



Physical and Health Education

GRADE 12

TERM 2




Authored and designed
by a specialised committee from the Ministry of Education

First edition I439I438- A.H. / 20I820I7- A.D.

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The graphic is a stylized representation of a tablet or screen with a dark grey border. It features a QR code in the top left, a circular logo with a red Arabic calligraphic element in the top right, and three app store download buttons at the bottom. The text is centered and uses a clean, sans-serif font.

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"Extensive knowledge and modern science must be acquired. The educational process we see today is in an ongoing and escalating challenge which requires hard work.

We succeeded in entering the third millennium, while we are more confident in ourselves."

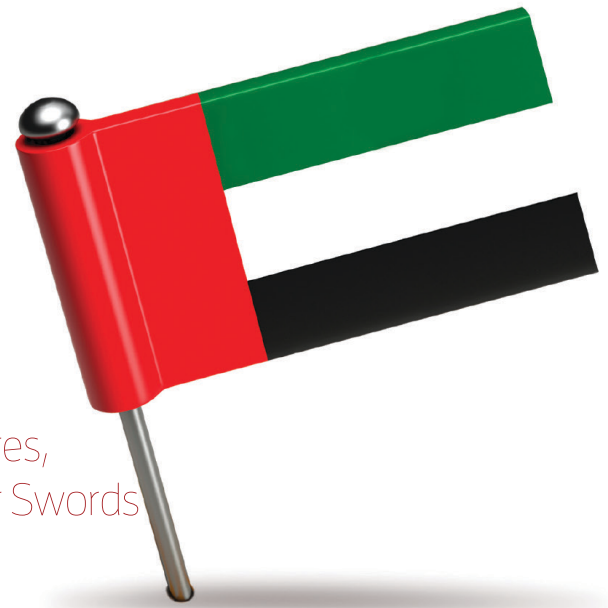
H.H. Sheikh Khalifa Bin Zayed Al Nahyan

President of the United Arab Emirates



The Meaning of the United Arab Emirates Flag Colors

The colors of the United Arab Emirates (UAE) flag are inspired by the famous verse of the poet Safiyuddin Al-Hilli:



White are our deeds, Green are our pastures,
Black are our Battles, Red are our Swords



Symbolizes goodness, welfare and giving, as well as the State's approach of supporting worldwide peace and security.



Symbolizes growth, prosperity, green environment and cultural revival in the country.



Symbolizes the strength, staunchness and might of the people of the State, as well as the rejection of injustice and extremism.



Symbolizes the sacrifices of the pre-union generation, and of the nation's martyrs who sacrificed their lives to protect the homeland's achievements and gains.

The UAE Vision 2021

United in Responsibility

- Confident and responsible Emiratis
- Cohesive and prosperous families
- Strong and vital social relations
- Rich and vibrant culture

United in Destiny

- Following the example of the Founding Fathers
- Safety and security of the nation
- Enhancement of the UAE's status on the international arena

United in Knowledge

- Harness full potential of national human capital
- Sustainable and diversified economy
- Knowledge-based and highly productive economy

United in Prosperity

- Long and healthy life
- First-class educational system
- Well-rounded lifestyles
- Environmental protection

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Unit 5

**Physiology of
Fitness**



Unit 5

Physiology of Fitness



Student learning objectives

- 5.1 Describes the movement of lever systems (examples of their use in physical activity). (G12.1.1.1)
- 5.2 Describes the movement patterns of planes and axes of movement (sagittal, frontal, transverse). (G12.1.1.2)
- 5.3 Develops deeper knowledge of the functions of the musculoskeletal system and how it impacts on health, fitness and performance in physical activity and sport. (G12.1.1.4)
- 5.4 Develops deeper knowledge of the functions of the cardio-respiratory system and how it impacts on health, fitness and performance in physical activity and sport. (G12.1.1.5)
- 5.5 Compares the difference between aerobic and anaerobic exercise activities. (G12.1.1.6)
- 5.6 Explains the short-term effects of exercise on the body systems, (musculoskeletal, cardiovascular, respiratory and energy systems) (G12.1.1.7)
- 5.7 Explains the long-term effects of exercise on the body systems (musculoskeletal, cardiovascular, respiratory and energy systems) (G12.1.1.8)



Unit 5 Introduction

Exercise and physical activity have a variety of effects on the body systems in both the short and long term. You will have experienced these effects in your PE lessons throughout your time in school. Increased breathing, pulse rate and sweating are due to the body temperature rising from these activities. However, there are many other complex reactions occurring in your body during exercise.

Within this unit, we will build on our basic knowledge of human anatomy and physiology. We will also explore the impact of exercise on the body systems and explain why and how these changes occur.

You will link basic and complex movement patterns to specific musculoskeletal lever systems before investigating further into the functioning of the cardiovascular and respiratory systems. You will then go on to consider the key differences between anaerobic and aerobic exercises and why you may decide to participate in one over the other.

As in Grade 11, you identified the short and long term effects of exercise on the body systems; you will now deepen your understanding of these processes. By the end of this unit, you will be able to explain why your body systems react to exercise and how these reactions benefit athletic performance in the long and short term.

Glossary of key terms

Word	Form	Definition
Alveoli	noun	air sacs in the lungs
acute effects	noun	short term effects
arteries	noun	blood vessels which carry oxygenated blood away from the heart
adenosine triphosphate	noun	the energy currency of the body
bradycardia	noun	a slow heart rate - below 60bpm
chronic effects	noun	long term effects of exercise
concentric	noun	shortening of the muscle
eccentric	noun	lengthening of the muscle
expiration	noun	breathing out
fast twitch muscle fibre	noun	muscle fibres suited for fast, powerful contractions
hypertrophy	noun	growth of muscle fibres in response to exercise
inferior	adjective	below or smaller than
inspiration	noun	breathing in
isometric	noun	muscle stays the same length during contraction
lactic acid	noun	a waste product created by anaerobic respiration
slow twitch muscle fibres	noun	muscle fibres suited to slow, long duration activities
superior	adjective	above or bigger than
sweating	verb	release of water through the skin to cool body temperature
thermoregulation	noun	maintenance of body's internal temperature
vasoconstriction	noun	reducing the diameter of blood vessels
vasodilation	noun	increasing the diameter of blood vessels
Veins	noun	blood vessels carrying deoxygenated blood to the heart

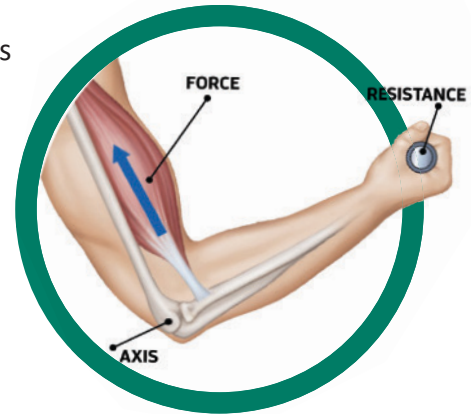


Lever systems of the human body

When we want to move any part of our body, our muscles and bones must work together in a series of levers.

Levers in the body are made up of a FULCRUM (Pivot), LOAD and EFFORT.

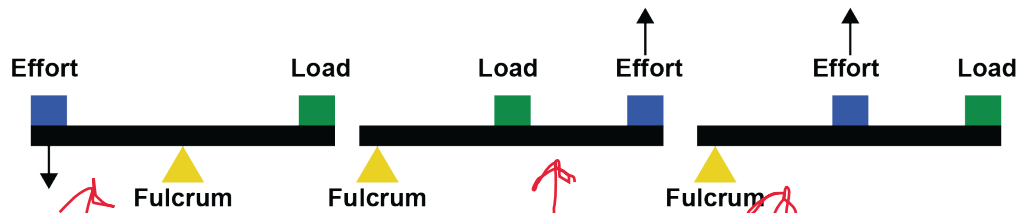
In grade 11 you learned about how you can use your arms and legs as levers in sport. These levers can be classified into different categories. This depends on where the fulcrum, effort and load is placed.



Classification of levers

Activity 1

Below there are three different classes of lever and a table containing descriptions. Can you draw the correct lever in the table to match the description?



Class	Description	Illustration
1	The fulcrum lies between the effort and the load.	
2	The fulcrum is at one end, the effort at the other end and the load lies between the effort and the fulcrum.	
3	The fulcrum is at one end, the load at the other end and the effort lies between the load and the fulcrum.	

See Elite Extension Task E 1

Planes and axes of movement

When we play sport, whether this is running, jumping or side stepping, we move through different PLANES. We do not just move forwards, backwards or side to side in sport. Different movements take us through different movement planes.

There are three basic planes of motion.

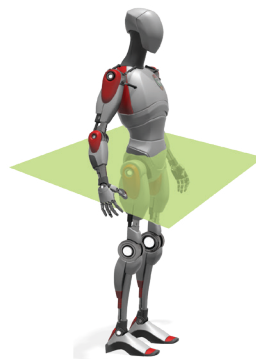
GRADE 11 RECAP

- ☹ Stand upright
- ☹ Legs together, feet facing forwards
- ☹ Knees straight/locked
- ☹ Arms by the side
- ☹ Palms Facing forwards

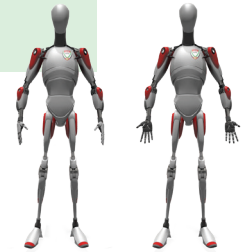
Sagittal plane



Horizontal plane



Frontal plane



Activity 2

Using the diagrams above, describe how each plane passes through the body and the movements at each of planes.

Sagittal Plane



.....

Horizontal (Transverse) Plane



.....

Frontal Plane



.....



Axes of movement

An axis is a straight line which an object rotates around. Movement at a joint takes place in a plane around an axis.

There are three axes of rotation.

Activity 3

Match the axis to the correct description:

Passes horizontally from back to front and is formed by the crossing of the sagittal and transverse planes

Passes horizontally from left to right and is formed by the crossing of the frontal and horizontal (transverse) planes.

Passes vertically from bottom to top and is formed by the crossing of the sagittal and frontal planes.




Frontal

Vertical

Sagittal

Activity 4

Complete the table to give examples of movements across each of the planes and axes

Plane	Motion	Axis	Example
Sagittal	Flexion/Extension	Frontal	
Frontal	Abduction/Adduction	Sagittal	
	Side flexion		
	Inversion/Eversion		
Horizontal	Internal and external rotation.	Vertical	
	Horizontal Flexion/extension Supination/pronation		

See Elite Extension Task E 2

Foundations of the skeletal system

The human skeleton is made up of 206 bones. The skeleton protects and provides structure, shape and movement. Your bones also produce blood cells.



