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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	1	TOPIC	COMPOSITION AND THE STRUCTURE OF THE ATMOSPHERE
SUBTOPICS:	• Importance of the atmosphere • Composition and structure of the atmosphere: troposphere, stratosphere, mesosphere and thermosphere. • The ozone layer-in the stratosphere • Causes and effects of ozone depletion; and • Ways to reduce ozone depletion						
RELATED CONCEPTS:	• Atmosphere, Air, Atmospheric pressure ,Thermosphere ,Ozone, Ozone layer, Chlorofluorocarbons (CFCs), Hydrofluorocarbons (HFCs)						
PRIOR/BACKGROUND KNOWLEDGE:	• Climate and Weather (SS Grade 5, 6 and Grade 8) • Matter and Materials e.g. gases (NS Grade 7)						
ERRORS AND MISCONCEPTIONS:	• Confusion in differentiating layers and zones of separation between layers of the atmosphere (e.g. mesosphere and mesopause). • Confusion between the variable gases and permanent gases • Confusion on differentiating between weather and climate (e.g. daily observation of cloud cover perceived as climate) .						
DATE STARTED:				**DATE COMPLETED:**			
LESSON OBJECTIVES	***Learners should be able to :*** • *Define the atmosphere* • *Explain the importance of the atmosphere* • *Identify the layer in which weather conditions occurs* • *Identify the gases that make up the atmosphere* • *Explain the importance of the ozone layer*						

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	• *To explain what ozone is, the importance of ozone, factors that contribute to ozone depletion, effect of ozone depletion* • *On human and environment.* • *Discuss the strategies to reduce ozone depletion.*

Methodology:

- Brainstorm around the composition and the structure of the atmosphere using the simple language
- Definition of concepts related to the composition and the structure of the atmosphere
- Importance of the atmosphere with learners explain and clarify the importance of the atmosphere in sustaining life on Earth
- Learners annotate (label) a sketch representing the structure of the atmosphere on worksheet provided
- Learners view satellite images of atmosphere and the ozone depletion using overhead projectors, data projectors and pictures
- Using case studies to read and interpret the ozone depletion and its effecting selected areas of the Earth e.g. Antarctica

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** • Introduce the topic (atmosphere, the composition, the structure and the importance of the atmosphere) ***Main Body (Lesson presentation)*** • *Defining what is atmosphere* • *Discussing the composition, structure of the atmosphere, the importance of the atmosphere and the different layers of the atmosphere* • *Discuss the importance of ozone, causes of ozone depletion and strategies to reduce the impact of ozone depletion* • *Unpacking the different gases that make the highest and lowest proportions in the atmosphere* ***Conclusion*** • *chalkboard summary* • *Assessment taken from the guide provided*	• Define atmosphere • Description of the importance of the atmosphere • Indication of the atmosphere on the globe (thin blue layer) • Provide visible characteristics of layers of the atmosphere through diagrams/ chart/ graph	• *Textbooks* • *Map of South Africa* • *Working guide* • *Past Exam question papers* • *Newspapers, websites,*

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COMPOSITION AND STRUCTURE OF THE ATMOSPHERE

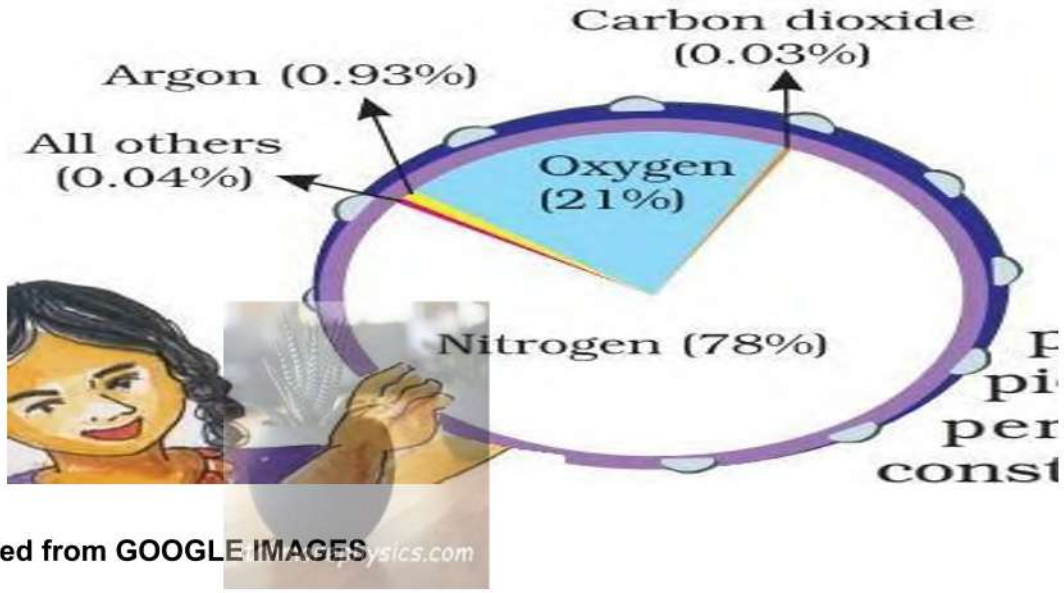
What is the *atmosphere*?

Atmosphere refers to the layer of gasses surrounding the earth.

Why atmosphere is so important for life on earth?

- Atmosphere provides oxygen for respiration
- It is the source of rainfall
- It provides carbon dioxide needed for photosynthesis
- It provides nitrogen necessary for plant and animal growth
- It is important for energy balance , through wind circulation transferring heat from the equator to the cold polar regions and cold temperature from poles the the equatorial regions

Composition of the atmosphere



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Atmosphere is composed mostly of gasses, but it also contains some liquids and particles.

