan@cityleicester.leicester.sch.uk

Mr Cruickshank: ACruickshank@cityleicester.leicester.sch.uk

Mr Chadwick: MChadwick@cityleicester.leicester.sch.uk

Contents:

1. Reading List
2. Tasks
3. Questions Papers and Exam Practice
4. Worksheets and Resources

Reading List:

Books:

S. Bointon, et al. 2016. Cambridge Technical Level 3 Sport and Physical Activity, 2016, Hodder Education - ISBN: 9781471874857 (main textbook – advised as the book to purchase)

Clegg, C. 1995. Exercise Physiology and Functional Anatomy. Feltham Press Walder, P. 1998. Mechanics and Sport Performance. Feltham Press

Honeybourne, J. 2006. Acquiring Skill in Sport: An Introduction. Routledge

Jarvis, M. 2006. Sports Psychology: A Student's Handbook. Routledge. Free PDF version - https://memberfiles.freewebs.com/37/84/82578437/documents/1841695815.pdf

Scholarly Articles:

Zaichkowsky, L. 2004. Arousal in Sport. Applied Psychology.

Weinberg, R. S. (2002) Goal setting in sport and exercise: Research to practice. Exploring sport and exercise psychology, pages 25-48.

Television:

Sports News Channel- This will support how you show your understanding by using current examples from sport.

Hoop Dreams. 1994- A film regarding barriers to participation in sport.

Remember the Titans. 2000 – A film about barriers to participation and group dynamics.

Live Sporting Events- This will support how you show your understanding by using current examples from sport.

YouTube Clips:

Venous Return: https://www.youtube.com/watch?v=J80hhCkLuaA

Mechanics of Breathing: https://www.youtube.com/watch?v=bHZsvBdUC2I

Energy Systems: https://www.youtube.com/watch?v=dWe8vtztW-4

Stages of Learning: https://www.youtube.com/watch?v=n7UcobScnck

Newton's Laws: https://www.youtube.com/watch?v=MAm6LOUnJ80

Aggression in Sport: https://www.youtube.com/watch?v=DlrTha8cbAI

Arousal in Sport: https://www.youtube.com/watch?v=Y9ejADHgPNU

Structure and Funding of UK Sports: https://www.youtube.com/watch?v=UCCwzKfflt4

National Governing Bodies in the UK: https://www.youtube.com/watch?v=MgsQqE2Usgo

Tasks:

Task 1:

Label the muscles and bones on worksheets 1 and 2. These need to be in detail and will extend the terminology that you have learned at KS4. In order to complete this task you should include the following bones and muscles…

Bones:

Axial Skeleton (Centre Line):
Cranium, Sternum, Ribs, Vertebral Column - Cervical/Thoracic/Lumbar/Coccyx

Appendicular Skeleton (Peripheral and Extremity):
Scapula, clavicle, humerus, radius, ulna, carpals, metacarpals, phalanges, ilium, ischium, pubis, femur, patella, tibia, fibula, tarsals, talus, metatarsals

Muscles:

You need to know the main muscles acting at synovial joints:

Shoulder:
Deltoid, latissimus dorsi, pectoralis major, trapezius, teres major

Elbow:
Biceps brachii, triceps brachii, radio-ulnar - pronator teres, supinator muscle

Wrist:
Wrist flexors, wrist extensors

Vertebral column:
Rectus abdominus, erector spinae group, internal and external obliques

Hip:
Iiliopsoas, gluteus maximus, gluteus medius, gluteus minimus, adductor longus, adductor brevis, adductor magnus

Knee:
You need to research the muscles that cause movement at the knee. Clue you need to find the scientific names for the quadriceps (4 muscles) and hamstrings (3 muscles), plus the muscles of the lower leg.

Task 2:

Levers in Sport:

Using the YouTube clip below for background information, complete the table (worksheet 3) to demonstrate your knowledge and understanding of levers within sport.

https://www.youtube.com/watch?v=d1wS_OlJzm

Task 3:

Energy Systems:

Create a poster which highlights a number of different skills, sports or events and explain which energy system is used to supply the necessary energy for performance. Make the poster informative, fun and most importantly…accurate!