Activity 5

Give examples of how your skeleton helps your every-day needs and helps you during physical activity:

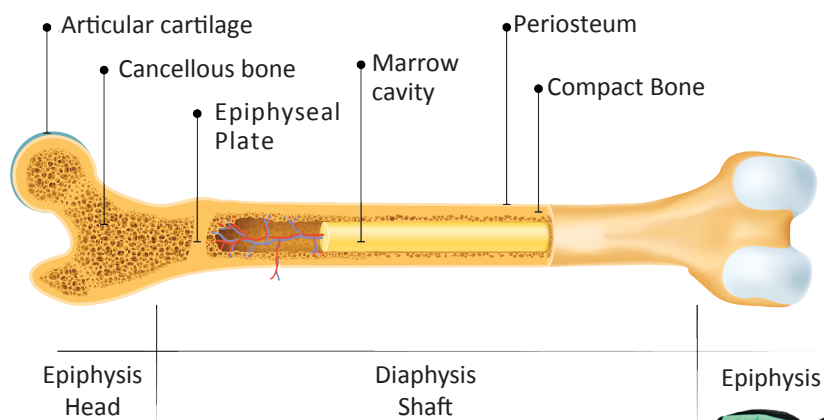


What is the skeleton made up of?

What do we know about the building blocks of our skeleton? What do we know about the bones and what they are made of?

A long bone is made up of different parts.

Articular cartilage - covers the ends of the bone; it stops them rubbing together and absorbs shock



Unit 5 Physiology of Fitness

Epiphysis - the ends of the bone

Cancellous bone - spongy bone storing red bone marrow; where blood cells are made

Epiphyseal plate - where bones grow in length

Diaphysis - the long shaft of the bone

Compact bone - hard and thick bone which provides strength

Periosteum - a protective layer where there is no hyaline cartilage; ligaments and tendons attach here

Medullary cavity/marrow cavity - contains the yellow bone marrow; where white blood cells are made

Activity 6

A long bone is one of the five types of bone found in the skeleton. What are the other four types of bone? Can you give an example for each type?



Making movement happen - Joints

Joints are the point where two bones meet. In sport the most useful joints in our bodies are **SYNOVIAL JOINTS**. Synovial means **FREELY MOVEABLE**. All synovial joints have the same parts to help them function.

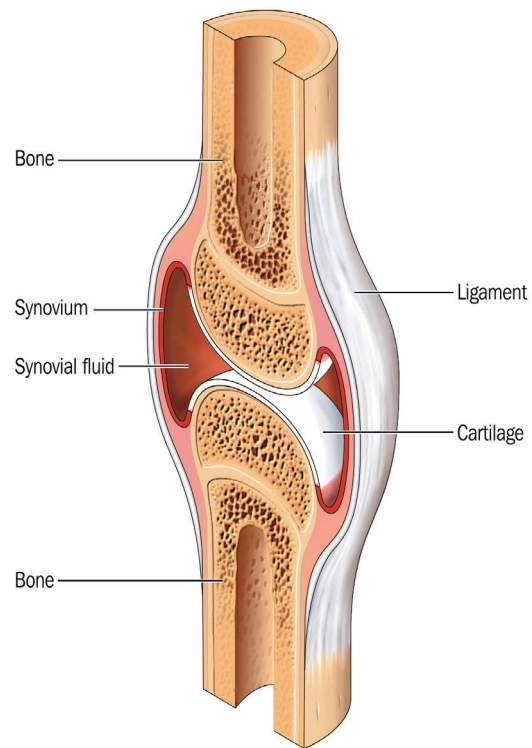
Cartilage - reduces friction, acts as a shock absorber.

Synovial fluid - loosens the joint.

Synovial membrane - produces synovial fluid.

Tendon - joins muscle to bone allowing movement.

Ligament - joins bone to bone, stabilising the joint.



RECAP!!- TYPES OF SYNOVIAL JOINT

BALL AND SOCKET - HIP/SHOULDER

HINGE - KNEE/ELBOW

PIVOT – SPINE (ATLAS/AXIS- TOP)

GLIDING - BETWEEN VERTEBRAE

CONDYLOID - WRIST

Activity 7

Give two reasons why it is important to move the joints in a warm-up routine:

1



2



Investigating the main movements at joints

Flexion and extension

Flexion of a joint makes a body part move forward from the anatomical position by closing the angle of a joint. Extension of a joint makes a body part move backward by opening the angle of a joint.

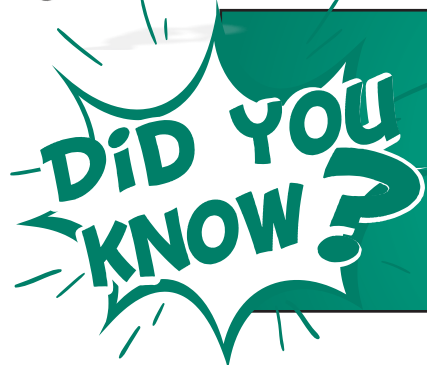
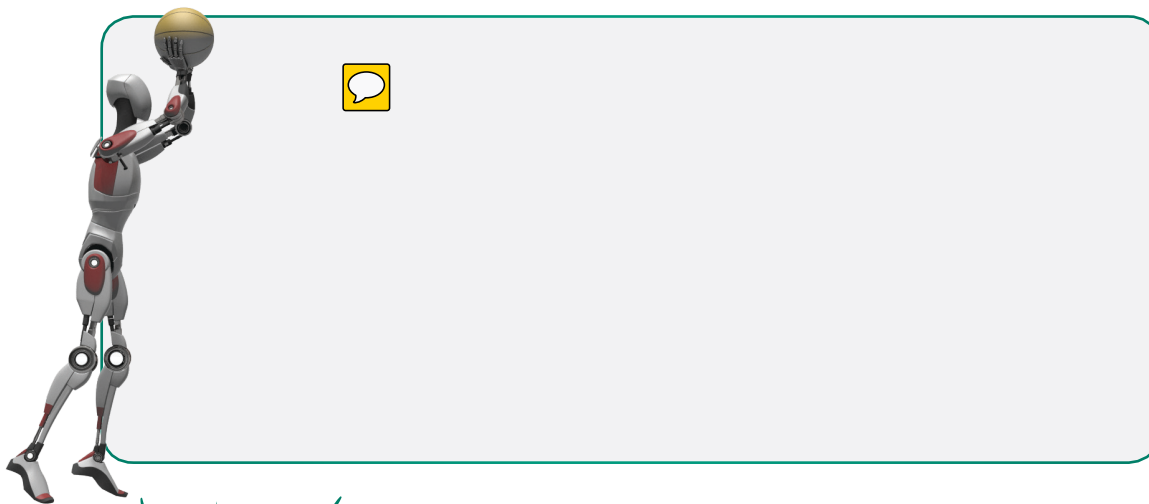
FAST FACT

This does not happen at the knee because flexion moves the lower leg backwards and extension moves the lower leg forwards.

Activity 8

Can you demonstrate both flexion and extension of the elbow, shoulder and knee joints? Work with a partner.

For each of the movements you have identified, give a sporting example that demonstrates the movement. For example, flexion of the wrist happens in the follow-through of a set shot in basketball.



To score a lay-up Qais Omar will need good flexibility to extend his ankles to jump and flex his wrists to score the basket



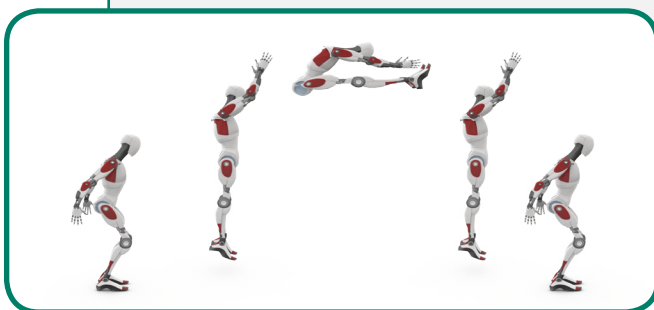
Abduction and adduction

Abduction of a joint makes a body part move away from the middle of the body in the anatomical position. Adduction of a joint makes a body part move towards the middle of the body.

Activity 9

Can you demonstrate abduction and adduction of the shoulder and the hip joint? Work with a partner.

Provide a sporting technique for each of the movements you have demonstrated. For example, abduction of the hips occurs when performing the upward phase of a straddle jump.

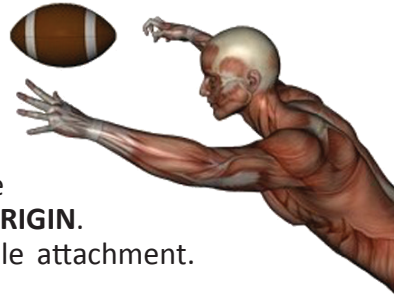


See Elite Extension Task E 3



Exploring the muscular system

There are over 600 skeletal muscles in our bodies. All muscles stretch from one bone to another. They are attached in at least two places and cross at least one joint.



TENDONS connect muscles to bone. The muscle attaches to a fixed point, this is the **ORIGIN**. The **INSERTION** of a muscle is the moveable attachment.

It is important to remember that muscles can only **PULL**. They never push. When a muscle contracts it will pull a bone towards another, crossing a joint and causing movement.

Activity 10

Muscles help us to move. Can you think of any other functions muscles perform to help us in our everyday lives?



RECAP- KEY TERMS

- ★ antagonistic pairs - muscles work in pairs so when one contracts its opposite muscle will relax, e.g. biceps and triceps
- ★ origin- point of attachment of a muscle that remains fixed during muscular contraction
- ★ Insertion Point - attachment of a muscle that moves toward the origin during contraction movement at a joint



See Elite Extension Task E 4

Muscle movements

Muscles work in pairs. For example, during a sit up the abdominals (stomach) act as the AGONIST (working muscle) to contract in the upward phase and the back muscles act as the ANTAGONIST (relaxing muscle) to allow movement.

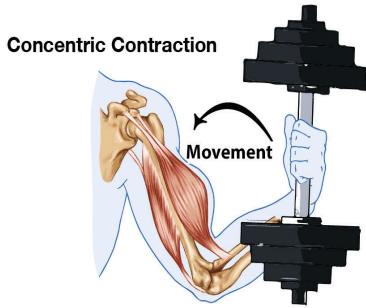
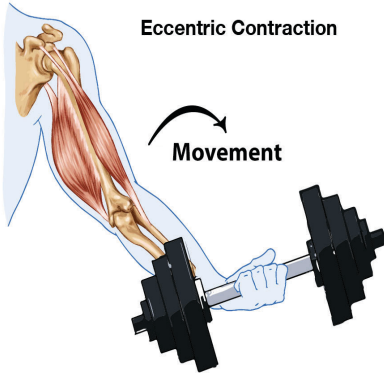
Activity 11

Can you name the agonist (working muscle) and antagonist (relaxing muscle) in the following movements? It may be useful to demonstrate them with a partner.

- ★ Bicep curl - 
- ★ Kicking action - 

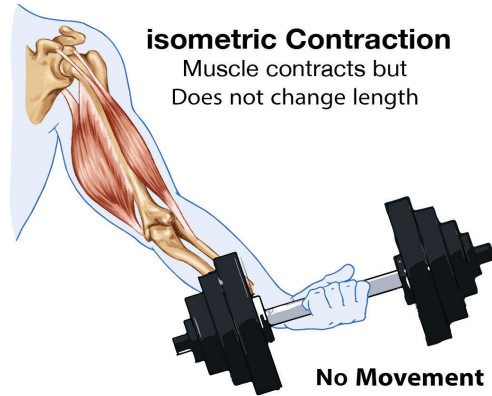
Muscle contractions

There are two different types of contraction; isometric and isotonic. Isotonic contractions can be split into two categories, these being concentric and eccentric.

