ENGLISH ACROSS THE CURRICULUM (EAC) SCRIPTED LESSONS FURTHER EDUCATION AND TRAINING (FET)





Department: Basic Education REPUBLIC OF SOUTH AFRICA



Introduction

It is well-known fact that English is the language of learning and teaching (LoLT) for the majority of learners in South African schools. Equally well-known is the finding by numerous studies that English is a barrier to learning. Learners, the studies and reports state, are not able to read and comprehend instructions, and neither are they able to express their knowledge in response to questions. In order to mediate this challenge, the DBE developed *The Strategy for Teaching English Across the Curriculum* (EAC). This was quickly followed by *The Manual for Teaching English Across the Curriculum: Book 2*, which comprised content subject input on how the strategy should be mediated in the classroom. Copies of the strategy and the manual were distributed to schools in provinces, with the intention to enhance implementation of the strategy and, consequently, to strengthen the LoLT.

However, reports on visits undertaken in provinces, as well as audits conducted on the implementation of the strategy, reveal that provinces need assistance to see to the implementation of the strategy and its intended goal. The department presents herewith, an EAC Toolkit for Teachers, comprising scripted lessons in the form of a DVD and a booklet, in which subject experts demonstrate how the EAC can and should be infused in various content subjects. The toolkit seeks to stimulate thought processes and creativity about how to implement the strategy. The scripted lessons, developed by subject specialists from provincial and the national departments, dispel the criticism that content subject teachers will spend more time teaching English rather than subject content. Instead, the lessons strengthen the hand of the content subject teacher who, by addressing the language used in the subject, enhances the process of decoding the science in the subject.

The foregoing assertion is confirmed by Young, Van der Vlugt and Qanya (2005), who state that 'concepts cannot be understood or used in isolation from the language in which they occur' (pviii). This belief in strengthening the LoLT is also supported by a study conducted by Thürmann (2017), who cites one of the Council of Europe's project, "Languages in Education, Languages for Education", which has, as one of its major aims, devising and supporting strategies and actions that seek to ensure that 'language awareness becomes a matter of course in content teaching across the curriculum' (p1).

Experts quoted in Thürmann's (2017: p1) study also came to the conclusion that 'mastering the language of schooling is a key to successful learning across the curriculum and the most reliable track to school success and elevated socio-economic status after graduating from school.' This assertion affirms the department's approach of implementing the EAC strategy. You are urged to engage with the scripted lessons and employ your expertise in enhancing learner attainment through strengthening the LoLT.

By turning the LoLT into a carrier and not a barrier to teaching and learning, we look forward to improved quality of learner attainment.

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Agricultural Sciences

Subject	Agricultural Sciences - Gr 10						
Торіс:	Agricultural Ecology						
Lesson Content:	Farming Systems						
Pre-Activity	Vocabulary	Meaning of words and context of use in the subject					
Vocabulary	Sustainable	Able to maintain its viability by using techniques that allow for continual use.					
	Renewable	Able to be recreate / re-use the resource / natural resource or source that is not depleted by use; examples include water, wind and solar power.					
	Resources	A source or supply that can be readily accessed when needed for production.					
	Recyclable	To process so that it is suitable for re-use. / To adapt for new use without changing the form or nature.					
	Primary agriculture	Involves farming or the extraction or of raw material from the Earth.					
	Secondary agriculture	The transformation of raw materials from the farm into useful goods / products.					
	Intensive farming	An agricultural production system that involves higher levels of input / resources per unit of agricultural land.					
	Extensive farming	A production system in which a large area of land is farmed with few inputs or resources.					
	Commercial farming	The farming practice where the main purpose is to sell and make profit.					
	Subsistence farming	A self-sufficient farming practice, which involves the farmer growing and harvesting only enough food to feed his family, with little or no surplus for selling.					
	Pollution	Introducing non-biodegradable harmful substances or products into the environment.					
	Environmental	External factors surrounding and affecting a given organism at any given time, e.g. air, water, minerals, other organisms.					
	Sedentary farming	The farming practice where the farmer is settled in an area and fields are not rotated.					
	Nomadic farming	The farming practice where farmers are constantly on the move in search of greener pastures / better growing land.					
	Arable farming	Cultivating crops on viable land.					
	Pastoral farming	A form of agriculture aimed at raising livestock, rather than growing crops.					
	Inputs	Resource used to produce goods and services.					
	Processes	A systematic series of actions intended to produce a product.					
	Outputs	The amount produced in a given time. / Material produced. / Yield in a given time.					
	Food security	Ensuring that all people have access to the basic supply of food they need at all times.					
	Starvation	A severe deficiency in the caloric energy intake needed to maintain an organism's life [starve].					
	Malnutrition	An unhealthy condition that results from not eating enough food or not eating enough healthy food.					
Language used in	VOCABULARY FOR GRA	<u>DE 10:</u>					
the subject.	Vocabulary activity: Matchi	ng terminology with definition.					
Reference to specific words:	Printed pages given to learners / groups, who must find the words discussed during the period. Once the terms are identified, learners (individually) must match the words provided in the word search with the definitions provided in part 2.						

Introduction to the topic: Farming systems

At the end of the lesson, the learner should:

- Know the terminology used in farming systems.
- Differentiate between farming systems, input, output and processes.
- Understand how the factors determine the farming system.

Different farming systems are practised all over the world.

Farming Systems

Subsistence or commercial?

- Subsistence farming is when crops and animals are produced by a farmer to feed their family, rather than to take to market.
- Commercial farming is when crops and animals are produced to sell at market for a profit.



Sedentary or nomadic?

- Sedentary farming is when a farm is based in the same location all the time.
- Nomadic farming is when a farmer moves from one place to another.



Arable, pastoral or mixed?

- Arable farms grow crops.
 Crops are plants that are harvested from the ground to be eaten or sold.
- Pastoral farms rear animals either for animal by-products such as milk, eggs or wool, or for meat.
- Mixed farms grow crops and rear animals.



These Farming systems are predicted by factors such as:

- Inputs / Resources these include physical (land, sun, rain), human (labour) and capital (money for livestock and feed, seeds, equipment, wages).
- <u>Processes</u> are the activities on the farm that turn inputs into outputs; for example, feeding and caring for the animals or planting and tending to the crops.
- **Outputs** are products farmers sell at market or use to feed and clothe their families. Barley, hops, wheat, hay and straw are products from crops; meat, wool, leather and cheese are products from animals.

Farms can be categorised according to what is grown or reared, the size of the operation, or the agricultural techniques used.

a) Physical factors

Like other primary industries, farming is highly dependent on physical factors such as:

- Weather and climate: Suitable temperature, rainfall and climate for a selected crop / animal production system.
- Slope or relief of the land: For crop production, these physical factors allow for the neccessary cultivation methods.
- Soil fertility: The soil is suitable for crop production, and in the case of animal production, it is suitable for the growth of pastures.
- Water and drainage: Dry land / irrigation. Water-holding capacity / waterlogged soil.



The educator must link climate and rainfall with the occurrence of type and amount of vegetation, e.g.:

Write a short paragraph on the influence of climate on the occurrence and amount of vegetation.

These factors are **naturally** occurring, so farmers must work with the physical factors of their farm's location. Farmers can manipulate these **inputs** / **resources through various processes**, **in order to achieve increased output** – for example by growing crops in a poly-tunnel (plastic tunnel greenhouse) to protect them from frost, and improving plant growth or providing additional water in the form of irrigation. However, such human interventions require extra input in the form of money or work.

b) Human / Social Factors

As with physical factors, human / social factors vary according to the type of farm and the country where the farm is located. Factors include:

- Government policy e.g. EU subsidies, loans and US tax reductions.
- Labour some farms require more labour than others, e.g. a market garden will employ more labourers than a hill sheep farm.
- c) Economic / Financial factors money is needed for wages, seed, buildings, animal feed, fertilizers, pesticides and machinery.

Post teaching	The following questions are presented to the class randomly or at the end of the class. Each student answers the questions presented to them on a piece of paper or index card:
	What did we do in class?
	• Why did we do it?
	What did I learn today?
	How it is applied?
	What questions do I have about it?
	Educator hands out Activity 1 for completion by the learners at home.

Activity: Vocabulary word search - Part 1

GRADE 10

Agricultural Ecology: Farming Systems

Use the information below to find words related to farming systems and agro ecology. Words could be written in any direction: up, down, diagonally, etc. Once you find the word, draw a circle around, as in the example.

С	F	0	Ι	Ν	Т	Е	Ν	S	Т	۷	Е	В	w	R	А	R	S	Κ	۷
Ν	0	Т	T	U	L	L	0	Ρ	0	J	D	0	J	A	U	Ν	Т	м	Е
D	S	Ν	0	Ι	Т	Т	R	T	U	Ν	L	А	м	G	Е	L	U	Ζ	L
L	J	Т	I	S	Е	С	R	U	0	S	Е	R	Т	R	S	Ρ	Ρ	0	В
R	S	Х	U	R	S	м	Y	R	S	Y	R	Е	В	Т	Е	А	Т	V	А
W	U	Е	А	Ρ	В	х	U	Н	Ζ	T	Ν	D	Ρ	С	Ρ	S	U	G	L
Т	S	Y	R	F	Ν	Е	Q	А	м	۷	J	Е	х	U	Ζ	T	0	0	С
Y	Т	w	А	0	Т	Т	Н	L	Т	J	Ν	М	Ζ	L	۷	0	D	Е	Y
W	А	L	В	0	С	Y	۷	R	S	Е	D	Е	Ν	T	А	R	Y	м	С
R	Т	В	L	D	Т	Т	0	L	В	Х	L	R	F	U	S	А	Е	Y	Е
L	Ν	J	Е	-	С	Ν	С	T	D	А	М	0	Ν	R	А	L	w	F	R
Ζ	А	0	J	S	м	Ρ	R	T	м	А	R	Y	х	E	Q	U	w	Е	Ν
Ζ	В	В	L	Е	Q	м	А	Ζ	U	T	G	J	м	Ĥ	T	۷	м	В	А
С	L	А	Ν	С	Е	S	Н	Н	L	А	Т	С	R	Е	М	М	0	С	С
R	Е	Т	W	U	D	х	S	Е	С	0	Ν	D	А	R	Y	Y	V	0	R
Ζ	А	С	D	R	S	Т	А	R	V	А	Т	Ι	0	Ν	Х	Q	Ν	Ν	W
L	Κ	В	А	I	Е	V	Т	S	Ν	Е	Т	Х	Е	0	Κ	Ρ	В	м	А
Т	G	F	А	T	В	J	U	T	S	U	В	S	Т	S	T	Е	Ν	С	Е
S	Y	D	С	Y	Ρ	R	0	С	Е	S	S	Е	S	Q	С	W	Q	R	м
S	U	Т	Ν	L	Н	R	Е	Ζ	R	Е	Ν	Е	w	А	В	L	Е	Т	F

Created with TheTeachersCorner.net Word Search Maker

Activity 1- Part 2: Understanding of Agricultural farming systems terminology

After you've done the word search, link the words found to each of the definitions / meanings below. Also indicate your understanding of the word by marking one of the smiley faces on the sheet.

No	Vocabulary	CipatOl conv114203	00		Meaning of word and use in the subject context
		I know it	I sort of know it	I don't know it at all.	
					Able to maintain its own viability by using techniques that allow continual use.
					Able to be recreate / re-use the resource / natural resource or source that is not depleted by use, such as water, wind, or solar power.
					A source or supply that can be readily accessed when needed for production.
					To process something so that it is suitable for re-use. / To adapt something for new use without changing the form or nature.
					Involves the extraction or farming of raw material from the Earth.
					The transformation of raw materials from the farm into useful goods / products.
					The agricultural production system that involves higher levels of input / resources per unit of agricultural land.
					The production system where a large area of land is farmed with few inputs or resources.
					The farming practice where the main purpose is to sell and make profit.
					A self-sufficient farming practice that involves the farmer growing and harvesting only enough food to feed his family, with little or no surplus goods produced to sell for profit.
					Introducing non-biodegradable harmful substances or products into the environment.
					External factors surrounding and affecting a given organism at any given time, e.g. air, water, minerals, other organisms.
					The farming practice where the farmer is settled in the area and fields are not rotated.
					The farming practice where farmers are constantly on the move in search of greener pastures / better growing resources.
					It deals mainly with cultivating crops on viable land.

No	Vocabulary	CipetOf com 1144003	00		Meaning of word and use in the subject context
		I know it	I sort of know it	I don't know it at all.	
					A form of agriculture aimed at raising livestock, rather than growing crops.
					Resources used to produce goods and services.
					A systematic series of actions directed to produce a product.
					The amount produced in a given time / material produced / yield in a given time
					Ensuring that all people have access to the basic supply of food they need at all times.
					Substance or object that can be decomposed by bacteria or other living organisms.
					A severe deficiency in the caloric energy intake needed to maintain an organism's life.



Farming Systems - Grade 10

Assessment Activity

1. Complete the table by identifying the inputs, processes and outputs for the required farming operations depicted. Example:

EXAMPLES

In a sheep farm, the inputs will include the sun and water required by the grass, the purchase of breeding stock and the farmer's labour.

include herding and caring for the sheep and

Finally, the outputs will include wool and meat.



Illustration	Inputs	Processes	Outputs
1			
3			
6			
7			
9			
11			
15			
18			
20			

Study the illustrations carefully and identify the farming system depicted by writing the correct word in each column.

Illustration no.	Sedentary or nomadic	Subsistence or commercial	Arable, pastoral or mixed	Extensive or intensive
1				
3				
6				
7				
9				
11				
15				
18				
20				















Farming Systems - Grade 10

Assessment Activity: MEMO

Complete the table by identifying the inputs, processes and outputs required for each farming operation depicted.

EXAMPLES

In a sheep farm, the inputs will include the sun and water required by the grass, the purchase of breeding stock and the

farmer's labour. The processes will include herding and caring for the sheep and lambs. Finally, the outputs will include wool and meat.



Illustration	Inputs	Processes	Outputs
1	Inputs, machinery, fuel, fertilizer seed	Cultivation, planting management	Crop and example
	(Any 2)√√	(Any 2)√√	$\checkmark\checkmark$
3	Housing, feed, veterinary products,	Management, feeding, slaughtering,	Meat, manure
	livestock	packaging	$\checkmark\checkmark$
	(Any 2)√√	(Any 2)√ ✓	
6	Seed, labour	Separating seeds	Wheat, rice, straw (feed for
	(Any 2)√√	(Any 2)√√	animals)
			$\checkmark\checkmark$
7	Livestock, grass,	Management, feeding, slaughtering,	Meat, hide
	(Any 2)√√	packaging	$\checkmark\checkmark$
		(Any 2)√√	
9	Labour, seed / seedling, water	Cultivation, planting, fertilising	Vegetable crop and example
	(Any 2)√√	(Any 2)√√	$\checkmark\checkmark$
11	Manual labour, animal power, seeds,	Cultivation, fertilizing, management,	Field crop and example
	water, fertiliser	harvesting	$\checkmark\checkmark$
	(Any 2)√√	(Any 2)√√	
15	Livestock, labour	Management, protection, herding(Any 2)	Meat, fuel (dung), hide
	(Any 2)√√		$\checkmark\checkmark$
18	Livestock, grass,	Management, feeding, slaughtering,	Meat, hide
	(Any 2)√√	packaging	$\checkmark\checkmark$
		(Any 2)√√	
20	Manual labour, seeds, water, fertiliser	Cultivation, fertilizing, management,	Field crop and example
	(Any 2)√√	harvesting	$\checkmark \checkmark$
		(Any 2)√√	
			(54)

Study the illustrations carefully and identify the farming system depicted by writing the correct word in each column.

Illustration no.	Sedentary or nomadic	Subsistence or commercial	Arable, pastoral or mixed	Extensive or intensive
1	SedentaryP	CommercialP	ArableP	IntensiveP
3	SedentaryP	CommercialP	PastoralP	IntensiveP
6	SedentaryP	SubsistenceP	ArableP	ExtensiveP
7	SedentaryP	CommercialP	PastoralP	ExtensiveP
9	SedentaryP	SubsistenceP	ArableP	IntensiveP
11	SedentaryP	SubsistenceP	ArableP	ExtensiveP
15	NomadicP	SubsistenceP	PastoralP	ExtensiveP
18	NomadicP	SubsistenceP	PastoralP	ExtensiveP
20	SedentaryP	CommercialP	ArableP	IntensiveP
				(36)

Subject:	Agricultural Sciences Gr 11						
Topic:	Reproduction in plants						
Lesson Content:	Vegetative reproduction						
Pre-Activities	Vocabulary	Meaning of word and use in the context of the subject					
Vocabulary:	Asexual reproduction or vegetative reproduction	No fertilization takes place and propagation happens by using parent plants or plant material to develop new material.					
	Fertilization	• The action or process of fertilizing an egg or a female animal or plant, which involves the fusion of male and female gametes to form a zygote.					
		Take note of the alternative meaning of the word.					
		The action or process of applying fertilizer to soil or land.					
	Grafting	A process of joining the living parts of two plants to encourage permanent union and the eventual formation of one plant.					
	Budding	A process whereby a single bud with a small piece of bark is joined to the stock.					
	Propagation	A process of creating new plants using different forms of live material or methods.					
	Layering	A method of creating new plants by causing their shoots to take root while they are still attached to the parent plant.					
	Transplantation	Replanting the plant by moving it to a different location.					
	Scion	The part of the plant that is to be grown by grafting or budding.					
	Stock / rootstock	The new plant to which another plant (variety) is grafted or budded.					
	Stolon	A horizontal stem / branch, which runs from the base and across or just under the ground, and which produces new plants from buds.					
	Bulbs	Bulbs are small underground stems covered in fleshy leaves where new green leaves and a flower stalk develop in the growing season.					
	Tubers	Tubers are enlarged underground stems / stolons that thicken to develop into storage organs.					
	Stem cuttings	Cuttings to be taken from the previous year's growth - normally in winter – that are then rooted (rooting hormones increase success).					
	(Hardwood cuttings)	Underground stems with buds at the joins of scale-like leaves that are used for storage; these grow larger every year.					
	Rhizomes	Corms are short thick underground swollen stems.					
	Corm	Stems that grow along the ground and new plants and roots grow out at the nodes.					
	Runners	New plants develop on the stem of the parent plant, and the offsets may have their own roots or be connected at the stem above the soil.					
	Plantlets	Tuberous roots are roots that store food where buds form at the stem end, and which develop into new plants using the stored food.					
	Tuberous roots	Plants / animals that are genetically identical to the parent plant / animal.					
	Clones						
Language used in the subject	Use Activity 1 - Matching term	ns and definitions - to test learners' understanding					
Pre-teaching	The teacher must collect actu the assessment being done.	al examples of items listed in the vocabulary table above to show to learners prior to					

At the end of the lesson, learners should to:

- know the terminology involved
- be able to identify various vegetative reproduction practices and uses.

Introduction:

Reproduction in plants (plant propagation)

Reproduction in plants can be either sexual or asexual (vegetative).

- Sexual reproduction involves fertilization of an ovum by a pollen grain to form a zygote;
- In asexual reproduction, no fertilization takes place and propagation happens by using pieces of the parent plant. Asexual reproduction is also called vegetative reproduction.

There are various methods in which vegetative reproduction can take place.

During teaching:

The educator must discuss the following:

Virtually all types of shoots and roots are capable of vegetative propagation, including stems, basal shoots, tubers, rhizomes, stolons, corms, bulbs, and buds. In a few species, leaves are involved in vegetative reproduction.

- The **rhizome** is a modified underground stem serving as an organ of vegetative reproduction, e.g. iris, couch grass and nettles.
- Prostrate aerial stems, called **runners** or **stolons**, are important vegetative reproduction organs in some species, such as the strawberries, numerous grasses, and some ferns.
- Adventitious buds form on roots near the ground surface, on damaged stems (e.g. on the stumps of cut trees), or on old roots. These develop into above-ground stems and leaves.
- Suckering is a form of budding and involves the reproduction or regeneration of a plant by shoots that arise from an existing root system. Species that characteristically produce suckers include roses.
- Another type of vegetative reproduction process is the production of **bulbs**. Plants like onion, hyacinth and tulips reproduce by forming bulbs.
- **Tuberous roots:** a thick and fleshy root-like tuber without buds; examples are the dahlia and sweet potato.
- **Tubers:** A much thickened underground part of a stem or rhizome, e.g. in the potato, that serves as a food reserve and which bears the buds from which new plants arise.
- Gladioli and crocuses (crocus) reproduce by forming a bulb-like structure called a corm.
- Some orchids reproduce by growth from the stem or cane of the parent plant.
- Another method of using stems for propagation is **cuttings**, which can be either **hardwood**, **semi- hardwood or softwood cuttings**.

Post teaching	1.	Have students write or talk about:			
		• 3 things they learned			
		2 things they still want to learn			
		• 1 question they have.			
	These	values are interchangeable and can be used in different combinations, or with different questions altogether.			
	2.	Trivia Game			
	Learne	ers create the questions (and answers) that will be used in a review game.			
	Provid	de learners with assessment Activity 2 - Vegetative reproduction			

Understanding terminology used in Vegetative reproduction

Activity 1

Choose a description from COLUMN B that matches a term in COLUMN A.

Write only the letter (A-L) next to the question number. Each description in Column B may be used only ONCE.

Column A		Column B								
1.	Propagation	a.	A process whereby a single bud with a small piece of bark is joined to the stock							
2.	Fertilization	b.	Cuttings to be taken from the previous year's growth - normally in winter - and then rooted (rooting hormones increase success).							
3.	Asexual reproduction	c.	Corms are short thick underground swollen stems.							
4.	Grafting	d.	A horizontal stem / branch running from the base and across or just under the ground, which produces new plants from buds.							
5.	Fertilization	e.	A process of creating new plants using different forms of live material or methods.							
6.	Budding	f.	Tubers are enlarged underground stems / stolons that thicken to develop into storage organs.							
7.	Scion	g.	No fertilization takes place and propagation happens by using parent plants or plant material to develop new material.							
8.	Rootstock	h.	Underground stems with buds at the joints of scale-like leaves, which grow larger every year and serve as a storage mechanism.							
9.	Bulbs	i.	A process of joining the living parts of two plants to encourage permanent union and eventually form one plant.							
10.	Tubers	j.	The part of the plant that is to be grown by grafting or budding.							
11.	Stem cuttings	k.	The action or process of applying fertilizer to soil or land.							
12.	Rhizomes	I.	Stems that grow along the ground, and new plants and roots grow out at the nodes.							
13.	Runners	m.	Action or process of fertilizing an egg or a female animal or plant, involving the fusion of male and female gametes							
14.	Corm	n.	A method of creating new plants by causing their shoots to take root while they are still attached to the parent plant.							
15.	Tuberous roots	0.	The plant to which another plant (variety) is grafted or budded.							
16.	Plantlets	p.	New plants develop on the stem of the parent plant; the offsets may have their own roots or be connected at the stem above the soil.							
17.	Clones	q.	Tuberous roots are roots that store food where buds form at the stem end, and which develop into new plants using the stored food.							
18.	Layering	r.	Plants that are genetically identical to the parent plant / animal.							
19.	Stolon	s.	Bulbs are small underground stems covered in fleshy leaves, and where new green leaves and flower stalks develop in the growing season.							

Vegetative reproduction

Assessment activity 2:

Grade 11

Instructions:

Study the different modes of vegetative reproduction and complete the following table. Instead of using the diagrams, learners can bring examples to class of plants that reproduce vegetatively. Examples include potato, onion.



Figure	Vegetative mode	Description	Examples
A			
	(1)	(2)	(2)
В			
С			
D			
E			
F			
G			
Η			[40]

Vegetative reproduction

Assessment activity: Memorandum

Grade 11

Figure	Vegetative mode	Description	Examples
A	Runners√	Stems that grow along the ground.	Strawberries /
		New plants and roots grow out at the nodes. $\checkmark \checkmark$	hen & chickens
	(1)	(2)	✓ √ (2)
В	Plantlets / Offsets√	New plants develop on the stem of the parent plant. The	Prickly-pears
		offsets may have their own roots or be connected at the stem above the soil \checkmark	Pineapple
			$\checkmark\checkmark$
С	Corm√	Corms are short thick underground stems. There are	Gladiola
		buds at the bottom of the scale- like leaves that develop into new plants. $\sqrt{}$	Freesia
			Crocus
			(Any two)√ √
D	Tuberous roots√	Tuberous roots are roots that store food. Buds form at	sweet potatoes
		the stem end; these develop into new plants using the stored food \checkmark	cassava
			dahlia
			(Any two)√ √
E	Rhizomes√	Underground stems with buds at the joins of scale-like	Canna
		Dizemes arew larger every year and plants form at the	Bamboo
		buds to form clumps of plants. $\sqrt{}$	Ginger
			Some grasses
			(Any two)√ √
F	Tubers√	Tubers are the swollen ends of underground stems.	Potatoes
		Buds on the tubers grow into new plants. $\checkmark\checkmark$	Yams
			$\checkmark\checkmark$
G	Bulbs√	Bulbs are small underground stems covered in fleshy	Onion
		leaves. New green leaves and a flower stalk develop from the bulb in the growing season.	Garlic
		Buds that develop into new bulbs $\checkmark \checkmark$	$\checkmark\checkmark$
Н	Stem cuttinas √	Cuttings to be taken from the previous year's growth -	Trees
	(Hardwood cuttings)	normally in winter - arethen rooted. (Rooting hormones	Shrubs
		Increase success.)✓ ✓	√√ [40]

Subject		Agricultural Sciences - Gr 12									
Topic:	Agricultural Genetics										
Lesson Content:	Variation and Selection										
Pre- Knowledge:	In this lesson, you will be exposed to the following terminology: (Tick for understanding)										
Vocabulary	Heritability:	The degree to which genetics determine a characteristic.									
	Trait:	Characteristics that are inherited.									
	Characteristics:	The distinguishing features or qualities. / Indicating the character. / Constituting. / Distinctive to.									
	Gene:	The unit of hereditary material.									
	Artificial-selection:	Using technology in choosing the parents for the breeding process.									
	Natural-selection:	Survival of the fittest.									
	Artificial Insemination	Introduction of sperm into the female using a pistolette.									
	Artificial vagina:	An instrument used for the collection of fresh semen.									
	Spermilisor:	A microscope used to test sperm quality.									

Reference to specific words:	Vocabulary	Meaning of words and context of use in the subject								
New Terminology	Selection:	Choosing from numerous items or objects. In our case, choosing animals to breed with								
	Breeding:	The process by which young animals are produced by their parents. / Mating or improvement of animal or plant breeds using selection or other methods.								
		NB: Meaning of breed								
		- mate and then produce offspring (verb) or								
		- stock of animals or plants within a species, which have a distinctive appearance and which have been developed by selection. (noun)								
	Desirable:	Worthy of having / Pleasing / Excellent / Recommended								
	Qualitative:	Concerned with quality / qualities								
	Quantitative:	Can be measured / May be estimated by ${\bf numbers} \ {\bf or} \ {\bf quantity}$ / Measuring of quantity / Relating to a metric system								
	Profitability:	Yielding profit / Useful economically / Beneficial								
	Pure-bred:	Not mixed - Animals whose ancestors derive over many generations from a recognized breed.								
	Culling:	Remove or put aside those that are inferior. / To choose and get rid of the inferior ones. / To separate bad ones from good ones and get rid of bad ones.								
	Disruptive:	Relating to a new product or idea that radically changes an industry by creating a new market or disrupting an existing one.								
	Directional:	Adapted to a particular direction. / A/dapted to achieve a particular outcome.								
	Stabilising:	[stable] To maintain at a given level or quantitiy. / Unfluctuating.								
	Pedigree:	Derived from a line of descendants / Excellent record / Pure ancestry history / A type of selection that is based on the quality of the animal's ancestor.								
	Progeny:	As a child / Off-spring / Resulted from something else / Outcome / A type of selection that is based on the quality of the animal's offspring								
	Mass:	In the whole / Collection / In numbers / Type of selection that is based on the individual animal in a population performance on the field								
	Family:	The basic social unit consisting of parents and their children. / A type of selection that is based on the quality of the animal's relatives of its generation (full-siblings / half-siblings).								
	Ancestors:	A person from whom one is descended.								
	Heritability:	Capable of being inherited.								
	Estimated Breeding Value (EBV):	Simply, the value of an animal's additive genetic effect. / The value of genes that an animal may transfer to its offspring / Half of the Breeding Value (BV) of its parent or twice the value of the BV of its offspring.								
	Activity 1 – Voca	bulary understanding and knowledge (list of words).								
	Copy this and give	e it to learners to complete before or during the lesson.								
During teaching	At the end of the les	sson, the learners should:								
	Understand the	terminology used.								
	Be able to apply	y selection types based on variations available.								
	Understand var	iation and selection, as used in Agriculture.								
	Introduction to the t	opic: p3								
	See script: p3-p5									

	:eaching Activity 2 – Word recognition and understanding (crossword puzzle) Activity 3 - Complete during lesson (Selection types) Examples of alternative activities: • Classwork activity • Matching terminology Summary Assessment - Roll the die: The teacher; walks around with a die and stops at a table, then rolls the die. The student must briefly answer the question that corresponds to the number rolled. Dice No. Question to be answered: 1 I want to remember 2 Something I learned today									
Post-teaching	Activity 2 – Wo	rd recognition and understanding (crossword puzzle)								
	Activity 3 - Complete during lesson (Selection types)									
	Examples of all	ternative activities:								
	Classwork	activity								
Matching terminology										
Summary Assessment - Roll the die:										
	The teacher; walks around with a die and stops at a table, then rolls the die. The student must briefly answ question that corresponds to the number rolled.									
Dice No. Question to be answered:										
	1	I want to remember								
	1 I want to remember 2 Something I learned today									
	1 I want to remember 2 Something I learned today 3 One word to sum up what I learned									
	4	Something I already knew	with a die and stops at a table, then rolls the die. The student must briefly answer the to the number rolled. e answered: emember g I learned today to sum up what I learned g I already knew nfused about							
	5	I'm still confused about								
	 Matching terminology Summary Assessment - Roll the die: The teacher; walks around with a die and stops at a table, then rolls the die. The student must briefly answer the question that corresponds to the number rolled. Dice No. Question to be answered: 1 I want to remember 2 Something I learned today 3 One word to sum up what I learned 4 Something I already knew 5 I'm still confused about 6 An "aha" moment that I had today 									
1										

Lesson Script

Introduction to the topic: Variation and Selection.