Task 4:

Increasing participation in sport:

Create a promotional video/advert for one of the national partners aiming to increase participation in sport (E.g. Sport England and the 'This Girl Can' campaign). In the video/advert include the aims of the partner, the benefits to increasing participation and outline strategies already in place – you need to play the role of the campaigner so sell your initiative passionately!

Task 5:

Training Programming:

Design 3 different training programs; one for a marathon runner, one for a 800m runner and one for a shot putt thrower. Justify your choices around the key training methods that you have applied within the program. When thinking about the types of training that you would use, be sure to establish a link between the main 'components of fitness' used in the performance of that skill and the specific training processes needed to develop that athlete.

Task 6:

Personality and Sport:

Complete the personality test from the link below and then explain the role that personality plays on sporting performance:

https://www.quietrev.com/the-introvert-test/

Task 7:

Performance Analysis:

Watch a sporting match of your choice (either current or archive footage). Create a notational analysis table including the keys skills demonstrated within the game. Tally the number of times each skill is completed within a game by one of the individual performers. Then compare these statistics to their opposite number. Who had the better game? How have you proved it?

Task 8:

Sport Organisation:

Compare the organisational structure of UK sport to America, France or Italy. You will need to research both the way that UK sport is organised and the way that one of these other countries organises competition, funding and athlete support. To complete this take fully you may need to translate foreign document (Google Translate will help here). Present your findings in a PowerPoint presentation.

Task 9:

Cardio-Respiratory System:

Humans have a double circulatory system, which is responsible for transporting oxygen around the body to facility sporting performance as well as day-to-day life. Fish typically have a single circulatory system. Compare these two system types and write a blog for 'Respiratory Weekly', explaining which is the most efficient system and why.

Task 10:

COVID-19:

In 2020, the sporting world was rocked by the impact of COVID-19. Sport in almost all forms was cancelled and worldwide confusion ensued. The full impact of COVID-19 on the sporting community is still unknown so I would like you to write a newspaper article outlining your opinion of the possible fallout from this disease. Consider factors such as; Sport Organisation, Funding, Commercialisation, Barriers to Participation, Ethics in Sport as well as Health, Fitness and Well-being of the nation (both now and in the coming months/years).

Unit 1: Body Systems

Section A

Answer **all** questions. Put a tick (✓) in the box next to the **one** correct answer for each question.

1 Which one of the following is **not** part of the pelvis?

(a) Ischium ☐

(b) Pubis ☐

(c) Femur ☐

(d) Ilium ☐

[1]

2 Which one of the following bones is part of the appendicular skeleton?

(a) Humerus ☐

(b) Sacrum ☐

(c) Cranium ☐

(d) Ribs ☐

[1]

3 Which of the following bones form the elbow joint?

(a) Humerus, femur and ulna ☐

(b) Humerus, tibia and fibula ☐

(c) Humerus, radius and fibula ☐

(d) Humerus, radius and ulna ☐

[1]

4 Which one of the following describes flexion at a joint?

(a) Elbow movement during the downward phase of a press up ☐

(b) Movement at the shoulder when bowling in cricket ☐

(c) Turning the palms of the hands to face downwards ☐

(d) Lifting the head to look upwards to take a high catch ☐

[1]

5 Which one of the following is an effect of a cool down after exercise?

(a) Reduces adrenaline ☐

(b) Speeds up the removal of lactic acid ☐

(c) Slows down the breathing rate ☐

(d) Reduces oxygen uptake ☐

[1]

6 Which one of the following will benefit most from a high percentage of slow twitch muscle fibres?

(a) Shot put ☐

(b) 800m race ☐

(c) Marathon ☐

(d) 50m swimming race ☐

[1]

7 Which one of the following components of blood carries oxygen as its primary function?

(a) White blood cells ☐

(b) Red blood cells ☐

(c) Platelets ☐

(d) Plasma ☐

[1]

8 Which one of the following respiratory structures warms and moistens air as it is inhaled?

(a) Larynx ☐

(b) Pharynx ☐

(c) Epiglottis ☐

(d) Nasal cavity ☐

[1]

9 What type of joint is found at the base of the thumb?

.....[1]

10 What is meant by the term 'isometric muscle contraction'?

.....