ISOTONIC	
CONCENTRIC	ECCENTRIC
	
<ul style="list-style-type: none">★ concentric contraction in the biceps during upward phase of exercise★ the biceps produce tension and shortens★ it pulls the forearm upwards to cause flexion of the elbow	<ul style="list-style-type: none">★ eccentric contraction occurs in the biceps during the downward phase★ the biceps produce tension and lengthens★ it slows the lowering of the forearm and controls extension of the elbow



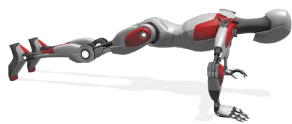
ISOMETRIC



- ★ isometric contraction occurs in the biceps when the muscle holds the weight still
- ★ the biceps develop tension and stays the same length
- ★ it stops flexion and extension of the elbow

Activity 12

Look at the images below. Write the correct muscle contraction next to the image:



Contraction in this position:



.....

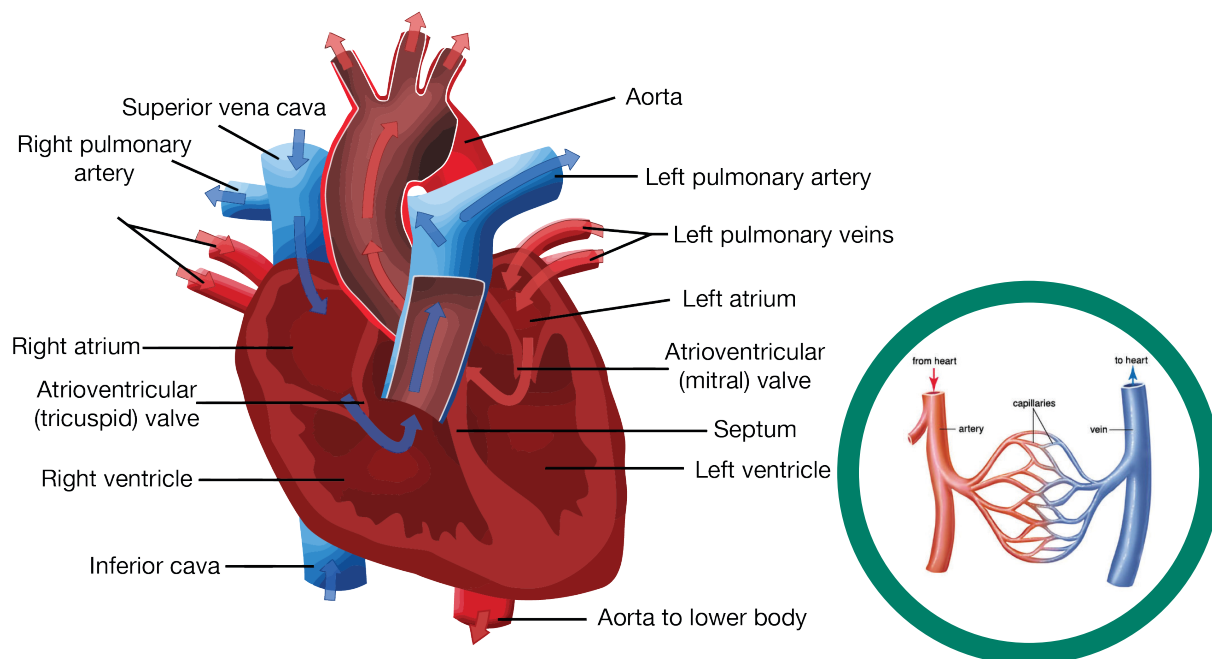


Contraction of quadriceps when kicking the ball:



.....

Understanding the Cardiovascular system



The cardiovascular system is made up of the heart and blood vessels; veins, arteries and capillaries. It works as a transport system to move nutrients and oxygen around the body. As well as transportation, the cardiovascular system has other functions:

temperature control - changes in the size of blood vessels to keep heat in the body

protection - white blood cells protect from infections

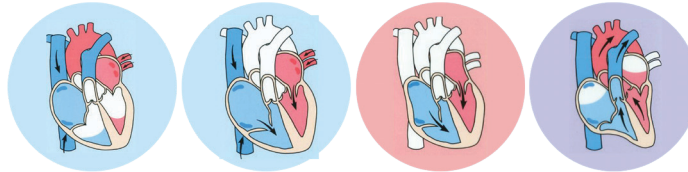
maintaining balance - controls temperature, hormone, ion and sugar levels

The heart is the main organ of the cardiovascular system and it works by beating continuously to pump blood around the body. It is made up of four chambers (atria and ventricles) with connecting major blood vessels (see above diagram).



The cardiac cycle - explaining the heart beat

One heart beat is made up of two phases:



Activity 13

Complete the table below to show the stages of the cardiac cycle.

<p>Diastole (the relaxation phase lasting about 0.5 seconds)</p> <p>Missing Words: ventricular, atria, blood</p>	<p>Both <input type="text"/> fill with blood. AV valves closed.</p> <p style="text-align: center;">↓</p> <p>Arterial blood pressure rises above <input type="text"/> pressure.</p> <p style="text-align: center;">↓</p> <p>Rise in <input type="text"/> forces AV valves open and blood passively passes into ventricles. Semilunar valves closed.</p>		
	<p>Systole (the contraction phase lasting about 0.3 seconds)</p> <p>Missing words: ventricles, atria, diastole, pulmonary</p>	<p>ATRIAL SYSTOLE</p>	<p>Both <input type="text"/> contract forcing blood into the ventricles.</p> <p style="text-align: center;">↓</p> <p>Semilunar valves remain closed.</p>
	<p>VENTRICULAR SYSTOLE</p>	<p>Both <input type="text"/> contract, semi-lunar valves open and AV valves close.</p> <p style="text-align: center;">↓</p> <p>Blood is forced into Aorta (to body) and <input type="text"/> artery (to lungs)</p> <p style="text-align: center;">↓</p> <p><input type="text"/> of the next cardiac cycle begins. Semilunar valves closed.</p>	

Stroke volume is the amount of blood pumped out per heart beat and this increases whenever we exercise.

When muscles need more oxygenated blood, they push more blood into the veins. This means there is more blood coming back to the heart. This extra blood makes the heart stretch so it holds more. This will force more blood out to the working body each beat.

Cardiac output is controlled by heart rate (**HR**) and stroke volume (**SV**).

$$\mathbf{HR \times SV = CO}$$

In sport, you want to increase cardiac output. This can be done by increasing heart rate and stroke volume.

★ **HEART RATE (HR)** - The number of times the heart beats in a minute.

Activity 14

Can you count your resting heart rate?



(Tip: Find your pulse on your wrist/neck and count the beats for 60 seconds.)

You can also work out your maximum heart rate using this equation $220 - \text{AGE}$

Write your answer in this box:



Useful information - blood pressure

- ★ **What is it?** The force of blood against the blood vessel walls.
- ★ **How do we measure it?** Using a special piece of equipment called a **sphygmomanometer**. It is always taken from the upper arm and should be done when at rest.
- ★ **What affects blood pressure?** Age, exercise, stress, smoking, diet and weight.
- ★ **What if it's high?** High blood pressure is called **hypertension**. This makes the heart work harder which can cause angina or a heart attack.

Normal blood pressure is 120/80.

The first number refers to the pressure of blood when the heart contracts. This is known as **SYSTOLIC PRESSURE**.

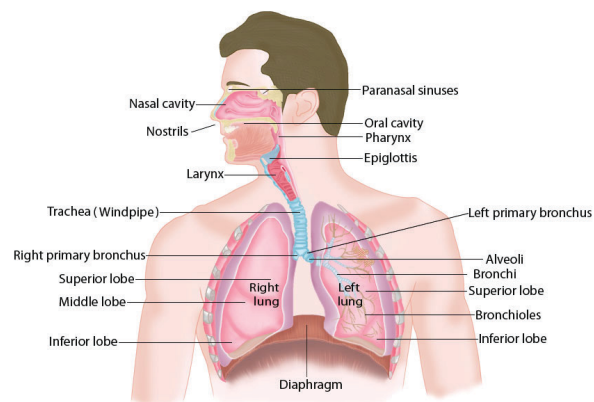
The second number is the pressure of blood when the heart relaxes, and is known as **DIASTOLIC PRESSURE**.

See Elite Extension Task E 5

Understanding the functions of the respiratory system

The main function of the respiratory system is transporting air into the lungs and carbon dioxide to the atmosphere. You have learned about the respiratory system in earlier grades.

The respiratory system is made of the upper and lower respiratory tracts. Each part of the respiratory system has its own specific function.



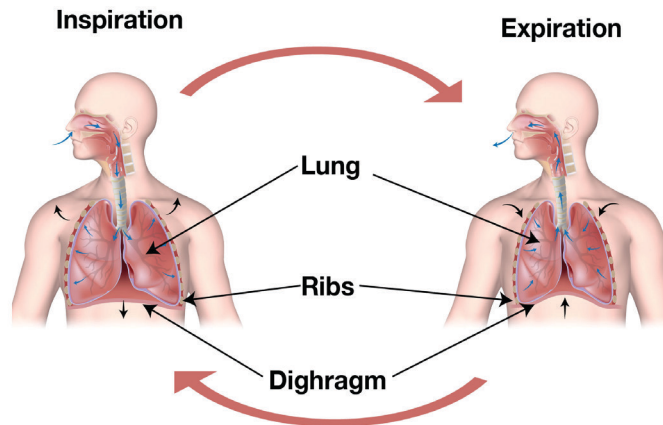
Activity 15

In the table below EXPLAIN the function of each part of the respiratory system.

Nose	
Mouth	
Pharynx	
Larynx	
Trachea	
Bronchi	
Lungs	
Alveoli	
Diaphragm	



Mechanics and control of breathing



You have learned about how we breathe in earlier grades. Breathing is involuntary which means we do not control our breathing rates.

Breathing is controlled by the respiratory centre in the brain. Nervous impulses sent through the inspiratory nerves cause the intercostal muscles (the muscles in the ribs) and diaphragm to contract. When these impulses stop, exhalation happens. Breathing rate is also controlled by chemoreceptors which detect changes in acidity levels in the blood. When carbon dioxide levels increase and oxygen levels drop, the receptors send messages and breathing rate increases.

Activity 16

What do you think happens to your breathing rate during exercise?



Activity 17

Lung volumes

Match the volumes to the correct definitions.

TERM	DEFINITION
inspiratory capacity	The largest amount of air we can breathe out after breathing in as deeply as we can.
tidal volume	Vital capacity + Residual volume
vital capacity	The extra volume of space available for breathing out more deeply.
residual volume	The amount of air needed in the lungs to function correctly.
total lung capacity	The amount of air breathed in and out in one breath.
functional residual capacity	The volume of space left for breathing in, after tidal volume has been met.
inspiratory reserve volume	The amount of air left in the lungs after breathing out as hard as we can.
expiratory reserve volume	The volume of air needed to fill the lungs completely by breathing in.