Now that we have dealt with the basic principles of genetics, we need to see how genetics fits into the farming sector and how genetics is applied to enhance agricultural production, which will eventually influence the profitability of the enterprise. Variation in populations forms the basis of selection in breeding programmes. <u>Watch the video – Meet the Super Cow</u>

During teaching: The following must be discussed

What is variation?

As seen in the video, in order for a new breed to be developed, the farmer needs individual animals / plants he can select from. These individuals all come from the population of animals he has available and they have varying characteristics. We can thus say that variation refers to the differences in characteristics between individuals of the same species.

Variation is the raw material the breeder has available for herd and flock improvement, e.g. variation in size, rate of growth, efficiency of feed utilization, **milk production**, speed, milk fat %, etc.

Selection is done using variation in the hope of producing better offspring. (Discuss.)

As explained, variation occurs in tems of normal distribution, as shown in the Bell Curve below:



Performance Review 1 to 5 Ratings Bell Distribution Curve

Teacher to discuss the above graph:

- The majority of the population falls into the average band (Meets expectations).
- The smallest number of individuals in a population with a specific characteristic will be on the extreme ends of the curve (Unacceptable and Outstanding).

If we apply the above normal distribution curve regarding milk production in a population of dairy cows, the distribution will be as follows:



As seen in the graph, the majority of cows produce an average milk yield of between 3000-4500kg over a 250 day period. As shown, the number of cows producing the least amount of milk and the number of cows producing the highest amount of milk can be found at the extreme ends of the graph.

Why is this information important in selection and breeding?

To increase milk production in a **herd**, the farmer selects bulls from the dark blue band and breeds them with cows from the green and light blue band.

Applied principal: When improving the herd for better milk production (or any other **quantitative** characteristic), average and above average cows are being inseminated / mated by the best bulls (top 2%).

Selection for improving traits / characteristics can either be directional, stabilizing or disruptive

Directional selection leads to a shift in the average of the population – either right or left.



Directional selection : For one extreme against the other extreme

In the case of disruptive selection, selection is done in such a manner that two distinct populations are created.



Disruptive selection: For both extremes against moderate traits

E.g. Normal Brahman vs miniature Brahman populations.



In the case of stabilizing selection, selection is done against both extremes.



Stabilizing Selection: For moderate traits against both extremes

For example, calves with heavy (birth) weight in calves may result in dystocia, whereas to small (light) calves will have a limited chance of survival.

To achieve any of the above aims, the following selection methods can be used:

Family selection		
Pedigree selection	L	Learners must be able to
Progeny selection		describe these
Mass selection		

Mass selection	type of selection that is based on the individual animal in a population performance on the field
	The most basic way is to rank the animals according to their phenotype and select the best ones for breeding.
Progeny selection	type of selection that is based on the quality of the animal's offspring
Family selection	type of selection that is based on the quality of the animal's relatives of its generation (full-siblings / half-siblings)
Pedigree selection	type of selection that is based on the quality of the animal's ancestors

It is important to realize that selection dictates the breeding method that you will use in your herd.

Next Lesson - Breeding methods

Activity 1 - Vocabulary understanding.

Your understanding of the meaning of the words and use in the subject context.																					
Condition 114000																					
Vocabulary	Selection	Breeding	Desirable	Characteristics	Qualitative	Quantitative	Profitability	Purebred	Culling	Disruptive	Directional	Stabilising	Artificial selection	Natural selection	Pedigree	Progeny	Mass	Family	Ancestors	Heritability	
No.	<i>–</i> .	2.	З.	4.	5.	9	7.	œ.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	2

Activity 2:

Complete the following crossword puzzle on selection terminology. Use the clues provided on the right.



Ac	ross	Do	wn
1.	Selection based on the individual's performance in a mixed	2.	The peak of the Bell curve becomes narrower.
	population.	4.	It is used to deliver sperm into the female reproductive tract
3.	Choosing animals to breed with.		using a pistolet to reach the cervix.
7.	Instrument used for the collection of fresh semen.	5.	Two peaks are created in a Bell curve.
11.	Characteristics that are inherited.	6.	An instrument used to analise sperm activity and health /
13	Choosing breeding stock based on the family history /		quality.
	bloodline.	8.	Using technology in choosing the parents for the breeding
14	Choosing breeding material based on ancestors.		process.
15	The process by which young animals are produced by their parents.	9.	Choosing breeding stock based on the performance of the off- spring.
16	Survival of the fittest	10.	The degree to which genetics determines the characteristics
17	The Bell curve peak moves in one direction.	12.	Selection based on an individual's performance in a group.

Activity 3: Learners must have this available when you explain this content. Types of Selection:

Breeders raise cattle for various reasons. Example: Full / large size cattle for large farms and small sized cattle for small farms or to be used as pets. While listening in class, complete your understanding of the types of selection and how these are applied in the agricultural sector.

Small medium large	Small medium la	rge Small medium large
Directional selection	Stabilizing selection	Disruptive selection
Most common phenotype (previously)	Most common phenotype (previously)	Most common phenotype (previously)
Most common phenotype now	Most common phenotype now	Most common phenotype now
Because the peak of the graph	Because the peak of the graph	Because the peak of the graph
This will lead to	This will lead to	This will lead to
Agricultural Example	Agricultural Example	Agricultural Example

Marking guidelines for activities:

Activity 2: Crossword puzzle

Across

- 1. Selection based on the individual's performance in a mixed population Mass selection
- 3. Choosing animals to breed with Selection
- 7. The instrument used for the collection of fresh semen Artificial Vagina
- 11. Characteristics that are inherited Traits
- 13. Choosing breeding stock based on the family history / bloodline Family Selection
- 14. Choosing breeding material based on ancestry Pedigree selection
- 15. The process by which young animals are produced by their parents Artificial Breeding
- 16. Survival of the fittest Natural selection
- 17. The Bell curve peak moves in one direction **Directional selection**

Down

- 2. The Bell curve becomes narrower Stabilizing Selection
- 4. Delivers sperm into the female reproductive tract using a pistolet to reach the cervix Artificial insemination
- 5. Two peaks in a Bell are created **Disruptive selection**
- 6. Analysing sperm activity and health / quality Spermilisor
- 8. Using technology in choosing the parents for the breeding process Artificial selection
- 9. Choosing breeding stock based on the performance of the offspring Pedigree Selection
- 10. The degree to which genetics determines characteristics Heritability
- 12. The unit of hereditary material Gene

Selection against the mean Selection against the mean after selection population Population Population Large	Disruptive selection	Phenotypes: Small ✓, Medium ✓, Large ✓	Most common phenotype: Medium✓	After selection, the most common phenotype is both small and large. \checkmark	Because the peak of the graph will develop in two places, i.e. on the left and on the right.	This will lead to two distinct populations developing, i.e. small and large individuals. $\checkmark\checkmark$	Agricultural examples:	Miniature and normal sized breeds \checkmark , colour variation \checkmark .
Selection against both extremes Population after selection Original population Email	Stabilizing selection	Phenotypes: Small ⁄, Medium ⁄, Large ⁄.	Most common phenotype: Medium✓	After selection, the most common phenotype is still medium. \checkmark	Because the peak of the graph narrows and remains over the medium sized animals. \checkmark	This will lead to more animals having a medium weight \checkmark	Agricultural examples:	Mature mass≺, birth weight≺
Selection against one extreme Population after selection Original population Small Medium Large	Directional selection	Phenotypes: Small ⁄, Medium ⁄, Large ∕	Most common phenotype: Medium </th <th>After selection, the most common phenotype is larger. \checkmark</th> <th>Because the peak of the graph will move to the right. \checkmark</th> <th>This will lead to an increase in the average weight in the population. $\checkmark\checkmark$</th> <th>Agricultural examples:</th> <th>Higher milk production \checkmark , higher weaning weight \checkmark</th>	After selection, the most common phenotype is larger. \checkmark	Because the peak of the graph will move to the right. \checkmark	This will lead to an increase in the average weight in the population. $\checkmark\checkmark$	Agricultural examples:	Higher milk production \checkmark , higher weaning weight \checkmark

Activity 3: Memorandum

Examples of alternative assessment

Classwork / Homework activity

From the illustrations below, select the animals you will breed to show:

- 1. Stabilizing selection
- 2. Disruptive selection
- 3. Directional selection

You should also be able to show the F1 generation of your proposed breeding practice, and indicate for which traits / selection goals you would apply each selection type.





Memo

1 Stabilising

Animals to breed $D \checkmark X \qquad 3 \checkmark \rightarrow F1 D \text{ or } 3\checkmark$

Selection goals / traits – birth mass \checkmark , mature weight \checkmark

2. Disruptive

Animals to breed $A \checkmark X 2 \checkmark \rightarrow F1 A/2 \checkmark$ and $B \checkmark X 4 \checkmark \rightarrow F1 B/4 \checkmark$

Selection goals / traits – miniature and normal sized populations √ / colour differences √

3. Directional

Animals to breed $A \checkmark X \qquad 3 \checkmark \rightarrow F1 A/2 \checkmark$

Selection goals / traits – Increase in weaning weight, \checkmark milk production, \checkmark etc. (20)
Basic Genetics

Selection and Variation

Name:_____

1.	Mass selection	a.	Degree to which the genetics determines the characteristic.	
2.	Selection	b.	The Bell curve peak moves in one direction.	
3.	Artificial Vagina	c.	Survival of the fittest.	
4.	Traits	d.	Choosing breeding stock based on the performance of the offspring.	
5.	Family Selection	e.	The process by which young animals are produced by their parents.	
6.	Pedigree selection	f.	Using technology when choosing the parents for the breeding process.	
7.	Breeding	g.	It delivers sperm into the female reproductive tract using a pistolet to reach the cervix.	
8.	Natural selection	h.	Two peaks are created in a Bell curve.	
9.	Directional selection	i.	Choosing breeding material based on ancestry.	
10.	Stabilising selection	j.	Characteristics that are inherited.	
11.	Artificial insemination	k.	Analysing sperm activity and health / quality.	
12.	Disruptive selection	I.	Choosing animals to breed with.	
13.	Spermilisor	m.	The instrument used to collect fresh semen.	
14.	Artificial selection	n.	The Bell curve becomes narrower.	
15.	Heritability	0.	A unit of hereditary material.	
16.	Pedigree selection	p.	Choosing breeding stock based on the family history / bloodline.	
17.	Gene	q.	Selection based on the individual's performance in a mixed population.	

Matching: Write the letter of the correct matching item next to each problem, e.g. 17. r____

http://www.water.ca.gov/education/images/watersupplyuse-sm.jpg

- Each group is to use the source and own knowledge to discuss how water is used in their allocated category.
- One person from each group reports back to the class about the uses of water in each category.
- The educator consolidates the lesson by alluding to the different uses of water.

English

am is are	$\begin{array}{c} 125 & 678 \\ +133 & +223 \\ 333 & -101 \\ 554 & 564 \\ 8+3 = -366666 \\ +7 - +5+2 \\ 10+2 + 12 \\ 10+2$	
[Google Images]	[Google Images]	
Role of the language teacher	Role of the content subject teacher	
 Teaches general vocabulary. 	 Teaches subject related vocabulary. 	
 Teaches language structures and conventions, e.g. prefixes and suffixes. 	 Makes learners practise the structures. Helps learners to create their own definitions of concents 	
 Teaches how to create definitions of concepts. 	Makes learners practice process writing	
Teaches the formal steps of the writing process.	 Makes learners practise process writing. Consults language teachers for advice on language. 	
 Gives guidelines to the subject teachers. 		

Subject	ENGLISH	
Topic:	COMPREHENSION	TEACHER NOTES
Lesson Content:	Being able to comprehend a text to determine its purpose and to evaluate its content is a life skill that will be important for you, no matter what you do in the future. In your future, you will have to read contracts, newspaper articles, reports, literature, business letters, advertisements you know that I could go on and on with this list. Our immediate need is for you to be able to understand comprehension passages and to answer the questions that accompany them, and so do well in your language classes and the examination papers. In the Language and Comprehension Examination you will be given one passage with questions to test how well you understand the text. You will also be given a piece of visual material in this section, and you will be asked questions on it. Other parts of the paper will also test your ability to understand what you are reading in context.	Slide 2
	Language aspects covered	

Pre-activities	Vocabulary:	solar	renewable	Slide 4	Slide 5
Vocabulary		biomass intermitted	capacity-optimization intermittent	Renewable	Renewable
Language		fluctuation	bio-energy	Re – I I G VV - able	Re - new - able
used in the		synergy	photovoltaics		Y Internet
subjectPrediction	You should try to word attack skills	work out the mear , for example:	ning of the words above. Use	Slide 6	Slide 7
	 breaking the - the base we making some 	word down into its s ord here is NEW. R thing new again or	implest form, e.g. "renewable" enewable then has to do with replacing (re-using) it.	Renewable Re – new - able	Renevable The trole of wind and solar hetericity production will increase nore republy compared enter Renevable Bources
	 identify the p "renewable": the suffix -al 'have the ab means 'havir 	refix and/or suffix to the prefix in the wo ole makes the word ility to do'. Therefo g the ability to make	o establish the meaning, e.g. rd is re-, which means 'again'; d an adjective, which implies re, the root word "new" now e new again'.	Slide 8	Slide 9
	 read the wor role of wind more rapidly the word 're implies that, u can be exhau always be av 	ds in the context of and solar in electr compared to other newable' with the unlike other sources usted / depleted (us ailable.	the passage provided – "The icity production will increase renewable sources." Linking words wind and sun (solar) of electricity (e.g. coal), which eed up), the wind and sun will	Slide 10	Slide 11
	 Sometimes y "photovoltaic it means ligh scientist Ales battery, and i 	rou will have to lool s". (The word 'photo t.) The word 'volt' sandra Volta, who t is used to refer to a	k for the origin of the word – o' has its origin in Greek and comes from the name of the invented the first photovoltaic a unit of electricity.	Slide 12	Slide 13
	You will now ha meaning of the w that you understa	ve to try some of ords in the word list and the following lan	these techniques to find the . Before you start, make sure aguage aspects:	Slide 14	Slide 15
	Language aspec	<u>ts</u> :			
	Jargon – These a a profession or g understand. For	are special words or roup of people and v example, scientific ja	expressions that are used by which are difficult for others to argon.	¥10. AUS	Yan Az
	Hyphen - Hypher the component w	is are used in many ords have a combir	compound words to show that ned meaning.	Slide 16	Slide 17
	Compound word more words that	- A compound wo function as a single	rd is a combination of two or e unit of meaning.		The second secon
	Prefix - A prefix i meaning.	s added to the begi	nning of a word to change its	norm/1 (\.dtt	
	Suffix - A suffix is of a word to chain into a sentence.	a letter or group of l nge its meaning or t	etters that is added to the end to ensure it fits grammatically		
	Root word - A ba are added is call new word . The r	isic word to which a ed a root word, be oot word is also a v	affixes (prefixes and suffixes) ecause it forms the basis of a word in its own right.		

Vocabulary:	
Solar - relating to or determined by the sun.	
$Re \cdot new \cdot able$ - (of a natural resource or source of energy) not depleted when used. A natural resource or source of energy that is not depleted by use, such as water, wind or solar power.	
<i>Bio mass</i> - organic matter used as a fuel, especially in a power station for the generation of electricity.	
Capacity-optimization [focus on use of the hyphen] - the action of making the best or most effective use of a resource to produce the maximum amount of energy. The hyphen is a punctuation mark that is used to form a compound word – it links two words together to form a new compound word.	
Inter · mitted – Prefix 'inter' means 'between', 'among', 'in the midst of'. Therefore, intermitted means when something is suspended or discontinued for a time before it becomes active again.	
Inter · mittent - occurring at irregular intervals; not continuous or steady.	
Fluctuation [to fluctuate] - an irregular rise and fall in number or amount.	
<i>Bio</i> · <i>energy</i> - renewable energy produced by living organisms .	
<i>Synergy</i> - the interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect that is greater than the sum of their separate effects.	
<i>Photo+volt+aics</i> - the branch of technology concerned with the production of electric current at the junction of two substances. It is a term that means the conversion of light into electricity .	
<u>Subjects</u> : Physical Sciences, Agricultural Sciences, Geography and Life Orientation	
<u>Prediction</u> : The heading of the article you are about to read is: Flexibility from bio-energy .	
Consider the terms above and the heading of the article. What would you guess the passage is about?	
The title of the article is very important, as it prepares you for what you are going to read in your comprehension passage.	
Reading for comprehension is different to reading for enjoyment, therefore your approach to reading for comprehension will be different to when you are just reading a book. The purpose of reading for comprehension is to read with a specific focus, in order to answer questions.	
Skimming: Before you read the text, try to work out what it is about. Often the title, source (where the text is from), or the author's name can provide hints about what the text will be about or what genre it is from. This is just a VERY quick glance at the contents of the text. You are just finding out what the passage is about in a brief way.	

During teaching Introduction of topic:	After skimming the text, you will first read the questions to ensure you know what questions you will need to answer before you read the text in full. A good strategy (especially during examinations, when you have limited time to re-read the passage) would be to start by reading the questions first.	Slide 18
	appearance. Focus on the question verbs and their meaning to get an idea of what the passage is about, and (most importantly) what to look out for when you start reading it. Underline significant words in the questions – if you are to answer the questions properly, you need to be thoroughly familiar with the vocabulary of questioning.	What should my brain do while I'm reading?
	Now that you have an idea of what is being asked, carefully read the extract, with the aim of discovering as many points as possible that seem to be related to the questions. Keep the questions in the back of your mind.	WHO? WHAT? WHEN? WHERE? How?
	As you read through the passage, answer the following questions mentally, to help you gain an overview of what the text is about.	
	Who wrote the text?	(7) tar dama
	Perhaps you are familiar with the author, or you may realise that it was written by someone famous. <i>In the example text, the author is a researcher.</i>	Slide 20 Flexibility from bioenergy The role of bioenergy in balancing the electricity add and anywiding storage aptions
	• For whom was the text written?	The role of wind and solar in electricity production will increase more rapidly compared to other renewable sources. The energy market transformation from an
	Knowing who the intended audience is will help you to see how the author has written with this target group in mind. <i>The audience is very specific in our sample text, hence the jargon (subject specific words) used.</i>	energy optimized to capacity-optimized system is expected when the share of intermittent or uncontrollable electricity becomes large enough. Bioenergy, in its various forms, can eventually contribute to balancing the electricity grid as an effective, low carbon and low-cost grid management and energy storage option.
	• Why has the author written this text?	Slide 21
	The writer's intention will influence his or her style of writing. In our sample, the writer wants to inform the reader about the benefits of moving away from the conventional ways of creating energy to using bio-energy as a flexible option.	Seasonality, i.e. energy demand fluctuations in the winter and summer seasons, is one of the key challenges for future smart energy system management, which will have various consequences for optimization in various parts of Europe and globally. This represents a clear synergy in seasonal balancing between photovoltairs and biomass, especially in connection to biomass combined heart and waves (full)
	Where does this text come from?	Written by Antti Arasto, Research Manager
	The source of the text - for example a magazine, recipe book, newspaper, blog, scientific journal, etc will influence the subject matter and the style of the text. <i>The source of this text is a webpage, as referenced.</i>	
	How is the message being communicated?	
	What style, tone and register does the author use to convey his or her ideas to the reader? In the sample text, the style and tone is formal, factual, informative, and scientific jargon is used.	

	While reading, you must also underline keywords and phrases that would make answering the questions easier.	
	Flexibility from bio-energy	
	The role of bio-energy in balancing the electricity grid and providing storage options	
	The role of wind and solar in electricity production will increase more rapidly compared to other renewable sources. The energy market transformation from an energy-optimized to capacity- optimized system is expected when the share of intermittent or uncontrollable electricity becomes large enough. Bio-energy, in its various forms, can eventually contribute to balancing the electricity grid as an effective, low carbon and low-cost grid management and energy storage option. Seasonality, i.e. energy demand fluctuations in the winter and summer seasons, is one of the key challenges for future smart energy system management, which will have various consequences for optimization in various parts of Europe and globally. This represents a clear synergy in seasonal balancing between photovoltaics and biomass, especially in connection with biomass combined heat and power (CHP).	
	Written by Antti Arasto, Research Manager	
	http://makingoftomorrow.com/flexibility-from-bioenergy/	
Assessment (consolidation)	Always pay attention to the marks allocated per question. The amount of detail provided in your response should relate to the number of marks allocated. Answer all the questions. Do not leave any out – even if you do not know the answer. Try! You are sure to get no marks if you leave a question out, but you may get some marks if you just try. Partially accurate answers are allocated part credit. When asked for an opinion, substantiate your answer. Give reasons why you say what you say. Sometimes this substantiation will come from the text, but not always. It should, however, ALWAYS be grounded in the text. Make sure the marker understands why you have answered as you have. When asked to quote, copy the words from the text exactly as they appear in the text, and use inverted commas. Pay attention to spelling and punctuation in your answers, as spelling mistakes are unforgiveable when the words appear in the text, or in the questions. Write neatly, and check that your numbering is accurate. Certain words seem to occur frequently in comprehension questions. Different questions require distinct types of responses. Answers to most questions that use the following verbs will be found in the text, e.g. name, list, state, identify, outline, etc. These questions are called lower order questions, as they require very little thinking to answer them correctly.	Slide 22 How to answer questions File Construction File Constructio

	Question: List TWO renewable energy sources.(2) Answer: Windü and Solar (sunlight)ü	Slide 25 Higher Order Questions
	The answers to questions that use verbs from the list below, require you to take what is in the passage and to infer meaning from it or to change the way the information is presented, e.g. explain, compare, what is the intention, why is the statement true / false, etc. These type of questions are called middle order questions, as they require some understanding and interpretation from you of what you have read. Answers are not as readily available as with lower order questions.	 comment critically do you think in your opinion is the title suitable do you agree with discuss the writer's use of discuss the effectiveness of the discuss your response to
	Question: Explain the writer's intention in the passage 'Flexibility from bio-energy'. (2) Answer: The writer wants to informü the reader about the benefits of moving away from conventional ways of creating energy to using bio-energy as a flexible optionü.	
	The most challenging questions are called higher order questions, as they require the highest level of thinking. This does not mean they are the most difficult to answer, but they do require you to think for yourself, as the answers cannot be found in the passage. These questions require that you critically analyse the question to be able to answer effectively. These questions traditionally carry the highest marks, so be sure to answer them fully. Examples of verbs used in these questions are: comment critically; do you think; in your opinion; is the title suitable; do you agree with; discuss the writer's use of; discuss the effectiveness of; discuss your response to; etc. Traditionally, these answers do not have a clear right or wrong answer; marks are awarded for your argument within the context of the passage and the question - so be very clear and concise when answering these questions. No marks are awarded for: yes / no; agree / disagree.	
	Question: In your opinion, is the title of this article suitable? Substantiate your answer.(2) Answer: Open-ended. A suitable response will be accepted, e.g.:	
	Yes.	
	The passage focuses mainly on bio-energy and how it can be a useful alternative source of energyü; therefore, 'Flexibility from bio- energy' is a suitable title, as it hints at the use of bio-energy as a flexible source of energyü.	
	OR	
	No.	
	Although the article addresses the use of bio-energyü, it does not explore the flexibility of bio-energy, as is suggested in the titleü.	
	NOTE: NO mark will be awarded for 'Yes' or 'No'. Other suitable responses can be accepted. You can score one mark for an answer that is not well-substantiated.	

Other questions that may seem difficult:	
 What is the effect of? Effect means the impression created, for example: 'buzzing' conveys the sound made by bees. 	
• Why is this word effective? Effectiveness refers to the merit or advantage of using a particular word or phrase. Does the word produce the effect it was meant to produce? Is it a good / poor choice of word to express / convey the meaning? Significance is the importance of a word in its context. Why has it been used rather than another word?	
 What is implied by? Implied is used to ask what hidden meanings a word or sentence might have in addition to its literal meaning. 	
• What is the writer's attitude towards? Attitude is how the writer views a particular event, person, place and so on.	
• What are the writer's / reader's feelings about? Feeling is the emotion the writer or reader has about a particular matter. Feeling is often made clear by the tone or 'sound' used to express the particular emotion.	
Presentation slides	COMPREHENSION GR 10.pptx

Subject:	ENGLISH
Grade	11
Торіс:	READING AND VIEWING
Lesson – content	CARTOON / COMIC STRIP
Subjects	Business Studies, Life Orientation, Economics, Accounting, Mathematical Literacy, etc.
	red
Pre-reading activities Introduction • Vocabulary	 Vocabulary Activity: In a classroom setting, the teacher will give learners a mix-and-match activity. Complicated or strange words / phrases will be written on strips of paper and given to learners to match with meanings already pasted on the wall / board. Below is a list of examples of words and their meanings:
 Language used in the subject Prediction 	 Sick - (slang) meaning 'awesome' or 'cool'. Naw - (slang) meaning 'no' Rate - the amount of a charge or payment expressed as a percentage of another amount, or as a basis of calculation. Loan-shark - a moneylender who charges extremely high rates of interest, typically under illegal conditions. Dude - (slang) meaning a man. Steep - (with reference to price or demand) not reasonable; excessive.
	 NB! The cartoonist has used the pun and the connotative meaning of words to create humour. Caption analysis: Learners are asked to read the caption, 'Personal Financial Management' and predict what the comic strip / cartoon could be about.

During teaching	Language used in the subject, e.g. Every day we are bombarded with visual texts	A cartoon can be a single frame cartoon or consists of a
	that are designed to communicate a message to us. Understanding <i>visual</i> texts is a unique skill and is not the same as understanding a <i>written</i> text. In this session, we will analyse cartoons / comic strips, focussing on how and what they communicate to us, the readers.	
	• Cartoons / comic strips consist of two kinds of text, namely picture texts and language texts.	Speech bubble, thought bubble,
	• Apicture of a character tells the reader about emotions and characteristics.	ξ 3 O
	 Language text refers to the words that appear in the panel. 	and the
	 Language texts usually consist of dialogue and sound effects. 	To and
	 Language texts can be seen in speech bubbles, thought bubbles, captions and headings. 	
	• A speech bubble indicates the words spoken by the character. It has a sharp point, called a connecting line, pointing towards the character who is speaking.	Captions and headings
	• A thought bubble has rounded edges with smaller bubbles serving as a connecting line. This indicates that the character is thinking the words - the words are not <i>uttered</i> .	The new rates of the second se
	• Captions and headings are normally at the top of the cartoon / comic strip.	
	• Sound imitations / indications are usually in bold or <i>large</i> letters.	Movement is indicated by vertical, curved and diagonal lines.
	A blasting cloud indicates an explosion.	
	• Action lines indicate the movement of a character.	
	The following are a few examples of the features of comic strips, as explained above:	
		Speckyaction is indicated by streaky lines or the action Law ing the frame Image: Construction of the action of t

 The pictures in a cartoon are usually in a single frame. Cartoons often contain caricatures of well-known people. You can recognise who they are about, but certain features are exaggerated.
 In an examination, you will be required to answer questions based on both the visual text and the written text. When you answer questions on the visual text, be very specific. Let's look at a few possible examples:
 Study the body language of the characters in Frame 1. What words can we use to describe the characters? Look at the arms and shoulders the character on the left has his hands in his pockets. Look at their faces - the character on the left has a wide smile and both characters are excitedly looking at the car. Look at their posture - they both look relaxed.
• Let's look at another example. In frames 1-3, the man on the left is constantly smiling and his posture does not change. In Frame 3, the man on the left is <i>very excited</i> and <i>proud</i> , while the man on the right looks <i>puzzled / shocked</i> .
We can see this in their body language (facial expressions, e.g. a smile is replaced by a frown, there is a change of direction of the head).
<i>Humour</i> in this comic strip is that the character on the left is excited and proud about his spending. He finds it very easy to rob Peter for Paul.
Comic strips are similar to cartoons. The main difference between a comic strip and a cartoon is that a comic strip consists of more than one frame and these follow on from each other.
 When you next look at cartoons / comic strips, try to decipher the message in the visuals before you read the words and see if you can accurately predict on the situation in the cartoon / comic strip.
Remember that cartoons / comic strips are meant to be enjoyed, so do not lose sight of the humour in the cartoon.
TERMINAL LANCE #35 "Personal Financial Management" Image: a pretty slok Ober man. If mail'o Useu it's all good. Image: a great rate prom Image: a great rate prom a loan shark out in town. (a loan shark out in town. (b) Use utilized by Maximilian Uricet © 2010

Assessment	Assessment words –
	Identification of visual / verbal clues.
	Learners must scrutinise / examine the cartoon / comic strip to look for both visual and verbal clues.
	Mention / compare characters' tone / mood / feelings.
	Learners must scrutinise / examine the cartoon / comic strip to look for both visual and verbal clues; they do this by focussing on the words the characters say to identify the tone, e.g. sarcastic, excited, etc. Learners might also have to compare the tone, mood and feelings of two or more characters.
	Cite a reason for an action.
	Analyse the character's action and facial expression and suggest a reason for the action.
	 Discuss the cartoonist's intention, e.g. humour / satire / sarcasm / stereotypes.
	Study the cartoon / comic strip and fully explain the writer's intention in drawing the cartoon / comic strip. Focus on the devices used.
	Give your own opinion / point of view (sympathise / empathise).
	Study or interpret the cartoon / comic strip and give your own opinion about it.
	Take a stance and make a judgement about a character's behaviour / action / decision.