.....[1]

Section B

Answer **all** questions.

11 **Fig. 11.1** shows the major skeletal muscles of the body.

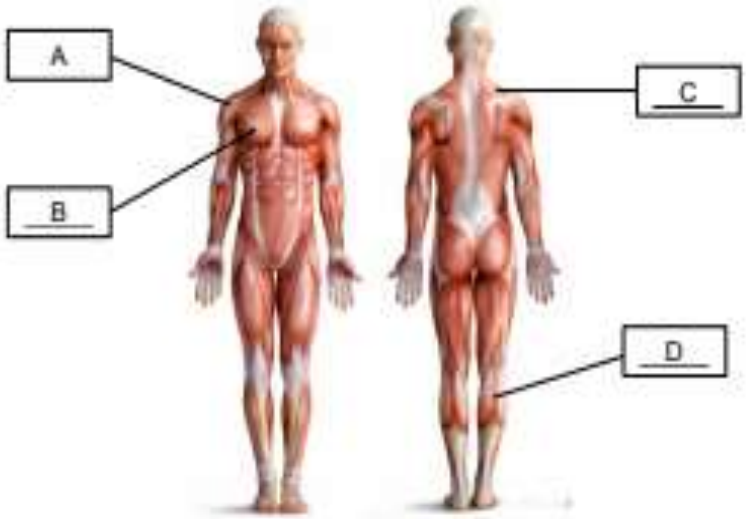


Fig. 11.1

Identify the muscles labelled A, B, C and D.

A.....

B.....

C.....

D.....

[4]

12 Complete the table by identifying the structural type of each bone below.

Bone	Type of bone
Vertebra	Irregular
Carpals	
Cranium	
Patella	
Phalanges	

[4]

13 **Fig.13.1** shows the upward phase of an arm curl.

Fig. 13.1

Identify **one** agonist and **one** antagonist during this phase, and state the type of muscle contraction taking place in the agonist.

Agonist: .....

Antagonist: .....

Type of Muscle contraction: .....

.....

[3]

14 In a team game such as volleyball, a player will use different muscle fibre types for different skills and situations.

Using a team game of your choice, identify **three** skills or situations when a player would use their fast glycolytic fibres.

Team game .....

1 .....

.....

2 .....

.....

3 .....

.....

[3]

15. Complete the table below to show the functions of various structures of the heart.

Structure of heart	Function
	Deoxygenated blood enters here from the venae cavae
Tricuspid valve	
Left ventricle	
	Blood vessel that carries deoxygenated blood towards the lungs
	This valve prevents blood flowing back into the left ventricle

[5]

Unit 3: Sports Organisation and Development

Answer **all** questions.

1 In the UK, National Disability Sports Organisations (NDSOs) work to develop and promote sporting opportunities for individuals with disabilities or impairments. Examples of NDSOs include British Blind Sport and the British Wheelchair Athletics Association.

(a) Describe **two** ways in which National Disability Sports Organisations (NDSOs) develop and promote sporting opportunities.

.....

.....

.....

.....

[2]

(b) Explain the role of UK Sport.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[7]

(c) Describe how County Sports Partnerships attempt to increase participation in sport.

.....

.....

.....

.....

.....

.....

.....

.....

[4]

(d) International organisations such as the Federation Internationale de Football Association (FIFA) oversee the development of football across the world. Describe how the work of an international sporting organisation impacts on sport in the UK.

.....

.....

.....

.....

.....

.....

.....

.....

[4]

Knowledge and understanding of sports development is vital to ensure sport survives.

(a) Define Sports Development.

.....

.....

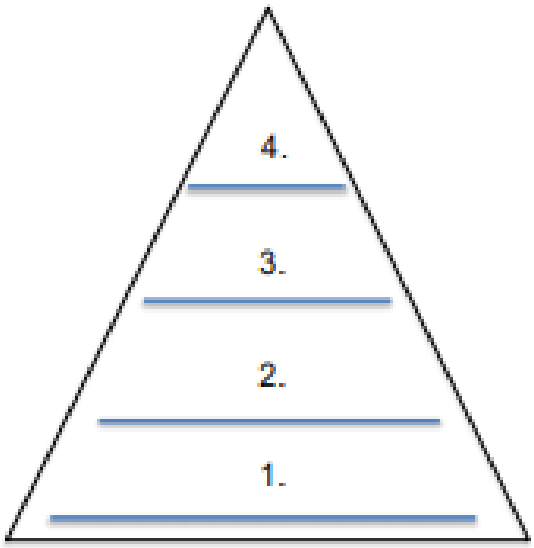
[1]

(b) Other than a Sports Development Officer identify **one** additional role involved within sports development.