Exploring Lung Capacity

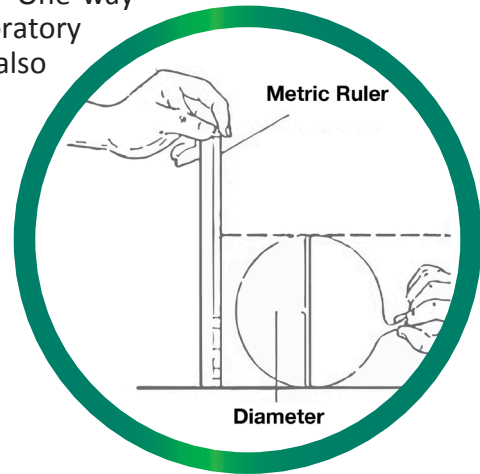
Lung capacity can be measured in different ways. One way to measure lung capacity is using a piece of laboratory equipment called a spirometer. Lung capacity can also be measured with a balloon.

Activity 18

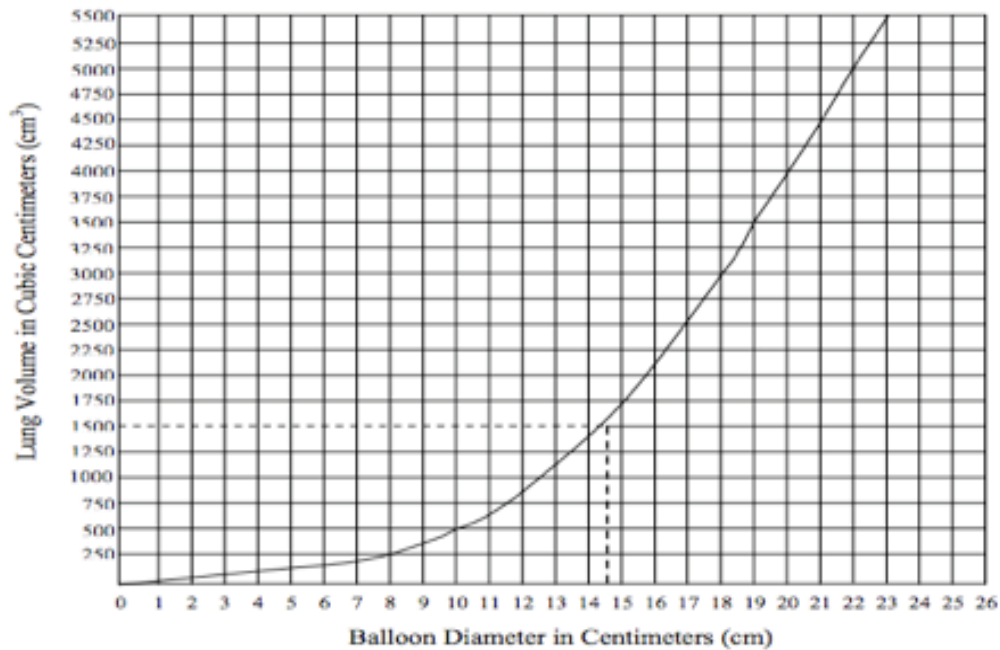
Complete the tasks below:

Vital Capacity

1. Stretch the balloon
2. Take as deep a breath as possible.
3. Then **exhale all the air you can into the balloon** and pinch the balloon closed to stop air from escaping.
4. Measure and write down the size of the balloon in centimetres in the data table below. You will need a partner to help you.



Relationship Between Balloon Diameter (cm) and Lung Volume (cm³)



Find the volume by using the graph to the right.

Trial	Diameter of Balloon (cm)	Volume of Balloon (see graph)
1		
2		
3		

Repeat for Expiratory Reserve Volume but this time inhale normally before **EXHALING FORCEFULLY INTO THE BALLOON.**

Trial	Diameter of Balloon (cm)	Volume of Balloon (see graph)
1		
2		
3		

Repeat the process for Tidal Volume. Inhale normally then exhale a normal breath into the balloon. **DO NOT FORCEFULLY EXHALE.**

Trial	Diameter of Balloon (cm)	Volume of Balloon (see graph)
1		
2		
3		

See Elite Extension Task E6



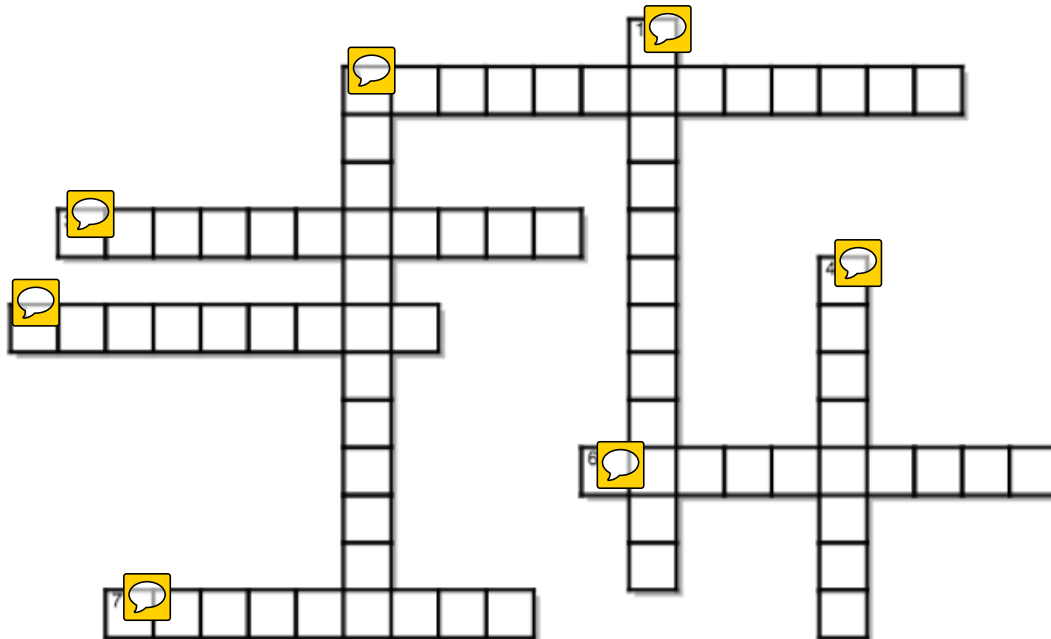
Unit 5 Physiology of Fitness

Understanding the immediate effects of exercise on the body systems:

The body reacts in many ways to adapt to the demands of exercise. These adaptations affect all the bodies systems in different ways.

Activity 19

Complete the crossword below



ACROSS





- 2 Increases in this helps the joints to move freely when exercising
- 3 This increases, allowing more air to reach the lungs per breath
- 5 This happens to your heart rate when you begin exercising
- 6 Small tears in the muscle as a result of exercising
- 7 Breathing increases in _____ when we start exercising

DOWN

- 1 This happens to the blood vessels when exercising
- 2 The amount of blood pumped out of the heart per beat increases
- 4 This happens to help cool the body down

Activity 20

Now look at the effects that you have identified above. Write them in the table under the correct body system.

Cardiovascular	Respiratory	Muscular	Skeletal
			

Why do we experience these changes?

When we exercise, the body must adapt to meet the demands of exercising. For example, our heart rate will increase because the heart needs to work harder to pump blood to the working muscles.

In the table below explain why the different body systems react to exercise in different ways.

Activity 21

Choose four short term effects of exercise and explain why they happen:



1. _____
2. _____
3. _____
4. _____















Understanding the long-term effects of exercise on the body systems

When we participate in regular exercise, such as a personal training plan or playing sport, our bodies will undergo a series of changes. These adaptations can make sport's performances easier, and is sometimes known as someone 'getting fitter'.

Activity 22

If you exercise for a long time, what happens to the body systems in the long term? Complete the table to show the effects of exercise in the long term:

EFFECT	Description
CARDIOVASCULAR SYSTEM	
Cardiac hypertrophy	
Increased capillaries in the muscles	
Reduced blood pressure	
Reduced resting heart rate	
Reduced recovery time	

EFFECT	Description
RESPIRATORY SYSTEM	
Increased minute ventilation	
Increased strength of the respiratory muscles	
Increased diffusion rate	
Increased vital capacity	
MUSCULAR SYSTEM	
Increased size (hypertrophy) and strength	
Increased tendon strength	
Increased myoglobin and mitochondria	
Increased glycogen and fat storage	
THE SKELETAL SYSTEM	
Increased calcium stores	
Increased thickness of hyaline cartilage	
Increased production of synovial fluid	

See Elite Extension Task E7



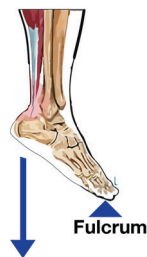
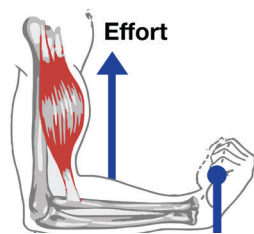
Elite Extension Tasks

Lever systems

When you play sport, your body must use its lever systems to create movement. In our physical education lessons, we will have taken part in lots of different sports and exercises. Below are the muscle and lever diagrams of three common exercises; tricep push down, bicep curl and calf raise.

Activity **E1**

What type of lever is being used in the diagrams below?



Planes and Axes of movement

Activity E2

Identify and describe the dominant plane of movement in the following sporting activities. The first one is done for you.



Plane: Sagittal


Description: When we kick a football, we flex and then extend at the knee and hip joint



Plane: 

Description:



Plane: 

Description:

Investigating joint movements

Rotation is the circular movement around a fixed point. For example, your shoulder when you are using a screwdriver.

Circumduction of a joint makes a body part move in a cone shaped movement. The joint performing circumduction stays still while the furthest end of the body part moves in a circle.

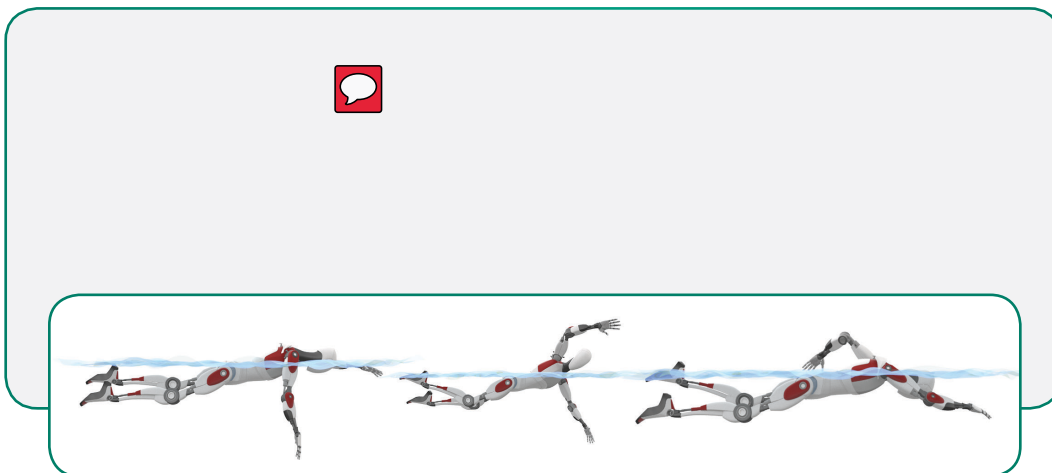


Activity E3

Muscle anatomy

Demonstrate rotation of the hip joints and circumduction of the shoulder joint. Work with a partner.