Gasses making atmosphere are classified into two categories

Permanent gasses* and *variable gasses

Permanent gasses refers to the gasses that do not change in their proportion on the atmosphere. Those gasses are Nitrogen (78%) Oxygen (21) and Argon (0, 9 %)

Variable gasses are those gasses that can chance their proportion from time to time and from place to place. Common examples of variable gasses are ***carbon dioxide*** and **water vapour**

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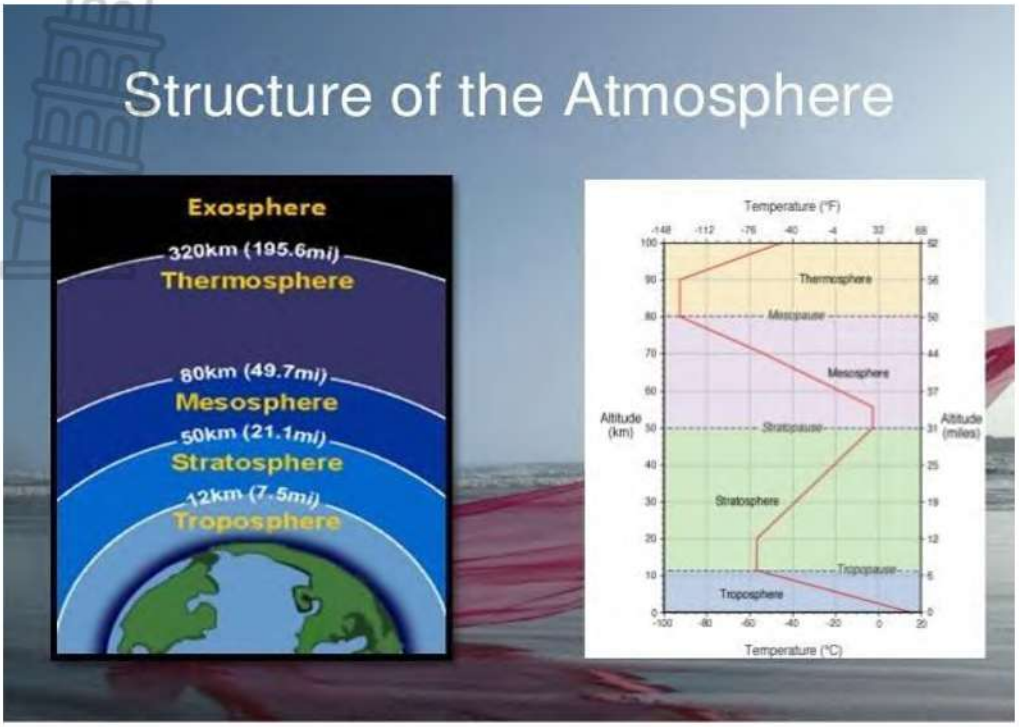
There are four layers that make atmosphere and those are:



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Troposphere -The lower atmosphere with the densest layer of air. Temperature decreases with altitude.

Stratosphere -The second layer of atmosphere above earth containing ozone. Temperature increases with altitude.

Mesosphere – The third layer of atmosphere where meteors burn up. Temperature decreases with altitude.

Thermosphere -The fourth and furthest layer of the atmosphere where temperature increases with altitude

The zone separating troposphere and stratosphere is called tropopause
The zone separating stratosphere and mesosphere is called stratopause
The zone separating mesosphere and thermosphere is called mesopause
The lower part of the thermosphere is called ion sphere
The upper part of the thermosphere is called exosphere

What is an inversion?
Inversion refers to an increase temperature with the increase in altitude
The two layers of the atmosphere where inversion occurs are
STRATOSPHERE AND THERMOSPHERE

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	2 - 3	TOPIC	HEATING OF THE ATMOSPHERE
SUBTOPICS:	• Processes associated with heating of the atmosphere • Factors that affect the temperatures of different places around the world – latitude, altitude, ocean currents and distance from oceans. • Heating of the atmosphere • Processes associated with the heating of the atmosphere: insolation, reflection, scattering, absorption, radiation, conduction and convection						
RELATED CONCEPTS:	• Insolation, absorption, reflection, scattering, convection, conduction terrestrial radiation, albedo ,solar content , Altitude, temperature inversion, Global warming ,Aspect, • Terrestrial radiation, Conduction, Latent heat, Albedo, Greenhouse gases, Greenhouse effect						
PRIOR/BACKGROUND KNOWLEDGE:	Heat transfer (NS Grade 7)						
ERRORS AND MISCONCEPTIONS:	• Confusion in differentiating latitude and altitude • Confusion between temperature inversion and the relationship between temperature and latitude (e.g. the higher you go the colder it becomes) • Confusion on the differentiation of chlorofluorocarbons and hydrofluorocarbons • Difficulty in understanding greenhouse gases and greenhouse effect						
DATE STARTED:				**DATE COMPLETED:**			
LESSON OBJECTIVES	**<u>Learners should be able to:</u>** • Identify processes associated with the heating of the atmosphere when presented on the diagram • Explain how factors affecting temperature of different places around the world operate • *differentiate between greenhouse gases and greenhouse effect* • *The greenhouse gases and the main greenhouse gases* • *What is global warming, causes of global warming and consequences of global warming* • *Strategies to reduce the impact of global warming and climate change* • *The factors affecting temperatures of different places around the world.*						

Methodology:

- Brainstorm around heating of the atmosphere using simple language and definition of concepts related to heating of the atmosphere.
- **Processes associated with the heating of the atmosphere**: - demonstrating **insolation** and **scattering** by using a globe and a torch -demonstrating **reflection** using a torch and a mirror,demonstrating **absorption** using a torch, an A4 paper and a globe,demonstrating **conduction, convection** and **radiation** using apparatus such as Bunsen burner and a pot

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- **Factors that affect the temperature of different places around the world-** using a torch and a globe to demonstrate variation of insolation in different parts of the world (latitudes), Use of diagrams/ illustrations to show temperature differences in different **altitudes**
- Demonstrating the different **ocean currents** using the world map (atlases)
- Learners view satellite images of the **atmosphere and ozone depletion** using overhead projectors, data projectors.

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** • *Introducing processes associated with heating of the atmosphere i.e. latitudes, altitudes, distance from the ocean, ocean currents, aspect* • *Explain the difference between the greenhouse gases and the greenhouse effect* • *The teacher lists greenhouse gases and their importance on the atmosphere* ***Main Body (Lesson presentation)*** • *Discussing with the learners how latitudes, altitudes, distance from the ocean, ocean currents, aspect affect temperatures of the different places around the world.* • *Using local examples to discuss the factors affecting temperatures of the different places around the world* • *Discuss with learners the factors that affect temperatures of different places around the world i.e. latitudes, altitudes, ocean currents, distance from the ocean and aspect.* • *Discuss the greenhouse gases, their importance and how they contribute to global warming* • *Explain the impact of climate change on people and environment* ***Conclusion*** • *chalkboard summary* • *Assessment taken guide provided*	• Definition of related concepts e.g. latitude, altitude, ocean currents • Demonstrate using a torch and a globe how temperature differ in different places of the world • Explanation through illustrations how altitude and latitude influence temperature of ocean currents • Explanation and demonstration using a map/ globe how ocean currents influence temperature of different places, as well as influence of the distance from the ocean • Description of the general causes of ozone depletion • Identification of the effects of ozone depletion from a case study • Description of the causes and effects of ozone depletion • Discussion on the ways to reduce ozone depletion	• *Textbooks* • *Map of South Africa* • *Working guide* • *Past Exam question papers* • *Newspapers, websites,* •