SAMPLE QUESTIONS

- 1. LOW ORDER: Refer to Frame 1: Give one visual and one verbal clue that indicates that the car owner is satisfied with his achievement / purchase. (2)
 - The man says 'It's all good'. ü
 - He looks relaxed with his hands on his hips / a smile on his face. ü
- 2. MIDDLE ORDER: Explain a reason for the cartoonist to use slang words like 'naw', 'dude', etc. (2)
 - Slang words are used to show that the TWO men are familiar with each other / friends. üü

OR

- Slang words have been used to emphasise that the man has acted recklessly or made an irresponsible financial decision. üü
- 3. Do you think the car owner has made a sound financial decision? Discuss your view. (3) Opinion, e.g.:
 - Yes.

The man does not have cash readily available and the only solution would be to get credit. It looks like he always has a back-up plan.

OR

• No.

The man does not realise he will be drowning in debt. The interest paid to the loan-shark is too high. It is also not wise to borrow from one party to pay another and he has borrowed on his credit card to pay the loan-shark.

Presentation slides:



Subject	ENGLISH	
Grade	10	
Торіс:	POETRY	
Lesson – Content:	We should not just focus on the academic analysis of the poem, but also enjoy the poem for what it is and find the beauty in it.	
	Now we will focus on the academic part.	
	How do you analyse a poem? There are various methods; however, the SIFTSEI method is one of the most popular. With this method of analysing a poem, we look at the poem in TWO ways: we look at the poem objectively, from the poet's point of view; and then we look at it subjectively, i.e. how we, the readers, respond to the poem.	
	Firstly, the SIFT part of the analysis is where we look at the poem objectively, not taking our own response into consideration.	
	S – Sense : this refers to what the poet is trying to communicate to us. Here we look at the content of each line.	
	I – Intention: here we try to find out why the poet wrote the poem, i.e. his overall message. We would describe it as the theme of the poem.	
	F – Feelings: here we try to find out how the poet feels about the subject he is writing about.	
	T – Tone : we look for the tone of voice that the poet is using. The poet's feelings will give us a clear indication of the tone of the poem. The tone can change or intensify as the poem progresses.	
	The second part of the analysis is done from the reader's point of view. Here we look at the SEI part. In this part of the analysis, you may discuss your personal impressions and you do not have to agree with others, as long as you base your response on the poem itself.	
	S – Sensory impression: all the physical sensations or experiences suggested to us as we read the poem. The poet would have used various images that appeal to the sense of sight, hearing, taste, touch and smell.	
	E – Emotions: here we must be able to describe our OWN emotional reactions to what we have just read. Do we share the poet's feelings? Are we also upset or excited?	
	I – Intellect and imagery ; the thoughts and ideas that a word or image prompts in our minds. What do we think about after having read the poem? Poetic devices are looked at here - e.g. rhyme, rhythm, structure, imagery and figures of speech - used by the poet, which all add to the meaning of the poem.	
	What are figures of speech / literary devices? You would be surprised at how often you use figures of speech, especially similes and metaphors. (Think about some pick-up lines boys use, for example, "You must be a magnet, because I'm attracted to you."). So they may not be as foreign to you as you might suppose. Figures of speech generally (but not always) involve a comparison of two objects, and we use these to express ourselves in a creative way. In literal language, the words mean exactly what they say. Figurative language, on the other hand, provides a meaning that is different from the literal meaning. Poets use figurative language to add vigour, colour and depth of description to their works.	
	The structure of a poem is called form. Each form of poetry has its own style. Style refers to the way something is written or said. The purpose of a poem dictates the style to be used. For example, a humorous poem would lend itself to a limerick poetic style, but it would not suit the haiku style of poetry.	

Pre-activities	Vocabulary / Language used in the Subject:	
VocabularyLanguage used	Figures of speech help us express the intensity of our feelings, by painting a colourful picture with words. There are many figures of speech, but the most common are the following: simile, metaphor, alliteration and personification.	
in the subject	Figures of Speech / Literary Devices:	
Prediction	Alliteration	
	Alliteration is the repeated use of a sound (a consonant) at the beginning of closely connected words: e.g. Low lying layer; or, As soft as silk.	
	Assonance	
	Assonance is the repetition of a particular vowel sound, e.g. 'The loon in the moon plays a crooning tune'.	
	Metaphor	
	A metaphor is a figure of speech which makes an implicit, implied or hidden comparison between two things, e.g. "You are my rock". This metaphor compares a person who provides the speaker with to a rock. A rock is hard to move, implying that the friend is a solid, dependable supporter who is unmoved by circumstances.	
	Onomatopoeia	
	Onomatopoeia is the use of words to recreate the sounds they describe, like 'sizzle' or 'bang'.	
	Personification	
	Personification is a way of giving inanimate objects human qualities. E.g.: "Fear knocked on the door. Faith answered. There was no one there." (proverb)	
	Simile	
	A simile is when two objects, unlike each other in every respect except one, are compared. A word such as 'like' or 'as' is generally used to draw attention to the comparison:	
	As alike as two peas in a pod.	
	As clean as a whistle.	
	As delicate as a flower.	
	Rhythm	
	Rhythm is the musical quality of poetry. A slow rhythm creates a sombre mood in a poem, while a quicker-paced rhythm creates a happier, more exciting mood in a poem.	
	Rhyming Couplets	
	Rhyming couplets are pairs of rhymingd lines. Poems that use rhyming couplets often tell a story.	
	As you can see, there are many aspects to poetry, and as you progress through the grades to Grade 12, you will be challenged by many more aspects. It is important for you to always go back to appreciating the poem for what it is - an art form.	
	Now that you know a little bit about poetry, let us analyse Sonnet 18: Shall I compare thee to a summer's day? By William Shakespeare	
	Subjects: Life Orientation, History, Religion Studies.	
	<u>Prediction</u> : Based on the title, "Shall I compare thee to a summer's day", what do you predict is the theme of the sonnet.	

Introduction of topic: Learning to answer questions based on a poem is a skill that most learners can acquire and improve. Success depends on a careful, thorough and thoughtful approach. • Read the poem silently, and slowly, to yourself. The first time you read through a poem, think in terms of, 'How of leal about this? Why? Why not?' These reactions can help you focus on the type of response the poet is looking for in a reader. • Read the poem again and find the literal meaning of the poem. The literal meaning is the most straightforward explanation of the poem. It does not refer to any poetic devices. Translate the poem into conversational English. How would you tell the story in the poem to a friend? • Read the poem again to find the connotative meaning of the poem. Analyse the figurative language in the poem. • Identify any symbolism in the poem. Think in terms of, 'What is the author trying to say?' What is his goal for this poem? What kind of reaction is he trying to get out of readers? Why?' Try to identify the author's purpose for writing. What are the features of a sonnet? There are fourteen lines in a Shakespearean sonnet. The first twelve lines are divided into three quatrains of four lines each. In the three quatrains, the poet establishes a theree or problem and then resolves it in the final two lines, called the couplet. The rhyme scheme of the quatrains in this poem is abb cdcd eff. Draw your conclusions. What is the theme or goal of the poem? What tools did the poet use to convey the theme or main idea of the poem? How did he / she use them? Read the poem below: Sonnet 18 Shall I compare thee to a summer's day? Thou art more lowely and more	During teaching	There are steps that can be followed to answer a poem effectively.
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But thy eternal summer shall not fade, Nor lose possession of that fair thou ow'st; Nor shall Death brag thou wander'st in his shade, When in eternal lines to time thou grow'st:		By chance, or nature's changing course, untrimm'd:
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When in eternal lines to time thou grow'st:		Nor lose possession of that fair thou ow'st;
Voten in eternal lines to time thou grow st:		INOR SHAIL DEATH DRAG THOU WANDER ST IN HIS SHADE,
		vinen in eternal lines to time thou grow st.
So long lives this, and this gives life to thee		So long lives this and this gives life to thee

	SONNET 18	PARAPHRASED		
	Shall I compare thee to a summer's day?	Shall I compare you to a summer's day?		
	Thou art more lovely and more temperate:	You are more lovely and more constant:		
	Rough winds do shake the darling buds of May,	Rough winds shake the lovely buds that appear in spring (May)		
	And summer's lease hath all too short a date:	And summer is far too short:		
	Sometime too hot the eye of heaven shines,	At times the sun is too hot,		
	And often is his gold complexion dimm'd;	But often it goes behind the clouds;		
	And every fair from fair sometime declines,	And everything beautiful will lose its beauty eventually,		
	By chance, or nature's changing course, untrimm'd;	By misfortune or by nature's planned out course.		
	But thy eternal summer shall not fade	But your youth shall not fade,		
	Nor lose possession of that fair thou ow'st;	Nor will you lose the beauty that you possess;		
	Nor shall Death brag thou wander'st in his shade,	Nor will death claim you for his own,		
	When in eternal lines to time thou grow'st;	Because in my eternal verse you will live forever.		
	So long as men can breathe or eyes can see,	So long as there are people on this earth,		
	So long lives this and this gives life to thee.	So long will this poem live on, making you immortal.		
	Discussion and Identification of Figurative	e Language		
	 Personification: the sun is compared to a person with eyes that shine. It shines from heaven (like someone looking down onto the Earth). At first it would seem that the sun is a friendly person – but the speaker actually suggests that the sun is very, very hot, which can cause major discomfort. Excessive heat exhausts people, and makes them thirsty and uncomfortable. Metaphor: the sun is compared to 'the eye of heaven'. This is a metaphor: the lady is compared to summer. The speaker compliments / flatters her by telling her that her beauty is eternal and, never ending. Alliteration – f:fair from fair This emphasises the fact that everything fades with time. 			
	shall / shade: emphasises the shadows of death, i.e. death's presence.			
Assessment (Consolidation)	Questions: 1. "Sometime too hot the eye of heaven shines". What is the poet referring to in these lines? (1) ANS: The sun. 2. Explain the metaphor, "And summer's lease hath all too short a date." (2) ANS: The summer holds a lease on part of the year, but the lease is too short and has an early termination date. 3. The poet compares the young man to summer, but in line 9 the young man is summer. Why does the poet do this? (3) ANS: The young man has metamorphosed into the standard by which true beauty can and should be judged. The poet's friend will become one with nature and time. He is now the standard by which others should be compared. His beauty is eternal			
	like the sun. Presentation slides		POETRY GR 12.pptx	

Subject	GEOGRAPHY
Grade	10
Торіс	Water Resources
Subtopic	Water in the world
Lesson - content	Different forms of water in the world The bydrological cycle
	The hydrological cycle

PRE-ACTIVITIES:

VOCABULARY:	
Resource	Any substance (material) used to supply a need
Hydrology	The study of water (hydro: water logy: study of)
Hydrological cycle / Water cycle	The movement of water to and from the oceans, changing its state
Evaporation	The process involved when water changes to gas (water vapour).
Transpiration	The process whereby plants release water vapour through their leaves.
Condensation	The process whereby water vapour changes to liquid form (water).
Precipitation	The process when water falls clouds as rain, snow or hail onto the surface of the Earth.
Infiltration	The process whereby water on the surface of the soil enters the soil.
Run-off	The process when water flows over the surface of the ground.

LANGUAGE USED IN THE SUBJECT GEOGRAPHY:

Forms of water: liquid, solid and gas.

Cycle: events that occur in the same order repeatedly.

The use of *-ology* and *-tion*.

DURING TEACHING:

• Introduce the topic by asking learners about forms of water that they know about and examples for each form.



- Give learners an opportunity to perform an experiment of boiling water in a kettle to show how water changes from liquid to gas, and how it condenses and changes from gas to liquid form. Terminology (evaporation, condensation and precipitation) is explained.
- Distribute copies of the hydrologic cycle sketch and the list of processes: Evaporation, Transpiration, Condensation, Precipitation, Infiltration, Run-off.



- Label the form of water in the diagram in each process.
- Explain how each process occurs.
- Learners label processes using the explanations provided and take notes.
- Discuss with the learners what could happen if each process was tampered with.

ASSESSMENT

- Identifying: places where the hydrological processes takes place
- Explaining: processes of water changing its state
- Paragraph writing:
- Predicting: What will happen

Task: Questions

Study the diagram and answer the following questions:



1.	Where does the hydrological cycle starts?	(1 X 1) (1)
2.	Which process seen in the diagram occurs when gas changes to liquid?	(1 X 1) (1)
3.	Study the process "precipitation". Explain how the process takes place.	(2 x 2) (4)
4.	Plants are also important in the hydrologic cycle. In a paragraph of not more than SIX lines, predict what will happen with the cycle if the trees were cut down.	(3 X 2) (6)

Marking guide

- 1. In the ocean
- 2. Condensation
- 3. The water vapour in the atmosphere condenses to form water droplets / ice. This occurs due to temperature differences between the ocean and the upper atmosphere. Water / ice / vapour in the atmosphere grows to a size that can no longer be held in suspension and it therefore falls down to the surface of the Earth.
- 4. Transpiration will not take place or it will be lower. This will lower the amount of gas / water vapour released into the upper atmosphere. Precipitation will therefore be less and the Earth will have less water. Plants and people will suffer / die.

Subject:	Geography
Торіс:	Population Geography
Sub-topic	Population Structure
Lesson – content	Population Indicators

Pre-activities:

- Vocabulary: meaning of words and context of use
- **Population:** The total number of persons inhabiting a country, city, or any district or area.
- Indicators: Something that provides specific information on the state or condition of something else.

Population indicators:

- **Birth rate:** The number of live births occurring among the population of a given geographical area during a given year, per 1000 people.
- **Death rate:** The number of deaths occurring among the population of a given geographical area during a given year, per 1000 people.
- Life expectancy: The average number of years a new-born infant would live, given the patterns of mortality at time of birth.
- Fertility rate: The expected number of children a woman will have during her lifetime.
- Natural increase: The difference between the number of births and the number of deaths recorded over a period

During Teaching:

The teacher uses the graphs to indicate and discuss trends with regard to population indicators for South Africa.

Birth Rate: It is affected by factors such as nutrition, fertility, attitude to abortion, labour value of children, government policies, social value, the availability of contraception and culture.

Province	2009 N	('000)	2014	N ('000)	Percenta	ge growth
	SA population	Youth population	SA population	Youth population	SA population	Youth population
Western Cape	5 573	1 936	6 130	2 078	10,0	7,3
Eastern Cape	6 490	2 370	6 655	2 478	2,5	4,6
Northern Cape	1 123	387	1 172	411	4,3	6,1
Free State	2 737	1 015	2 757	1 030	0,8	1,4
KwaZulu-Natal	10 022	3 698	10 571	3 913	5,5	5,8
North West	3 401	1 222	3 649	1 302	7,3	6,6
Gauteng	11 693	4 333	12 996	4 585	11,1	5,8
Mpumalanga	3 917	1 483	4 181	1 598	6,7	7,8
Limpopo	5 262	2 031	5 585	2 188	6,1	7,8
SA	50 222	18 478	53 701	19 586	6,9	6,0

Google image: 24/08/2017



Google image: 24/08/2017

Life expectancy declined in South Africa during the period 1980-2012, despite a rise in GDP per capita.





Note: Fertility rates have increased at all ages since 2005. However, rates for women under 30 years are still well below the rates experienced during the 1960s. Fertility rates among females under 15 years and over 44 years remain under 1 birth per 1,000 women.

Stats SA

Natural increase: birth rate minus death rate, calculated as a percentage. (This does not take migration into consideration.)



SOUTH AFRICA POPULATION

Google image: 24/08/2017

Post-teaching

The teacher assesses the learners at the end of the period with a short class-work activity.

Assessment words

List: To write a series of concise statements; to present a list of names, facts, aspects or items.

Explain: To make clear or plain. To make sure the reader understands what is being said.

Define: To give the precise meaning.

QUESTION 1

1.1.

- 1.1.1. List and explain factors that lead to population growth.
- 1.1.2. Explain how a population grows naturally.
- 1.2. Study Figure 2.1 and answer the questions that follow:

Figure 2.1: Fertility Rate



Google image: 24/08/2017.



1.3. Study Figure 1.3 and answer the questions that follow:

Figure 1.3: Life Expectancy



Grand Total = 18

(2x2) (4)

(1x2) (2)

Markir	ng Guideline	
1.1.1.	Health factors: Control of diseases, improvement in maternity care, improvement in diet, etc.	
	Education factors: female education, female empowerment, tertiary education Social provision	
	Cultural factors:	(1 x 2) (2)
1.1.2.	It grows naturally when the birth rate is higher than the death rate.	(2 x 2) (4)
1.2.1.	2.1. The expected number of children a woman will have during her lifetime. (1 x 2) (2)	
1.2.2.	The relationship is: for those without education, the percent is5.9; for those with a primary level of education, it is 1.5 percent.	(1 x 2) (2)
1.3.1.	The average number of years that a person may expect to live.	
1.3.2.	At 6 years it is: 54.7	(1 x 2) (2)
	At 17 years it is: 66.7	
	Gra	nd Total = 18

Subject:	Geography
Торіс:	Development
Sub-topic	Framework for development
Lesson – content	Development model: Free market model, such as Rostow's model with its limitations and criticisms .

Pre-activities

Vocabulary: meaning of words and context of use

Development: the process in which someone or something grows or changes and becomes more advanced.

Model: a thing used as an example to follow or imitate

Structuralist: a development theory that focuses on structural aspects that impede the economic growth of developing countries. The unit of analysis is the transformation of a country's economy, mainly from subsistence agriculture to a modern, urbanized manufacturing and service economy.

Limitations: restrictive weakness

Criticism: the analysis and judgement of the merits and faults of a literary or artistic work.

Free market: a system in which the price of goods and services is determined by the open market and consumers, and in which the laws and forces of supply and demand are free of intervention by government, a price-setting monopoly, or other authority.

Economic Growth: an increase in the capacity of an economy to produce goods and services, seen when one period is compared to another.

Mass consumption: The use or purchase of goods or services by many people.

Subsistence farming: Subsistence agriculture is self-sufficiency farming in which farmers focus on growing enough food to feed themselves and their families. A typical subsistence farm has various crops and animals needed by the family to feed and clothe themselves during the year.

Economic take-off: a rapid rise in activity, growth, or popularity.

Very primitive: belonging to a very early period in the development of an animal or plant.

Very limited technology: the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, and which draws upon such subjects as industrial arts, engineering, applied science, and pure science.

Ruling elite: the social class of a given society that decides and sets that society's political agenda by mandating that there is one such class in the given society, and then appointing itself as that class.

Specialisation: the process of concentrating on and becoming an expert in a subject or skill.

Commercialisation: the process of managing or running an organisation principally for financial gain.

Investment: the purchase of goods that are not consumed today, but which are used to create wealth in the future.

Exports: send goods or services to another country for sale.

Self-sustaining: a process or system that can continue by itself without anyone or anything else becoming involved.

Urban flight: the process of people leaving the cities and moving to the suburbs.

Rural depopulation: the process in which population density in rural areas decreases over time.

Domestic production: the production of goods for use in the home country.

Import substitution: a trade and economic policy that advocates replacing foreign imports with domestic production.

Service provision: the act of performing a task for a business or person who wants it in exchange for acceptable compensation.

Infrastructure: the basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.

Consumer durable goods: goods that do not wear out quickly.

Commercial exploitation: a term that includes all activities used to enable one to benefit commercially from one's property.

Industrialisation: the process by which an economy is transformed from a primarily agricultural base to one based on the manufacturing of goods.

Urbanisation: the process by which towns and cities are formed and become larger as more and more people begin living and working in the central area.

Innovation: the process of translating an idea or invention into goods or services that create value and for which customers will pay.

Economic sector: one classical breakdown of economic activity, which distinguishes three sectors, i.e.: the primary sector, which includes agriculture, mining and other natural resource industries; the secondary sector, which deals with manufacturing, engineering and construction; and; a tertiary sector for the service industries, the quaternary sector for intellectual activities involving education and research and the quinary sector reserved for high level decision makers in government and industry.

During Teaching

The teacher explains Rostow's five stage model to the learners using Figure 1.1 below.

- The model is one of the more structuralist models of economic growth.
- It was published by the American economist Walt Whitman Rostow in 1960.
- Rostow argued that economic take-off must initially be led by a few individual economic sectors.
- The model postulates that economic growth occurs in five basic stages of varying length.



The teacher discusses the limitations and criticisms of the model with the learners.

Limitations and criticisms of the model:

- Historical the result is known at the outset and is derived from the historical geography of a developed, bureaucratic society.
- **Mechanical** the underlying motor of change is not disclosed and therefore the stages become little more than a classificatory system based on data from developed countries.
- His model defines the American norm of high mass consumption as integral to the economic development process of all industrialized societies.
- His model assumes the inevitable adoption of neoliberal trade policies, which allow the manufacturing base of a given advanced polity to be relocated to lower-wage regions.
- The model does not apply to Asian and African countries, as events in these countries are not justified in any stage of his model.
- The stages are not properly identifiable, as the conditions of the take-off and pre-take-off stages are very similar and overlap.
- According to Rostow, growth becomes automatic by the time it reaches the maturity stage; but Kuznets asserts that no growth can be automatic there is always a need for push.
- There are two unrelated theories of take-off: one is that take-off is a sectoral and a non-linear notion, and the other is that it is highly aggregative.
- Assumption- he saw economic progress as, a linear system.
- It is false, as evidence is available of many countries making a false start, then reaching a degree of progress and change and then slipping back. For example, Russia slipped back from a high mass consumption to a country in transition, the main cause being the end of the Cold War and geo-political struggles.
- Another problem with Rostow's work is that it considered large countries with large populations and with natural resources available at just the right time in their history (coal in Northern European countries), or with a large land mass. What about small countries like Japan?
- He has little to say and indeed offers little hope for small countries, such as Rwanda, which do not have such advantages.
- The model does offer hope to much of the world that economic maturity will be achieved and that the age of high mass consumption is nigh.
- But that does leave a sort of "grim meat-hook future" for the outliers, which do not have the resources, political will, or external backing to become competitive.

Post-teaching

Assessment words (list the assessment words and explain them)

- Discuss to examine or investigate the various aspects of a statement by way of an argument.
- Explain to make clear or plain; to make sure the reader understands what is being said.
- Name to state something; to give a name; to mention.

QUESTION 1

1.1.	What Is a free-market economy?	(1 x 2) (2)
1.2.	Write a paragraph of not more than six lines to discuss why Rostow's theory has limitations.	(3 x 2) (6)
1.3.	Can technological transfer or acquisition enable an economy to skip early the stages stipulated by Rostow and achieve sustainable growth? Explain your answer.	still (2 x 2) (4)
1.4.	Name and explain Rostow five stages of development.	(5 x 2) (10)
		Grand Total = 22

MARKING GUIDELINE

- 1.1. Free-market economy: a system in which the price of goods and services is determined by the open market and consumers, and in which the laws and forces of supply and demand are free of intervention by government, a price-setting monopoly, or other authority.
 (2x1) = (2)
- 1.2. Rostow's theory provides economic progress as a linear system. This is false, as evidence is available of many countries making a false start by reaching a degree of progress and change and then slipping back, e.g. Russia slipped back from a high mass consumption economy to a country in transition, the main cause being the end of the Cold War and geo-political struggles. Another problem with Rostow's work has is that it only considered large countries with a large population and natural resources available at just the right time in its history (coal in Northern European countries), or with a large land mass, as being the only countries that can develop. What about small countries like Japan?

Furthermore, he has little to say and indeed offers little hope for small countries, such as Rwanda, which do not have such advantages. The model offers hope to much of the world that economic maturity will be reached, while the small countries that do not have resources, political will, or external backing to become competitive, have a bleak future.

In Rostow's model, growth becomes automatic by the time it reaches the maturity stage; but Kuznets asserts that no growth can be automatic - there is always a need for push. (3x2) = (6)

Yes. There is evidence of many countries making a false start, i.e. reaching a degree of progress and change and then slipping back, e.g. Russia slipped back from high mass consumption to a country in transition, the main cause being the end of the Cold War and geo-political struggles. (2x1) = (2)

1.3.

1.1.2 Traditional Society

Society is very primitive, with limited technology and reliance on subsistence farming. People rely on community bartering, rather than the advanced coinage system. Society is governed by a small wealthy ruling elite, who have strong traditional values. (2x1) = (2)1.1.3 Pre-conditions to "take-off" Citizens see possibilities for improvement. There is growing specialisation and commercialisation of skills and investment infrastructure. (2x1) = (2)1.1.4 Take-off Economic growth is self-sustaining. Huge technological advancements. Agricultural output increases, as do services. Political modernisation takes off. Urban plight and rural depopulation skyrockets. (2x1) = (2)1.1.5 Drive to Maturity The range of domestic production widens. The country replaces imports with domestic production. Increasing diversification and investment. It increases the need for innovation for efficiency gains in existing techniques. (2x1) = (2)1.1.6 Age of Mass Consumption Economy becomes heavily geared toward service provision. High quality world class infrastructure is now in existence and citizenry demand durable consumer goods. (2x1) = (2)Grand Total = 22

Geography

Subject	GEOGRAPHY	
Grade	11	
Торіс	GEOMORPHOLOGY	
Sub-topic	Mass Movements and Human Responses	
Lesson – content	concept of mass movements	
	• types of mass movements: soil creep, solifluction, landslides, rock falls and mud flows, and slumps	
	the impact of mass movements on people and the environment	
	• strategies to prevent or minimise the effects of mass movement – South African case studies.	

PRE-ACTIVITIES:

VOCABULARY: Resultant landforms				
Mass movement	Movement of weathered (broken) material down a slope.			
Soil creep	Slow movement of soil downslope by about 1mm/year.			
Solifluction	Slope movement of saturated (wet) soil at about 5-20cm/year			
Landslide	When a large land mass breaks loose and plunges (fall from a higher altitude) down a slope.			
Rockfall	Rapid movement of material up a slope exceeding 401.			
Mudflow	A stream of mud moves down a slope after heavy rain.			
Slump	Downward and outward movement of material along a concave (curves inward) rupture (break) surface.			

LANGUAGE USED IN GEOGRAPHY:

Impact: Possible effect - it could be either positive or negative.

Strategies: A plan of action designed to achieve a long-term aim.

DURING TEACHING:

- The teacher gives the glossary of terms and the explanations to the learners.
- Learners use diagrams to identify types of mass movements, as explained by the teacher.

Soil Creep: Figure 1



Soil creep: Figure 2



Soil Creep: Figure 3



Solifluction: Figure 4



Solifluction: Figure 5



Landslide: Figure 6



Landslide: Figure 7



Rock fall: Figure 8



Rock fall: Figure 9



Mud flow: Figure 10



Slump: Figure 11



SLUMP: FIGURE 13

The teacher explains conditions, processes and characteristics of each mass movement.