Provide sporting examples of the movements you have identified. For example, circumduction of the shoulder occurs during the full arm action in front crawl.



Activity E4

Stand in the anatomical position and identify the position of the: biceps in the arms and quadriceps in the legs.

For each muscle, identify the estimated positions of:


- the origin
- the insertion
- the partner muscle that produces the opposite movement

Write your answers in the box below:

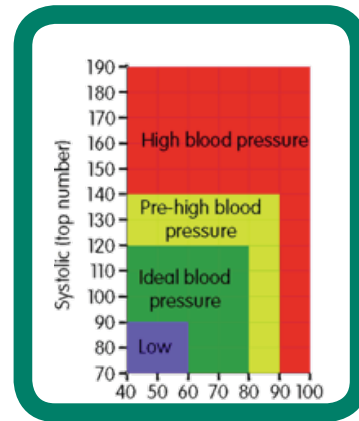
The circulatory system- blood pressure

Activity E5


Having high blood pressure can be a health risk. Can you explain the causes of high blood pressure?



A large, empty rounded rectangular box for writing an answer to the question about the causes of high blood pressure.



How might exercise help you reduce your blood pressure?



A large, empty rounded rectangular box for writing an answer to the question about how exercise might help reduce blood pressure.

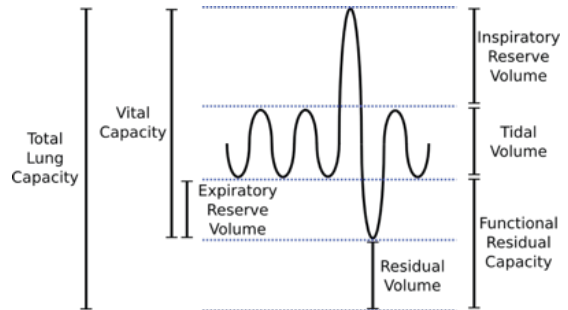


Exploring lung volumes

Activity E6

Look at you results in the lung volume and capacity activity.

Explain why your tidal volume result may be different to your classmate:



🗨️

Now explain how exercise would affect the three lung volumes you measured:

Tidal volume:

🗨️

Expiratory reserve volume:

🗨️

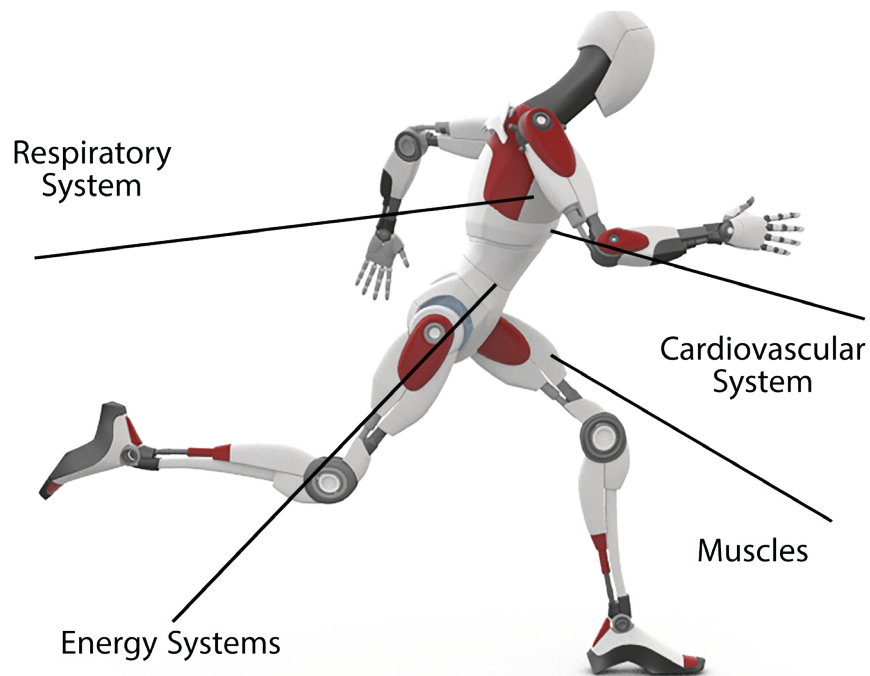
Vital capacity:

🗨️

Effects of exercise in the long and short term

Activity E7

Explain how the body systems work together to help you run a 100m sprint



A large, empty rectangular box with rounded corners and a light gray background, intended for writing an answer. A small red speech bubble icon is located in the top-left corner of the box.



Activity E8

Can you explain the impact an exercise programme will have on overall health and fitness?



A large, empty rectangular box with rounded corners and a thin green border, intended for a student's response. A small red speech bubble icon is located in the top-left corner of the box.

Teacher's feedback

Things to think about:

Did the student participate?

What was the student's attitude towards activities?

Did the student display safe and appropriate behaviour?

Additional comments:

Student's comments

Things to think about:

What did you enjoy?

What did you do well?

What do you need to improve?



Unit 6

Technique and Tactical Analysis in Rugby



Unit 6

Technique and Tactical Analysis in Rugby

Student Learning Objectives

- 7.1 Demonstrates competency (tactical awareness) while defending when opposition has ball in their hands (defends against opposition player dribbling and manoeuvring a ball with hands) (G11.2.1.3)
- 7.2 Demonstrates competency (tactical awareness) while defending when opposition has ball in their hands (defends against opposition player travelling and manoeuvring a ball with their hands) (G11.2.1.4)
- 7.3 Demonstrates competency when attacking with a ball in hands or feet (G11.2.1.5)
- 7.4 Describes tactics and strategies to overcome opponents in team games (G11.2.1.10)
- 7.5 Applies a range of advanced strategies to overcome opponents in team games (G11.2.1.11)
- 7.6 Describes how participation in team sports may develop social skills, team work and collaboration (G11.5.1.6)

Unit 6 Introduction

This unit will enhance on your current knowledge and understanding of performing in rugby. You will analyse your techniques, skills and tactics needed to be successful in rugby. You will also use advanced techniques in rugby and how to use these effectively based on the tactics used in the sport. You will develop attacking and defending tactics and apply these in small game situations.

You will also spend time developing specific components of physical fitness that will help you to improve your performance. For excellence to be achieved, you need to show competent fitness levels to be able to demonstrate various techniques. Your fitness levels may also change the positions and way you perform in the sport. We will have a chance to analyse and evaluate our own performance, comparing techniques and tactics with those of elite performers.

Glossary of Key terms

Word	Form	Definition
agility	noun	ability to move quickly and easily.
analyse	verb	to study a subject closely and carefully to make a decision on it.
apply	verb	work hard to give your full attention to do a task.
awareness	noun	having knowledge about the area you are in.
competent	adjective	having the necessary ability or skill to do something successfully.
demonstrate	verb	give a practical showing of your ability.
excellence	noun	the quality of being outstanding.
formation	noun	the positioning of players on the pitch.
lineout	noun	restarting play from the sidelines when the ball has gone into touch.
offside	noun	when a player receives the ball ahead of the player passing or kicking the ball.
position	noun	a specific place within a formation.
power	noun	move or travel with great speed or force.
try	noun	a player grounds the ball in the opposition goal area to score four points.



Advanced techniques in rugby

Rugby players need to practise even the basic techniques on a regular basis to reach excellence. Performing in technique drills and sessions will make techniques trained, permanent. Understanding advanced techniques can be aided by coaching other players.

Activity 1

You are the coach of a youth rugby team. You need to deliver four coaching sessions on techniques.

Identify four key techniques you need to coach.

1.

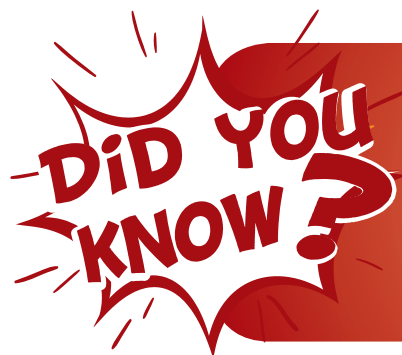




2.

3.

4.




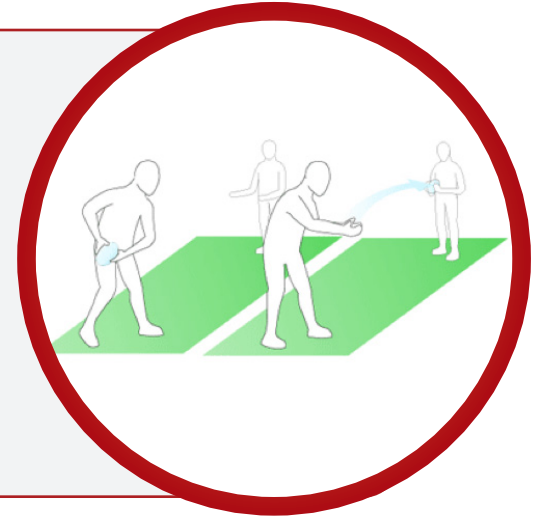
The UAE hosts an annual international rugby event. The Dubai Rugby Sevens tournament has been running for 48 years. Over 290 teams compete in sports matches over the event.



Activity 2

Write three teaching points for a pass.



1. 
- 2.
- 3.



Activity 3

Describe two different ways to pass the ball to change the attacking position of the team.



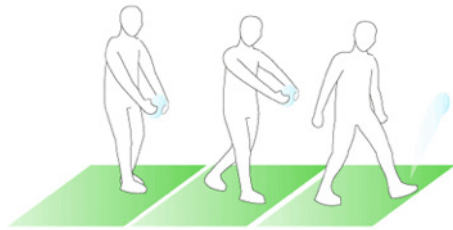
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See Elite Extension E1

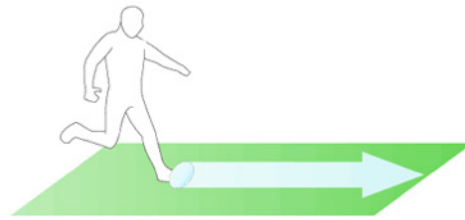


Activity 4

Label the different types of kicking in rugby.



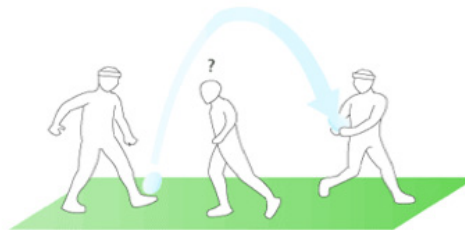
1.



2.



3.



4.

Describe why you would use these kicking technique in a match?



1.