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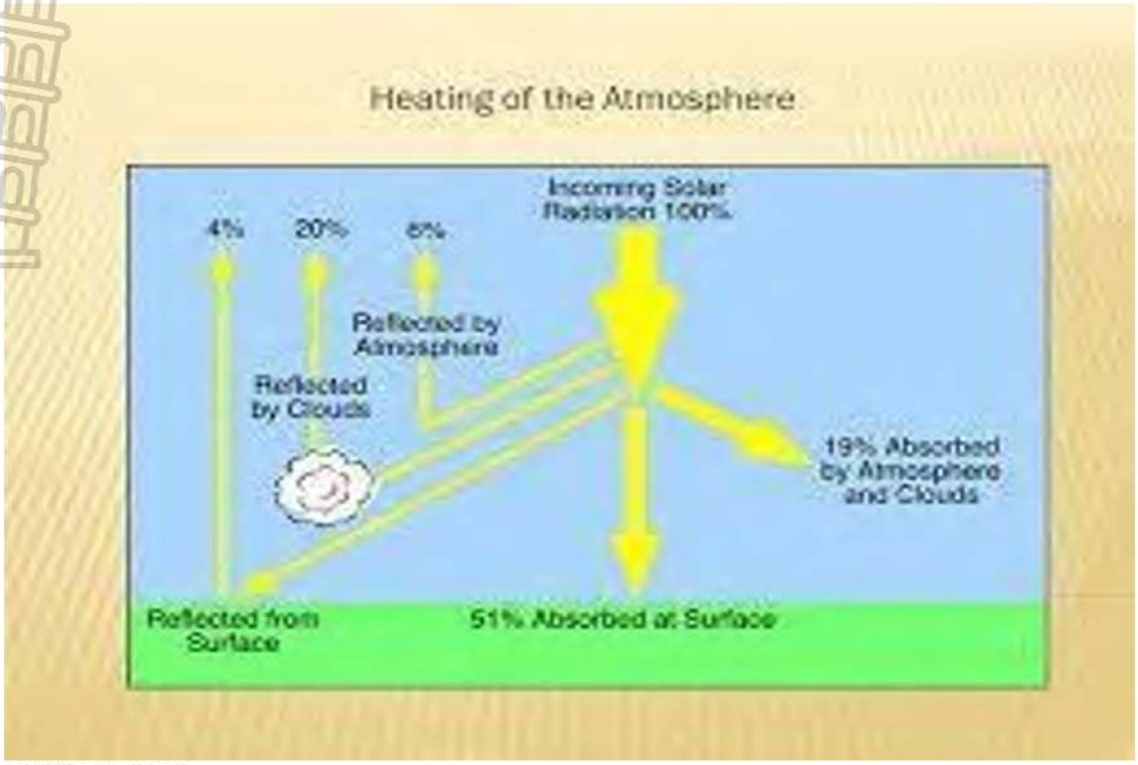
PROCESSES ASSOCIATED WITH THE HEATING OF THE ATMOSPHERE



INSOLATION

- Refers to the heat energy emitted direct from the sun, the concept insolation has been derived from the Incoming Solar Radiation. Approximately 51% out of 100% of insolation reach the Earth's surface, and it is referred to Solar content.
- Most of the insolation is lost before reaching the Earth's surface due to the following processes:

Absorption, Scattering, and reflection

- **Absorption**- most of the Heat energy is absorbed by clouds and dust before it reaches the atmosphere
- **Scattering** refers to split up of insolation by small dust particles and gases deflecting into different direction.
- **Reflection** occurs when sunrays striking the earth are redirected back to the space usually by clouds
- **Albedo** refers to the percentage of light reflected back to a space. Clouds and grass can reflect large percentage of sunray hence we say they have high Albedo in contrast with concrete surfaces the reflect little heat and we say they have low Albedo

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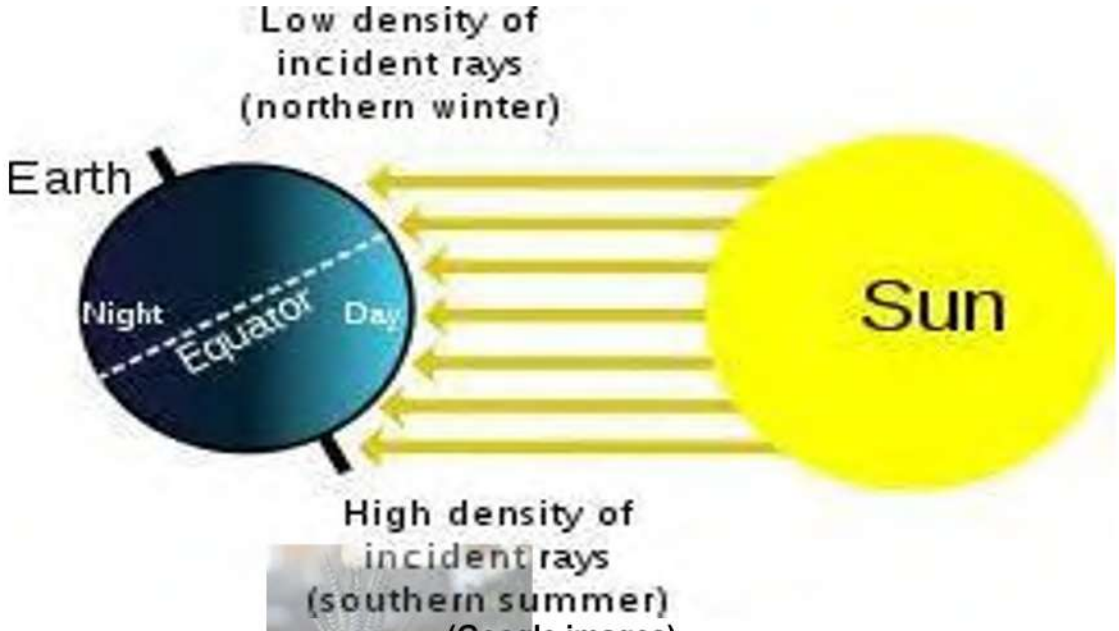
FACTORS THAT AFFECT TEMPERATURE OF DIFFERENT PLACES AROUND THE WORLD.