.....

[1]

(c) The following diagram below is known as the sports development continuum. Identify the **four** stages of the continuum.



1 .....

2 .....

3 .....

4 .....

[4]

(d) As well as developing specific skills in chosen activities, sports development also aims to promote values and attributes needed to lead and coach through sport. Describe the leadership attributes needed to coach that can be generated through participation in sport.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[6]

(e)* Young adults (16-24) are a target group for increasing sports participation.

Discuss the barriers to participation for this target group.

[8]

3 (a) Identify **three** methods which can be used to measure the impact of a sports development initiative and state what each one measures.

.....

.....

.....

.....

.....

.....

[6]

(b) Name **one** example of a sport development initiative.

.....

[1]

(c) Outline the purpose of measuring the impact of sports development initiatives.

.....

.....

.....

.....

.....

.....

[3]

4 (a) Describe how an international sporting event such as Wimbledon supports the aims of sports development.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[5]

(b) Name **two** national sports events.

.....

.....

[2]

(c) Describe how sport development is funded in the UK.

.....

.....

.....

.....

.....

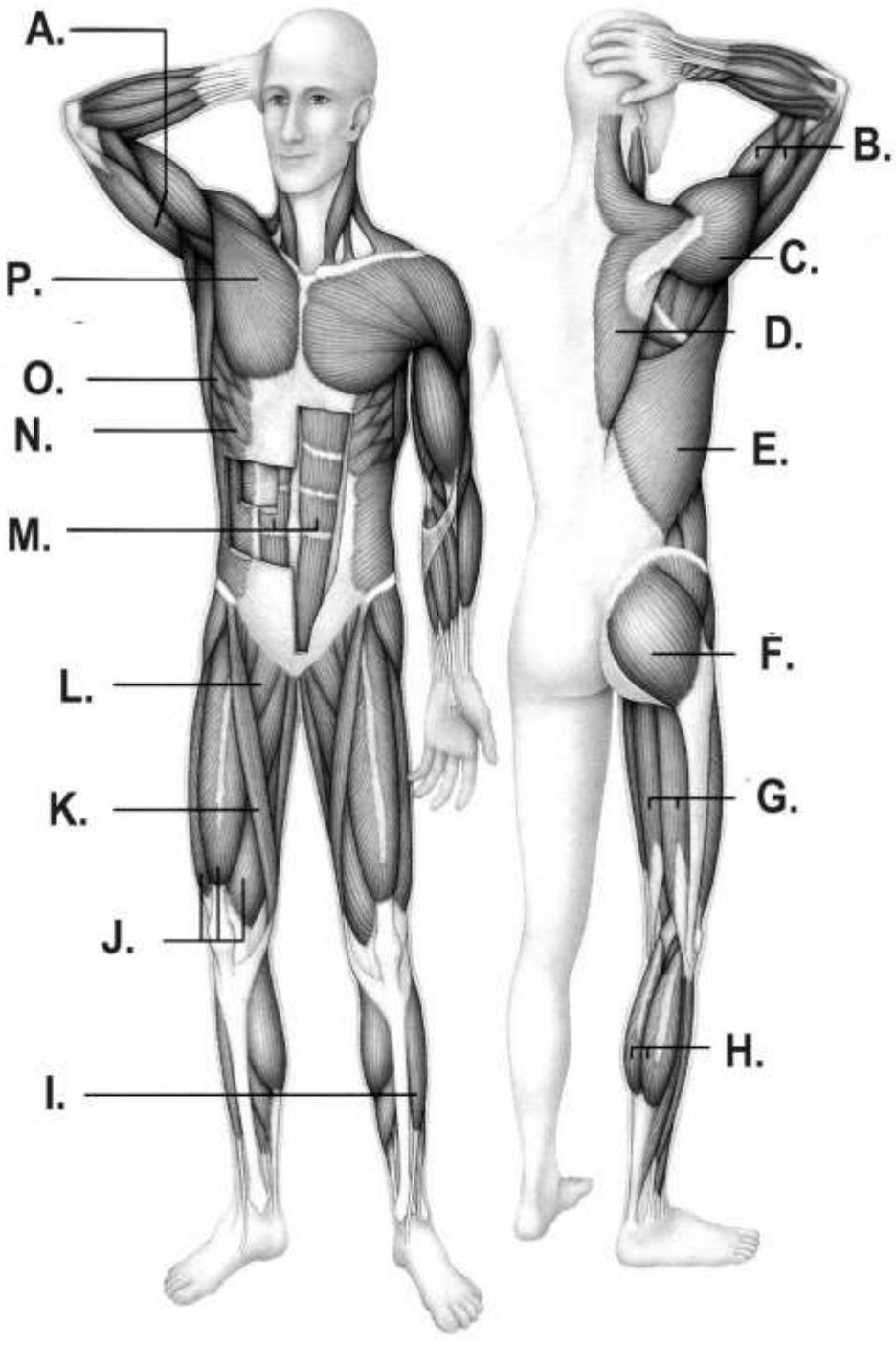
.....