2.

3.

4.

Rugby tackles need to be conducted in a safe and controlled way. It is important that both the tackler and the player travelling with the ball are safe throughout the tackle.

Activity 5

Number the teaching points from start (1) to finish (4).

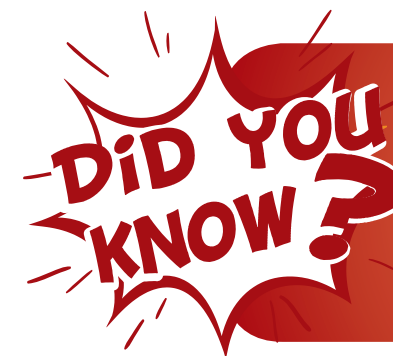
Get in to a crouching position and prepare the shoulder for impact. Use your legs to push into the player for the tackle.

The player's thigh should be your target. Make sure your shoulders are above the player's hips when contact is made.



Keep momentum of the tackle until you land. Get up quickly to be ready for the next play.

Wrap your arms tightly around the legs of your opponent. Hold on until you land. Make sure your head is tucked behind your opponent's body.



Rugby players need to be confident when tackling. Technique and timing are essential to tackle any opponent, big or small.




See Elite Extension E2



Activity 6

Explain what is meant by evading defenders.

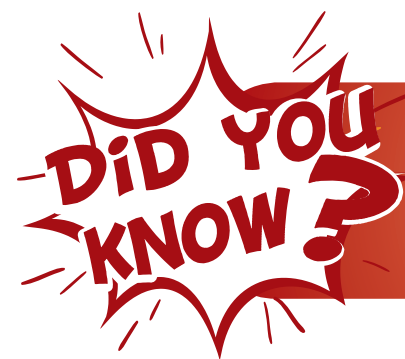


Activity 7

Identify three components of fitness that are essential for evading defenders.



1.
2.
3.




Hareb Al Azri won his first rugby sevens UAE cap in 2013. Hareb Al Azri's body type is suited for a back. What components of fitness do you think he has trained more?

See Elite Extension E3

Activity 8

How can teammates help you evade defenders when travelling with the ball?





Advanced Tactic and Strategies in Rugby

Rugby team tactics and strategies are key to winning matches. Decision making is key to ensuring the tactics and strategies of the team work effectively. You have six attempts to travel with the ball before possession is passed over to the opposing team. It is important that you and your team make the right decisions on tactics when attacking and defending.

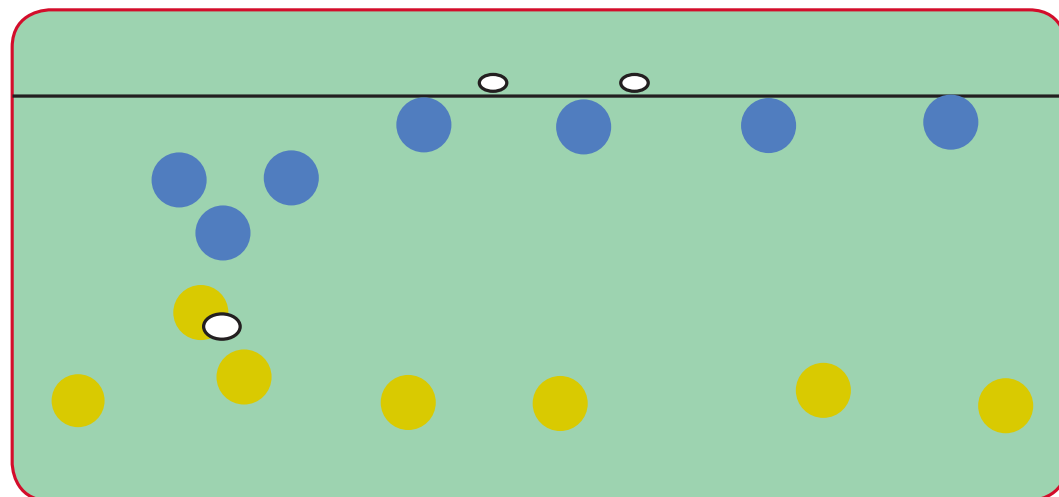


Rugby teams are made up of forwards and backs. Forwards are usually bigger and rely on their strength to defend. Backs are usually fast and more agile than forwards. This helps them to evade defenders more effectively.

Activity 9

Read the following two scenarios on attacking.

Scenario 1: Your team (in yellow) is losing by two points. There are only a few minutes left of the match. You have possession of the ball, what tactics will you decide to use?

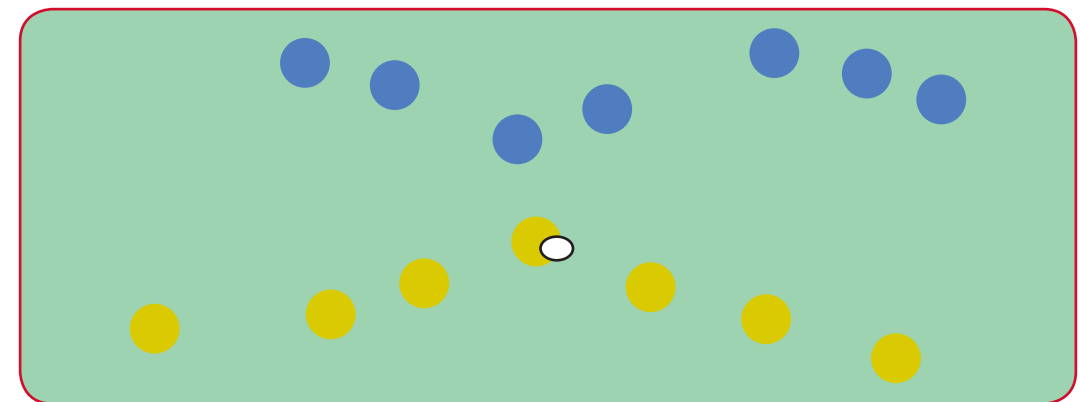


Explain why you chose the tactics. You can use the diagram to help with your answer.

Response area for Scenario 1, containing a yellow speech bubble icon.

See Elite Extension E4

Scenario 2: The opposition forwards (in blue) are weak on one side. How do you take advantage of their weakness?



Explain your tactical decision. You can use the diagram to help.

Response area for Scenario 2, containing a yellow speech bubble icon.

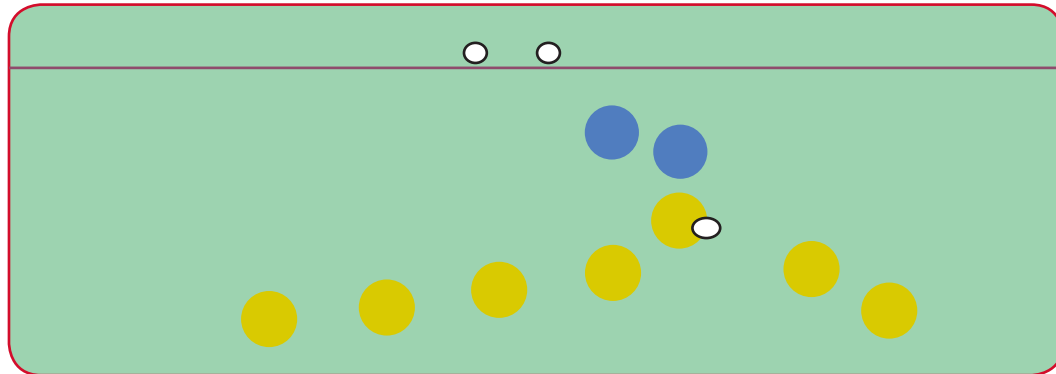


Activity 10

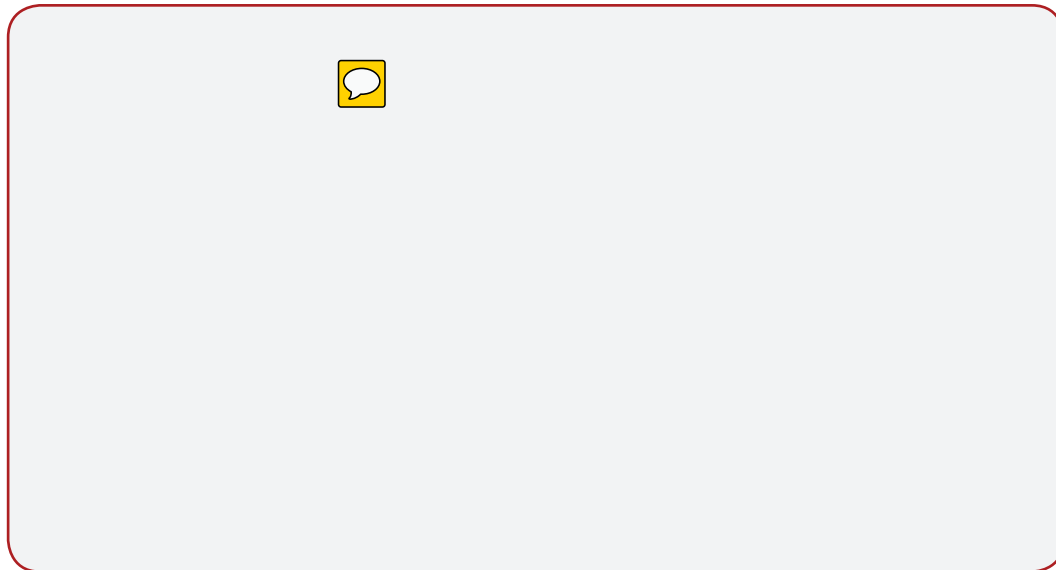
Read the following two scenarios on defending.

Scenario 1: Your team (in blue) are winning, but the attacking team need a try to win. How will you position for forwards in a defensive line to stop them scoring?

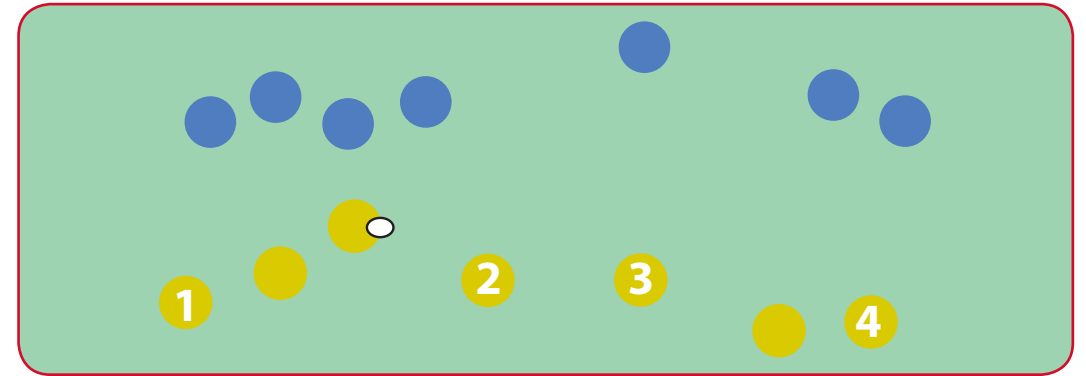
Draw five more defenders to create your defensive line.