- **Latitude**- angular distance north or south of the equator
- **Altitude** – height above the sea level
- **Ocean currents**
- **Distance from the ocean**
- **Aspect –** angle in which the sun's rays strike a slope

LATITUDES



(Google images)

Places closer to the equator are warmer than places further away from the equator. The sun heats the equator at a direct angle while Polar Regions receive indirect sunrays.

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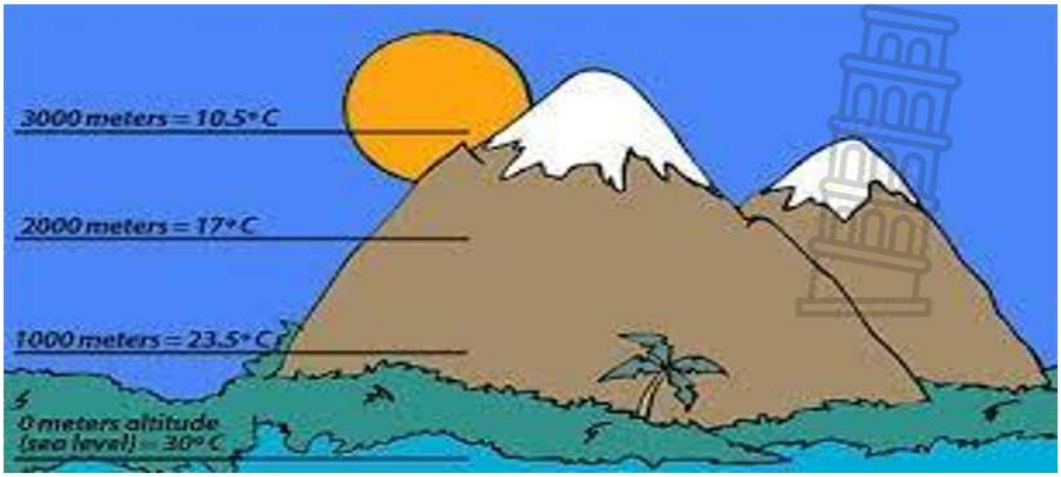
ALTITUDE



Normally the temperature decreases with an increase in high. Places in upper altitude are colder than places in lower altitude. That is why some taller mountains are covered by ice caps.

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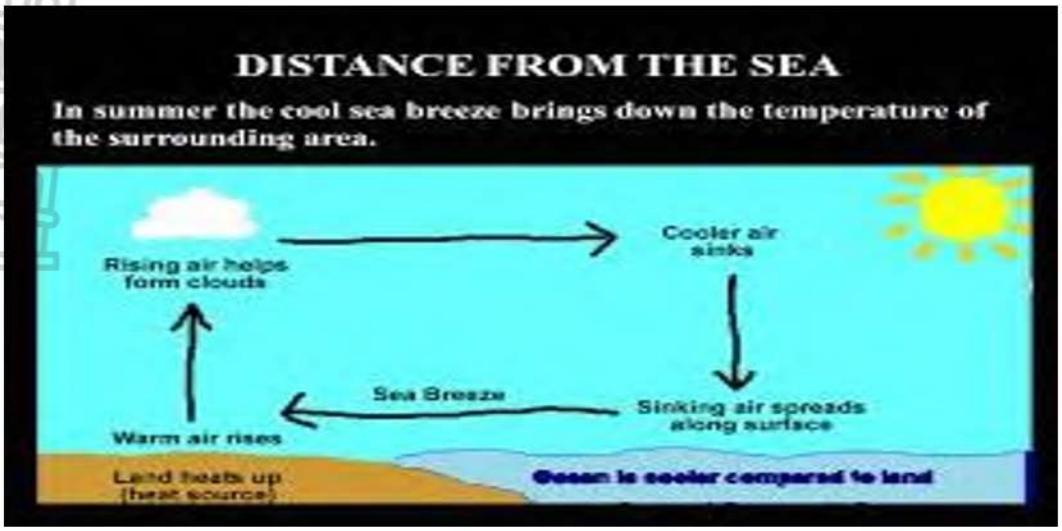
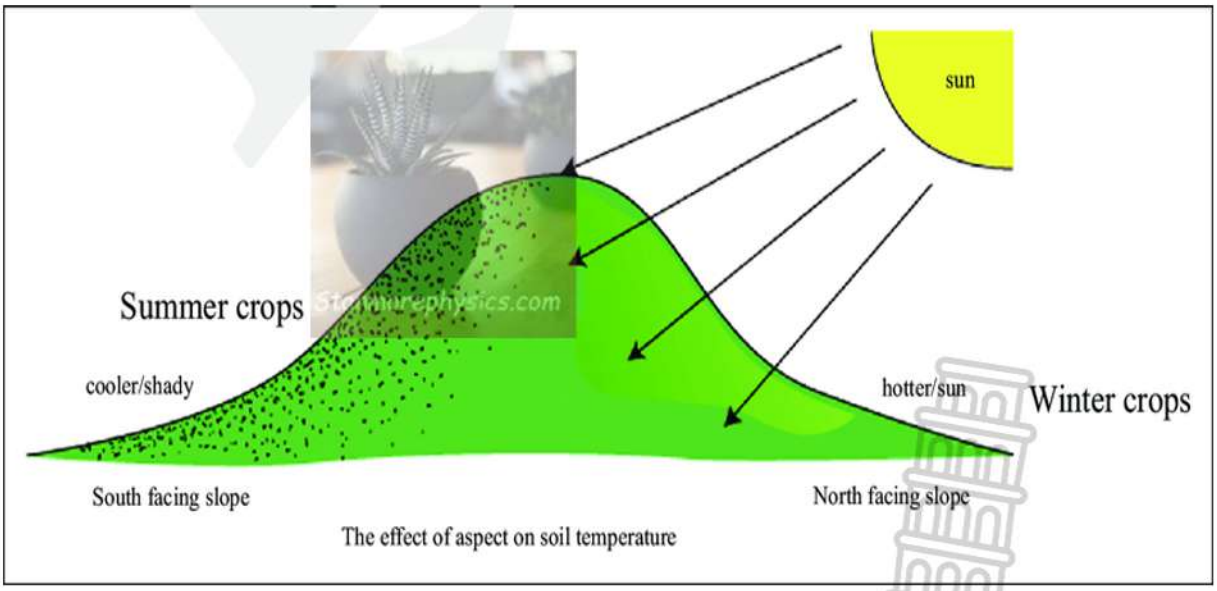
DISTANCE FROM THE OCEAN



Places inland have hotter summers and colder winters. This is caused by the fact that land heats up quickly and cools up quickly as well.