[3]

Resources and Worksheets:

Worksheet 1:

Label all of the muscles listed in Task 1. Some of these will be the muscles marked A-P, some will require you to research the muscular system in more detail to find the answers.



Worksheet 2:

Label all of the bones listed in Task 1.

Worksheet 3:

Complete the table below to show your learning in Task 3.

Lever Type	1st class	2nd class	3rd class
Diagram of lever			
Where it can be found in the body- give two examples			
Give two examples of where the lever system can be used in sport			
What is the mechanical advantage of the lever system?			
What is the mechanical disadvantage of the lever system?			

The Skeletal System

Resource 1:

Functions of the skeletal system

Support
A combination of fused and unfused bones allows the body to be stable while also moving at particular joints, e.g. a rugby player in a scrum can push using their shoulders while also moving their arms to maintain balance.

Posture
The structure of the skeleton allows the body to remain upright, e.g. a good posture can reduce the likelihood of injury and improve the execution of sports skills, such as a golf swing.

Movement
The structure and type of different bones determine the movement at a point where they meet (a joint), e.g. the ball-and-socket joints at the shoulder and hips enable a greater range of movement than the hinge joints at the knee and elbow.

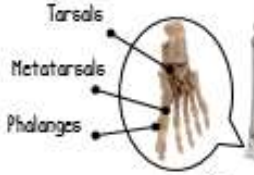
Storage of minerals
Bones store minerals, such as calcium and phosphorus, which are important for growth and development, e.g. the storage of calcium is important for bone density and can reduce the risk of bone injuries in contact sport such as American football.

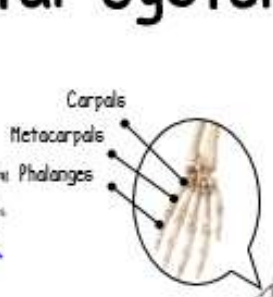
Blood cell production
Bones produce:

- Red blood cells which have a function of carrying oxygen to our working muscles
- White blood cells which fight infections
- Platelets which perform the role of blood clotting

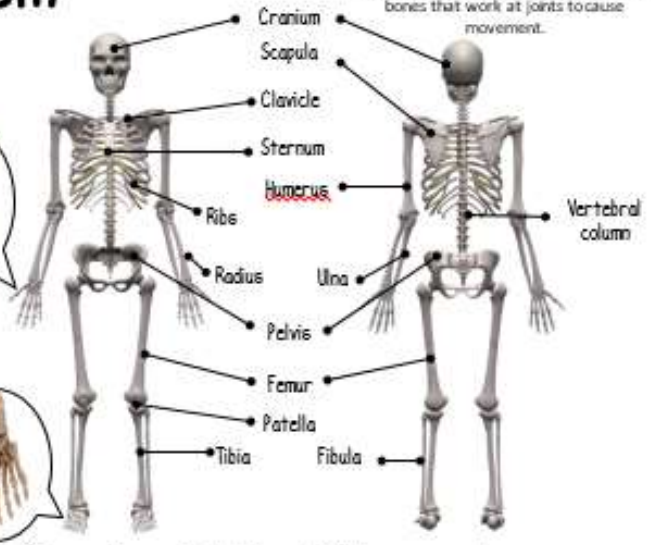
Blood is important during sport as the red blood cells provide the muscles with oxygen to produce energy and the platelets prevent major blood loss when e.g. athlete cuts themselves in a sporting accident.