Mass movement	Another phrase / term is mass wasting: movement of weathered material down a slope	
Soil creep	Slow movement of soil downslope by about 1mm/year	The rate is less than 1mm/year. Terracettes (step-like features), bent tree trunks, cracks in walls and buildings.
Solifluction	Slope movement of saturated / waterlogged soil over frozen material. It moves at about 5-20cm/year in cold climates: ice.	Terracettes
Landslide	When a large land mass breaks loose and plunges down a slope. It moves as a single unit	A mass of material moving downhill. It is caused by earthquakes.
Rockfall	Rapid movement of the material of a slope exceeding 40 ^[] . Can be instant. Most common in cliff faces or very steep slopes of +40 ^[] .	Displaced rocks. Very dangerous. Rock. Rock piled at the bottom of the slope.
Mudflow	A stream of mud moves down a slope after heavy rain. Can move at a speed of 1 to 200km per hour.	Mud movement depends on the amount of water present and the slope. These occur in arid areas after heavy rain.
Slump	The downward and outward movement of material along concave rupture surface.	These occur along a surface break / rupture that is concave (curved inward). Scarp, swampy area, occurrence of ridges, can generate a tsunami.

Teacher teaches the impact of mass movement on people and the environment.

- Environmental: factor of erosion because it
 - o Carries and rolls from high altitudeBlocks rivers, damming the water to form lakes
 - Causes destruction of vegetation
 - Causes floods be damming up water
 - Pick up trees and rocks
- People:
 - People might lose their lives
 - Long term economic damage to railroads, building structures and underground pipes.Landslides cause loss of productivity of agricultural lands.
 - Interruption of transportation systems by landslides causes a loss of industrial productivity
 - Road closures force road users to take long detours.
- The teacher uses a recent South African case study on mass movements and prompts learners to develop strategies to minimize or prevent the effects of mass movement.
 - Plant natural vegetation on slopes
 - Safety nets to stop rockfalls
 - o Build drainage and run-off channelling structures to remove excess water
 - Build retaining walls
 - Fasten unstable rocks with rock bolts.

ASSESSMENT

- Defining: give the concise and clear meaning.
- Matching: make words / definitions correspond.
- Identifying: give the essential characteristics of ...
- Differentiating: show the difference between things.
- Accounting / reasoning / substantiating: explain the cause.
- Interpreting: give an explanation / the meaning of ...
- Paragraph writing

TASK

Read the information given below and study the accompanying sketches. Then answer the questions.

CAUSE AND MANAGEMENT OF MASS MOVEMENTS

Landslides cause destruction of lives and property and also displacement of large numbers of people. There are instances where whole villages have been totally destroyed by landslides.

Apart from the natural factors, man's unwarranted intervention with the environment by way of deforestation, cultivation on slopes, non-engineered construction, obstructing natural drainage, improper drainage, mining and quarrying causing artificial vibration coupled with continuous heavy rainfall or excessive rainfall, may lead to landslides.

The National Building Research Organisation (NBRO) of Sri Lanka is an institution responsible for giving timely information of an impending landslide. In order to identify landslide-prone areas, a Landslide Hazard Zonation Mapping project is in progress in this country. Research has been undertaken in respect of hydrology, geology, slope and soil types for identification of different hazard potential. The NBRO promotes the following:

- Mapping of the distribution of landslides hazard potential in the highlands of Sri Lanka.
- Introduction of standard guidelines and codes on practices for planning human settlements and infrastructure in the landslide-prone areas.
- Establishment of sustained long-term and short-term mechanisms for landslide disaster management in Sri Lanka.

Landslide occurrences are closely associated with rainfall. Therefore, the Meteorology Department also plays an important role by providing weather-related information.

The NBRO also promotes the creation of public awareness about causative factors of landslides. The factors that should be considered, while being watchful during heavy rainfall, can be summarised as follows:

- · Big boulders would start moving.
- · Trees would slant towards the slope.
- · Cracks would appear on the walls and other structures.
- Springs and water spouts would appear and there will be a rise in the water level.
- · The earth itself would show cracks and fractures.


Answers 1. Bulk movement of material down a slope under the influence of gravity (2) [Concept] $1 \times 2 = (2)$ 2. (i) = Q(2)Reason: Slope is gentle (2) Slow movement (2) [Any ONE reason] (ii) = P(2)Reason: Slope is steep (2) Fast movement (2) [Any ONE reason] $4 \times 2 = (8)$ 3. A scarp (P) and a dip (Q) slope (2x2=4) 4. Speed of the movement of material down the slope (2) Volume / quantity of material moving down the slope (2) [Any ONE] $1 \times 2 = (2)$ 5. Man's contribution: Deforestation destabilises a slope. (2) Cultivation on slopes destabilises the slopes. (2) Non-engineered construction of roads / railways loosens rock particles. (2) Obstructing natural drainage increases the amount of water in the soil. (2) Improper drainage increases the water in the soil. (2) Mining and quarrying loosens rock particles. (2) Economic consequences: Destruction of settlements (2) Destruction of infrastructure (2) Railway line blocked (2) Goods cannot be transported (2) Destruction of cultivated land (2) Expensive to rebuild (2) Loss of property (2) Measures: Concrete spraying on slopes (2) Building tunnel roofs (2) Wire mesh (2) Gabians (building retaining walls) (2) Drilling bolts into the side of a slope to stabilise the slope (2) Trigger artificial rockfalls to clear debris (2) Reforestation or revegetation (2) Putting up wire nets to catch falling rock particles (2) Mapping of landslide hazards (2) Guidelines for planning human settlements and infrastructure (2) Landslide disaster management strategies (2) Avoid developing settlements on slopes (2) No cultivation on slopes (2) [Must make at least ONE reference to each of the THREE aspects.]

[Single marks only if answered in point form and not in paragraph / essay style]

Subject	GEOGRAPHY		
Grade	11		
Торіс	Resources and Sustainability		
Sub-topic	Energy management in South Africa		
Lesson – content	South Africa's changing energy needs.		
	 Energy management, towards greener economies and sustainable life styles: responsibilities of governments, businesses and individuals. 		

PRE-ACTIVITIES:

VOCABULARY: Resultant landforms		
Energy management	Monitoring and control of energy use to ensure efficiency	
Greener economy	Economy aimed at <u>reducing environmental risks</u> (dangers) and ecological scarcity (resource shortages) that aims at sustainable development without degrading the environment.	
Sustainable	Protecting the resource / environment for future usage.	
	It is aimed at reducing the carbon footprint by altering the methods of transport, energy consumption and diet.	
Non-conventional energy	Energy sources that are renewable or inexhaustible and do not cause pollution	
Solar energy	Energy source generated from the sun	
Wind energy	Energy generated by wind power	
Carbon footprint	A measure of the impact our activities have on the environment, and climate change in particular.	

LANGUAGE USED IN GEOGRAPHY:

DURING TEACHING:

- Introduce the topic by defining what energy management means and give examples from conventional energy (preceding lesson).
- Learners study the graph below on total carbon emissions.



Each Country's Share of 2011 Total Carbon Dioxide Emissions from the Consumption of Energy

2011 Country Rank Total Carbon Dioxide Emissions from the Consumption of Energy (Million Metric Tons)



http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html#.WZ_PzkFvHhc

- Teacher facilitates the interpretation and analysis of graphs:
 - Reading (direct reading)
 - o Contribution of each country to the total carbon emission
 - o Trend in emission in relation to the level of development
 - Possible causes of / reasons for such trends
- Teacher leads the discussion on how to manage energy in South Africa.
- Each learner writes a paragraph on sustainable lifestyles geared towards a greener economy.
- Each learner writes an essay on the responsibility of governments, businesses and individuals in terms of energy management.
- The best essay should be presented to the SGB / parents.

ASSESSMENT

- Identify: give the essential characteristics
- State: present the information plainly without discussion
- Analyse: examine (something) methodically and in detail, typically in order to explain and interpret it.
- Account: explain the cause of / explain why
- Essay writing

Task (Based on the figures that show countries' emissions of CO2)

- 1. According to the bar graph, which country contributes the least?
- 2. Name the TWO countries with the highest carbon emissions in 2011.
- 3. Describe the trend in carbon emissions in relation to the country's level of development.
- 4. Account for the rate of carbon emissions in South Africa.
- 5. Write an essay on how the government, businesses and individuals can contribute to a greener economy.

Answers:

- 1. Poland
- 2. China and USA
- 3. More developed countries have higher carbon emissions; less developed countries are associated with lower carbon dioxide emissions.
- 4. SA still uses conventional energy generated from coal, non-conventional energy steadily introduced. The lifestyles of most citizens are not yet sustainable. An increase in wealth increases consumption. There is a high demand for an increase in energy.

	Criteria			Points	
	1	2	3	4	
Organization	Sequence of information is difficult to follow.	Reader has difficulty following work because student jumps around.	Student presents information in logical sequence which reader can follow.	Information in logical, interesting sequence which reader can follow.	/15
Content Knowledge	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with content and is able to demonstrate basic concepts.	Student is at ease with content, but fails to elaborate.	Student demonstrates full knowledge (more than required).	/50
Grammar and Spelling	Work has four or more spelling errors and/or grammatical errors.	Presentation has three misspellings and/or grammatical errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.	/10
Neatness	Work is Illegible.	Work has three or four areas that are sloppy.	Work has one or two areas that are sloppy.	Work is neatly done.	/10
References	Work displays no references.	Work does not have the appropriate number of required references.	Reference section was completed incorrectly	Work displays the correct number of references, written correctly.	/15
				Total>	



Subject	GEOGRAPHY
Grade	12
Торіс	Geomorphology
Subtopic	Fluvial processes
Lesson – content	Identification, description and formation of fluvial landforms.

PRE-ACTIVITIES:

VOCABULARY: Resultant landforms			
Erosion	The action by which the earth is worn away by water, wind or ice.		
Headward erosion	A river lengthening its course by cutting upstream above its original course.		
Fluvial	Related to rivers / caused by rivers.		
Meander: undercut slope Slip-off slope	Occurs when the river winds / bends from one side to the next due to the gentle gradient, which results in undercut (outer) and slip-off (inner) slopes.		
Oxbow lake	An oxbow lake starts out as a curve, or meander, in a river. A lake forms as the river finds a different, shorter, course. The meander becomes an oxbow lake along the side of the river.		
Sand island	Patches of sand / other alluvium exposed above the water in a river		
Braided stream	A river that splits into separate channels as alluvium is deposited.		
Flood-plain	Flat valley floor caused by the deposition of material.		
Natural levee	The raised banks of a river formed when a river floods.		
Waterfall	This forms when a river crosses a layer of resistant rock that dips upstream then flows down a steep gradient.		
Rapid	A resistant layer of rock causes a slight change in the gradient and turbulent flow of the river.		
Delta	It is formed by deposition by a river as it enters the sea / a lake.		
V-shaped river	A river with a steep gradient formed by river erosion.		

LANGUAGE USED IN GEOGRAPHY:

Relief: the highest and the lowest elevation points in an area.

Spur: the ridges of high ground between individual channels.

Widening: an increase in stream channel width caused by erosion.

Deposit: the build-up / addition of sediment, soil and rocks on a landform / land mass or the dropping of eroded material.

DURING TEACHING:

- Introduce the topic by finding out what the learners already know about erosion.
- Ask the learners to read through the section on fluvial landforms in their textbook and identify new words.
- Learners write new words in their books, and the teacher explains the new terms.
- The teacher explains how the fluvial landforms result (explaining the new words) with the aid of pictures / diagrams while learners take notes.

Fig. 1: Fluvial Landforms



How a waterfall results from rapids



Floodplain showing meander landforms



Picture of a sand island



Delta



How levees build up.

Pictures taken from Google: 24/08/2017

- Teacher discusses and gives notes on the uses of different landforms. Erosional landforms: aesthetical / tourist attraction, water source Depositional landforms: water source, best for agricultural activities
- Using the 1: 50 000 topographical maps available at the school, learners should identify the fluvial landforms and discuss the lead to such identifications with assistance from the teacher.
- **Conditional**: The energy of a river / its erosive power depends on the volume of water, gradient and depth of the river. If the energy level is high, the river will have a higher erosive power and carrying capacity.

ASSESSMENT

- Label: give the name of the thing
- Name: provide the name without explanation
- Identify: select and name
- Describe: give a mental picture, e.g. main aspects / characteristics / processes
- Paragraph writing: refining, explaining your ideas in coherent sentences
- Predicting: suggest what will happen / what will be the consequences

Task





Label l	abel landforms 4, 6 and 10.	
1.	Explain how landform 8 is formed.	(2 x 2) (4)
2.	What geomorphological name is given to 1?	(1 x 1) (1)
3.	Identify and describe the kind of erosion that will take place at 1.	(3 x 1) (3)
4.	The meandering river winds from 1 side to the next. With the help of a cross section diagram, describe the formation of the slip-off and undercut banks.	(4 x 2) (8)
5.	Discuss two factors that could result in a drainage basin having a high drainage density.	(2 x 2) (4)
6.	In a paragraph of not more than EIGHT lines, explain the negative impact on the farmer if the river breaks through feature 9.	(4 x 2) (8)

Marking guide

- 1. 4 waterfall 6 levee 10 delta
- 2. Feature 8: An oxbow lake is formed when more deposition takes place in the inner bend and more erosion takes place on the outer bank. This increases to a point where the neck is cut off from the main stream, creating a U-shaped / crescent-shaped body of water.
- 3. Source
- 4. Headward erosion: when the stream lengthens by moving back away from the direction of flow
- 5.



In the bend (B), the water flows faster than at the outer bend (A), so erosion occurs at this point, forming an undercut slope at **B**. At the inner bend, the speed is slower, so material is deposited there, which forms a slip-off slope (A).

- An increase in precipitation will increase the number of streams. PP Saturated soil increases run-off, and more streams are formed. Low permeability results in run-off and the development of streams. Sparse vegetation increases run-off and more streams form. Steep gradients increase run-off and more streams develop.
- 7. Cropland is swept away
 Flooding damages crops
 Fertile soil / silt is lost through soil erosion
 The soil becomes over-saturated
 Flooding increases
 Swamp conditions start to develop
 It becomes difficult to contain / control water in the channel
 The soil is no longer suitable for the original crops that were grown
 There is loss of income / employment
 There is shortage of food for the smaller subsistence farmer

Subject:	Geography
Topic:	Sub-tropical Anti-cyclones and Associated Weather Conditions
Sub-topic	Travelling disturbances associated with anti-cyclonic circulation
Lesson – content	Moisture front, line thunderstorms, coastal low-pressure systems, South African berg winds

Pre-activities

Vocabulary: meaning of words and context of use

Moisture front / boundary: A zone separating warm and dry air masses.

Moisture: the amount of water vapour present in the air.

Front: an area that separates two air masses.

Line thunderstorms: A violent storm or a series of storms of rain and wind believed to take place during the Equinoxes.

Thunderstorm: a violent, short-lived weather disturbance that is almost always associated with lightning, thunder, dense clouds, heavy rain or hail, and strong, gusty winds.

Weather: the state of the atmosphere at a place and time in terms of heat, cloudiness, dryness, sunshine, wind, rain, etc.

Equinoxes: the time or date (twice a year) on which the sun crosses the celestial equator, when day and night are of equal length (about 22 September and 20 March).

Coastal low-pressure systems: A *coastal* low is a shallow *low-pressure* system that is limited to the lower layers of the Atmosphere. It is formed when the wind blows from the land to the sea, usually during berg wind conditions.

Coastal: refers to the boundary between the land and the ocean.

Low-pressure: a condition of the atmosphere in which the pressure is below average.

Berg wind: a hot dry wind blowing down the Great Escarpment from the high central plateau to the coast.

It comes from the Afrikaans word **berg** «mountain» + "wind", i.e. a mountain wind) and is the South African name for a katabatic wind: a hot dry wind blowing down the Great Escarpment from the high central plateau to the coast.

A berg wind is a hot, dry wind blowing off the interior plateau of South Africa, roughly at right angles to the coast.

Kalahari high-pressure cell

Mid-latitude cyclone

High-pressure system

Teaching:

Introduction to lesson: Questions based on travelling disturbance

Moisture front

Formation of Moisture front:

- o It develops in summer when the land heats up enough to cause low-pressure cells in the interior of the country.
- It develops where the cool dry air from the South West pushed into the country from the South Atlantic HP meets the warm moist air coming from the North East (South Indian HP). See Figure 1.

Figure 1: Sketch from Telematics 2015



- The cool air lifts the warm air and **line thunderstorms** develop along this front.
- These thunderstorms will form in a line on the north east of the **front** and can extend laterally for hundreds of kilometres.

Weather associated with a line thunderstorm:

They are usually accompanied by strong winds, heavy rain, and sometimes snow, sleet, hail, or, in contrast, no precipitation at all. Theyoccur in association with a type of cloud known as a **cumulonimbus**.

Coastal low-pressure systems

- These develop during summer and winter in South Africa.
- These low-pressure systems cause completely different weather on either side of the pressure cell.
- The air moves in a clockwise direction around the cell.
- On the one side of the pressure cell, air will move from land to the sea and will cause warm, dry and light offshore wind conditions.
- On the other side of the pressure cell, where the air moves from sea to land, moist cloudy and breezy onshore weather conditions will develop, which can lead to rainfall along the coastline (more along the east coast).

This is due to a combination of the clockwise airflow around the Coastal Low and its migration from west to east. See the coastal low-pressure cells along the coast of South Africa in Figure 2 below.

Figure 2: Coastal low-pressure systems /cells



Berg winds

Formation of berg winds:

Berg winds usually occur in winter, when there is a low-pressure system along the coastal areas and a high-pressure system over the continent.

Ahead of the mid-latitude cyclone, berg wind conditions occur, as air flows from the Kalahari High-pressure cell to the costal low-pressure system.



Google image: 23/08/2017

High-pressure and **Low-pressure** systems develop with the approach of a **mid-latitude cyclone**. As a result, there is a strong **High Pressure** over the interior and a low pressure along the coast. The wind blows from the high pressure area to the low pressure area. As the air drops down the **escarpment**, it heats up **adiabatically** at 1°C per 100m and becomes drier and hotter. This causes hot, dry uncomfortable conditions that are generally quickly replaced by cold conditions associated with the cold front.

These conditions may cause veld fires.

Characteristics of Berg Winds

It is a warm dry **wind** at the coast which blows from April to September. Temperatures of 42°C at midday and 36°C at midnight have been recorded in Durban. Berg winds blow from the **interior** down the **escarpment** mountains to the coast. See berg wind conditions in the diagram:

Assessment

Question 1

1.1 Refer to the figure below, which shows the formation of a storm line.

Figure 1.1. Line Thunderstorm



Gr.12 Nov. Question Paper, November 2008

1.1.1	What is meant by the term 'storm line'?	(1 x 2) (2)
1.1.2	Describe some of the processes (air movement, influx of air) that lead to line thunderstorms occurring.	(3 x 2) (6)
1.1.3	What name is given to the band of low pressure that extends across the South African interior along which line thunderstorms develop?	(1 x 2) (2)
1.1.4	Do line thunderstorms develop on the eastern or western side of the band of low pressure mentioned in Question 2.1.3?	(1 x 2) (2)
1.1.5	Discuss the consequences of line thunderstorms for farming activities in South Africa's interior.	(2 x 2) (4)



Markiı	ng Guideline	
1.1.		
1.1.1	(a) Late autumn / winter (2)	1x2 = (2)
	(b) Clear sky / no clouds / cloud cover 0/8 (2) High temperatures (2)	2x2 = (4)
	(c) Air subsides down escarpment / adiabatic heating (2) Subsiding air heats up. (2)	
	Subsiding air does not allow for condensation (2) Subsiding air becomes drier. (2)	
	[Any TWO]	2x2 = (4)
	(d) Veld fires (2)	1x2 = (2)
	(e) Mid-latitude cyclone (2)	1x2 = (2)
2.1.		
2.1.1.	A <i>coastal</i> low is a shallow <i>low-pressure</i> system limited to the lower layers of the Atmosphere; it is formed when the wind blows from the land TO the sea.	(1x1) (1)
2.1.2.	Coastal lows are characterized by a significant change in weather from warm, dry and light offshore wind conditions to cooler, moist and breezy onshore weather.	(2x2) (4)
3.1.		
3.1.1	A band of low pressure over land stretching, from the NW to the SE and along which line thunderstorms occur (2) [Concept]	(1 x 2) (2)
3.1.2	Cold, dry air moves over the country from the SW. (2) Warm, moist air moves over the country from the NE.	
	(2) Cold, dry air meets warm, moist air over the interior. (2) Warm moist air is forced to rise rapidly and very high.	
	(2) Large scale cooling and condensation results in thunderstorms. (2) [Any THREE]	(3 x 2) (6)
3.1.3	Moisture front / Trough line (2)	(1 x 2) (2)
3.1.4	Eastern (2)	(1 x 2) (2)
3.1.5	Large scale soil erosion. (2) Damage to crops. (2) Damage to livestock. (2) Lightning sets The veld on fire.	
	(2) Huge economic losses. (2) It does bring some water to the interior. (2) [Any TWO]	(2 x 2) (4)
	TOTAL	MARK = 37



History

Subject:	History
Grade	10
Торіс:	European Societies
Lesson – content	How did feudalism affect societies in Europe during the middle ages? - The Black Death
	Language aspects covered
 Pre-activities Vocabulary Language used in the subject Prediction 	 Vocabulary: meaning of words and context of use: The Teacher creates an environment for learners to discuss the following terms as a baseline assessment [Recognition of prior learning]: Trade: The exchange of goods between people. Architecture: Forms of buildings / structures, e.g. castles. Feudalism: A system of class distinction. Black Death: An epidemic that killed people in Europe during the Middle Ages. Renaissance: A period of re-awakening. Learners should take note of the action verbs before responding to a question. Explain the following terms: Explain: To make an idea or a situation clear to ensure that someone can understand it. Why: Give a reason for / the cause. Define: Give a description of (a term or concept). What: State or list reasons, name, year, etc.
	Compare: Examine two different sources to understand how they are similar or different.
During teaching Introduction of topic:	Introduction: The teacher gives a preview of Europe during the Middle Ages. Europe was isolated, backwards and its influence on the world outside its borders was as yet insignificant.

Presentation / Body	Main presentation [Note taking]
	There was no political unity.
	There were continual threats from the Vikings and the Ottoman Empire.
	This led to the development of the feudal system.
	The main two features of this system were churches and castles.
	People prayed for protection against invaders.
	Castles were built for protection against invaders.
	It was a system designed for a region that was always at war.
	the educator explains terms like feudal, nobles, lord, knight, peasant
	• Explain the timeline of history of Europe from ancient history to modern history and the timeline of events from the fall of Constantinople
	In the 14th century, a terrible plague (bubonic plague) hit Europe.
	This plague was called the Black Death.
	 It was brought to Europe by trading ships that had been to the Crimea.
	 It was caused by germs breeding in the blood of certain fleas.
	• In humans, the germs caused haemorrhaging. Dark patches would appear all over the body, the tongue would turn black, and swellings and sores would appear under the arms and in the groin.
	There was no cure. People died quickly.
	The plague resulted in thousands of deaths.
	Some villages were wiped out.
	Britain lost half its population.
	 This terrible disease helped the peasants, because it meant more opportunities for them, as fewer people were left alive.
	Those who survived were in a stronger position to sell their labour.
	They could bargain and work in the best conditions offered.
	This was the beginning of the end of the feudal system, as many peasants moved to towns.
Assessment	SOURCE 1 A
Marking Guideline	The following source highlights the impact of feudalism in Europe.
	The period 410 AD to 1500 AD in Europe is known as the Middle Ages or Medieval Period. Society was characterised by two dominant social forces, namely,the Feudalism and the growth of larger states for protection.
	Feudalism was a rural class system based on ownership of large estates. It was a system of economic and social control that
	Divided people into two classes. The nobility (the lords) owned the farms and peasants (serfs) worked on the land. The serfs worked the land without pay, had to give some of their crops to the lord and had to pay taxes to use the lord's land, mill and oven.
	It was characterised by the belief that God's authority was exercised on Earth through the Pope and the king. The feudal system benefited medieval state because it kept the nobility rich and the peasants poor.
	The feudal system did not encourage high production, as the peasants had no incentive to produce more. The fall of feudalism was sparked, in part, by noblemen realising that all classes must unite in order to prosper.
	There was no political unity in Europe before the fifteen century. There were many small, independent landowners, who were Roman Catholics. Independent landowners united under the control of a king, because of an increased need for protection from common enemies.
	From 'In Search of History'

Study Source 1A to answer the following questions	
1.1.1 According to the source, which period is classified as the Middle Ages?	1 x 2 (2)
1.1.2 What do you understand by the term Feudalism?	1 x 2 (2)
1.1.3 Use the source and your own knowledge to give a reason for the failure of the feudal	
system in Europe.	2 x 2 (4)
Marking memorandum	
1.1.1 [Extraction of information from the source]	
• From 1410 AD to 1500 AD	1 x 2 (2)
1.1.2 [Explanation of a concept – L1]	
Feudalism: A system of class distinction (land owners and tenants)	
Any other relevant response	1 x 2 (2)
1.1.3 [Interpretation of information from the source – L2]	
 The feudal system did not encouraged high production as the peasants had no incentive to produce more 	
 There was no political unity in Europe before the fifteen century 	
Any other relevant response	2 x 2 (4)

Subject:	HISTORY
Торіс:	The world in 1600
Lesson – Content	Songhai - an African Empire in the 15 th and 16 th century
	Language aspects covered
 Pre-activities Vocabulary Language used in the subject Prediction 	 Vocabulary: meaning of words and context of use: The Teacher explains the following terms in detail: Empire: a state that is ruled by an Emperor. Expansion: a powerful state that increases its territory by over-powering an inferior state. Feudalism: a system of class distinction. Tyrant: a cruel ruler / one who rules with an iron fist. Learners should take note of action verbs used in the formulation of essay questions, e.g. A learner should take a stance by <u>agreeing or disagreeing</u> Explain to what extent: Learners should view both options and make a decision as to which one was more / less successful than the other. Critically discuss: Look carefully at both sides and further clarify both sides of the topic under discussion. /
	Critically refer to both the positives and the negatives of the topic under discussion.
During teaching	Lesson presentation [Note taking]
Introduction of topic:	• Songhai was a West African empire that rose to prominence after the decline of the Mali empire. It became known for its wealth and learning.
	• It became very powerful because of its strong army, mineral wealth, rich agriculture and fishing.
	• Its most important rulers were Sunni Ali the Great (1464-1492) and Muhammad Ture (1493-1528).
	• Sunni Ali was the founder of the Songhai Empire and he excelled in creating a strong army and forging unity in government and empire.
	Muhammad Ture excelled in promoting trade, culture and learning.
	The rulers of Songhai were hereditary tyrants.