Places closer to the ocean have cooler summers and warmer winters. This is caused by the fact that ocean water heats up slowly and releases heat slowly as well

SLOPE ASPECT



Aspect refers to the angle in which the sun's rays strike a slope.
Slopes facing the equator are warmer than slope facing poles. Slopes facing the equator receive more sunrays than slopes facing poles
In the southern hemisphere the north facing slopes are warmer than south facing slopes.

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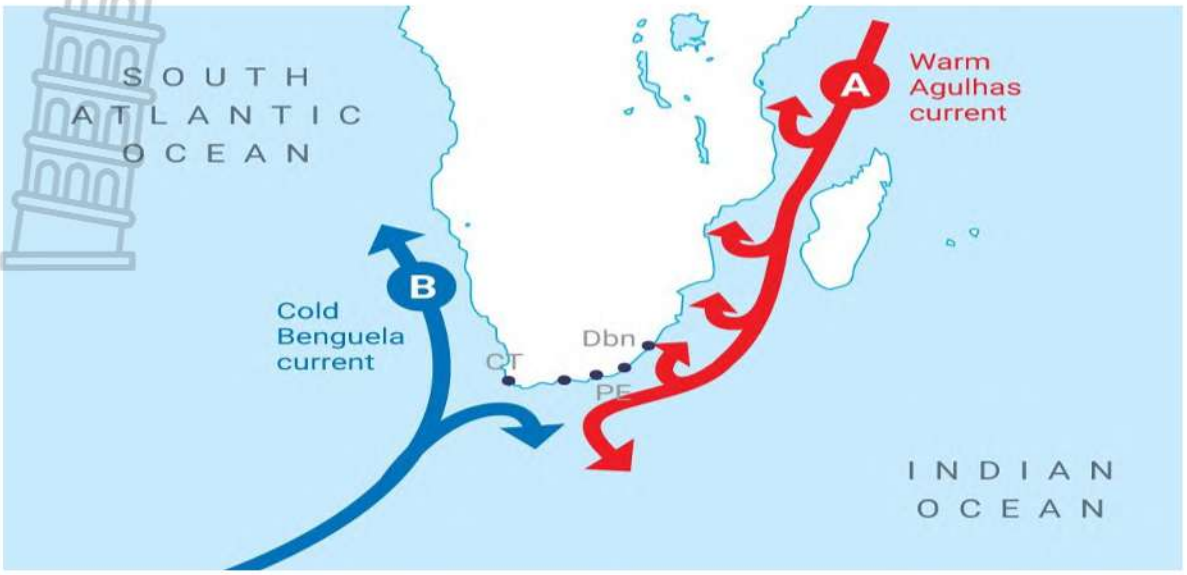
OCEAN CURRENTS



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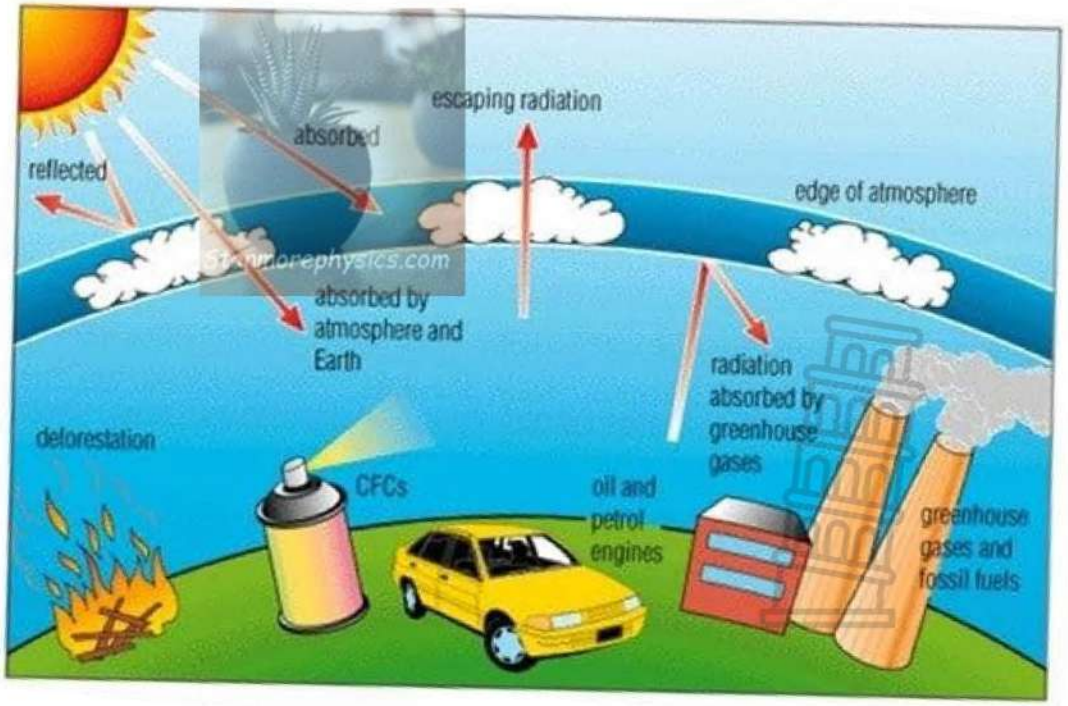
BENGUELA CURRENT transfers cold temperature from the south pole to the equator in the west coast. ***AGULHAS CURRENT*** transfers heat from the equator to the South Pole.

GREENHOUSE EFFECT



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Greenhouse effect is the ability of the atmosphere to trap the heat and remain warm
What are the ***greenhouse gasses?***
Greenhouse gasses refer to the gasses that trap long wave radiation and increase the temperature on the atmosphere.
Long wave radiation/ terrestrial radiation refer to the heat released from the earth usually at night.