Protection
Bones protect internal organs from injury, e.g. during contact sports, such as rugby, the ribs and cranium protect the heart, lungs and brain from injury in the tackle.





Major bones of the skeleton
The skeleton has many major articulating bones that work at joints to cause movement.



Synovial joints
A synovial joint is the articulation of two bones which is surrounded by a joint capsule. The capsule is lined with a synovial membrane and contains a cavity filled with synovial fluid.

Components of joints
There are three main components of a joint and each has a different role during physical activity and sport.

Ligaments
Ligaments are connective tissues that join **bone to bone**. Their main role is to **stabilise the joint** and keep it together.

Tendons
Tendons are connective tissues that join **muscle to bone**. When the muscle contracts, the tendon pulls the bone to **allow movement**.

Cartilage
Cartilage is a connective tissue found between two articulating bones at a joint in order to reduce the friction between them and act as a shock absorber. It can also form flexible tissue in structures such as the ear lobe.

Types of synovial joints and their movements
Different joints allow for different movements. There are two main types of joints outlined below. Notice that each joint allows a different degree of movement.

Hinge joint

Elbow
Articulating bones: *humerus, radius and ulna*

Knee
Articulating bones: *Femur and tibia*

Extension – increasing the angle between the upper arm/leg and the lower arm/leg by straightening at the joint, e.g. lowering a dumbbell during a biceps curl

Flexion – Decreasing angle between the upper arm/leg and the lower arm/leg by bending at the joint. E.g. backswing of the knee to kick a rugby conversion

Extension – straightening at the hip or shoulder and backwards movement of the humerus or femur, e.g. upwards phase of a squat

Flexion – bending at the shoulder/hip and lifting the humerus/femur in front of the body, e.g. throwing the ball up during a tennis serve

Adduction – movement towards the midline of the body, e.g. dragging a hockey stick towards/across the body when passing

Abduction – movement away from the midline of the body, e.g. a goalkeeper lifting the arms to the side to save a shot

Circumduction – circular movement of a body part, e.g. spinning a ribbon during a rhythmic gymnastics routine

Rotation – movement of a joint around an axis, e.g. rotating the shoulder when throwing a cricket ball

Ball-and-socket joint:

Shoulder
Articulating bones: *Humerus and scapula*

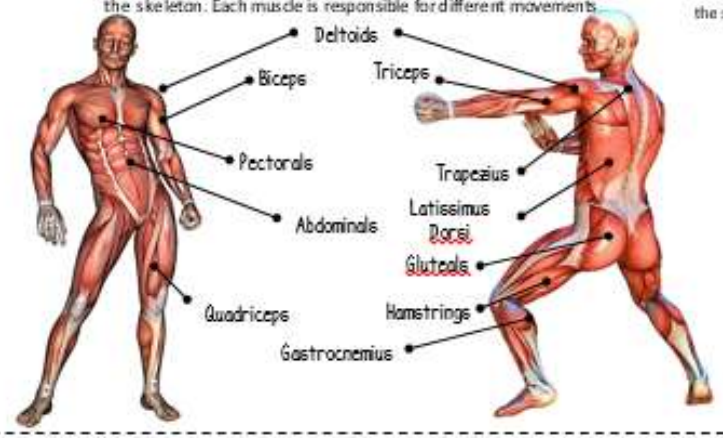
Hip
Articulating bones: *Pelvis and femur*

To find out about how muscles work at different types of joint, go to .

The Muscular System

Major muscles of the human body

The voluntary muscles' main role is to allow movement by working with the skeleton. Each muscle is responsible for different movements.



The muscular system works in partnership with the skeletal system in order to allow the body to move and perform physical activity.