Presentation / Body	• The educator explains Sunni's style of governing, his attitude to religious worship and how he allowed all individuals to prove their worth.
	Compare the Songhai with the Ming Dynasty: unlike the Ming Dynasty, Sunni Ali kept slaves.
	Sunni Ali the Great:
	 Supporters of Sunni Ali who benefited from his rule would have thought he was great because: He con- trolled a vast empire.
	 He generated great wealth through trade.
	 He encouraged religious tolerance.
	 He encouraged military promotion based on merit.
	• He inspired confidence.
	Sunni Ali the Great Oppressor:
	People regarded Sunni Ali as a great oppressor because:
	 He was a powerful military ruler / tyrant.
	 He put governors loyal to him in charge of the provinces and ignored / got rid of local leaders.
	 He did not encourage scholarship in Timbuktu.
	 Islamic leaders (ulama) did not approve of religious tolerance.
	 They favoured a state based on Islamic law.
	 They wanted to play a greater role in the running of the country.
Assessment	Explain to what extent the rise of Sunni Ali transformed (changed) Songhai into a powerful empire. [50]
Marking Guideline	Summerie: Learners are expected to explain to what extent the rise of Suppi Ali transformed (changed) Sanghai
	into a powerful Empire
	Main Aspects:
	Introduction : Learners should take a stance, and support it, on the extent to which Sunni Ali transformed (changed) Songhai into a powerful Empire.
	Elaboration:
	[Learners should make use of the PEEL method in developing and sustaining their line of argument.]
	• Excelled in creating a strong army and forging unity in government and empire. Educator explains Sunni's
	style of governing, his attitude to religious worship and how he allowed all individuals to prove their worth.
	Muhammad Ture excelled at promoting trade, culture and learning.
	Ihe rulers of Songhai were hereditary tyrants.
	Compare the Songhai with the Ming: unlike the Ming Dynasty, Sunni Ali kept slaves.
	He generated great wealth through trade.
	He encouraged religious tolerance.
	He encouraged military promotion based on merit.
	He inspired confidence.
	He put governore level to him in oberge of the provinces and ignored / get rid of level leaders
	He did pet encourage scholarship in Timbuldu
	Ine du not encourage scholarsnip in Hillbuktu. Islamic leaders (ulama) did not approve of religious telerance
	The ulama favoured a state based on lelemic lew
	The ulama wanted to play a greater rele in the running of the sountry
	Conclusion: Learners should tie up their argument with a relevant conclusion

Subject:	History Grade 11 (Paper 2)
Торіс:	Nationalism – South Africa
Lesson – content	How did Afrikaner nationalism grow in South Africa? (Essay lesson)
	Language aspects covered
Pre-activities	Vocabulary: meaning of words and context of use: [Recognition of prior knowledge]
 Vocabulary Language used in the subject Prediction 	 The teacher (orally) test learners' pre-knowledge of the following concepts / terms: Nationalism - derived from nation; Great Trek; Centenary celebration. Providing a scenario of a family or community can give learners a clue of what to expect and will prepare them to understand nationalism.
During teaching	Lesson presentation
Introduction of topic:	Introduction: The teacher should unpack these concepts / terms:
	 Great Trek: the movement by many Voortrekkers from the Cape to the interior for occupation of land and self-rule.
	 Voortrekkers: The first group of Afrikaners who moved from the Cape to the interior for self-rule away from British colonial control.
	 Nationalism: a sense of belonging together of people sharing a common identity through aspects such as culture, language, etc.
	 Centenary celebration: centenary refers to a period of 100 years. Centenary celebration refers to a celebration that occurred 100 years (in 1938) after the Great Trek took place (in 1838).
	 Segregation: A policy of separating people because they come from different races or tribal groups; in this case, a policy practised by Afrikaners to exclude, undermine and oppress other racial groups.
	Die Federasie van Afrikanes Kultuurvereniginge (FAK) Church – Dutch reformed church Afrikaner nationalism
	Afrikaner print- media Afrikaans Language Movement Reddingsdaadbond (Volkskapitalisme) Business & Investment

Assessment	Explain to what extent various Afrikaner structures contributed to the rise of Afrikaner Nationalism.
	Introduction: Learners should take a stance and explain the extent to which various Afrikaner structures contributed to the rise of Afrikaner Nationalism.
Marking Guideline	Main Aspects: Learners should make use of the PEEL method in developing and sustaining their line of argument.
	Afrikaner Broederbond
	Afrikaans Language Movement
	Afrikaans print media
	Dutch Reformed Church
	FAK (Die Federasie van Afrikaanse Kultuurvereniginge)
	Reeddingsdaadbond
	 Conclusion: Learners should tie up their argument with a relevant conclusion

Subject:	History Grade 11 (PAPER 2)
Topic:	Apartheid in SOUTH AFRICA - 1940s TO 1960s
Lesson – content	What was the nature of internal resistance to apartheid in South Africa before 1960? (source-based lesson)
	Language aspects covered
Pre-activities	Vocabulary: meaning of words and context of use:
Vocabulary	• Recognition of prior knowledge: The teacher tests learners' pre-knowledge orally, by asking if they have
 Language used in the subject 	ever written a list of complaints / demands to any level of authority. The explanation of the terms / concepts should be in the context of internal resistance in SA before 1960.
Prodiction	 Grievances (list of complaints against some form of authority, which should be addressed)
• Frediction	 Petition (demands submitted to an authority for implementation)
	 Delegation (a group of people sent to the authority to submit or present the concerns of a bigger group)
	 Defiance as in defiance campaign (intentionally do the opposite of what should be done, with the fully understanding of the result thereof)
	 Learners should take note of action verbs before responding to a question, e.g. Explain the term; Explain why; Define; What do you understand by; Compare; etc.
During teaching	Lesson presentation
	Main presentation: [Note taking]
	Non-violent forms of resistance:
	 Petitions
	 Delegation (1914 – 1916) – after the 1913 Land Act
	 Defiance campaign (1952)
	 Marches, e.g. leading to the Sharpeville massacre (1960)
	Resistance becoming violent:
	 Programme of Action (1944)
	 Armed conflict (1960 – after Sharpeville massacre)
	 Rivonia Trial

Assessment	WHAT LED TO THE SHARPEVILLE MASSACRE?
Marking Guideline	SOURCE 1A (READ)
	This source, from the <i>Sunday Nation of Nairobi</i> (22 February 1976), sheds light on the Sharpeville massacre (21 March 1960).
	On the eve of the march, Sobukwe in his speech said: "Sons and daughters of the Soil, Remember Africa! The step we are taking is historical, pregnant with untold possibilities. We must, therefore, appreciate our role. We must appreciate our responsibility. The African people have entrusted their whole future to us. And we have sworn that we are leading them, not to death, but to life abundant. My instructions, therefore, are that our people must be taught NOW and CONTINUOUSLY THAT IN THIS CAMPAIGN we are going to observe ABSOLUTE NON-VIOLENCE!"
	(In the morning of the day of the march) the PAC task force members started out before the break of dawn lining up marchers in street after street In line with the instruction of the Party leadership, when all the groups had been assembled, the 10,000 and more men, women and children proceeded to the local police station - chanting freedom songs and calling out campaign slogans " <i>Izwe lethu</i> " (Our land); " <i>I Africa</i> "; " <i>Awaphele amapasti</i> " (Down with passes); " <i>Sobukwe Sikhokhele</i> " (Lead us Sobukwe); "Forward to Independence, Tomorrow the United States of Africa"; and so on and so forth.
	When the marchers reached the Sharpeville police station, a heavy contingent of police was lined up outside, many on top of British-made Saracen armoured cars The chanting of freedom songs was picking up and the slogans were repeated at greater volume But shortly after the PAC branch leaders had been let through into the police station, without warning, the police facing the crowd opened fire and in two minutes hundreds of bodies lay sprawled on the ground like debris. The joyful singing had given way to murderous gunfire, and the gunfire was followed by an authentic deadly silence, and then screams - wild screams - and cries from the wounded.
	Littering the ground in front of the police station and in nearby dusty streets were 69 dead and nearly 200 injured men, women and children - a revolting sight that appalled decent human beings the world over, as pictures of the massacre spread around the world.
	Source: Saho.htm: The Sharpeville massacre: its historic significance in the struggle against Apartheid. Accessed: 2 March 2012
	SOURCE 1B (VIEW)
	This photograph depicts the crowd running away on the day of the Sharpeville massacre (21 March 1960) as the policemen started shooting at them.



Source:http://media.photobucket.com/image/Sharpeville%20massacre/ProfessorofTruth/ Protest/AzaniaSharpevilleMassacre-2.jpg?0=1 Accessed on: 07 March 2012

SOURCE 1C (READ)

This source is the Apartheid government's report on the Sharpeville massacre that was published in The Cape Times on 22 March 1960 (the day after the Sharpeville massacre).

Dr Verwoerd, the Prime Minister, making a further statement about the riots, said the latest information was that 49 Bantus were killed and 156 wounded in the disturbances at Sharpeville Bantu Township near Vereeniging.

... At Sharpeville, Colonel Pienaar, in command of the police there, had to force his way through a crowd of about 20,000 Bantu who had surrounded the police station.

... Stones rained on the police and the mob advanced on them. Colonel Pienaar then gave orders for the police to load. At that moment three shots were fired at the police from within the Bantu crowd. The shouting crowd advanced and the police fired a volley with stun guns and 303s, without the order being given to fire.

... He regretted that the effect of all the propaganda of the past years had brought the government's handling of Bantu affairs under suspicion and these people had now been instigated to try the impossible and challenge the authority of the state.

From: Saho.htm: Archive Sharpeville massacre 1960. Accessed: 7 March 2012

SOURCE 1D (READ)

This source elaborates on the impact of the Sharpeville massacre after March 1960.

This massacre created a crisis for the apartheid government, both inside the country and internati government immediately declared a State of Emergency and banned political meetings. Within I month, it banned both the Pan Africanist Congress, which had organized the action in Sharpevil African National Congress. After lengthy internal discussions, the ANC and PAC turned to armed si went underground.	onally. The ess than a e, and the ruggle and
From: http://overcomingapartheid.msu.edu/multimedia.php?id=13. Accessed on 7 March 2012	
Use Source 1A and your own knowledge to explain the concept <i>non-violence</i> .	,
• According to Source 1B, the police force opened fire without warning. What does this imply?	1 x 2 (2)
• Explain how useful Source 1A could be to a historian doing research on the Sharpeville massac	e. 2 x 2 (4)
• Refer to sources 1A and 1B . Explain how the two sources support each other regarding the action of the police officials.	2 x 2 (4)
• Using information from relevant sources and your own knowledge, explain circumstances that led to the Sharpeville massacre.	(8)
 [Explanation of a historical concept in Source 1A – L1] A peaceful process or march that does not involve harm, in this case a peaceful march against pass laws. 	(1 x 2) (2)
2. [Interpretation of information from Source 1B – L2]	
They were violent; police brutality; disregard for human rights	(1 x 2) (2)
3. [Evaluation of usefulness of Source 1A – L3]	
 It provides the exact words used by the leader of the PAC, R Sobukwe, who played a leadership role in the march. 	
It elaborates on the slogans chanted during the march.	
It reflects the incident as it happened.	
Any other relevant response.	(2 x 2) (4)
4. [Comparison of Sources 1A and 1B – L3]	
 Source 1A refers to police on top British Saracens, while Source 1B shows police on top of British Saracens and in a good position to can take aim at the marchers. 	
 Source 1A mentions police lining up and opening fire without warning, while Source 1B show marchers running away after police had opened fire on them. 	S
Any other relevant response.	(2 x 2) (4)
5. [Analysis and evaluation of information from Sources – L3]	
Dissatisfaction of Africans (blacks) about apartheid laws. (Own knowledge)	
Protest by Africans in Sharpeville against Pass Laws. (Source 1A)	
Demonstrations through burning their dompasses. (ID books) (Source 1A)	
Marching to the police station. (Source 1A)	
Brutality by the police. (Source 1A and 1B)	
Fear or inexperience by the police / police inconsiderate. (own knowledge)	
Any other relevant response.	(8)

Subject:	History GR 11 Lesson - Communism
Торіс:	Communism in Russia - 1900 to 1940
Content	How was communism applied in Russia under Stalin?
	Language aspects covered
 Pre-activities vocabulary language used in the subject prediction 	 Vocabulary: meaning of words and context of use: The teacher tests the learners' pre-knowledge by allowing them to discuss (in groups) their understanding of the following concepts. Communism: An ideology that is aimed at establishing a moneyless and classless society based on communal ownership of the means of production - services and property. Socialism: According to Marxist theory, the phase that is implemented after capitalism on the way to communism. It is a system of ownership and control of the means of production being in the hands of the community. Soviet: A workers' council; a citizen of the Soviet Union (USSR) after 1923. Collectivization: A policy of consolidating individual ownership of land into large collective or communal farms. Gosplan: The State Planning Commission in Russia that formulated the Five-Year Plans to solve Russia's economic problems. Learners should take note of the action verbs before responding to questions, e.g. A learner should take a stance by <u>agreeing or disagreeing</u>. Explain to what extent - Learners should view both options and make a decision as to which one was more / less successful than the other. <u>Critically discuss -</u> Look carefully at both sides and further clarify both sides of the topic under discussion. / Critically refer to both the positives and the preatives of the topic under discussion.
During teaching	Introduction
During teaching	Stalin's interpretation of Marxism-Leninism
	 The teacher should highlight leadership under Lenin so that they anticipate (predict) leadership under Stalin
	 Marx and Lenin believed that communism must serve the people. Under Stalin, the people served communism.
	 Under Stalin, people's needs were sacrificed for the needs of the state.
	Main Body: Lesson presentation (Note taking)
	Stalin's First Five-Year Plan: Collectivization
	Industrialisation
	Collectivization of agriculture.
	• Gosplan, the state planning agency, drew up targets for production for each factory. The first two plans concentrated on improving heavy industry, i.e. coal, oil, steel and electricity.
	• The First Five-Year Plan called for transforming Soviet agriculture from predominantly individual farms into a system of large state collective farms.
	• The anticipated surplus was supposed to pay for industrialization. Collectivization was further expected to free up many peasants for industrial work in the cities and to enable the party to extend its political dominance over the remaining peasantry.
	• Stalin focused particular hostility on the wealthier peasants, or kulaks. About one million kulak households (some five million people) were deported and never heard from again.
	• Forced collectivization of the remaining peasants, which was often fiercely resisted, resulted in the disastrous disruption of agricultural productivity and a catastrophic famine in 1932-33.
	• Although the First Five-Year Plan called for the collectivization of only twenty percent of peasant households, by 1940, approximately ninety-seven percent of all peasant households had been collectivized and private ownership of property had been eliminated almost entirely.

Assessment Marking Guideline	Explain to what extent Stalin succeeded in transforming Russia from a backward agricultural state into a modern industrial state. [50]
	COMMUNISM IN RUSSIA 1900-1940
	SYNOPSIS
	Candidates should indicate the extent, whether greater or lesser, to which Stalin succeeded in modernising Russia. The content focus must be on economic development and planning under Stalin and the impact thereof on Russia. Having taken a stand, the candidate must maintain a clear line of argument in support of the viewpoint taken.
	MAIN ASPECTS
	INTRODUCTION The candidate should take a stance and indicate how he / she will support it. It should focus
	on Stalin's efforts to consolidate communism in Russia and the modernisation and economic development of Russia through the Five-Year Plan Programme.
	ELABORATION Election of Stalin as the leader of Russia after Lenin Stalin's opposition to the NEP – withdrawal of the NEP Stalin's objectives – Economic Development and Planning First Five-Year Plan Industrialisation Collectivisation (Agriculture) Mining Role of Gosplan Closed nature of Russian society Any other relevant response
	CONCLUSION Candidates should tie up the argument with a relevant conclusion that is in keeping with the line of argument. [50]

Subject:	History GR 12 (PAPER 2)
Торіс:	What was the nature of civil society resistance after THE 1960s?
Lesson – content	What was the impact of the international response to apartheid in South Africa?
	Language aspects covered
Pre-activities:	International Response to Apartheid by the Anti-Apartheid Movements from Britain, Ireland and other Western European countries
Vocabulary	Vocabulary: meaning of words and context of use:
Language used in the subject	 The explanation of the terms / concepts should be in the context of historical developments in the international response to Apartheid.
Prediction	 Apartheid: A policy used by the National Party government to separate people in South Africa according to race group using legislation.
	 Internal resistance: resistance to the policy of Apartheid in SA by organisations within the country.
	 External resistance: resistance to the policy of apartheid by anti-Apartheid movements and frontline states that were operating from outside the country.
	• Learners should take note of action verbs used in the formulation of essay questions, e.g. A learner should take a stance by <u>agreeing or disagreeing</u> ;
	• Explain to what extent: Learners should consider both options and make a decision as to whether or not the international response was influential in dismantling apartheid.
	• <u>Critically discuss</u> : Look carefully at both sides and further clarify on both sides of the topic under discussion / critically refer to both the positives and the negatives of the topic under discussion.

During teaching	Lesson presentation
Introduction of topic:	 Background information: The teacher should introduce the topic by making reference to: Why Apartheid was not accepted by the majority of people in South Africa. Internal resistance to Apartheid.
	South Africans living in exile because of Apartheid.
	Main Presentation / body of lesson
	• The teacher should introduce terms / concepts relevant to the topic to unlock learners' understanding on the content focus: (sanctions, disinvestment, boycott, Release Mandela Campaign, etc.)
	The teacher should clarify the context of international resistance to Apartheid
	 Sports boycott: International sporting federations preventing Apartheid South Africa from participating in their activities: Basil D'Oliveira incident. The all-white SA rugby tour of Britain & Ireland (1969 – 70). The all-white SA cricket tour, 1970. In 1980, the UN compiled a 'Register of Sports Contacts with South Africa'. Athlete, Zola Budd's UK nationality application fast-tracked for the 1984 Summer Olympics. Cricketer, Kepler Wessels acquired Australian eligibility in the 1980s through residency. In 1985, the UN Gen Assembly adopted the International Convention Against Apartheid in Sports on 10 Dec.
	 Cultural boycott: In 1961, the British Musicians Union adopted a policy decision that its members should not perform in South Africa as long as Apartheid exists. In 1963, 45 prominent British playwrights signed a declaration denouncing their performing in any country where there was discrimination. The UN Special Committee Against Apartheid compiled a list of musicians who undermined the cultural boycott in 1980, e.g. Millie Jackson (1980) and Frank Sinatra (1981).
	 Academic boycott: Scholars refusing to collaborate with SA scholars on research; Publishers, journals refusing to publish SA experiments; International conferences refusing to include SA scholars; etc.
	 Consumer boycott: it started as a Boycott Movement in 1959 to persuade shoppers to boycott apartheid goods; It supported a call by Chief A Luthuli's for an international boycott of South African products; Boycott Movement leaflets listed SA products, e.g. Craven A cigarettes; Between 1983 and 1986 British imports on SA textiles & clothing fell by 35%; When PM Thatcher undermined international sanctions, the AAM called for 'people's sanctions' through the 1989 Boycott Bandwagon (converted double-decker bus).
	• Disinvestment: In 1962, the UN Gen Assembly passed Resolution 1761 that established the UN Special Committee Against Apartheid. It was opposed by Western nations, but the AAM used it to call for the International Conference for Eco Sanctions Against SA in 1964.
	 Barclays Bank & General Motors, 1986.
	Sanctions: covered trade & finance; import / export sanctions.
	 Release Mandela campaign: it was started in the Netherlands in 1980 by Dutch AAM using leaflets & signatures.

Assessment Assessment Guideline	In the form of an essay, e.g.: Critically discuss the contribution of various forms of protest by the international community in bringing Apartheid to an end.
	[Learners are expected to indicate the contribution on the AAMs; the unwillingness by some leaders of international countries and the impact of both to putting pressure to the apartheid government to end their racist ideology.]
	Synopsis: Learners are expected to critically discuss the contribution of the anti-Apartheid movements to the demise of Apartheid in South Africa
	Main Aspects:
	Introduction: Learners should outline the various forms of protest and indicate how they had an impact on the demise of Apartheid in South Africa. Reference should also be made to international governments that were not supportive of the AAMs.
	Main Aspects: Learners should make use of the PEEL method in the development and sustaining their line of argument:
	Sports boycott
	Cultural boycott
	Academic boycott
	Disinvestment
	Sanctions
	Consumer boycotts
	Release Mandela campaign
	Conclusion: Learners should tie up their line of argument with a relevant conclusion.

Subject:	History GR 12 (Paper 1)	
Торіс:	Cold war: Extension of the cold war	
Lesson – content What was the impact of Mao Zedong's policies on the People's Republic of China?		
	Language aspects covered	
Pre-activities	• Vocabulary: meaning of words and context of use: The teacher tests learners' pre-knowledge of the following concepts / terms:	
 Vocabulary Language used in the subject 	 Capitalism vs Communism: Rival ideologies, one Western and the other Eastern, led by the USA and the Soviet Union respectively. Capitalism has making money and profit (individually) as its economic policy, while Communism advocates that wealth should be under the control of the state. 	
Prediction	 Revolution: replacing one form of government with another by sudden change, i.e. the forceful take-over of a government. 	
	 Civil War: a war involving people (civilians) in the same country, who are influenced by different ideolo- gies or tribal beliefs. 	
	 Cold War: an ideological war, mainly between proponents of Capitalism and Communism, in which the affected countries are not directly involved – but use other countries instead 	
	 Propaganda: False information deliberately spread by a government / company / group to win public support or to discredit its opponent. 	
	• Learners should take note of the action verb before responding to a question, e.g. A learner should take a stance by <u>agreeing or disagreeing</u> .	
	• <u>Explain to what extent:</u> Learners should view both options and decide which one was more / less successful than the other].	
	<u>Critically discuss:</u> Look carefully at both sides and further clarify both sides of the topic under discussion. / Critically refer to both the positives and the negatives of the topic under discussion.	

During teaching	Lesson presentation [Note taking]
Introduction of topic:	Background information:
	The teacher should introduce the topic by making reference to the Civil War between the Nationalists / Capitalists & the Communists.
	Chiang Kai Shek (Nationalists) vs Mao ZeDong (Communists).
	The take-over by the Communists in 1949.
	• Land Reform; the First 5-Year Plan (1953 – 1957); the 100 Flowers Campaign (1956).
	Main Presentation / body of a lesson
	The Great Leap Forward (The Second Five-Year Plan: 1958 - 1962)
	Reasons why the Great Leap Forward is regarded as a failure:
	 System of industrialisation introduced (backyard factories)
	 Unskilled labour (lack of skills) in industries
	 Poor quality of industrial production
	 Poor management & corruption in collectivised farms
	 High taxation of peasants
	 Starvation / hunger of millions because of poor production in farming & famine (drought) - about 20 million killed
	 Mao ZeDong resigned as head of state in 1959. (He was replaced by a moderate - Liu Shao-qi). Mao remained chairperson of the Communist Party.
	Some successes achieved by the Great Leap Forward:
	 Improvement in the standard of social wellbeing
	 Recognition of women
	The Cultural Revolution:
	Reinforced Communist principles
	Reclaimed authority
	Use of the Red Guards to eliminate opposition
	The Little Red Book
	Attacking the FOUR Olds
	The Purges

Assessment	say form, e.g.: Explain whether the Great Leap Forward was able to transform (change) China into a world or.		
	[Learners should state that, to a large extent, the Great Leap Forward was unable to transform China into a competitive world power.]		
	Synopsis: Learners are expected to explain whether the Great Leap Forward was able to transform (change) China to become a world power.		
	Introduction: Learners should take a stance and outline whether or not the Great Leap Forward was able to transform (change) China to become a world power.		
Marking Guideline	Main Aspects: Learners should make use of the PEEL method in the development and sustaining their line of argument.		
	 Reasons the Great Leap Forward is regarded as a failure: 		
	 System of industrialisation introduced (backyard factories) 		
	 Unskilled labour (lack of skills) in industries 		
	 Poor quality of industrial production 		
	 Poor management & corruption in collectivised farms 		
	 High taxation of peasants 		
	 Starvation / hunger of millions because of poor production in farming & famine (drought) - about 20 million killed 		
	 Mao ZeDong resigned as head of state in 1959. (He was replaced by a moderate - Liu Shao-qi.) Mao remained chairperson of the Communist Party. 		
	The Cultural Revolution:		
	 Reinforced Communist principles 		
	 Reclaimed authority 		
	 Made use of the Red Guards to eliminate opposition 		
	 The Little Red Book 		
	 Attacking the FOUR olds 		
	o The Purges		
	Conclusion: Learners should tie up their argument with a relevant conclusion.		

Subject:		History (Paper 2)		
Торіс:		How did SA come to terms with its apartheid past?		
Lesson – content		The TRC: Dealing with the injustices of the past		
		Language aspects covered		
Pre-activities		• Truth and Reconciliation Commission (TRC) : a body set up by the government in 1995 to investigate violations of human rights committed under apartheid.		
		Vocabulary: meaning of words and context of use:		
	in the subject	The teacher tests learners' pre-knowledge of the following concepts / terms:		
•	Prediction	• The explanation of the terms / concepts should be in the context of historical developments leading up to the TRC.		
		• Reconciliation: it comes from the word reconcile and means bringing former enemies (perpetrators & vic- tims) together to promote openness and forgiveness for a new democratic SA.		
		 Commission(s) (Committee(s) or a body of people given authority to unearth truth for reconciliation - in this case THREE Commissions for the TRC. 		
		 Reparation / compensation: payment made to victims who had suffered loss due to human rights violations by the Apartheid system. 		
		 Amnesty: oOfficial forgiveness granted to those who publicly told the truth about human rights offences committed during Apartheid. 		
		• Perpetrators: people who violated the human rights of others under the pretext of the Apartheid system.		
		 Victims: people whose human rights were violated because of the Apartheid system. 		
		 Restorative vs Retributive justice: justice for healing & reconciliation (restorative) instead of for revenge (retributive) 		
		Learners should take note of the action verbs before responding to a question.		
		Explain the following terms:		
		Explain: To make an idea or a situation clear for someone to understand.		
		Why: Give a reason for a cause.		
		Define: Give a description of (a term or concept).		
		What: State or list reasons, name, year, etc.		
		Compare: Examine two different sources to see or understand how they are similar or different.		

During teaching	Lesson presentation
	 Introduction: The teacher should unpack these concepts/ terms to unlock content on the TRC: Reconciliation; Compensation; Reparations; Amnesty; Perpetrators; Restorative justice vs Retributive justice.
	Discussion: Reasons for the formation of the TRC
	The structure (commissions / committees) of the TRC Discussion on content:
	<u>Committee on Human Rights Violations</u>
	 People told their stories to this committee.
	$_{\odot}$ 21 300 victims gave statements about 38 000 gross abuses of human rights.
	 Stories were told in public and covered by the media extensively.
	 Victims' stories were then investigated.
	 An attempt was made to ascertain who was responsible for the violations.
	<u>Committee on Reparations and Rehabilitation:</u>
	 It investigated the stories told by the victims.
	 About 21 000 victims applied for reparation.
	 16 800 were granted a R30 000 once-off payment.
	 571 still had to be contacted for payment (Nov. 2011).
	 It was not only the victims who needed to be rehabilitated, but also the perpetrators, so that they could be reconciled into society.
	<u>Committee on Amnesty:</u>
	 It granted amnesty from prosecution to perpetrators (wrong-doers) of gross human rights violations, if they could prove that their crimes were done because of a political motive. They had to tell the whole truth and acknowledge what they had done.
	 7112 people applied for amnesty.
	\circ 5392 were refused amnesty.
	 849 were granted amnesty.

Assessment	This photograph shows the opening of the first public hearing held in East London, Eastern Cape, from 15 April 1996.	
Marking Guideline	TRUTH AND RECONCILIATION COMMISSION HEALING OUR PAST FIRST REARING - EAST LONDON 15 - 18 APRIL 1996 Alex Boraine Archbishop Desmond Tutu	
	 What do you understand by the term 'reconciliation'? (1 x 2) (2) (Skilly Exploration of a bitteriord concernt (term) 	
	 What do you think is the main message conveyed by the photograph? (Skill: Photograph interpretation) (1 x 2) (2) 	
	 Using information from the source and your own knowledge, comment on why Alex Boraine and Archbishop Desmond Tutu are the focus in this photograph. (Skill: Source analysis) (2 x 2) (4) 	
	 4. Explain the usefulness of this source to a historian doing research on the work of the TRC. (Skill: Evaluation of usefulness of source) (2 x 2) (4) 	
	Marking guideline	
	1. (Explanation of a concept – L1)	
	 Bringing former enemies (perpetrators & victims) together to promote openness and forgiveness for a new democratic SA). 	
	• Any other relevant response. (1 x 2) (2)	
	 2. (Interpretation of a source – L 2) To show the TRC in its first public hearing session. To reflect the main purpose of the TRC, i.e. reconciliation and healing. Any other relevant response. (1 x 2) (2) 	
	 3. (Analysis of a source – L2) They are the leaders of the Commission. Archbishop Desmond Tutu was the Chairperson of the TRC. Alex Boraine was the Deputy Chairperson of the TRC. Any other relevant response. (2 x 2) (4) 	
	 4. (Evaluate usefulness of a source - L3) It is a photograph that was taken at the actual TRC session. It shows the date on which the first public hearing was held. It confirms the establishment of the TRC. It confirms Alex Boraine and Tutu as leaders of the TRC. Any other relevant response. (2 x 2) (4) 	

Life Sciences

Subject:	Life Sciences - Grade 10
Торіс:	Circulation system in mammals
Lesson – content	Structure and functions of the heart
	Language aspects covered
 Pre-activities: Vocabulary Language used in the subject Prediction 	 De-oxygenated blood: blood containing less oxygen Oxygenated blood: blood containing more oxygen Cavity: an empty / hollow space in a solid object, in particular, in mammals Atrium: chamber or space, e.g. the two upper cavities of the heart Ventricle: a hollow part or cavity in an organ Superior [position] vena cava: the main vein that carries deoxygenated blood from the upper part of the body to the right atrium Inferior [position] vena cava: the main vein that carries deoxygenated blood from the lower part of the body to the right atrium Inferior [position] vena cava: the main vein that carries deoxygenated blood from the lower part of the body to the right atrium NB: Superior and inferior does not mean that 1 blood vessel is BETTER than the other. It indicates position in the body. Valve: flap or pocket that allows a liquid to flow in ONE direction only Tricuspid valve: valve made up of 3 flaps Bicuspid: valve made up of 2 flaps Semi-lunar valve: half-moon shaped valve Atrio-ventricular [atrium - ventricle] valve Chordae tendineae: cords (strings) / tough connective tissue made up of tendons (a tough band of fibrous connective tissue) that prevents the atrio-ventricular valves from turning inside out Pulmonary – a term associated with the lungs Cardiac – a term associated with the lungs Cardiac – a term associated with the lungs Systemic circulation of blood – the circulation of blood between the heart and all parts (systems) of the body At the end of the lesson, learners should be able to: Label / name / identify the parts of the human heart on a diagram. State / mention the functions of the different parts of the human heart. Explain how / give details / make idea clear the different parts of the human heart are structurally suited to its function.
During teaching	See below after the assessment.
Assessment	Assessment words – definition and requirements
	Give – Write a term / label with no additional detail
	State – write a brief, specific answer that is to the point
	Explain – Give the reason
	Compare – Point out both the similarities and differences
	Tabulate – Draw a table

ASSESSMENT

• Study the diagram of the human heart.