Examples of greenhouse gasses

MAIN GREENHOUSE GASES	Carbon dioxide
	Water vapour
OTHER GREENHOUSE GASES	Methane
	Carbon monoxide
	Ozone
	Sulphur dioxide and CFCs

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	4 - 5	TOPIC	MOISTURE IN THE ATMOSPHERE
SUBTOPICS:	• Water in the atmosphere in different forms: water vapour, liquid and ice. • Processes associated with evaporation, condensation and precipitation. • Concepts of dew point, condensation level, humidity, relative humidity: The factors affecting relative humidity • Stages of development and related weather conditions. • Weather patterns associated with: cold, warm, and occluded fronts. Reading and interpreting satellite images and synoptic weather maps.						
RELATED CONCEPTS:	Evaporation ,Water vapour ,Condensation ,Condensation level ,Sublimation, Crystallization, Hydrological cycle/ water cycle ,Precipitation, Humidity, Relative humidity ,Saturated air ,Dew point temperature , Frost						
PRIOR/BACKGROUND KNOWLEDGE:	• Climate and Weather (SS Grade 5, 6 and Grade 8) • Matter and Materials e.g. gases (NS Grade 7) • Climate regions (SS Grade 8)						
ERRORS AND MISCONCEPTIONS:	• Struggling to differentiate between humidity and relative humidity. • Difficulty in determining relative humidity • Confusion in differentiating snow and frost • Confusing evaporation and condensation • Unable to differentiate the difference between dry adiabatic lapse rate and wet adiabatic lapse rate						
DATE STARTED:					**DATE COMPLETED:**		
LESSON OBJECTIVES	***Learners should be able to:*** • Distinguish between the various processes • Work out the relative and absolute humidity						

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TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** *Introduce the lesson by explaining how the water cycle occurs, with all the processes i.e evaporation, condensation and precipitation.* ***Main Body (Lesson presentation)*** • *Using the illustration of the diagram show and explain how evaporation,condensation and precipitation occurs.* ***Conclusion*** • *chalkboard summary* • *Assessment taken from the guide provided*	• Discuss the processes of the water cycle • Identify processes from the textbook • Write summary notes and class activities	• *Textbooks* • *Map of South Africa* • *Working guide* • *Past Exam question papers* • *Newspapers, websites,*

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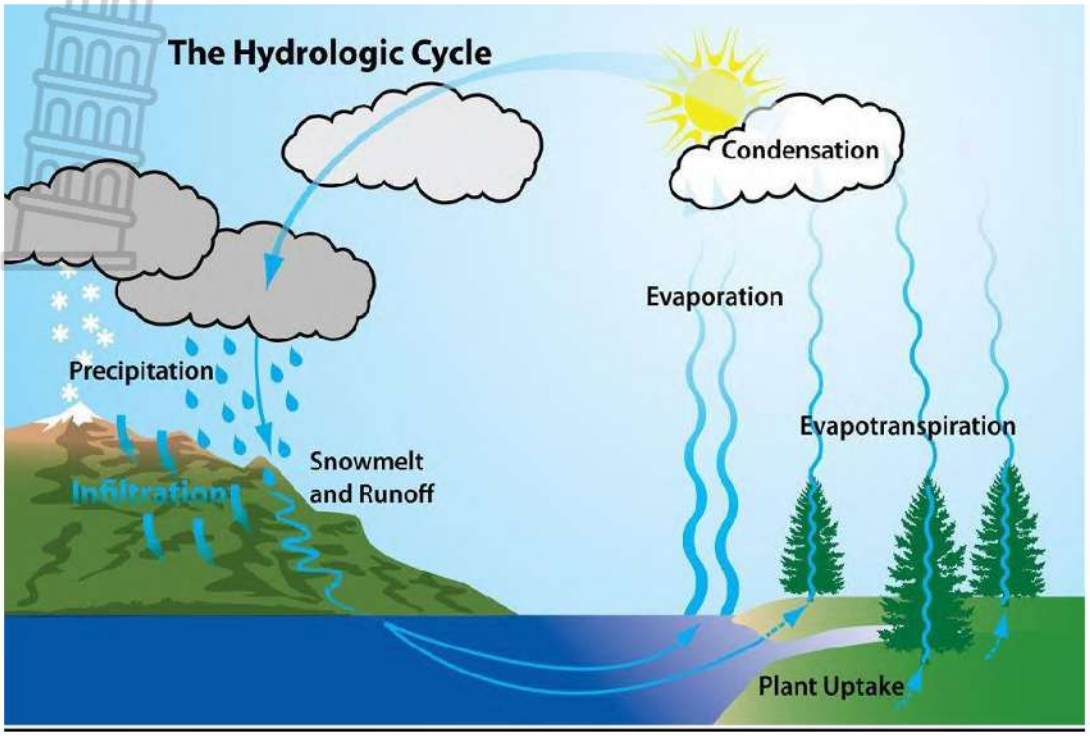
Water in the atmosphere



- Evaporation – the change from liquid to gas
  - Water vapour- is water in its gaseous state instead of liquid or solid(ice) (it is totally invisible in the atmosphere)
- Condensation – the change from gas to liquid
- Condensation level – height at which condensation occurs
- Sublimation – change directly from solid to gas
- Crystallization – change directly from gas to solid
  - Hydrological cycle/ water cycle – circulation of water between the sea, land and atmosphere
  - Precipitation – any form (could be liquid in the form of rain or solid in the form of snow/ hail) of water coming from cloud
- Humidity – the amount of water vapour in the atmosphere
- Relative humidity – the percentage of moisture in the atmosphere
- Saturated air – air that is full of water vapour
- Dew point temperature – the temperature at which condensation occur
- Dew – the drops of water that condensed on cool surfaces (vegetation)
- Frost – ice crystals that collect on cold surfaces

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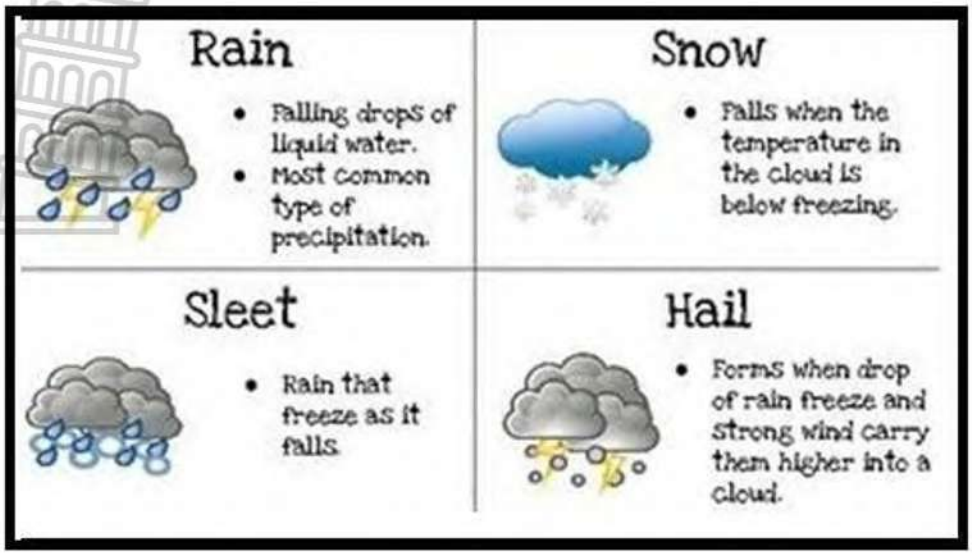
Types of precipitation



Week 4 TYPES OF RAINFALL

There three types of rainfall. Those are convectional rainfall, frontal rainfall, , and orographic rainfall

CONVECTIONAL RAINFALL

What is convectional rain?