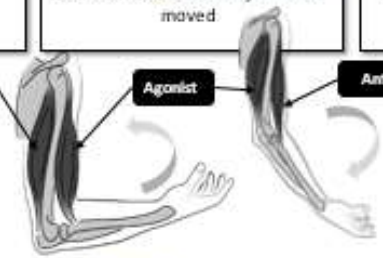
Antagonistic pairs

Muscles work together in pairs in order to cause movement. Each pair is called an antagonistic pair.

The agonist:
Also known as the prime mover, this is the muscle that contracts and shortens to allow movement by pulling on the bone

The antagonist:
This muscle works in the opposite manner to the agonist and lengthens and relaxes to allow the joint to be moved

The fixator:
This muscle works to stabilise the point of attachment of the agonist in order to stabilise the movement



*The **biceps** is the **agonist** as it contracts and shortens to cause flexion of the elbow, while the **triceps** works as the **antagonist** and relaxes and lengthens to allow the movement at the elbow.*

*The **triceps** this time works as the **antagonist** as it shortens, while the **biceps** works as the **antagonist** and lengthens to allow movement.*

Muscles and movement

Different joints allow for different movements. The table below outlines the movements possible at different joints and the bones and muscles located at each joint.

Joint	Joint type	Movement possible	Agonist	Antagonist	Example in Sport
Knee	Hinge	Flexion	Hamstrings	Quadriceps	*Bending the knee in preparation to kick a ball*
		Extension	Quadriceps	Hamstrings	*Straightening the knee as you kick a ball*
Elbow	Hinge	Flexion	Biceps	Triceps	*Bending the elbow when preparing to shoot in basketball*
		Extension	Triceps	Biceps	*Straightening the elbow when throwing in basketball*
Shoulder	Ball-and-socket	Abduction	Deltoid	Latissimus dorsi, pectorals	*Preparing to throw a ball when fielding in baseball*
		Adduction	Latissimus dorsi, Pectorals	Deltoid	*Throwing phase and follow-through when throwing a ball in baseball*
		Rotation	Rotator cuff*, Latissimus dorsi, Pectorals, Deltoids		*Performing a forehand in table tennis involves external rotation (backswing) and internal rotation (forward swing)*
		Circumduction	Rotator cuff*, Latissimus dorsi, Pectorals, Deltoids		*Moving the entire arm in a circular motion during bowling in cricket*
		Flexion	Pectorals, Deltoid	Latissimus dorsi, Deltoid	*Moving the arms from the side of the body to above the head during backstroke in swimming*
		Extension	Latissimus dorsi, Deltoid	Pectorals, Deltoid	*Moving the tennis racquet backwards during the preparation phase of a tennis serve*
Hip	Ball-and-socket	Abduction	Gluteals	Hip Adductors*	*Recovery phase of swimming breaststroke*
		Adduction	Hip adductors*	Gluteals	*Power phase of swimming breaststroke*
		Rotation	Gluteals, Hip adductors*		*Playing a side-footed pass in football*
		Circumduction	Gluteals, Hip flexors*, Hip adductors*, Abdominals		*Movement of the hip when performing step overs in football*
		Flexion	Hip flexors*	Gluteals	*Bending the hip during the recovery phase when running*
		Extension	Gluteals	Hip flexors*	*Straightening of the hip during the drive phase when running*

Extension / Flexion of the kicking leg

When kicking a football, the hamstrings and quadriceps work together to cause movement at the knee.

*During the backswing, the **hamstrings** act as the **agonist** to cause flexion at the knee and the **quadriceps** act as the **antagonist**, to enable the movement to occur.*

*Their roles are reversed when extending the knee to kick the ball, as the **quadriceps** contract and become the **agonist**, while the **hamstrings** relax and become the **antagonist**.*

Abduction/ Adduction of the shoulder

When throwing a ball as a fielder, the deltoids, latissimus dorsi and pectorals work together to cause movement at the shoulder.

*During the preparation phase, the **deltoids** act as the **agonist** to cause shoulder abduction and the **latissimus dorsi** and **pectorals** act as the **antagonists** to enable the movement to occur.*

*Their roles are reversed when bringing the arms back in, as the **pectorals** act as the **agonist** while the **deltoids** act as the **antagonist**.*

Extension/ Flexion of the hip

When running, the hip flexors and gluteals work together to cause movement at the hip.