- 1. Give the labels for the following parts:
 - 1.1 **G**
 - 1.2 **J**
 - 1.3 **A**
 - 1.4 I
- 2. State ONE function of the following:

2.1	н	
2.2	D	
2.3	κ	(3)
Tabul and tl	ate TWO differences in composition between the blood found in part E he blood found in part C .	(5)
Explain why the left ventricle has thicker muscular walls compared to the right ventricle.		(3)

(4)

TOTAL: 15

Memorandum to mark the above test

1	
т	٠

3.

4.

- 1.1 Right atrium V
- 1.2 Aorta √
- 1.3 Pulmonary veins V
- 1.4Superior vena cava √(4)

2.

- 2.1 To prevent back-flow of deoxygenated blood when the right ventricle contracts. \boldsymbol{v}
- 2.2 To prevent deoxygenated and oxygenated blood from mixing. V

3.

E (RIGHT VENTRICLE)	C (LEFT VENTRICLE)	
Contains a low concentration of oxygen. \checkmark	Contains a high concentration of oxygen. \checkmark	
Contains a high concentration of carbon dioxide. \checkmark	Contains a low concentration of carbon dioxide. \checkmark	

(2 x 2)

(3)

+1 mark for drawing a table (5)

4. The left ventricle needs a more powerful contraction ∨ to pump / propel / push oxygenated blood from the heart to all parts of the body. ∨

The right ventricle only needs to pump deoxygenated blood to the lungs, which are next to the heart. V (3)

TOTAL: 15
During Teaching / Script

1. Refer to the following **diagram**matic representation of the heart.



Explain the orientation of the heart. Why is the heart drawn with the right side of the heart on the left side of the page? The reason is that this diagram represents the frontal view of the heart, as it is situated in the chest of a person.

The heart is surrounded by a protective membrane – the Pericardium (peri – around; cardiac – referring to the heart).

The heart is divided into the right side and the left side by means of a **septum** – a **dividing wall** - made up of cardiac muscle. The septum prevents deoxygenated blood from the right side of the heart mixing with the oxygenated blood from the left side of the heart.

Note that the right half of the heart is coloured **BLUE** to represent deoxygenated blood. The left half of the heart is coloured **RED** to represent oxygenated blood.

Oxygenated blood is blood that contains a high amount of **oxygen (O₂)** and a low amount of carbon dioxide (CO₂).

Deoxygenated blood contains a low amount of O, and a high amount of CO,

The human heart is divided into 4 chambers / compartments: right and left atrium, and right and left ventricle.

An atrium is an upper region or chamber of the heart that **receives** blood. The right atrium receives deoxygenated blood and the left atrium receives oxygenated blood.

The two lower chambers of the heart are called the ventricles. The ventricles have thicker muscular walls compared to the two atria (plural of atrium) above them.

The right ventricle receives deoxygenated blood from the right atrium. The left ventricle receives oxygenated blood from the left atrium.

2. Refer to the diagram of the heart and the associated blood vessels.



- 2.1 *Point out the 4 chambers in the diagram of the heart.* Note that the right side of the heart is coloured blue (deoxygenated blood) and the left side of the heart is coloured red (oxygenated blood). *Point out the septum that divides the right and left sides of the heart so that deoxygenated and oxygenated blood do not mix.*
- 2.2 Refer to the Right side of the heart. Remember this right side of the heart deals with deoxygenated blood.

The **superior** vena cava carries deoxygenated blood from the veins of the **upper** parts of the body (head, neck, hands and chest) to the right atrium. The **inferior** vena cava carries deoxygenated blood from the **lower** parts of the body (abdomen, hips and legs) to the right atrium.

Between the right atrium and the right ventricle is a valve. A valve is a flap or pocket of tissue that allows a liquid (in this case blood) to flow in **one direction only.**

The valve is called an **atrioventricular** valve – the name is derived from the two words **atrium** and **ventricle**.

It is specifically called the **tricuspid** valve – a valve that has **3 cusps / flaps.**

This valve allows blood to flow from the right atrium to the right ventricle and then closes when the ventricle contracts, so that no blood flows back into the right atrium. The valve is held in place by chordae tendinae. Chordae tendinae are cords / strings made up of tendons. Its function is to hold the 3 flaps in place, so that it does not turn inside out when the right ventricle contracts. (*Show this on the diagram.*)

Contraction of the right ventricle pushes / pumps deoxygenated blood via the pulmonary arteries to the lungs.

Note:

- 1. Normally, veins carry deoxygenated blood and arteries carry oxygenated blood.
- 2. The pulmonary artery transports deoxygenated blood this is the only artery in the human body that transports deoxygenated blood.

The pulmonary artery has **semi-lunar** valves in it - **half-moon** shaped valves. These valves prevent the backflow of blood into the right ventricle when the right ventricle stops contracting.

2.3 *Refer to the left side of the heart.* Remember that this side of the heart deals with oxygenated blood.

Point out the pulmonary veins on the diagram. The pulmonary veins bring oxygenated blood from the lungs to the left atrium. Note: The pulmonary vein is the only vein in the body that transports oxygenated blood.

The valve between the left atrium and the left ventricle is also an atrioventricular valve. This is called the **BICUSPID** valve – it has 2 cusps / flaps.

This valve allows blood to flow from the left atrium to the left ventricle; it then closes when the ventricle contracts, so that no blood flows back into the left atrium. The valve is held in place by chordae tendinae. Chordae tendinae are cords / strings made up of tendons whose function is to hold the 2 flaps in place, so that they (the flaps) do not turn inside out when the left ventricle contracts.

Note: A good way to **not** confuse the tricuspid and bicuspid valves is to remember that t**R**icuspid has the letter **R** in it – it refers to the **R**ight side of the heart. When the left ventricle contracts, it pumps out oxygenated blood via the aorta to all parts of the body.

The aorta also has semi-lunar shaped valves. This prevents the backflow of blood into the left ventricle when the ventricle stops contracting.

2.4 Ventricles have a thicker muscular wall than atria - so atria have thinner muscular walls. *Point this out on the diagram of the heart.*

Reason: When the atria contracts, it only pumps blood a very short distance into the ventricle. Therefore atria do not need to have thick muscular walls.

The left ventricle has a thicker muscular wall than the right ventricle. Point this out on the diagram of the heart.

Reason: The right ventricle pumps blood to the nearby lungs (lungs are found alongside the heart). This is called pulmonary circulation of blood, which means the circulation of the blood to the lungs and back to the heart.

The left ventricle needs a more powerful contraction to pump blood to all parts of the body – this is the systemic circulation of blood.

LIFE SCIENCES – GRADE 11 LESSON

Subject:	Life sciences Grade 11
Торіс:	Energy transformations to sustain life
Lesson 1: 30-40 minutes	Introduction to photosynthesis
Lesson - content	 The process of photosynthesis using words and symbols. The requirements and products of photosynthesis. The site of photosynthesis. Language aspects covered
 Pre-activities Vocabulary Language used in the subject Prediction 	 Photosynthesis photo = light synthesis = to make / to produce metabolism = all chemical processes ana abolic = building up chemical processes ana = building up bolic = processes catabolic = breaking down bolic = processes catabolic = organisms that produce their own food autorophic = organisms that produce their own food autorophic = organisms feeding on different organisms heterotrophic = organisms feeding on different organisms heterotrophic = organisms feeding on different organisms heterot = different trophs = feeding radiate = send out (ray of light) potential energy = energy from the sun radiate = send out (ray of light) potential energy = stored energy chemical potential energy = energy stored in chemical bonds. chlorop phyll = pigment in green plants chloro = green phyll = pigment chlorop argenelle in which photosynthesis takes place chloro = green plast = plastid; double membrane structure found in plants only stroma = liquid form of chloroplast thyllakoids = disc-shaped structures in the chloroplast; they contain the chlorophyll thylla = flattened koids = discs grana = stack of thylakoids light dependent phase = not needing sunlight At the end of the lesson, learners should be able to: Define the process of photosynthesis take place. Write a word and chemical equation for photosynthesis. Draw and label a chloroplast.

Post-teaching:	Assessment words:
	• Give = write a name / label with no additional detail
	Draw = a labelled diagram
	Define = give a clear meaning
	Name = state the name (noun) of something
	• Identify = pick out, find or select the answer
	Describe = state in words the main points; say what happens
	• State = write a brief specific answer that is to the point.
	In each assessment question, put a circle around the question word (verb) and <u>underline</u> any other important key words. These words tell you exactly what is being asked.
	Assessment activity:
	Activity 1: Complete the crossword puzzle with learners to consolidate the vocabulary (Attachment 1 & 2).
	Activity 2:
	Allow learners to complete the assessment activity.
	Mark the activity with the help of the learners and provide feedback.

During Teaching /Script

PHOTOSYNTHESIS

Introduction:

'All living organisms need food / energy'.

Why?

- o for growth
- o for movement
- for active transport (requiring energy)

Where does food / energy come from?

Living organisms can be classified (grouped) into **Autotrophic** or **Heterotrophic organisms**, depending on where they get their food / energy from.

The difference between autotrophs and heterotrophs

- Autotrophs = organisms that are able to make their own food by the process of photosynthesis.
- Heterotrophs = organisms that feed on other organisms (They are unable to make their own food).

Plants are autotrophs because they produce their own food by photosynthesis.

What is Photosynthesis?

Photosynthesis is a chemical process in which green plants trap radiant energy from the sun and convert it into sugar (e.g. glucose).

Metabolism = a **chemical process** in which substances are either built up (anabolic) or broken down (catabolic).

Photosynthesis is an example of an **anabolic** process, because food is being produced (built up).

Use the diagram below for learners to identify the requirements and the products of photosynthesis



Requirements for photosynthesis:

(Ask learners to identify the requirements from the diagram.)

- Radiant energy sunlight
- Water (H₂O) inorganic substance absorbed from soil
- **Carbon dioxide** (CO₂) gas absorbed from the atmosphere
- Chlorophyll the green pigment found in chloroplast

Products: (let learners identify the products from the diagram)

- **Glucose** (C₆H₁₂O₆) sugar; stored as starch
- **Oxygen** (O₂) a by–product; the gas that is released

(Once learners have identified the requirements and products, let them write a word equation for photosynthesis on their own.)

Remember: requirements (reactants) are to the left of the arrow — the products are to the right.

EQUATION:



Site of photosynthesis: (where it takes place)

- Organ = leaves
- Cells = mesophyll
- Organelle = chloroplast



Structure of chloroplast: (surrounded by a double membrane)

- double membrane
- stroma = (surrounding liquid substance)
- thyllakoids (*thylla* = flattened; *koids* = discs); containing chlorophyll. (Use a stackof coins to explain how the thylakoids stack together to form a granum.)

Allow learners to draw a diagram of a chloroplast (using the skills for diagrams)

Activity 1: Crossword puzzle (Terminology) [10 minutes]

(Attachment 1 and 2)

Allow learners to complete the crossword puzzle. (It can be done as homework.)

Mark the activity and do corrections in class.

Process of photosynthesis

Two phases:

- Light phase light dependent (needs light)
- Dark phase light independent (does NOT need sunlight)

Assessment activity 2:

Allow learners to complete Assessment activity 2. (15 minutes)

Mark the activity with learners and provide feedback.

Activity 2:

- 1.1 Give the correct **biological terms** for the following items. (Write only the correct term next to the question number.)
 - 1.1.1 All chemical processes in a plant.
 - 1.1.2 The site of photosynthesis.
 - 1.1.3 The green pigment needed for photosynthesis.
 - 1.1.4 The disc shaped structures in the chloroplast, which contain chlorophyll.
- 1.1.5 The organic substance formed as a product of photosynthesis.(5)1.2 Draw a labelled diagram of the organelle in which photosynthesis takes place.(7)
- 2. What impact does deforestation have on the CO_2 concentration in the atmosphere? (3)

TOTAL: 15

Memorandum:

- 1.1 1.1.1 Metabolism 🗸
 - 1.1.2 Chloroplast ✓
 - 1.1.3 Chlorophyll ✓
 - 1.1.4 Thyllakoids ✓
 - 1.1.5 Glucose ✓



Mark allocation for diagram: (7)

Caption	1
Shape (oval)	1
Labels (any 5)	5

- 2. Deforestation is the removal of a large number of trees \checkmark
 - this leads to a decrease in photosynthesis \checkmark
 - and an increase in CO_2 in the atmosphere \checkmark



(3)

Attachment 2 Answers to crossword



Life Sciences Grade 12 Lesson

Subject:	Life Sciences Grade 12			
Торіс:	Genetics & Heredity			
Lesson: 30-40 minutes	Introduction to genetics			
	Language aspects covered			
 Pre-activities Vocabulary Language used in the subject Prediction 	 allele: allelomorph (allël = one another + morphë = form). One form of a gene. diploid: di = two + ploidy = number of sets of chromosomes. Two sets of chromosomes. genetics: the study of genes genotype: genea – generation or race. It is the genetic composition of an organism. It is the information present in the alleles of the gene. heterozygous: hetero= different + zygous = having zygotes of a specific kind. Having different alleles of a gene. homologous: homo = the same + logous = point / position. Homologous chromosome pairs are chromosomes with the same size, shape and alleles for the same characteristic. homozygous: homo = the same + zygous = having zygotes of a specific kind. Having the same alleles of a gene. inheritance: something you receive, e.g. genes from parents. locus: a place / specific point. maternal origin: from the mother. phenotype: phäenotypus – see + type. Physical appearance. somatic cells: body cells. 			
	This lesson will deal with: Concepts in Heredity			
During teaching	See below.			
Assessment verbs	Assessment words – definition and requirements:			
	Complete: the answer demands the completion / filling in of missing information.Define: give a clear meaning.			

During teaching / scripts

With your partner, discuss:

- 1. In what ways are you physically (that which you can see) different from your parents?
- 2. In what ways are you physically similar to either of your parents?
- 3. Do you have characteristics that are similar to those of your siblings or grandparents?
- 4. What characteristics do you have that are different from your partner? Describe how you are different.
- 5. Describe how similar you are to your partner.

Why do we differ from one another?

The educator should revise how crossing over, mutations and the random arrangement of chromosomes in meiosis results in genetic variation.

Genetics refers to the study of genes (plural of gene). A gene is a part of a DNA molecule that codes for a particular characteristic, e.g. attached earlobe. So genetics is the study of the inheritance of genes that you receive from your parents.

So let's look at heredity.

Heredity refers to the transfer of characteristics from parents to offspring. The set of characteristics that have been transferred from parent to offspring is referred to as inheritance. Remember that human **somatic cells** (body cells) have 23 pairs of chromosomes. One set of each pair is of **paternal** origin (from the father) and the other set of each pair is of **maternal** origin (from the mother). This makes all somatic cells **diploid**. (Di = two + ploidy = number of sets of chromosomes).

(Use the diagrams below to explain the following concepts):



The nucleus contains the chromosomes. A **chromosome** is a structure made up of two chromatids joined by a centromere. The chromosomes are made up of genes. A gene is made up of a block of DNA that codes for a particular characteristic (e.g. eye colour).

Each characteristic is determined by two alleles – one from your mother and one from your father. These are situated on each chromosome of a homologous (homo = the same + -logous = point / position) pair. (*Remember that a homologous pair of chromosomes has the same size, shape and alleles for the same characteristic.*)

In the diagram below we look at a single-strand chromosome. The position or location of a gene on a chromosome is called the locus of the gene. (Plural – loci)



Each gene consists of two alleles. One allele is found in the paternal chromosome and the other allele is found on the maternal chromosome; these form a homologous pair. In the above example, one of the alleles for eye colour is found at a particular position on chromosome number 15 and the other allele is found in the same position on the other chromosome of the homologous pair.

One of the alleles of a particular characteristic (e.g. eye colour) can be dominant over the other allele. This is called the **dominant allele.** The other is called the **recessive allele.** We use a capital letter to represent the **DOMINANT** allele and the lowercase of the **same letter** to represent the **RECESSIVE** allele.

In this diagram, homologous chromosome pairs are shown as single-strand chromosomes. The one chromosome is from the mother and the other chromosome is from the father.



Diagrams of diploid (2n) cells

- **Phenotype:** The physical appearance of that organism. E.g. the colour of the eyes.
- Genotype: The genetic composition of an organism. E.g. Bb.
- **Homozygous:** An organism with the same alleles of a gene. E.g. BB or bb.
 - An organism can be homozygous dominant (BB) the phenotype would be brown eyes.
 - An organism can be homozygous recessive (bb) the phenotype would be blue eyes. The recessive trait will only be visible if the organism is homozygous recessive.
 - Heterozygous: An organism has two different alleles (Bb) the phenotype would be brown eyes.
 - The characteristic of the dominant allele will be seen. In this case the allele for brown eyes is dominant over the allele for blue eyes.
 - This is also referred to as the Law of Dominance: One factor (allele) for a pair of inherited traits is dominant and the other factor (allele) is recessive.

Activity 1:

•

Study the diagram below that shows a homologous chromosome pair:



- 1.1 Define the following terms:
 - (a) Locus (1)
 - (b) Gene (2)
- 1.1 The allele for black hair colour (F) is dominant over the allele for blonde hair colour (f), give the genotype for an organism that is:
 - (a) Homozygous dominant and
 - (b) Heterozygous for hair colour (2)
- 1.2 Why is the chromosome pair illustrated above, a homologous chromosome pair? (3)

Memo Activity 1

- 1.1 (a) The position of the gene on a chromosome. $\sqrt{(1)}$
 - (b) A small portion of a DNA v coding for a particular characteristic $\sqrt{(2)}$
- 1.2 (a) FF√

(b) Ff√ (2)

- 1.3 Same size √
 - Same shape $\sqrt{}$
 - Have alleles for the same characteristic $\sqrt{}$ (3)

Activity 2:

Complete the cross word puzzle by following the keys provided.

TIPS:

Work in pencil. By working in pencil, you give yourself room to guess, make and correct mistakes. Remember, mistakes make you a better puzzler in the end.

Think about the theme. If a puzzle has a title, it indicates the theme of that puzzle

Tick off each clue that you solve. Marking your progress gives you a sense of accomplishment and helps you focus on those clues that remain.



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Subject:	Mathematics		
Topic:	Probability – Grade	10	
Lesson-Content			
	Language aspects co	overed	
Pre-activities	In our daily lives, we	come across statements such as:	
 Vocabulary 	It will probably r	ain today.	
 Language used 	 I doubt that he w 	vill pass the test.	
in the subject	The odds are ag	lainst him to win the elections.	
Prediction	Chances are hig	Ih that the price of petrol will drop, next wee	
	She stands a 50-	-50 chance of winning the SRC elections at	her school.
	Words such as "prol prevailed.	bably", "doubt", "chance", all point to son	he degree of uncertainty. The predictions made are based on our previous experiences when similar conditions
	The table below prov from the one we norm	rides us with some of the words we may en mally associate with the word.	counter in our study of probability in grade 10. The words may assume a different meaning in the mathematics class
	Term / Word	Ordinary English (OE)	Mathematical English (ME)
	Event	Refers to an activity, e.g.: the upcoming rugby game between arch rivals.	Specific result of an activity, e.g.: throwing a single dice and getting a 1, 2,3,4,5 or 6 is an event.
	Outcome	Refers to what we would like to achieve at the end of meeting / lesson, etc. e.g.: The outcome of this session is to	Is the actual result of an activity, e.g.: tossing a fair coin – outcomes are head or tail
	Frequency	The radio station is available of FM frequency.	The frequency of an outcome refers to the number of times it happens, e.g.: If a coin is tossed five times, what is the frequency of the coin landing on head?
	Possibility	There is a possibility of snow falling on the mountains in July.	A possibility is an outcome that can happen. E.g.: When tossing a coin, it is possible for the coin to land on heads.
	Probability	There is a strong probability of Anna achieving seven distinctions in her final grade 12 examinations.	The probability of an outcome (or event) is a measure of how likely that outcome is. A value of 0 (zero) means it is impossible; while a value of 1 (one) indicates that outcome is certain; otherwise the value must lie between 0 and 1. The probability may be given as a common fraction (); a decimal fraction (0,5) or as a percentage (50%).
	Probability scale	Your chances of achieving success feature low on the probability scale.	A probability scale is a line numbered from 0 to 1 or 0 to 100% on which outcomes (or events) can be placed according to their probability.
	Equally likely	Mpho is equally likely to assume the leadership role at her school.	A set of outcomes associated with an activity are described as being equally likely when each occurs as readily as any other.

Theoretical	"I do not understand the section on	The theoretical probability of an outcome is the value prodicted from the fraction niven hur
probability	theoretical prohability" said Ahmed	
	months approx 6 Generation of months include	NB: This can only be done when the items on which the activity is based (dice, cards, coins, etc.) have outcomes that are all equally likely.
		Example: When a normal dice (faces numbered 1 to 6) is rolled the probability of:
		Getting a 4 is: P(4) = OR 0,1666 OR 16,66%
		Getting more than 4 is: $P(>4) = =$
		Getting 1, 2 or 5 is: $P(1,2,5) = =$
Experimental probability	"The section on experimental probability is easier than theoretical probability", remarked the teacher.	The experimental probability of an outcome is the value found after an activity has been done several times and is given by:
Relative frequen	cy	Relative frequency is also sometimes referred to as experimental probability.
Fair	Susan is fair in complexion.	A fair item (dice, coin, pack of cards, etc.) is one for which all outcomes are equally likely.
Biased	Santha is biased towards Heidi in Life Orientation.	A biased item is one in which all outcomes are NOT equally likely.
Chance	"You stand a chance of winning this week's LOTTO prize of R45 million by	The chance of an outcome might refer EITHER to its being determined only by a whim of fate OR to the probability of that outcome.
	purchasing your ticket today".	Example: Whether a coin lands heads or tails is a matter of chance.
		The chance of getting a head is one-half.
Mutually exclusi events	ve The result of you passing or failing is mutually exclusive.	Are sets of events or outcomes for which the happening of one of them means that none of the others can happen.
		Example: When rolling a single fair dice the outcomes are mutually exclusive, e.g.: the number showing cannot be a 2 and 3 simultaneously.
Independent event(s)	The community in Jakkalsdraai will have an independent event celebrating the town's centenary.	Two or more events or outcomes are independent if the happening of one of them has no effect on the other.
Dependent event	(s) The team that wins the league title is dependent on the result of the later	Two events or outcomes are dependent if a statement or probability for one of them affects a statement or probability for the other.
	game.	Example: One box holds 4 red marbles and 6 blue marbles; while a second box holds 1 red marble and 99 blue marbles.
Odds	He was at odds with his wife over the	are another type of probability and the odds against a successful outcome happening are given by:
	type of car to be purchased.	(Number of other outcomes in the activity) TO (number of ways outcome can happen)
		Example: The odds against a 3 with a single dice are 5 to 1; since there are 5 other numbers and only one 3, so there are 5 ways of losing and only 1 way of winning.
		The probability of getting a 3 is: OR
		Odds of a to b change to a probability of :
		A probability of changes to odds of $(b-a)$ to a

Evens	"It's evens Stevens, Mr Cloud",	When the odds are 1 to 1 they are even. The probability for evens is
Sample space	remarked MS Lignton	ls the list of all possible outcomes of a probability experiment. E.a.: When a single die is rolled. the possible outcomes are:
		S = {1, 2, 3, 4, 5, 6}
Random experiment	I am basing my argument on a random experiment conducted by a local polling agent.	An experiment in which all outcomes are equally likely. No one outcome is more predictable than any other.
Random number	Your mobile number is a string of random numbers.	A number produced by a random experiment, such as rolling a single dice or spinning a spinner. For example, rolling a fair dice produces a random number each time, because each of the possible numbers - 1, 2, 3, 4, 5, 6 - has the same chance of appearing each time.
Random sample	I will randomly select my sample from the available list of schools.	A sample that gives all members of the population the same chance of being selected.
Sample	The shop assistant displayed a sample of items on sale to the customer.	A sub-set of a population that is obtained through some process, possibly random selection or selection based on a certain set of criteria, for the purposes of investigating the properties of the underlying parent population.
Population	The population of rhino's in South Africa is shrinking yearly.	The entire set of items from which data can be selected. For example, a poll given to a sample of voters is designed to measure the preferences of the population of all voters
Set	The guest liked the hostess's china tea set.	A set is a collection of objects (letters, numbers, symbols, etc.) that is defined either by listing all the objects OR by giving a rule that allows a decision to be made as to whether an object belongs in that set. Sets are usually shown listed or defined within {- curly brackets.
Sat	The brown cat sat on the white sofa.	
Universal set		A set which is first defined (by a list or rule) and within which all the statements that follow must be interpreted.
		<i>E.g.</i> : In the universal set {all positive numbers} $x^2 = 4$ has only the solution $x = 2$, since $x = -2$ is not in the universal set.
Member	Sihle is a member of the regional Under 23 soccer team.	A member of a set is one of the objects contained in each set.
Element	The element in the kettle is not working.	A member of a set is also referred to as an element of a set. We use the symbol to denote an item belonging to a set; e.g.: 2 {even numbers}
Empty set / null set.	There are no commonalities between the siblings Sarah and Thabiso.	The empty set is the set which has NO members. Example: The set of {all odd numbers divisible by 2} is empty. The symbol for empty set is {} OR
Complement		The complement of a set is all those members which are not in that set, but which are in the universal set originally given. The symbol for the complement of a set is .
		Example: Suppose the universal set is {odd numbers less than 30} and the set A is {all prime numbers}, then the complement of A is given by:
		$A = \{1, 9, 15, 21, 25, 27\}$
		A (read 'A complement') consists of all outcomes not in A (that is, S \A);

	Compliment	To thank a person for doing well on an activity.	
	OR	I prefer to wear either a brown shirt or a white shirt with my chino pants.	AuB (read 'A union B') consists of all the outcomes in A or in B (or both!)
	Union	The marriage of Beth and Betha is the union of two people.	The union of two or more sets is their combination into a single set containing ALL the members of the original sets. An element found in more than one of the original sets needed only be shown once in the union. We use the symbol to indicate the union of sets. Example: {4, 7, 13, 20} {2, 7, 10} is given by {2, 4, 7, 10, 13, 20}
	AND	I enjoy a toasted cheese and tomato sandwich.	A \cap B (read 'A intersection B') consists of all the outcomes in both A and B
	Intersection	The accident took place at the intersection of Johnny Walker and Castle Road.	The intersection of two or more sets is the single set comprising of those element(s) common to all the original sets. We use the symbol to denote the intersection of sets. Example: {4, 7, 13, 20} {2, 7, 10} is given by {7}
During teaching	 Take any fair coin, the appropriate col 	toss it ten times and note down the number umn.	r of times heads and tails comes up. Record your observations in the form of the following table, by placing a "1" in
	Toss Number	r Head	Tail
	e.g.:	1	
	1		
	2		
	£		
	4		
	5		
	9		
	7		
	8		
	6		
	10		
	TOTALS		
	Based on your resu	ults in the above table, determine the value	s of the following fractions:



	5.1 O and E are sub-sets of the s	ample space and therefore called	t events.	
	5.2 Events O and E contain all ele	ements of the sample space and t	therefore are called exhaustive e	vents.
	5.3 Events O and E have no com	mon element(s) and therefore are	e called mutually exclusive event	ts.
	5.4 Events O and E are exhaustiv	ve and mutually exclusive and the	rrefore are called complementary	events.
Assessment terms / verbs	The following terms are some of t	the common ones you will come a	across.	
	Term / word	Explanation	Example	
	Calculate	The learner is expected	If A and B are two mutu-	
		to perform a mathemat-	ally exclusive events and	
		ical calculation using a formula or a known	P(not A) = 0,1 and P(A or A)	
		algorithm.	B) = $0,5$, calculate $P(A)$	
	Justify	When the learner is	If $P(A) = 0,2$ and $P(B)$	
		asked to justify his /	= 0.8. Are the events	
		her response he / she is	A and B independent	
		expected to provide a	or dependent of each	
		mathematical argument	other? Justify your re-	
		that either supports or	sponse.	
		rejects a claim made		
	Evaluate	When the learner is	Evaluate , if P={2,3,5}	
		asked to evaluate, he /	and E={2,4,6}	
		she is expected to de-		
		termine the value of an		
		expression / statement		
		using given information.		