• Occurs when there is intense heating of the Earth's surface especially during summer. • Evaporation takes place and moist air rises and cools. • Convectional rain occurs in areas with high temperatures. • Common in summer rainfall areas in **the** South African interior.

OROGRAPHIC RAINFALL

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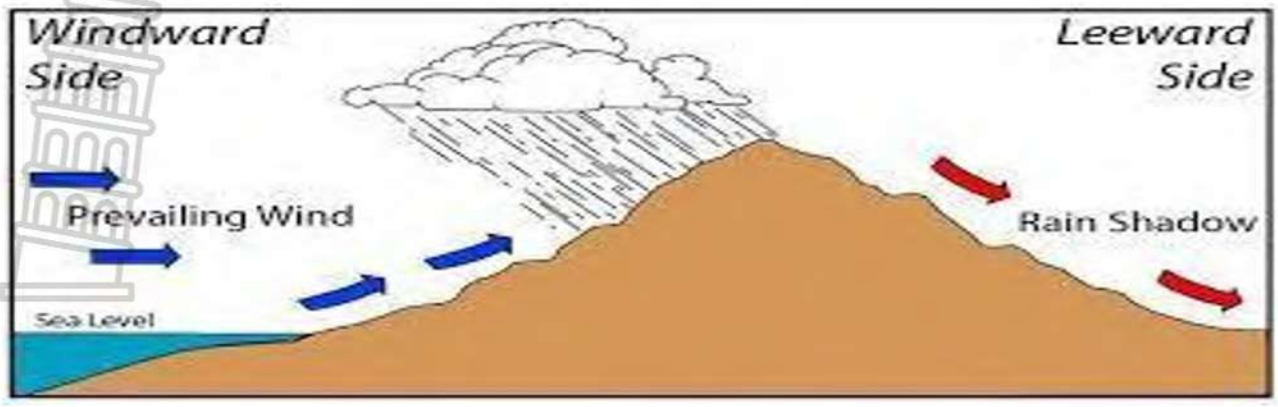
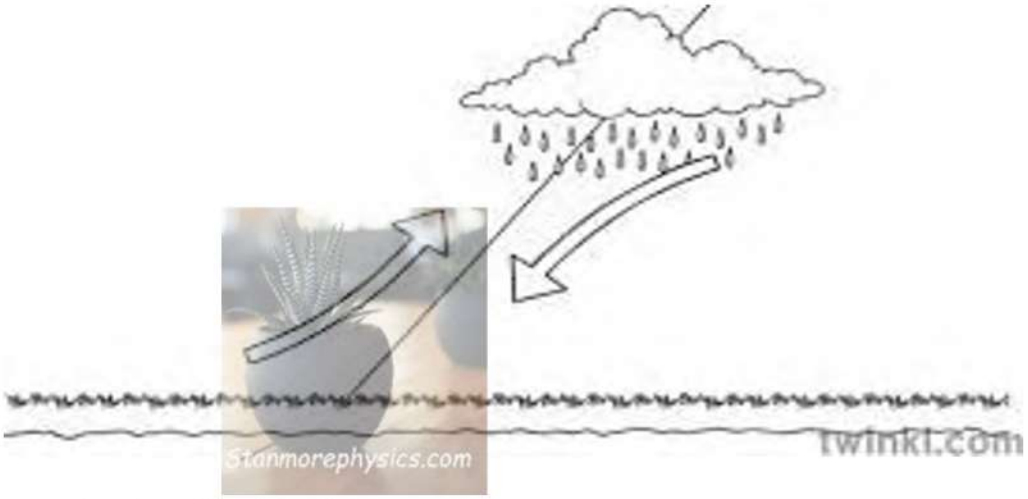


What is relief or orographic rain?

• Occurs in coastal areas that have hills or mountains. • Wet, onshore winds from the sea are forced to rise and cool against the mountain. • When the air cools to its dew point, condensation occurs. • Relief rain falls on the sea-facing mountain side. • The other (lee) side is drier.

FRONTAL RAINFALL



What is cyclonic or frontal rain?

Frontal rain is formed when cold air masses converge with warm air masses. Cold air masses do no mix with warm air masses hence they are separated by a boundary called front. Warm air overrides the cold air is it has low density, warm air rises and condenses forming frontal rain. Cold air masses with high density under rides the warm air.