*During the drive phase, the **gluteals** act as the **agonist** to cause extension of the hip and the **hip flexors*** act as the **antagonist** to enable movement to occur.*

*Their roles are reversed when flexing the hip during the recovery phase of running. During this phase, the **hip flexors*** act as the **agonist** while the **gluteals** act as the **antagonist**.*

Resource 2:

Resource 3:

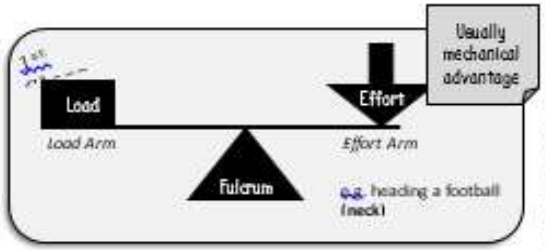
Movement Analysis (Levers, Planes and Axes)

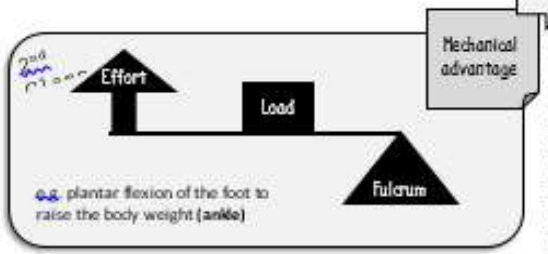
Lever Systems

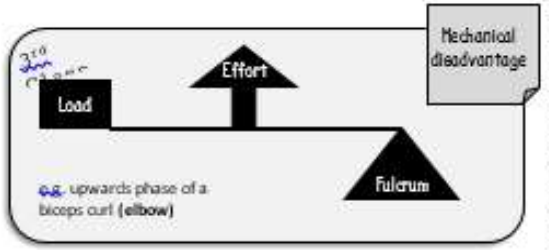
Movement at the joints occurs by one of the three classes of levers.

Depending on the lever system, the movement is either at a mechanical advantage or disadvantage.

A mechanical advantage allows heavy loads to be moved with minimal effort, whereas a mechanical disadvantage allows loads to be moved quickly.
Mechanical advantage = Effort arm ÷ Load arm







Analysis of Movement

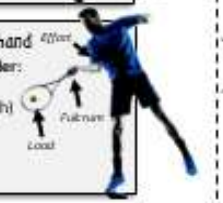
Press up
Movement at the elbow:
Flexion (downwards)
Extension (upwards)
Lever system:
2nd class

Cricket bowling
Movement at the shoulder:
Rotation
Lever system:
1st class

Jumping
Movement at the ankle:
Plantar flexion (take-off)
Dorsiflexion (landing)
Movement at the hip:
Extension (take-off)
Flexion (landing)
Lever system at the ankle:
2nd class

Running
Movement at the knee:
Flexion (backwards/bending)
Extension (forwards/straightening)
Lever system:
3rd class

Tennis forehand
Movement at the shoulder:
Abduction (backswing)
Adduction (follow-through)
Lever system:
1st class



Front somersault
Plane: Sagittal
Axis: Transverse

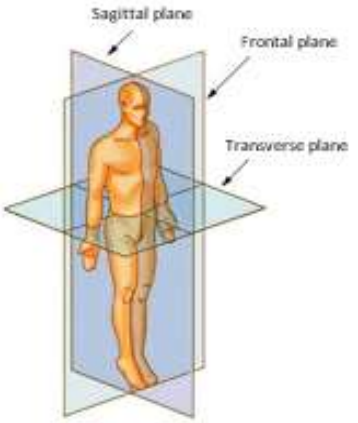
Discus throw
Plane: Transverse
Axis: Longitudinal

Cartwheel
Plane: Frontal
Axis: Frontal

Cycling
Plane: Sagittal
Axis: Transverse

Planes of Movement

Any movement at a joint occurs in one of the planes outlined below.



Axes of Rotation

Any time the body rotates, it does so around one of the three axes shown below.