Assessment	1. Two e	vents A and B are	mutually exclu	Isive							
	1.1 Ca	alculate									
	1.2 An	e the events comp	lementary? Ju	ıstify your ar	lswer?						
	2. In ea	ch row of this table,	an event is de	scribed. Put 6	a tick in the colu	umn which t	test describes	the like lih	100d of each	event.	
	Event			mpossible	Very unlikely	Unlikely	50% chance	Likely	Very likely	Certain	Γ
	(a) Nos size mar whe with	sipho has ten marbles e in her pocket, 6 whitk rbles. She takes out a en she puts her hand ii jout looking.	of the same e and 4 red white marble n her pocket								Γ
	(b) A sli spre floor	lice of bread with butter ad on one side is dropp r. It lands with the lam si	and jam bed on the de facing up.								Γ
	(c) A α kick Bafa their	oin is tossed to decide -off in a soccer match ana wins the toss at th r next match.	e who has the I. Bafana ie start of								Γ
	(d) A di land	ice is thrown and the I is on top.	number '3'								
	(e) A lig	ght bulb which is expe 300 hours blows after	ected to last 2 hours.								
	(f) A di with	rawing pin is tossed a	nd it lands ds.								
	(g) You birth	I will turn 2 years old c dav.	on your next								
	(h) Fifte You pack	een percent of Astros I choose a blue Astro K with vour eves close	are blue. from a full sd.								Ι
	(i) Two soci ball	o percent of the valves cer balls are defective with a good valve.	s in new 2. You buy a								
	3. A tyre	manufacturing con	npany kept a r	ecord of the	distance cove	red before	a set of four	tyres nee	ded to be re	placed. Th	The table below shows the results of 1000 reported cases.
	Distanc in kilom	travelled ietres (km)	Less than 40	00(4000 to 900	0	9001 to 14 0	000	Greater 14 0(than 00	
	Frequen	ncy	20		210		325		445		
	lf you buy	a set of four tyres	from this com	pany, calcul	ate the followi	ng probabi	lities:				
	3.1) The	set of four tyres wi	ill need to be r	eplaced befu	ore it has cov∈	ired 4000 k	cm?				
	3.2) The	set of four tyres wi	ill last more th	an 9000 km′.	~						
	3.3) The (set of four tyres wil	I need to be re	splaced after	r it has covere	d somewh	ere between 4	4000 km a	and 14000 ki	n?	



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Subject:	Mathematics			
Торіс:	Euclidean Ge	eometry- Grade 11		
Lesson – content				
	Language as	pects covered		
 Pre-activities Vocabulary Language used in the subject Prediction 	 Like alge Each sys In the for Building of Once the apparent These pricalled as Once we we apply These state the state of t	bra, the branch of tem has its own v mal study of a ma on this foundation, te terminology is s coperties are know sumptions. have developed a deductive metho atements can be p en heard about pe he" or "get to the p ts your outfit" are of	mathematics called geometry is a mathematics called geometry is a mathematical system, we begin with undefined , we can then define additional terms. Sufficiently developed, certain properties (ching) as axioms or postulates of the system; a vocabulary and accepted certain postulates ods. Poroved and are called theorems. Beople "talking in circles " or "going off at a t point " or "you are taking a different angle to commonly heard.	atical system. I terms. haracteristics) of the system become more generally, such statements are , many principles follow logically when angent" on a topic, or "that strikes a the matter at hand" or "that hand bag
	Term / word	Ordinary	Mathematical English	Diagram / Sketch
	Point	Come to the point regarding bullying.	A point marks a position but has no size. In practice, when we draw a point it clearly has a definite width, but it represents a point in our imagination.	۰P
	Line	Your comments regarding bullying are out of line.	A line has no width and extends infinitely in both directions. When we draw a line it has width and it has ends, so it is not really a line, but represents a line in our imagination. Given two distinct points A and B then there is one (and only one) line which passes through both points	A
	Parallel lines		Given two distinct lines, there are two possibilities: They may either meet at a single point or they may never meet, no matter how far they are extended (or produced). Lines which never meet are called parallel. In the second diagram, we write AB CD.	A D T

Term / word	Ordinary English	Mathematical English	Diagram / Sketch
Angle	You provide an interesting angle to discipline issues at same gender schools.	An angle is formed when two straight lines intersect (cross) or meet each other at a point, and its size is measured by the amount one line has been turned in relation to the other.	The two straight sides are called arms. The two straight sides are called arms. The any ansord between arm
Arc		An arc of a circle is any piece of the curve which makes the circle.	Constituence Chord Sector Centre Charmene Centre Centre Centre Constituence Chord Centre Constituence Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Chord Centre Ce
Circle	The presenter spoke in circles regarding bullying.	A circle is a set of points which is equidistant from a fixed point.	
Centre of circle		The centre of a circle is the fixed point from which the distance to the closed curve forming the circle is measured.	CENTER
Circum- ference of circle		The circumference of a circle is the distance measured around the curve which makes the circle.	CRECUMFERENCE •
Radius		The radius of a circle is the distance from the centre to the curve which makes the circle. A radius is any straight line from the centre to the curve.	center A

Term / word	Ordinary English	Mathematical English	Diagram / Sketch
Chord	His music struck a chord with me.	A chord of a circle is any straight line drawn across a circle, beginning and ending on the curve making the circle.	chord
Diameter	His views on bullying are diametrically opposed to his superiors.	A diameter of a circle is a straight line passing through the centre and which touches the curve forming the circle at each of its ends.	radius radius diameter
Sector of a circle	Johnny is the chairperson of his local sector policing forum.	A sector of a circle is the shape enclosed between an arc and the two radii at either end of that arc.	major sector minor sector
Segment of a circle		A segment of a circle is the shape enclosed between a chord and one of the arcs joining the ends of that chord	Segment
Major / Minor – arc/ sector/ segment		When one arc, sector or segment is made in a circle, then the remainder of the circle makes another arc, sector or segment. The larger part is known as the major arc / sector / segment and the smaller part is known as the minor arc / sector / segment.	Minor Arc Minor Sector Major Sector Major Arc
			Major Arc Major Segment Chord Minor Segment Minor Arc

Term / word	Ordinary English	Mathematical English	Diagram / Sketch
Semi- circle		A semi-circle is one half of a circle made by cutting along a diameter.	semicircle
Angle proper- ties of a circle		Refers to the collection of theorems which give the relationships between various parts of a circle (chord, segment, etc.) and angles associated with them.	
Subtend- ed angle		Given three distinct points A, B and C (which are not collinear), the subtended angle of any two points at the third, is the angle formed between the lines drawn from the first two points to the third. The subtended angle of points A and B at C would be the angle formed between the lines AC and BC.	Angle subtended by the minor arc AB at C A Minor arc AB
Angle in a segment		The angle in a segment is the angle formed between the two lines drawn from the ends of the chord making the segment to any point on the circumference of that segment. It is the angle subtended at the point on the circumference by the chord. In any given segment, all the subtended angles are the same size.	37.4° 37.4° 37.4°
Angle in a semi- circle		In any semi-circle, the angle subtended by the diameter at any point on the circumference is a right angle.	semicircle
Angle at the centre of a circle		The angle at the centre of a circle is the one formed between two radii drawn from two points on the circumference.	Angle at centre A 105° Arc AB

Term / word	Ordinary English	Mathematical English	Diagram / Sketch
Tangent	He went off at a tangent during the debate on bullying at schools.	A tangent to a circle is a line which touches the circle at one and only one point. From any one fixed point outside circle two tangents can always be drawn to that circle. The radius drawn at the point where the tangent touches the circle is at right angles to the tangent.	Point of Tangency
Common tangent		A common tangent is a tangent that touches two circles.	Common tangent A B Cm b = 5 cm
Direct common tangent		A direct common tangent is a common tangent that DOES NOT pass between the centres of the two circles.	O R
Trans- verse common tangent		A transverse common tangent is a common tangent that DOES pass between the centres of the two circles.	Direct common r_1 C_1 T C_2 P Transverse common
Secant		A secant is a line which cuts a circle in two points.	A Secant B O
Alternate segments		Any chord drawn in a circle creates two segments, and one is said to be the alternate of the other. When a chord is drawn from the point of contact of a tangent then the angle between the tangent and the chord, measured on ONE side of the chord, is equal to the angle in the alternate segment, which lies on the OTHER side of the chord.	Alternate segment

Term / word	Ordinary English	Mathematical English	Diagram / Sketch
Quadri- lateral		A quad rilateral is a poly gon which four sides. The sum of the interior angles adds up to 360°.	Trapezoid Rectangle
			Isosceles Trapezoid Square Rhombus
			Parallelogram Kite
Circum- circle		A circumcircle to any polygon is the circle drawn around the OUTSIDE of that polygon which touches ALL of its vertices.	Circumcircle
Concyclic points		Points which lie on a circle are called concyclic points.	Concyclic Points:points that lie on the same circle.
Cyclic quadri- lateral		A cyclic quadrilateral is a quadrilateral around which a circle can be drawn to pass through all of its vertices. It would be the circumcircle for that quadrilateral.	Cyclic quadrilateral

During teaching	1. The diagram below shows different parts of the circle:					
	Angle at circ	umference	Angle at centre			
	a =	=	b=			
	C=	:	d=			
	e=	=	f=			
	g=	=	h=			
	 1.1 Use the above diagram to determine the differences between the following terms: 1.1.1 Tangent and radius 1.1.2 Diameter and a chord 1.1.3 Arc and segment In each of the following circles, accurately measure the angles represented by letters <i>a</i> to <i>h</i>. Write your answers in the table supplied. Image: the supplied of the table supplied of the table supplied. Use your results to complete the following statements: The size of the angle subtended by an arc or chord of a circle at the centre is the supplied of the complete the following statements: 					
	size of the angle subtended by the same arc or chord at the					
Assessment terms	2.2. The angle in a semi-circle is a angle.					
	Torm/Vorb					
	Term/verb	Explanation				
	Prove	You are expected argument, using a rems, postulates,	to provide a mathematical appropriate facts (theo- axioms, etc.)	Prove that ABC is a tangent to the circle passing through points B, D, and E. E 64° D		
				$ \frac{5x}{4x} $ A B C		
	Justify	Provide mathema dispute a given p	atical reasons to support or iece of information.	Are the points P, N, A and R concyc- lic? Justify your response.		
	Hence	To use previously in subsequent qu	accepted / proven results estion).	Hence, prove that PN // QA		
	Name	You are expected reasons.	to identify / list with	Name with reasons, three angles each equal to \pmb{x}		



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Subject:	Mathematics				
Торіс:	Financial Mathematics - Grade 12				
Lesson -Content					
	Language aspec	ts covered			
Pre-activities	In our daily lives,	we come across statemer	nts such as:		
Vocabulary	The MPC dro	opped the repo rate by 0,2	5% today.		
Language	An increase i	in the repo rate does not b	ode well for the already cash strapped consumer.		
used in the subject	The vehicle of	lepreciates at 12% per anı	num.		
Prediction	 Employees in pension pay 	n the formal economic sec outs.	ctor are encouraged to have a retirement annuity fund to supplement their		
	Compound in	nterest is a wealth creation	tool.		
	 In the busine years. 	ess world equipment/ vehic	cles is normally sold at scrap value / book value after a certain number of		
	Everyone require the things we ne retirement with se it is imperative th	es food, housing, clothing ed and desire. The ability ome fun along the way. Ea at everyone is financially li	and transport, and a fulfilling social life. Money allows us to purchase to manage money is key to a financially secure future and a reasonable ch individual is responsible for managing his or her own finances; therefore, iterate.		
	The table below provides us with some of the words we may encounter in our study of financial mathematics in grade 12. The words/concepts may assume a different meaning in the mathematics class from the one we normally associate with the word. In some instances, words/concepts mean the same in both contexts.				
	Term / Word	Ordinary English (OE)	Mathematical English (ME)		
	Annuity	Same as in ME	An annuity is a compound interest investment from which payments are made on a regular basis for a fixed period of time. At the end of this time the investment has no residual value.		
	Deferred payments	Same as in ME. Also mean delayed payments	This happens when the loan agreement states that the first payment is made some time (say 3 months or 6 months) after the loan has been granted.		
	Effective interest rate		The equivalent annual interest rate that would be received due to the effects of compounding interest.		
			=.		
			Consider the following example: If the interest rate received is 10% p.a. compounded monthly, then the effective rate is given by:		
			=.		
			$1 + = (1 +)^{12}$		
			$i_{\rm eff} = (1 +)^{12} - 1$		
	Nominal interest rate		A nominal rate is an annual rate which financial institutions quote. This interest rate does not take into consideration the effect of different compounding periods, which are shorter than the annual period. For example, 15% per annum compounded monthly is a nominal rate. The annual rate is 15% but the fact that the interest is compounded monthly means that the accumulated amount at the end will be higher. The quoted annual rate of 15% will yield a lower accumulated amount than 15% compounded monthly.		
	Deposit	Similar to ME. For example, the school requires its learners to pay an annual book deposit fee.	Refers to a sum of money that is paid by an individual / company in lieu of an item purchased. Example, when purchasing a motor vehicle, the buyer paid R40 000,00 as a deposit towards the financing of the vehicle.		

Term / Word	Ordinary English (OE)	Mathematical English (ME)
Withdrawal	Similar to ME. Also used as an adjective, as in the example that follows: The young teacher has been diagnosed with having withdrawal symptoms.	Refers to the "taking out" / accessing of funds (money) from a savings account / investment account. Example: To finance his son's tertiary studies, the father withdrew an amount of R50 000,00 from his (the father's) savings account.
Depreciation	Same as in ME.	In many situations, equipment can lose its value over a given time period. Motor vehicles, computers lose value over time due to wear and tear or becoming obsolete. When this happens, we say that the equipment is depreciating in value over time. There two commonly used forms of depreciation- flat rate or linear depreciation and reducing balance depreciation.
		Depreciation is the opposite of appreciation.
Flat rate or linear (straight line) depreciation	Same as in ME.	In flat rate or linear depreciation, the value of an asset is depreciated by a fixed amount each year. Usually this amount is specified as affixed percentage of the original cost.
Reducing balance depreciation		In reducing balance depreciation, the value of an asset is depreciated by a fixed percentage of its value each year. Reducing balance depreciation is sometimes called diminishing value depreciation.
Scrap-value	Same as ME. For example, "That piece of scrap of yours has no value!"	Scrap value is the book value of the equipment at the end of its useful life.
Book-value	Same as in ME. Also used as follows: That book you are reading is of no value to you!	Book value is the value of equipment at a given time after depreciation has taken place.
Interest rate	The young lad shows an interest in soccer.	The figure quoted by a financial institution to borrowers.
Compound Interest		The interest earned by investing a sum of money (the principal) is compounded interest if each successive interest payment is added to the principal for calculating the next interest payment.
Period	The school has 10 periods per day.	This refers to the time period that a sum of money is invested for or the duration of a loan.
Compound- ing period		Interest is normally quoted per annum, but it can be calculated over different time periods during a year. The common compounding periods are:
		Annually: once per year (usually at the end of the year);
		Semi-annually or bi-annually or half-yearly: twice per year (or every six months);
		Quarterly: four times per year (or every three months);
		Monthly: twelve time per year (every month);
		Daily: 365 times a year (excluding leap years)
Simple interest		Simple interest is the interest accumulated when the interest payment in each period is a fixed fraction of the principal. For example, if the principal, P, earns simple interest at a rate of i % per period, then after n periods the accumulated simple interest is given by: SI =

Term / Word	Ordinary English (OE)	OE) Mathematical English (ME)		
Time line	I noticed you are posting interesting comments on your Facebook time-line.	A timeline is a visual representation to show movement (i.e. additional withdrawals and or deposits) on an account which is not made on a regular basis. Example: An amount of R2850,00 is initially invested at 8% p.a. compounded quarterly for 15 years. After 9 years the interest rate changes to 10,5% p.a. compounded monthly. How much is the investment worth after 15 years? The information can be shown on a time line as follows: To To T9 T15 For this period the amount of R2850 grows by 8% pa compounded quarterly for 9 years A= 2850(1 + $\frac{0.08}{4}$) ^{9×4} . $(1 + \frac{0.105}{12})^{6×12}$ = R 10 885, 95		
Loan	Same as in ME.	A loan is an amount of money borrowed from a registered financial institution like a commercial bank.		
Reducing balance loan		A reducing balance loan is a compound interest loan where the loan is repaid by making regular payments and the interest paid is calculated on the amount still owing (the reducing balance of the loan) after each payment is made.		
Future value calculations		Future value calculations are used when a certain amount of money is deposited into an account on a regular basis in order to save money. Therefore, future value calculations are used for: Retirement annuities; savings accounts (where equal deposits are made at regular set intervals); sinking funds.		
Present value calculations		Present value calculations are used when payments are made on a regular basis in order to pay back a loan. In these calculations money is first received and then paid back. Therefore present value calculations are used for: Loan repayments; bond repayments.		
Sinking fund		Many businesses will purchase equipment which will be used for a given period of time. After a number of years, this equipment is usually sold at scrap value and new upgraded equipment is bought. The business will often set up a savings plan at the time of purchasing the original equipment. This savings plan is a future value annuity which is called a sinking fund in the world of business.		
Pyramid scheme	"The pyramids at Gaza in Egypt are as old as humanity", remarked Mr Jonas	A pyramid scheme is an illegal multilevel marketing scheme. It relies on a participant recruiting new members into the scheme with the promise of very high returns on an investment. As each investor joins, a new level of the pyramid is created and the investors in each level above gain from		



KEY WORDS INVESTMENT Inflation rate, depreciate, trade in, etc. Sinking fund, book value, scrap value $A = P(1 \pm i)^n or/and$ $F_V = \frac{x((1 + i)^n - 1)}{i}$ Answer: Which formula(e) to use? Fv or A or Pv or AII?				
Data	Step 1	Step 2	Step 3	Step 4
	Price of the new machine in 4 year time after considering inflation rate	Trade in or book value of the old machine in 4 year time after considering depreciation rate	The value of the sinking fund (SF) being raised is:	The monthly instalment, x, that should be paid into the fund (SF), is:
Interest (i)	$i = \frac{8}{100} \div 1$ $= \frac{8}{100}$	$i = \frac{?}{100} \div ?$ $= \frac{?}{?}$	SF is given by: Step 1 (A)- Step 2 (A)	$i = \frac{12}{100} \div ?$ $= \frac{?}{?}$
Period (n)	$n = 4 \times 1 = 4$	$n = 4 \times ? = ?$		$n = 4 \times ? = ?$
Principal (P)	85 000	85 000	R115 641,56	SF = Fv
Amount (A)	$A = P(1+i)^n$	$A = P(1-i)^n$	R 49 277,90	$Fv = \frac{x[(1+i)^n - 1]}{i}$
	$= 85000\left(1+\frac{8}{100}\right)^{4}$	$= 85000\left(1-\frac{?}{?}\right)^{r}$	$\therefore SF = R49 277,90$	49 277,90 $x \left[\left(1 + \frac{2}{7} \right)^{2} \right]$
	= R115 641, 56	= R66 363, 66		$=\frac{x[(1+\frac{1}{2})-1]}{\frac{?}{?}}$
				x = R 804.90

Assessment	Herewith some of the assessment terms that you may encounter during this lesson.					
	Term / Word	Explanation	Example			
	Calculate / Determine	The learner is expected to perform a mathematical calculation using a known formula or algorithm.	Rachel wishes to save for her retirement. She can afford to invest R8000 at the end of each month into an account which offers an interest rate of 11,2% p.a., compounded monthly for a period of 20 years. After 20 years she wants to stop depositing R8000 each month and intends to let the investment sum grow at 11,6% compounded quarterly until she has an amount of at least R26 million. Calculate , how long, correct to the nearest month will it take her to realise her goal?			
	Show / Prove that	The learner needs to use appropriate formulae to prove or disprove a claim made in the question.	Tebogo plans to retire in 40 years' time. He has calculated that he needs an amount equivalent to the buying power of R1 million in today's rands. He expects inflation to be an average of 8,5% p.a. during the 40 years.			
			a) Show that he will need R26 133 015,58 in his account in 40 years' time.			
Assessment	 Tebogo plans to retire in 40 years' time. He has calculated that he needs an amount equivalent to the buying power of R1 million in today's rands. He expects inflation to be an average of 8,5% p.a. during the 40 years. 					
	a) Show that he will need R26133015,58 in his account in 40 years' time.					
	b) He plans to make equal monthly payments for the next 40 years, at the end of each month, into an according which offers an interest rate of 10,8% p.a. compounded monthly. Determine Tebogo's monthly repayments					
	 Rachel wishes to save the which offers an interest to stop depositing R800 until she has an amoun realise her goal? 	for her retirement. She can afford to rate of 11,2% p.a., compounded m 00 each month and intends to let th t of at least R26 million. Calculate ,	o invest R8000 at the end of each month into an account ionthly for a period of 20 years. After 20 years she wants e investment sum grow at 11,6% compounded quarterly how long, correct to the nearest month will it take her to			
	3. Equipment, when boug reducing balance method	ht new is valued at R350 000,00. A od. Calculate the annual rate of dep	fter 3 years it depreciates to R179 200,00, based on the preciation.			
	 An amount of R20 000, 18 months, a further R1 compounded monthly. 	00 is deposited into a new savings 0 000,00 is deposited. After a furth Determine the balance in the accou	account at 9,75% p.a., compounded quarterly. After er 3 months, the interest rate changes to 9,95% p.a. int 3 years after the account was initially opened.			

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Physical Sciences

Subject:	Physical Sciences Grade 10				
Торіс:	The periodic Table				
Lesson – content					
	Language aspects cov	ered			
Pre-activities	Vocabulary				
Vocabulary	Element	Atom			
Language used in	Period	Group			
the subject	Vertical	Horizontal			
Prediction	Column	Noble			
	Affinity				
	Activity The learners are given the following paragraph and asked to define the words in bold. They may look them up in a dictionary. The definitions are shared among members of the group or with the whole class. Use worksheet 1				
	"Elements are made up of small particles called atoms. These elements are arranged in rows called which are horizontal and also arranged in columns called groups which are vertical. Some elem classified as noble gases and all elements have different electron affinities".				
During teaching	The teacher clarifies all the terms using scientific terms / meanings using the periodic table.				
Assessment	Match each term on the left to the correct definition on the right.				
	Term	Definition			
	Element	The horizontal rows in the periodic table			
	Noble gases	The vertical columns in the periodic table.			
	Period	Is a pure substance consisting of one type of atom			
	Group	Are found in group 18			
		Elements which are metals			
Resources	Periodic TableWorksheet				

	Worksheet 1	
Name:		
"Elements are made up of small particles called atoms. These elements are arranged in rows called periods which are horizontal and also arranged in columns called groups which are vertical. Some elements are classified as noble gases and all elements have different electron affinities"		
Term	Definition	
Element		
Atom		
Period		
Group		
Vertical		
Horizontal		
Column		
Noble		
Affinity		
Subject:	Physical Sciences Grade 10	
--	---	--
Topic:	Magnetism	
Lesson – content	Poles of permanent magnets, attraction and repulsion, magnetic field lines	
	Language aspects covered	
 Pre-activities Vocabulary Language used in the subject Prediction 	Vocabulary Magnet Field Pole Opposite Like Attract Repel Spaced Cross Arrangements The teacher will ask learners to give the meaning of the above terms during the lesson.	
During teaching	 Activity Leaners mention things, devices, etc. that contain magnets. Leaners study the magnets and identify the poles (teacher helps them to understand the concept). They check which ones attract or repel (they are asked to give the meaning of the terms in bold) Learners are given two magnets, iron fillings, nails, white A4 sheets. Learners use iron fillings and compass to determine the pattern and direction of magnetic field lines. The learners will draw the magnetic field lines (Pattern). 	
Assessment	 Label the sketch given below: APole APole BPole Redraw these magnets in your classwork book and draw the magnetic field patterns. S NSSS	
Resources	 Bar magnet Iron fillings Nails Compass White A4 sheet 	

Subject:	Physical Sciences Grade 11	
Торіс:	Intermolecular Forces	
Lesson – content		
	Language aspects covered	
 Pre-activities Vocabulary Language used in the subject Prediction 	Vocabulary Intermolecular [molecule] prefixes: inter: 'between' or 'among' intramolecular intra: 'within' or 'inside Homogenous homo: 'same' Polar Induce Force Electronegativity Dipole Activity Learners give more words starting with 'inter'. E.g. international, etc. The teacher highlights the use of 'inter'	
	before every word that follows it. The teacher asks the learners to give their own interpretation of the concept <i>intermolecular forces</i>	
During teaching	Learners make models of HCI using plasticine or clay.	
	The teacher will ask the learners to use matchsticks to show intermolecular forces.	
	∠ Intermolecular force	
	The teacher uses the same model to explain dipoles.	
	The teacher explains the different types of intermolecular forces and also gives their definitions.	
Assessment	 Answer the following questions. Choose the correct answer and write down only the letter corresponding to the chosen answer. 1.1. Forces between two polar molecules are called A Hydrogen bonding B Dipole-dipole forces C Ion-dipole D London forces 1.2. What causes dipole-dipole interactions? A sharing of electron pairs B bonding of a covalently-bonded hydrogen to a lone electron pair C the random motion of electrons D none of these 1.3. Why is hydrogen bonding only possible with hydrogen? A hydrogen is the least electronegative element known. B the size of a hydrogen atom is similar to that of oxygen, nitrogen, and fluorine. C hydrogen is bonded to a highly electronegative element D all of the above. 	
Resources	PlasticineMatchsticks	

Subject:	Physical Sciences Grade 11	
Торіс:	Newton's Laws	
Lesson – content		
	Language aspects covered	
 Pre-activities Vocabulary Language used in the subject Prediction 	Vocabulary Normal Plane Perpendicular Relative Exerts Static Parallel Proportional Inclined Weight Component Activity Learners look up the listed words in a dictionary Teacher: Divides the learners into groups of six and each learner is assigned a term to look up. The teacher moves around checking the learners spelling. Learners: Each learner looks up and writes the definition of the term assigned to him/her. Each learner reads his/ her definition and the other learners write it down.	
During teaching	Activity The teacher assists the learners to come up with scientific meanings; definitions are linked with diagrams/drawings. E.g. for the term 'parallel', lines are drawn. The teacher asks the leaners to name the types of forces they know; each type goes with an explanation and an example/ demonstration where possible.	
Assessment	Identify and label the forces in the following diagram.	
Resources	 Dictionary Writing material Lab resources 	

Subject:	Physical Sciences Grade 11	
Торіс:	Ohm's Law	
Lesson – content	Verifying Ohm's Law	
	Language aspects covered	
 Pre-activities Vocabulary Language used in the subject Prediction 	 Activity (10 minutes) Learners are given an instruction sheet for the experiment. They read the instructions individually and then in small groups they discuss the method, etc. to ensure that they have a common understanding. They allocate duties to each other. Vocabulary Series Parallel Proportionality Constant Increase / decrease Conductor	
	Relationship	
During teaching	 Activity (20 minutes) The learners collect the apparatus. The precautions are discussed. The learners start connecting the apparatus with the teacher monitoring the connection of the apparatus. Readings are taken. 	
Assessment	The learners write individual reports for the experiment using the supplied worksheet.	
Resources	Lab equipment Worksheet / Instruction sheet	

VERIFICATION OF OHM'S LAW

Name: ____

Class:

Activity 1

Aim: Investigating the relationship between the potential difference (v) across a resistor / conductor and the current (I) in the resistor (Ohm's Law).



DIAGRAIN

Apparatus:

- 3 cells
- Resistor
- Voltmeter
- Ammeter
- Variable resistor / rheostat
- Switch
- Connecting wires

Precautions

- 1. All the connections must be very tight.
- 2. Record the current at the regular interval of potential difference.
- 3. While changing the potential difference, rheostat must be moved in one direction only.
- 4. Do not pass a large current through the resistor.
- 5. While measuring the potential difference and current the needle of meters should not move out of the scale, i.e. when connecting the positive terminal start with the one having the highest calibration / scale.

Procedure:

- 1. Set up a circuit as illustrated in the Diagram 1.
- 2. Close the switch, take the ammeter and voltmeter readings quickly and open the switch.
- 3. Adjust the variable resistor and repeat step 2.
- 4. Repeat step 3 twice.
- 5. Record your results in the table below.

	Ammeter reading I(A)	Voltmeter reading V / p.d. (V)	Resistance $R = \frac{V}{I} (\Omega)$
1			
2			
3			
4			
Average			

6. Use the information in your table to draw a graph illustrating the relationship between the potential difference (V) and the current (I). **Use graph paper**.