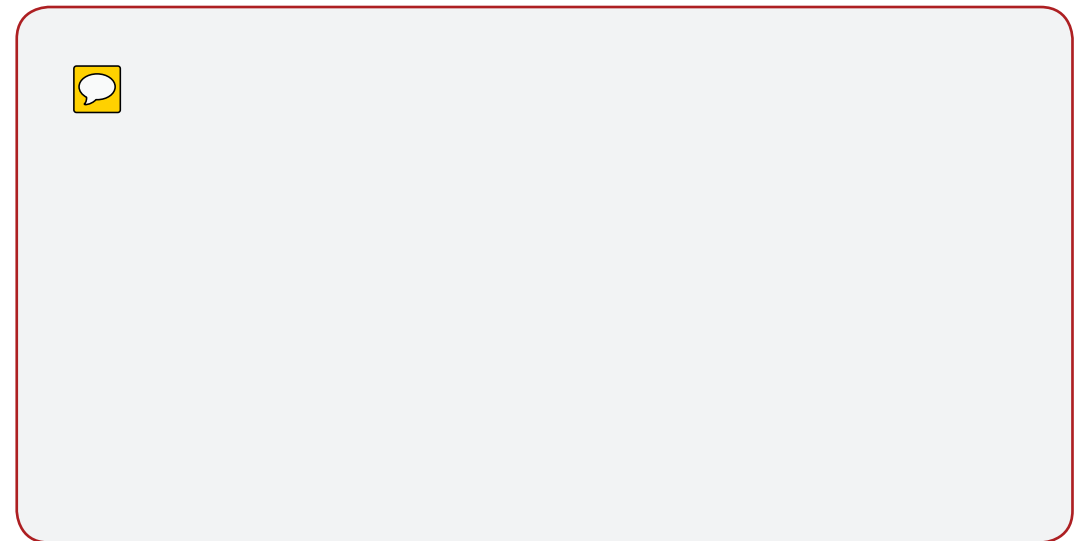
Explain why you placed your defenders in these positions.



Scenario 2: The attacking team (in yellow) have fast backs 1-4. You need specific players to defend against them. Draw arrows from four defenders (in blue) to show who would tackle the backs if they received the ball.



Explain why you chose the four players.



See Elite Extension E5



Performance Analysis

To improve as a rugby player, you need to analyse your performance. You will then be able to identify what your strengths and areas for improvement are when playing a match. Then, we can train to improve and maintain our performance levels.

Activity 11

Identify two strengths and two areas for improvement for your own rugby performance.

Strength	
Area for Improvement	

Using your answers above, explain why you chose your strength and area for improvement.

Strength:

.....

.....

Strength:

.....

.....

Area for Improvement:

.....

.....

Area for Improvement:

.....

.....

Fitness Testing Review

It is important to manage your fitness levels and celebrate progress. Rugby players will train hard throughout the season and regularly assess their level of fitness. Strengths and areas for improvement can be identified and any training required can be re-focused. Just like elite athletes, you need to be aware of your ongoing fitness levels. You can then see if you have improved your fitness since the start of the year.

Activity 12

Record your results for fitness tests and fill in any blank parts of the table.

Component of Fitness	Fitness Test	Term 1 Score	Term 2 Score



Activity 13

Compare your results. Explain two strengths and two areas for improvement.

Strength 1:

.....
.....

Strength 2:

.....
.....

Area for Improvement 1:

.....
.....

Area for Improvement 2:

.....
.....



Elite Extension Tasks

Activity E1

Draw a diagram of how to coach a simple passing drill in rugby.

A large, empty rectangular box with a thin red border, intended for drawing a diagram of a passing drill.

Activity E2

Explain why it is important to follow the teaching points for tackling.



.....

.....

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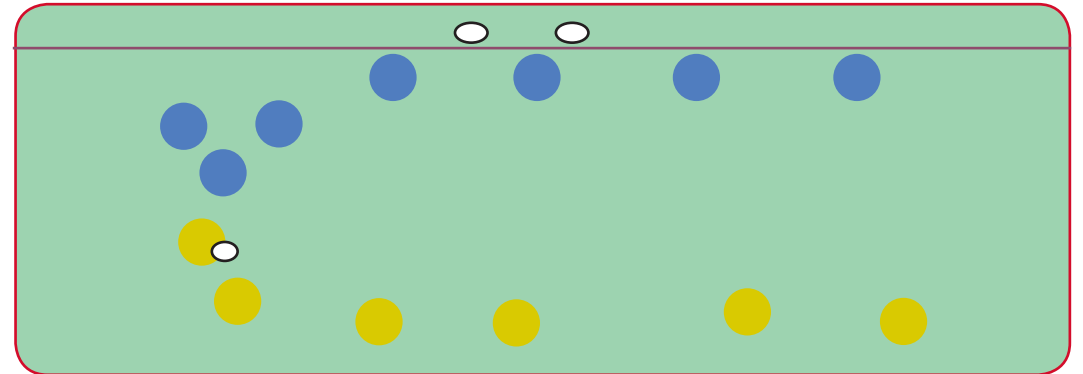
Activity E3

Explain why each component of fitness you have selected in activity 7 is needed to evade defenders in rugby.

Component of Fitness	Why it is needed

Activity E4

What alternative tactics could you use for scenario 1 from activity 9. Explain your answer below.



.....

.....

.....

.....

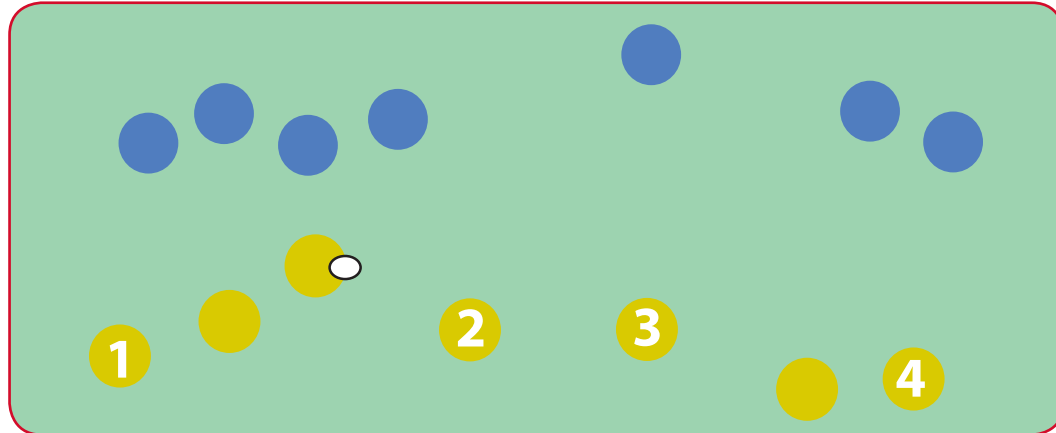
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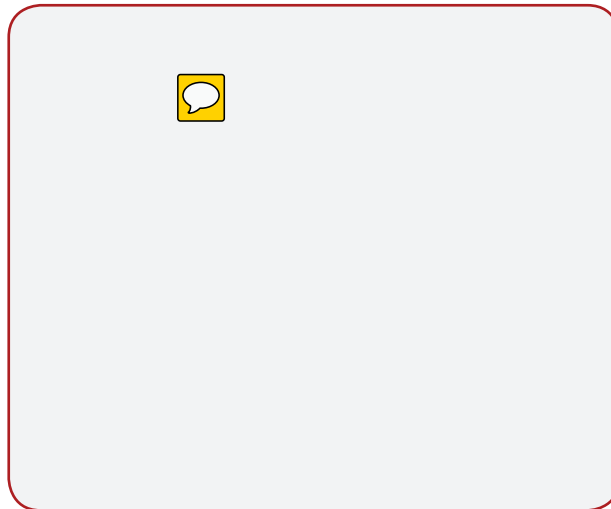


Activity E5

Circle the weak areas of your team's defensive line (Your team is in blue).



How does this formation put your team at a disadvantage?



Student's comments

Things to think about: What did you enjoy?

What did you perform well?

What do you need to improve?

Teacher's feedback

Things to think about: Did the student participate?

What was the student's attitude towards activities?

Did the student display safe and appropriate behaviour?

Additional comments:



Unit

7

Technique and Tactical Analysis in Volleyball



Unit

7

Technique and Tactical Analysis in Volleyball

Student Learning Objectives

- 6.1 Describes the stages of learning and developing motor skills. (G12.1.1.8)
- 6.2 Applies tactics and strategies to overcome opponents (attacking) in the team and individual games. (G12.1.1.9)
- 6.3 Applies tactics and strategies to prevent opponents (defending) in team and individual games. (G12.1.1.10)
- 6.4 Evaluates attacking and defending tactics and strategies to overcome opponents in the team and individual games (football, badminton, tennis, basketball, cricket, netball, rounders, rugby). (G12.1.1.11)

Unit 6 Introduction

All sports need some form of technical ability, tactics allow these techniques to be performed successfully. If you wish to be a high-level sports person you must have a good level of tactical and technical ability. Some skills can be general and can be used across all sports these include things like running and jumping. As seen in previous grades, some skills may be specific to only a few sports like a serve in volleyball or a golf swing. In sports and physical activity, tactics are like an action plan which is used to achieve an objective.

In this unit, you will continue to develop your volleyball skills through improving technique and tactical awareness. We will have a chance to analyse and evaluate our own performance, comparing techniques and tactics with those of elite performers. You will all discuss the stages of learning, and how we develop motor skills through volleyball and other similar sports.

Glossary of key terms

Word	Form	Definition
awareness	noun	being alert to the surroundings
approach	verb	moving towards a specific place
blocking	verb	raising hands high above the net to block an oppositions spike or volley
defensive	adjective	a technique used to protect or defend a goal
dig	noun	hitting the ball from waist height with hands closed together
jump serve	noun	a powerful serve which involves the player jumping on impact.
formation	noun	the positioning of players on the court
offense	adjective	a technique used to attack a goal
perimeter defence	noun	a common defensive tactic used in volleyball
rotate	verb	moving in a circle around a set point
float serve	noun	a serve which glides in a high loop over the net.
spike	noun	hitting the ball forcefully downwards over the net.
volley	noun	hitting the ball over the net with the finger tips





Motor skill development

A motor skill is any action or movement that involves using muscles. There are two types of motor skills, gross and fine.






Activity 1

Can you give some examples of gross and fine motor skills?