7. Analyse your results and graph and write down a conclusion for your activity.

Subject:	Physical Sciences Grade 12	
Торіс:	Acids and Bases	
Lesson – content		
	Language aspects covered	
Pre-activities	The teacher gives the learners the following words and the learners write down their antonyms:	
VocabularyLanguage used in	Strong Weak	
the subject Prediction 	Completely incompletely	
	Vocabulary The learners must look up these words in a dictionary. Donor Ionise Dissociate	
During teaching	 Activity (15 minutes) The teacher brings vinegar, lemon juice, water, bicarbonate of soda and Handy Andy. Learners will be given vinegar, lemon juice, and bicarbonate of soda to taste. The learners will describe the taste. All learners will rub all the chemicals between their fingers and describe how they feel like. Activity (25 minutes) The teacher gives a scientific definition of an acid and a base according to Arrhenius and Lowry-Brønsted theories. 	
Assessment	 Define an Arrhenius base Differentiate between (a) a weak acid and strong acid. (b) a concentrated base and dilute base. 	
Resources	 Vinegar Lemon juice Handy Andy Bicarbonate of soda Water Glasses 	

Subject:	Physical Sciences Grade 12	
Topic:	Work, Energy and Power	
Lesson – content	Conservative and non-conservative forces	
	Language aspects covered	
 Pre-activities Vocabulary Language used in the subject Prediction 	Vocabulary Work Energy Force Incline Net Horizontal Vertical Resultant Displacement Angle Change (Δ) Conservative Non-conservative Components Pull Push Activity The teacher will reinforce the other terms that were dealt with in the previous lessons. The teacher asks the learners to give their own understanding of the words Conservative and Non-conservative.	
During teaching	Activity	
	The learners will be given a worksheet with the following diagram and questions: A learner pulls a crate along a flat surface from point A to B.	
	 Calculate the work done if: a) The learner pulls the crate directly from A to B. b) The learner pulls the crate from A to C, then to B. The teacher defines a non-conservative force using the results of the values calculated by the learners. 	
	A worker wants to load a 50 kg drum on to a truck. Calculate the work done against gravity if: a) The drum is lifted vertically up on to the 1 m high truck load bed.	
	b) The drum is rolled up a 2m long ramp inclined at 30 ^o .	
	The teacher defines a conservative force using the learner's answers.	
Assessment	Define the following terms: a) A conservative force b) A non-conservative force	
Resources	Worksheets	

Subject:	Physical Sciences Grade 12
Торіс:	Momentum
Lesson – content	
	Language aspects covered
 Pre-activities Vocabulary Language used in the subject Prediction 	Vocabulary Momentum State Linear Net Final Initial Resultant Relationship Activity
	Learners give their own understanding of the term 'momentum'.
During teaching	 Activity One learner throws a tennis ball to another learner, and then the same learner throws a soccer ball to his / her partner at the same speed. The learner is asked to decide which of the two is difficult to catch. A second pair is requested to do the same demonstration with a tennis ball, initial the ball is thrown at a slower pace and the other learner catches it, and then the thrower throws the same ball at a faster pace. The teacher will explain that the quantity experienced has something to do with momentum. The teacher gives the definition of momentum, referring to the formula, p=mv. The learners are given the following activity: (a) Calculate the momentum of a 5 000 kg bus moving due west at 10 m·s⁻¹. (b) Calculate the momentum of the same bus travelling at 20 m·s⁻¹ due north. (b) Calculate the momentum of a 1 200 kg hatchback travelling at 5 m·s⁻¹ due north.
Assessment	 The momentum of a car with mass m and velocity v is 200 kg⋅m⋅s⁻¹ East. What will be its momentum if its velocity is made 5 times bigger? The momentum of a car with mass 1200 kg and velocity is 6000 kg⋅m⋅s⁻¹ to the right. Calculate the magnitude of the velocity v.
Resources	Tennis ball Soccer ball

Mathematical Literacy

GRADE 10

TOPIC	SECTION	CONTENT
PROBABILITY	Representation for determining possible outcome	Tree-diagram

PRE-ACTIVITY		
Terminology		
Probability [mathematical]	The results of a trial or experiment expressed as a fraction: the number of favourable outcomes divided by number of all possible outcomes.	
Probability [of an outcome]	The likelihood of a particular outcome occurring, expressed as a number between zero and one.	
Likely/likelihood	The chance of something happening is greater than the chance of it not happening.	
Event	An activity, e.g. rolling a single die.	
Compound events	Two or more events that happen, e.g. tossing a coin and rolling a dice.	
Fifty-fifty (even) outcome	The chances of something happening or not happening are the same.	
Outcome	Result of a trial (experiment).	
Outcome [fair]	All outcomes are equally likely to occur.	
Possible outcome	The chance that an event will occur.	
Impossible outcome	No chance of the outcome happening, e.g. getting a 7 with an ordinary six-sided dice.	
Prediction	A statement describing the chance of an outcome happening, based on given information.	
Represent [data]	Draw; graph.	
Tree diagram	A diagram that uses branches to display all the outcomes of a series of trials.	



LESSON PRESENTATION	Language Issues	
Introduction: Pre-knowledge • Definition of probability • Expression of probability • Decimal • Fraction	Whilst the word "fair" may be used as a noun , denoting an outdoor entertainment or a commercial exhibition, or as an adverb (as in: <i>He</i> <i>has always played fair with me</i>), or as a verb (meaning to smooth or streamline the surface of something such as a table top), it is mostly used as an ADJECTIVE meaning quite a number of things. Depending on the context within which it is used, the word fair would have different meanings as shown below:	
 Percentage 	• reasonable or unbiased: a fair decision	
Prediction	 done property or according to the rules: fair and free elections 	
Likelihood	weather	
A fifty-fifty chanceImpossible	• pleasing to look at, beautiful or pleasing to the eye: a fair maiden	
Note: Probability of an event is not between 0 and 1, instead it	• not blocked, clear and unobstructed: a fair view	
<i>ranges from</i> 0 to 1. Furthermore the probability of an event can be 1, where the chance of an event to happen is certain.	• sizeable, reasonably large in size or quantity: They had a fair number of responses to the advertisement	
	• acceptable or average: Your performance this year has been only fair.	
2	• moderately good or reasonable: a fair understanding	
Mention ways in which probability can be represented, i.e.	• not marred by any blemish or stain: to preserve your fair name	
two way table and tree diagram. For the purpose of the lesson we will focus on tree diagram.	A fair die in the context of probability is discussed below.	
Experiment:	Twice means the same coin is tossed two times:	
Tossing a coin	✓ 1 st time — Outcome 1	
Unfolding terminology used when tossing a coin:	✓ 2 nd time — Outcome 2	
Event: Tossing a coin a number of times (e.g. twice)	> Fair: all outcomes are equally likely to occur, and	
 Fair and unfair outcome Outcomes: Head or tail 	> Unfair: one outcome has more chances than others.	
Representation: Represent the outcomes by drawing a tree-diagram. • Draw a tree diagram	It is referred to as a tree diagram, because the classic representation resembles a tree, even though the chart is generally upside down compared to an actual tree, with the root at the top and the branches at the bottom.	
H	In this case the event of tossing a coin is the tree, the coin is a root and the outcomes (head or tail) are branches.	
Coin	Although a tree is commonly known as a plant, this is not the case in probability.	



ASSESMENT	
Assessment Words	What is required of you
Calculate	This means a numerical answer is required – in general, you should show your working, especially where two or more steps are involved
Define	Give a clear meaning
Describe	Describe State in words (using diagrams where appropriate) the main points of a structure / process / phenome- non / investigation
Determine	To calculate something, or to discover the answer by examining evidence
Explain	Make clear; interpret and spell out
Identify	Name the essential characteristics
Label	Identify on a diagram or drawing
List	Write a list of items, with no additional detail
State	State Write down information without discussion
Tabulate	Draw a table and indicate the answers as direct pairs
Assessment	Ask questions based on tossing a coin and rolling a die

Question 1				
		Language aspects		
1.1	How many possible outcomes are found in rolling a die once? Answer: 6	The key word here is "possible", without which the answer would have been 1. That is, for each roll of a die there can only be one outcome.		
1.2	Complete the following tree diagram by drawing outcomes of A, B and C:	The tree diagram has to be completed by " drawing outcomes of A, B and C". In other words, the complete diagram is required here, not to draw as in "deducing" what values of A, B and C would be.		
	Answer:			

1.3	Determine the probability of getting a 6 when rolling a die twice?	This rollin	question g two dio	n has p ce simult	otential aneously	to be n /.	nisinterpr	eted as
		When two dice are thrown simultaneously, the number of events can be $6^2 = 36$ because each die has 1 to 6 number on its faces. Then the possible outcomes are shown in the table below (where the outcomes come in doubles):						
			1	2	3	4	5	6
		1	(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
		2	(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(2,6)
		3	(3,1)	(3,2)	(3,3)	(3,4)	(3,5)	(3,6)
		4	(4,1)	(4,2)	(4,3)	(4,4)	(4,5)	(4,6)
		5	(5,1)	(5,2)	(5,3)	(5,4)	(5,5)	(5,6)
		6	(6,1)	(6,2)	(6,3)	(6,4)	(6,5)	(6,6)
		The where rega case colore outco	question n outcom rdless of which d urs (say l ome 6?	n then thes are r the outo lie to loo blue and	becomes now in do come of t bk at if th red)? W	how ca publes? / he other ney came /hat if bo	an we g A 6 from die? If th e in two th give th	et "a 6" one die hat is the different ne same
	Answer: $\frac{1}{36}$							
1.4	A die was rolled twice, the outcome of the 1 st roll was 3. What is the probability of getting an even number when rolling the die for the second time?	The die is the p	probabili s not dep previous i	ty of gett pendent roll. The	ing an ev on the ou se events	ven numt utcome c s are inde	per when of the out ependen	rolling a come of t.
	Answer: $\frac{3}{6}$							

GRADE11

TOPIC	SECTION	CONTENT	
MEASUREMENT	Volume, Area and	Calculate / measure the perimeter, area (including surface area) and/or volume of obje	
	Perimeter	 direct measurement (perimeter using rulers, etc.; area using grids, etc.; and volume using measuring jugs, etc.) 	
		calculation for each of the following:	
		rectangles, triangles and circles (quarter, semi and three-quarters) using known formulae [the singular form is <i>formula</i>]	
		rectangular prisms and cylinders using known formulae	

PRE-ACTIVITY			
Terminology			
Area	Area of a region is the amount of space which it occupies. It is measured in squares.		
2-D drawings	A shape with two (2) dimensions and no thickness.		
2-dimensional plans	A plan or design possibly representing three dimensional objects		
3- dimensional models	A dimensional construction of a real-life object. It is a solid, it has length, breadth/ width and height		
Capacity	The amount of space available to hold something OR Measure of the volume a hollow object can hold. Usually measured in litres		
Circle	A closed curve that is everywhere at the same distance from a fixed point		
Circumference	Distance around a circle / perimeter of a circle		
Cylinder	Three dimensional object with congruent parallel circles s bases that are joined by a curved surface. A cylinder is a geometric solid that is very common in everyday life, such as a can.		
Diameter	A straight line passing through the centre of a circle and touching the circle at both ends thus dividing the circle into two equal halves.		
Distance	How far it is from one place to another, e.g. from one town to another.		
	Usually measured in kilometres, and does not have to be in a straight line.		
Face	In any geometric solid that is composed of flat surfaces, each flat surface is called a face.		
Hypotenuse	The side of a right angled triangle that is opposite the right angle.		
Length	The measurement between two points, in a straight line, e.g. the length of a room		
Measuring	Determining the value of a quantity directly, e.g. reading the length of an object from a ruler or the mass of an object from a scale.		
Perimeter	The total distance around the boundary or edge that outlines a specific shape.		
Pi	The value obtained when dividing the circumference of the circle by its diameter.		
Prism	A three dimensional object, such as a cylinder with two identical faces at opposite ends. There are triangular, rectangular and circular prisms.		
Quadrilateral	A polygon with four sides		
Radius	The distance from the centre of the circle to any point on the circumference of the circle. Half of diameter		
Surface area	The areas of all the faces / surfaces of an object added together		
Unit of measurement	A standard amount of a physical quantity		
Volume	The amount of 3-D space occupied by an object. It is measured in cubic units		







Rectangular box

Surface area of a rectangular box =2($\ell x w$) + 2($\ell x h$) + 2(w x h)



To calculate the surface area ,we calculate the area of each flat surface separately: Surface area= Area of F1 + Area of F2 + Area of F3 + Area of F4 + Area of F5 + Area of F6

= (3cm x6cm) + (3cm x 8cm) + (6cm x8cm) + (3cm x 8cm) + (3cm x6cm) + 6cm x8cm)

= 18cm^2 + 24 cm² + 48 cm² + 24 cm² + 18 cm² + 48 cm²

= 180cm²

Which can also be written as :

Surface area = 2 (3cm x6cm) + 2(3cm x 8cm) + 2(6cm x8cm)

= 180cm²

In 2-D and 3-D: dimensions and faces, which is which?

For 3-D means three dimensional shape that has more than one "*face*" (e.g. cube, rectangular prism and cylinder), a 2-D can be regarded as ONE of the faces of the 3-D.

There is this tendency amongst learners to relate the words '2-D' and '3-D' to the number of faces; two faces and three faces, respectively. This is incorrect.

Furthermore, a triangle is incorrectly interpreted as a 3-D shape simply because it has three sides.

Area vs Surface Area:

AREA: From the definitions of 'area' and '2-D' provided above, it follows that area is in fact the amount of two-dimensional (2-D) space occupied by a 2-D shape. In other words, an area of a shape is the size of its surface measured in square units.

NOTE: In an 'ordinary' English use, the area would also refer to a field of knowledge or even a geographical region or district.

SURFACE AREA: In English *flu symptoms* means *symptoms of flu*. With this in mind, would *surface area* therefore mean *area of a surface*? Consider an area as part of a surface, then surface area would be the area of the entire surface. It is with this view that given, say, a rectangular box, the sum of the areas of all the faces is usually referred to as surface area.

Note: In essence, the area of a surface can also be the surface area of an object, depending on the context related to.

If the box is **open**, it means one area is not going to be added.

SURFACE AREA OF A CYLINDER

Surface area of a cylinder = $2\pi r^2 + 2\pi rh$



The surface area of a (closed) cylinder can be found by breaking it down into three parts

- The two circles that make up the ends of the cylinder.
- The side of the cylinder, which when "unrolled" is a rectangle

That is, to calculate the surface area of the cylinder we calculate the sum of the areas of the two circular disks and the rectangle as shown below:



When learners are asked to calculate the surface area of a cylinder, they take the cylinder as a **solid** figure; but if you take a cylinder apart, you find that it has two ends, called <u>bases</u>, which are usually circular. The bases are always <u>congruent</u> and <u>parallel</u> to each other. If you were to 'unroll' the cylinder you would find the side is actually a rectangle when flattened out.

Understanding Pi (π): When the length of the circumference of a circle is divided by the length of its diameter, the result is always the same number. This number is slightly more than 3 and is symbolised by the Greek letter π - pronounced pi (as in pie).

That is, $\frac{Conference(C)}{diameter(d)} = \pi$ Or $C = \pi d$

Or $C = 2\pi r$ (since d = 2r)

ASSESMENT			
Assessment Words	What is required of you		
Explain	Express in words		
Calculate	Work out		
Determine	Establish exactly by calculation.		
Estimate	To make an educated guess about what the answer of a calculation will be without actually calculating accurately, or what the value of a measurement e.g. length will be without actually measuring.		
Express	Write as		
Investigate	Examine; look into; study		
Measure	Using an instrument to determine size		
Rounding off	To decide to cut off a number at a certain digit to minimise errors		
Substitution	To replace a variable by a specific value		

QUESTION 1

Water is scarce in South Africa. The annual average rain fall is 446 mm. According to Statistics South Africa (www.statssa.gov.za) 88,6% of the South African population has access to drinking water. The measurements of a water tank are given in metres. The water tank's radius is 14 m and its height is 10m.



QUESTIONS AND SOLUTIONS	LANGUAGE ASPECTS	
1.1. Explain the difference between diameter and radius. (2) Solution:	In the context of Maths "difference" between x and y means " $x - y$ ". Then there is chance for learners to view "difference between diameter and radius" as $2r - r = r$. (ARGUMENT: Would this be the correct answer if the question was " <u>What</u> is the difference between diameter and radius?")	
Diameter touches the circle at both ends thus dividing the circle into two equal halves. \checkmark		
The distance from the centre of the circle to any point on the circumference of the circle. \checkmark	On the other hand learners could provide definitions of the two concepts to demonstrate the difference between the two concepts.	
	Instead of explaining the difference learners tend to give a relationship between the two i.e. radius is of half diameter.	
1.2. Determine the diameter of the water tank.(2)	To answer this question it requires learners to calculate diameter using	
Solution:	calculation how they got the answer.	
Diameter = 2 x 14m		
= 28m ✓ ✓		
1.3. The lid of the water tank must be painted on the outside in order for it to be clearly visible. Calculate the area of the lid (in m ²) if it has a radius of 14 m.	This question is clouded with "noise" that is used as context, making language a barrier to what is needed. The first sentence could be taken to where it is needed, say the next question (Q1.4)	
Use the formula: Area = $\pi \times (radius)^2$, where $\pi = 3,142$. (2)		
Solution:		
Area = $\pi \times (radius)^2$		
= 3,142 × 14 ² ✓		
= 615,44 🗸		
1.4. A one-litre tin of paint covers an area of 15 m ² . Calculate the area that can be covered with 17 litres of paint. (2)		
Solution:		
17 × 15 ✓		
= 255√m²		

1.5. The inside of the tank must be sealed with waterproof paint. The lid does not get waterproofed on the inside. Calculate the interior surface area (in m ²) by using the following formula.
Inside area = (2 × π × r × h) + (π × r²), where π = 3,14, r = radius and h = height / depth of the water tank. (3)
Solution:
Interior surface area = $(2 \times \pi \times r \times h) + (\pi \times r^2)$
$= (2 \times 3, 14 \times 14 \times 10) + (3, 14 \times (14))^2 \checkmark$
= 879,2 + 615,44 ✓
= 1 494,64√m²

Mrs Thabekhulu runs a small business from her home. She buys different types of laundry baskets to cover the inside of the baskets with fabric. Then she resells them.



QUESTION 2	
2.1. How much fabric will Mrs Thabekhulu need (in m ²) to cover the sides and base on the inside (but not the lid) of a rectangular laundry basket?	(4)
Use the following formulae: Surface area = $(I \times b) + 2 (I \times h) + 2 (b \times h)$	
2.2. Calculate the amount of fabric needed to cover the base and sides of the inside of the cylindrical laundry basket? Round off your answer to the nearest m ² .	
<u>Use the formula</u> : Surface area = $(\pi \times r^2) + (2 \times \pi \times r \times h)$, use $\pi = 3,14$	

GRADE 12

TOPIC	SECTION	CONTENT
Finance	Taxation	Calculating personal income tax:
	(income tax)	 Use both the tax deductions tables and the tax brackets to investigate how the tax value on a payslip is calculated
		Investigate the impact of an increase in salary on the amount of tax payable
		 Find reasons for differences in tax values calculated using tax deduction tables and tax brackets.

Net pay	The amount an employee "takes home" after income tax has been deducted.
Gross income	The total amount of all individual's or business' income before deductions.
PAYE (abbr.)	Pay as you earn: tax taken off your earnings by your employer and sent to the South African Revenue Service before you are paid (the balance).
Salary	An amount of money paid for the work you do. (This is normally paid monthly.)
Тах	A compulsory levy imposed on citizen's earnings or purchases to fund the activities of government.
Taxable	A service, purchase or item or earning that has tax applied to it.
UIF (abbr.)	Unemployment Insurance Fund: A government-run insurance fund which employers and employees contribute to, so that when employees are retrenched they can collect some earnings (a portion).
VAT (abbr.)	Value Added Tax is a tax that is levied at 14% (currently in South Africa) on most goods and services, as well as on the importation of goods and services into South Africa.
VAT exclusive price	The price before VAT is added [exclusive - exclude].
VAT inclusive price	The price after VAT is added [inclusive - include].
Wages	A wage is an amount of money paid to an employee normally based on a fixed number of hours worked per week.
Income tax	It is the amount of money one must pay to the South African Revenue Services (SARS) for earning an income.
Income	Is the money that an individual or business receives in exchange for providing a good or service.
Zero rated VAT items	These are goods that are exempt from VAT. Groceries that are basic foodstuffs are zero- rated in South Africa, e.g. brown bread, milk, mielie meal, samp, rice, etc.
Deduction	Expenditure or losses actually incurred by a person during a tax year in the course of producing income which that person is allowed to deduct against that income.
Tax threshold	The level of income or money earned above which people or companies must pay tax.
Rebates	Tax relief given to all tax payers
Pension	It is a fund established by an employer to facilitate and organize the investment of employees' retirement funds contributed by the employer and employees.
Notch salary	Annual basic salary

LESSON PRESENTATION			
INTRODUCTION Pre-knowledge • Calculation of VAT • VAT inclusive price • VAT exclusive price • Zero rated VAT items NB: Calculating a "VAT exclusive price" from a "VAT inclusive price" means dividing the VAT inclusive price by 114% to reverse it to 100%.	 Language aspects Value added tax (VAT) is the indirect tax on the domestic consumption of goods and services, except those that are zero-rated Zero rated items means items whose rate of tax is nil on their input supplies VAT Inclusive price is 114% of the original price. Since VAT Exclusive price is the price before VAT is added, it is simply 100% of the original price Misconception: Calculating a "VAT exclusive price" from a "VAT inclusive price" means subtracting 14% from the VAT inclusive price. 		
Explanation of terminology on a salary slip	Language aspects		
 Notch salary Gross salary Is the amount of money earned before any deductions such as medical aid, pension contributions, UIF, and PAYE are done. Deductions 	• Teachers only limit the definition of gross to gross salary, the actual definition of gross is not elaborated. Instead teachers should define gross as an independent word before explaining gross salary. Not every "gross" is a gross salary: gross means without deductions; total, as the amount of sales, salary, profit		
Money taken from earnings before navment is processed	Misconception		
Net salary	Learners confuse basic salary with gross salary. Gross salary is		
 Is the remaining amount of money paid after all deductions were done. 	the sum of the basic salary plus all benefits.		
PRESENTATION	Language aspects		
TAXATION	Taxation and tax are confused to be meaning the same thing. While tax is a levy, taxation is a means by which governments		
Two types of tax			
VAT – Compulsory tax	corporate entities.		
Income tax-Paid by everyone or business earning a salary			
KEY CONCEPTS	Language aspects		
 Income tax It is the amount of money one must pay to the South African Revenue Services (SARS) for earning an income. Examples of earnings an individual may receive include remuneration (income from employment) such as <i>salaries, wages, overtime pay</i>, etc. Income tax amount varies from one individual to another depending on the amount earned. 	 Income refers to the money we receive whereas "<i>income tax</i>" is the money that you pay from the "<i>income</i>". For both terms has the word "<i>income</i>", there could be a misconception that in both cases money is "<i>coming in</i>" when in one instance money is "<i>going out</i>". Learners think income tax is calculated from salary only. Whereas it is calculated from every source of income. 		
Tax refund			
 Tax refund is given to someone who has, over a year, paid more tax than he/she should have. 			
Pay-As–You-Earn (PAYE)			
Income tax deducted from the earnings			

CALCULATING INCOME	Definition
TAX Step 1:	Annual income refers to all the income one earned over the year in wages, salary, tips, bonuses, commissions, and overtime amount.
 Determine the annual income Multiply the monthly salary by 12 to make it the annual salary 	Misconception
and add extra benefits	Usage of only annual salary to calculate annual income , other benefits are excluded. All annual earnings should be added to calculate annual income.
Step 2:	Note:
 Calculate non-taxable income UIF: 1% of income Pension fund : 7.5% 	A donation is a gift given by legal persons, typically for charitable purposes and/or to benefit a cause and is considered when calculating non-taxable income.
DonationsChild support payments	Issue: How do you "legalise" a person? The gift has to be given to an organisation that is registered under section 18A.
(A donation will be exempted if the total value of donations for a year of assessment does not exceed:	
 Casual gifts by companies and trusts: R10 000. Donations by individuals: R100 000) 	
Step 3:	
Calculating the taxable income by subtracting non-taxable income from the total income	
Step 4	For threshold means point of entering, in this context it refers t
Tax threshold	the entrance level to qualify to pay tax
• Check if the person qualifies to pay tax by using the tax threshold The income level at which a person begins paying income taxes	
The people earning lower than the tax threshold do not pay tax	
Step 5: Identify the correct tax bracket, write down the correct rate and calculate payable tax before the rebates and medical credits could be subtracted, using BODMAS.	BODMAS is an acronym for brackets, orders, division, multiplication, addition and subtraction, and determines the order of operations. Learners and teachers commonly use this acronym as brackets, of, division, multiplication, addition and Subtraction, and this brings about confusion when other orders are omitted after the Brackets.

Step 6:		
Identify the correct rebate		
Calculate the annual medical credits.		
Subtract the rebate and medical credits from the calculated tax in step 4.		
Rebate:		
• The tax relief provided; it is deducted after annual tax has been calculated.		
The older the citizen, the higher the rebate.		
• People younger than 60 receive the primary rebate (compulsory rebate to every citizen).		
People above 65 qualify for both the primary and secondary rebate.		
• People above 75 qualify for the primary, secondary and tertiary rebate (the highest rebate).		
Medical tax credit	First means being before all others with respect to time	
• Is the fixed monthly medical rebate aimed at relieving personal tax;	or order.	
irrespective of the income	While in practice the 1st dependent is commonly	
• The more the number of dependents the higher the medical tax credit; the person's tax bracket is not considered.	understood to be one's wife/husband, this is not the case when calculating income tax.	
The medical credit depends on the number of dependents.	When calculating income tax, the1 st dependent is not	
• The medical credit allocated to the first dependent equals to that of the main member; there after the medical credit s of the remaining dependent	necessarily the wife or husband, but the 1 st depends captured.	
is the same for every additional member.	i.e. anyone can be the 1 st dependent, including wife / husband, depending on the order in which the dependents are captured.	

ASSESSMENT WORDS	
Explain	Make clear; express in words, interpret and spell out
Calculate	This means a numerical answer is required – in general, you should show your working, especially where two or more steps are involved
Show	Do calculations to prove that the answer is correct
Verify	Calculate, get the answer and compare the answer with the one given.

Example:	
Mr Nhlapo is the 56 year old HOD at Mahlenga Secondary school situated at	Basic salary is the amount of money that someone earns
Sokhulumi. She is earning a monthly salary of R27 876,80, she is also getting	every year in their job, not including any extra money.
a bonus that is equivalent to her monthly salary. She is also contributing 7.5%	Bonus is any financial compensation, reward, or return
of her basic salary towards GEPF. She pays medical aid for her 2 sons.	over and above what was expected by the recipient.

1.	Explain why it is important to know Ms Nhlapo's date of birth for tax calculation purposes.	Learners tend to give the tax threshold and
So	lution	rebate as answers without any explanation.
•	To identify the correct tax threshold, as the age determines the suitable tax threshold.	Learners should know what is expected of them if they have to explain
•	To identify the correct rebate, as the age will determine the rebate/s the person qualifies	
	for.	

2. Use calculations to show that Ms Nhlapo qualifies to pay tax.	Learners only calculate the annual income
Solution	without comparing the annual income to the
Annual income = (R27 876.80 x 12) + R27 876,80	to pay tax or not.
= R362 398,40	
She qualifies to pay tax because she earns an income more than R75 000	
3. Use the tax information in tax table below to calculate the annual tax payable on Ms	Learners only calculate the income tax
Nhlapo's taxable income.	before the rebate and medical credits are
Solution:	Subiracieu.
Step 1 : Taxable income as calculated in 2	
Step 2: Non –taxable income	
GEPF: 7.5% of R334 52160 = R25089,12	
Step 3 : Taxable income = R362 398,40 - R25089,12	
= R337 309,28	
Step 4:	
It falls in tax bracket 3	
Payable tax before rebates and medical credits	
= 61296 + 31% of taxable income above 293 600 = $61296 + 31\%$ (337 309 28 - 293 600)	
=R74 845,88	
Step 5:	
Medical credit = [(R286 x 2) + R192] x 12	
= R9168	
Income tax = R74 845,88 - R9168 - R13 500	
= R 52177.88	
4. Ms Nhlapo claims that if she was 10 years older she would pay the monthly tax of	Learners don't write the conclusion, they
4911.40, verify her claim.	only calculate and get the answer without
Solution:	
Annual income tax at 66 years = $52177,88 - 7407$ = 44770.88	
= 3730.91	
Her claim is correct	

RATES OF TAX FOR INDIVIDUALS

2017 tax year (1 March 2016 - 28 February 2017)

Taxable income (R)	Rates of tax (R)
0 – 188 000	18% of taxable income
188 001 – 293 600	33 840 + 26% of taxable income above 188 000
293 601 – 406 400	61 296 + 31% of taxable income above 293 600
406 401 – 550 100	96 264 + 36% of taxable income above 406 400
550 101 – 701 300	147 996 + 39% of taxable income above 550 100
701 301 and above	206 964 + 41% of taxable income above 701 300

Tax Rebate	2017
Primary	R13 500
Secondary (65 and older)	R7 407
Tertiary (75 and older)	R2 466

Tax Thresholds	
Person	2017
Under 65	R75 000
65 an older	R116 150
75 and older	R129 850

2016/2017 year of assessment(1 March 2016 - 28 February 2017)	
R286 per month for the taxpayer who paid the medical scheme contributions	
R286 per month for the first dependant	
R192 per month for each additional dependant(s)	





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