Gross	Fine
	

Activity 2

Volleyball involves many different gross motor skills. Write down a brief description of each of the basic volleyball skills

Set	
Dig	
Serve	
Hit/Spike	
Block	

Stages of learning and skill development

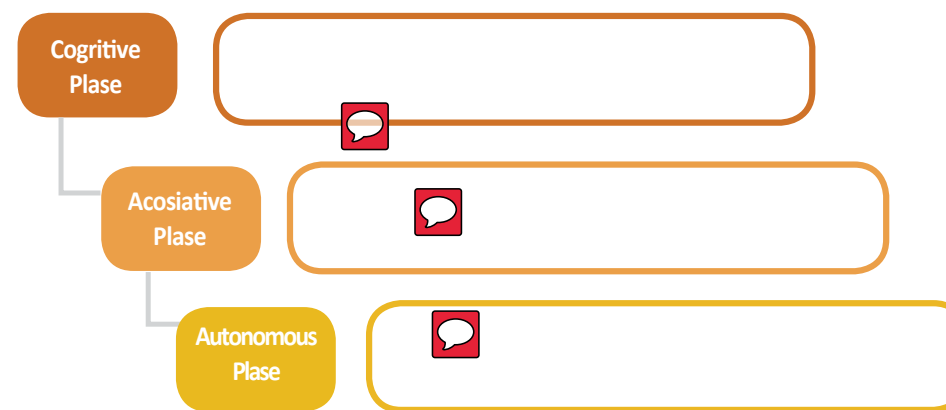
When it comes to learning new skills, we must go through certain stages to develop confidence in skill execution. We identified this in grade 11.

Activity 3

Using the diagram below, can you describe the stages of learning. Use a specific volleyball skill as an example:


Skill

Think about volleyball, write down which stage of learning you think you are in for the following basic skills.



Activity 4

Think about volleyball, write down which stage of learning you think you are in for the following basic skills.

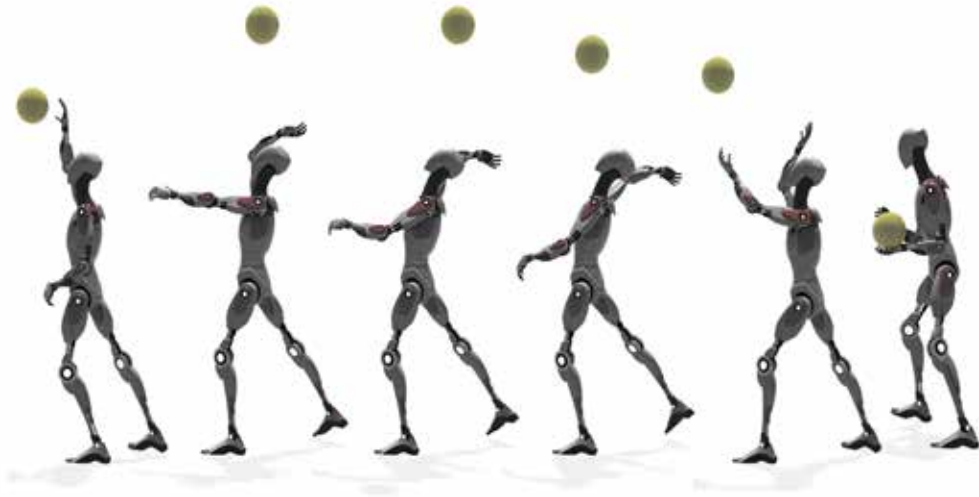
Skill	Stage of Learning
Dig	
Set	
Serve (underarm)	
Serve (overarm)	
See Elite Extension Task E1	



Developing and advancing techniques

Different types of serve


Float serve:



A float serve moves in unpredictable ways. It does not spin and is difficult to pass.

Activity 5

In the box below write down some key points of performing a float serve:




Jump serve:



A jump serve is more powerful. The server throws the ball high and jumps to strike the ball in the air.

Activity 6

In the box below write down some key points of performing a jump serve:





Should my serve be short or deep?

It is important to choose how far to serve the ball. If you serve short, the ball will fall for the frontline players. If you serve deep, it will travel to the back of the court. You should study your opponent's movement and position to help you decide how to serve.

Activity 7

Discuss with a partner when serving a serving short be useful:



See Elite Extension Task E2

Attacking

A spike is not the only way to attack in volleyball. Sometimes it is useful to 'tip' or 'dunk' the ball over a blocker.

In earlier grades, we have looked at hitting using a spike-style technique.



Activity 8

What are the four steps you need to go through when hitting in volleyball:



1.
2.
3.
4.

Activity 9

What do you understand by the term tipping in volleyball?



.....

.....

.....



Activity 10

Practise attacking movements in your team. Try different shots to try and score points against your opponen



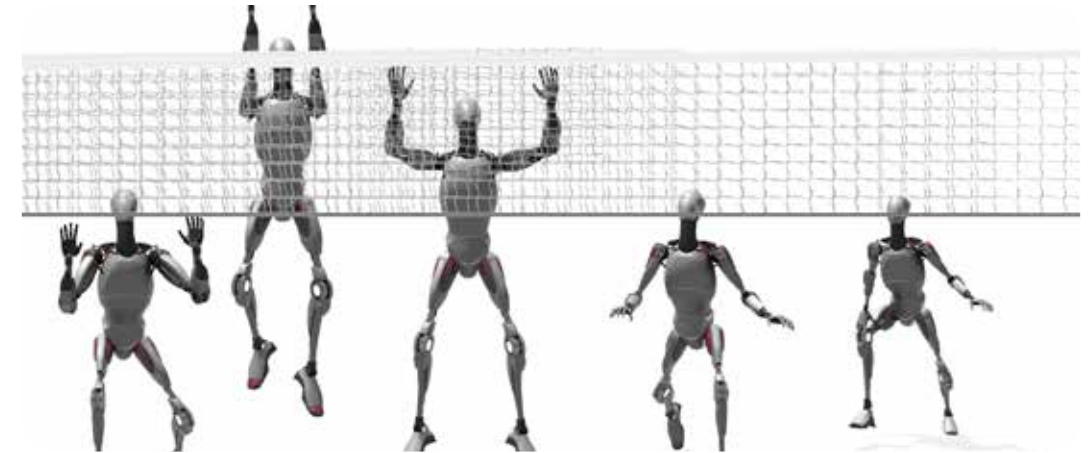
Activity 11

After playing volleyball games in class, read through the following scenario and identify the type of attacking shot you would use:

Scenario: The ball is played in a high loop over the net. It is passed to the setter. You notice your opponent's frontline has already jumped to try and block your hit, what kind of attacking shot do you play and why? (Use the image to help you)



Blocking



Blocking is an important technique in volleyball. It is useful for stopping the ball passing over the net.

Activity 12

Use the box to write down key coaching points of a successful block:



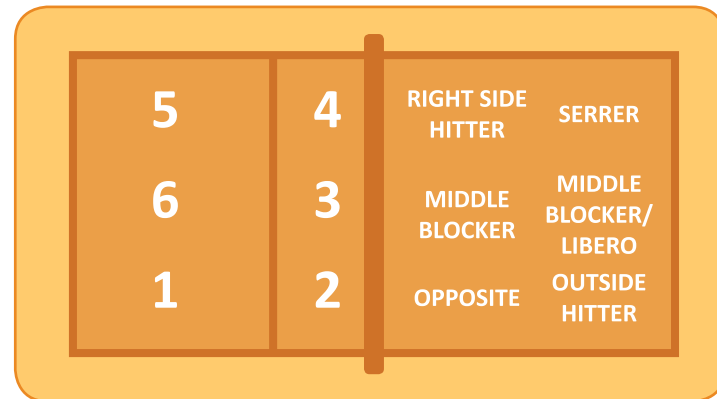
Activity 13

After practising blocking in your groups, can you give any other key points you need to remember to successfully block a ball?



Positional play in volleyball

In grade 11 we explored a basic 4-2 formation in volleyball. This means a team will have 4 hitters and 2 setters. Now we will build on this knowledge and learn about the six different positions in volleyball.



Activity 14

Use the image above to label the descriptions in the table with the correct position name:

	The main blocker and attacker. They stand in the middle of the net. Some teams have two, one at the front and one in the backline.
	This player is on the left side of the court and is the main attacking position.
	This player is positioned on the right of the court. This is the backup attacker.
	This player stands in the front row on the right side of the court. This is the backup hitter.
	They receive the ball usually from a pass and must set the ball for a third touch from one of the hitters
	The player is the main defender. They receive most of the serves or digs and are free to sub in for any other player.

See Elite Extension Task E4

Rotation



After a serve is won, players will rotate and move one place clockwise.

This does not mean you must always change position.

Skilled players can play the same position from a different location. To do so they must move back after the ball has been served over the net by an opponent.

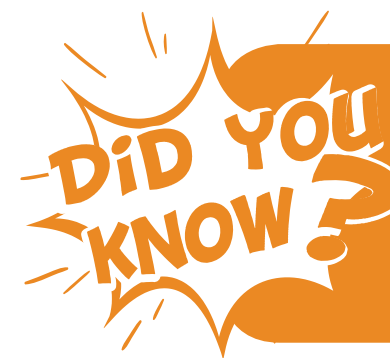
Back line players can attack the ball but cannot attack in front of the 10-foot line on the court.

Trying out the Positions

Activity 15

Demonstrate in the lesson you will have the opportunity to try out each position and decide which one you prefer.

See Elite Extension Task E4



You can improve your skills and join a team at Dubai Volleyball Academy!



Evaluating attacking and defending strategies in volleyball

Over the past unit, you have had the opportunity to further develop your volleyball skills. You have also had the chance to learn about and try different attacking and defending tactics.

Activity 16

After playing in the class volleyball tournament, complete the table to evaluate your own attacking and defending skills.

Skill	Rating /10	Strengths	Areas for improvement
Hitting			
Blocking			
Movement			
Setting			
Digging			
Elite Extension Task E5			


Elite extension tasks

Stages of learning

Activity E1

Can you explain the process of moving from the cognitive phase to the autonomous stage of learning a skill?

Think about volleyball performance:



Serving

Activity E2

Explain two things that you should consider before you serve the ball:



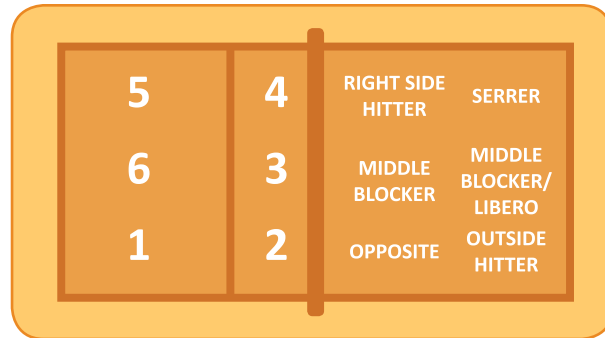




Positional play

Activity E3

Looking at the image and descriptions of the volleyball positions, write down at least one skill you think is needed to be successful in a specific position:



Middle Blocker	
Libero	
Outside Hitter	
Opposite	
Right Hitter	
Setter	

Rotation

Activity E4

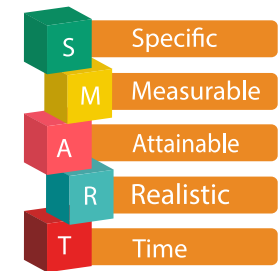
Explain why it is important for a volleyball player to get back into their original position after a rotation:

Evaluating performance

Activity E5

Create an action plan that will help you improve your volleyball performance (Remember to make your targets SMART!)

Smart Goals



Target	Action needed	Barrier to success	Evidence- How will you show you have improved?



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