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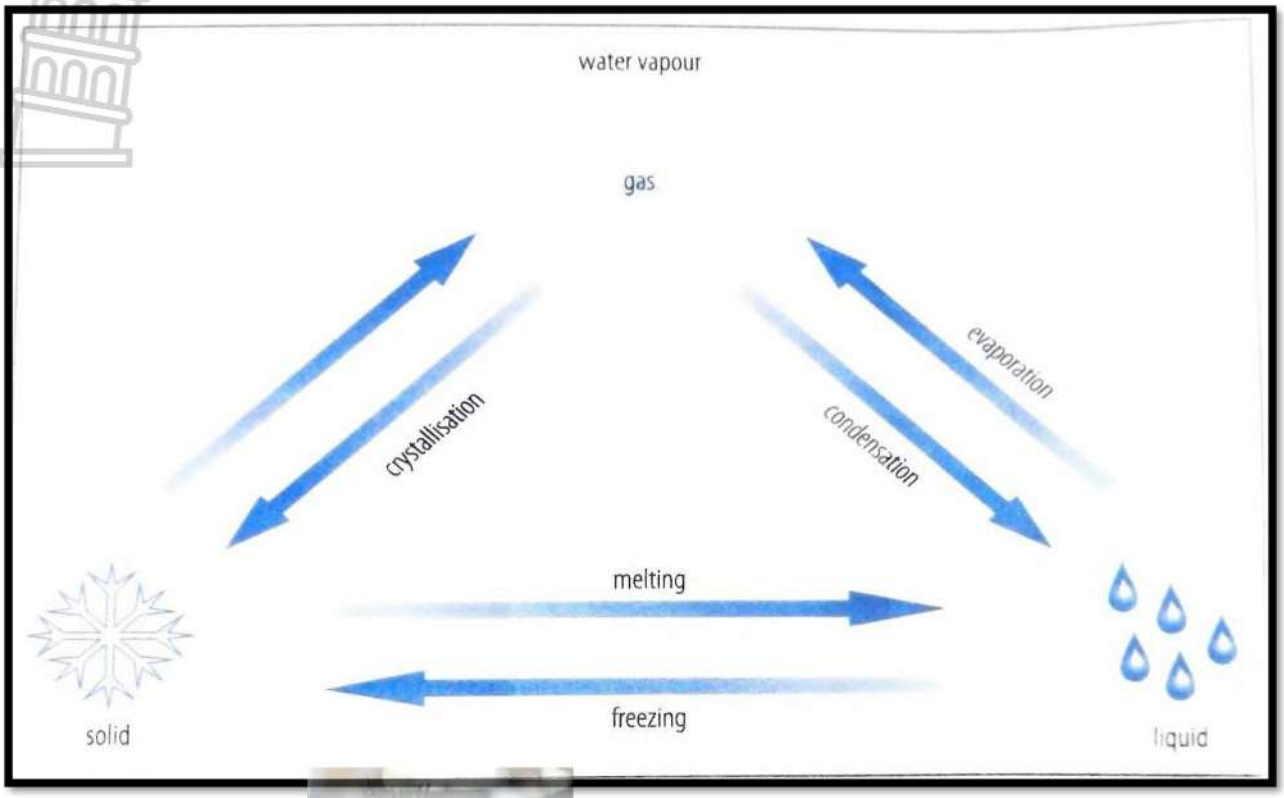
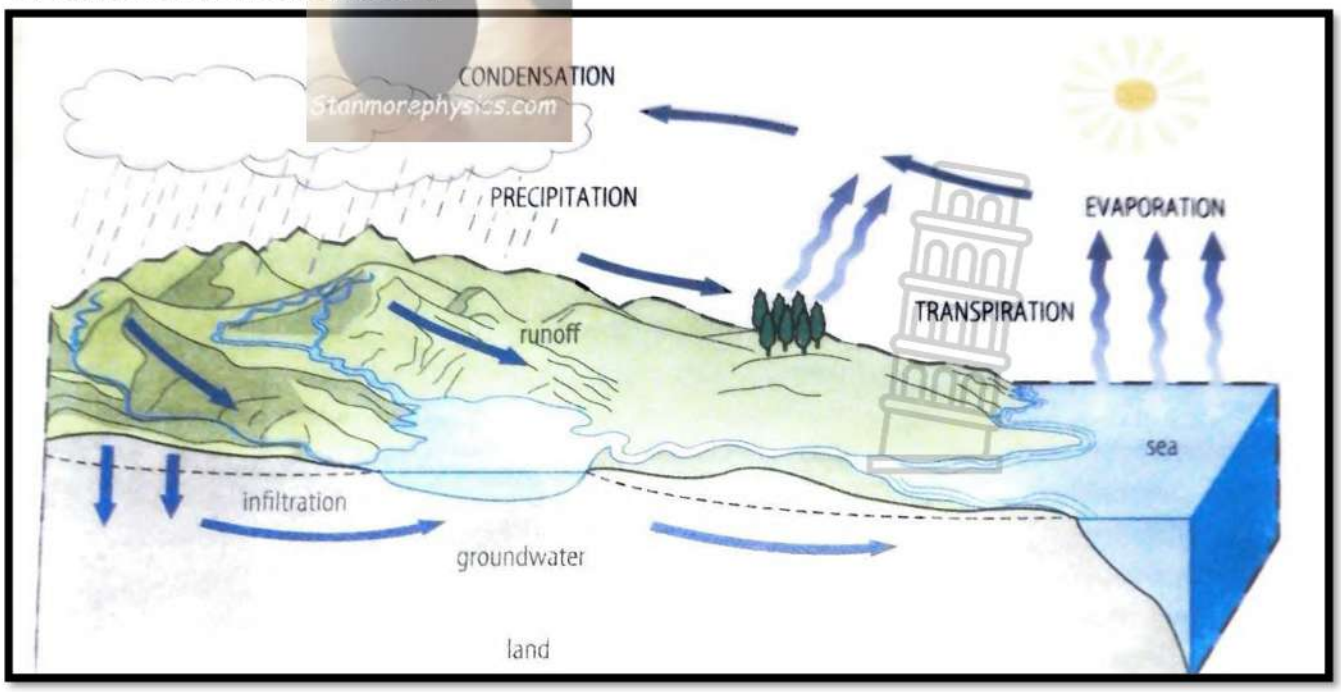
RESOURCES

FIGURE 1 DIFFERENT FORMS OF WATER IN THE ATMOSPHERE



(STUDY &MASTER-GRADE 10)

FIGURE 2 HYDROLOGICAL CYCLE



STUD(Y & MASTER GRA_DE 10)

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	6	TOPIC	MOISTURE IN THE ATMOSPHERE
SUBTOPICS:	• Concepts of dew point, condensation level, humidity, relative humidity: The factors affecting relative humidity • How and why clouds form. • Cloud names and associated weather conditions • Different forms of precipitation -hail, snow, rain, dew, frost						
RELATED CONCEPTS:	• Humidity, Relative humidity, Saturated air, Dew point temperature, Frost						
PRIOR/BACKGROUND KNOWLEDGE:	Heat transfer (NS Grade 7)						
ERRORS AND MISCONCEPTIONS:	• Struggling to differentiate between humidity and relative humidity. • Difficulty in determining relative humidity • Confusion in differentiating snow and frost • Difficulty in identifying types of clouds						
DATE STARTED:		**DATE COMPLETED:**					
LESSON OBJECTIVES	• ***Learners should know :*** • The formation of the water cycle/hydrological cycle • Types of precipitation (hail, snow, rain, dew and frost. • Mechanism that produce different kinds of rainfall i.e. frontal rain, convectional rain and relief rain.						

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** Brainstorm around different types of clouds Introduce different form of precipitation ***Main Body (Lesson presentation)*** • *Name and discuss different type of clouds such as cumulonimbus and nimbostratus* • *Discuss hail, snow, dew, frost with learners*	• Differentiation through observance of the chart/ illustration, the concept of dew and frost • Explanation of the concept humidity and factors influencing relative humidity. • Definition of related concepts e.g. cloud • Explanation of the how and why clouds form	• *Textbooks* • *Map of South Africa* • *Working guide* • *Past Exam question papers* • *Newspapers, websites,* •

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• *Discuss the mechanism behind the formation of convectional rain, frontal rain and orographic or relief rain.* • *Use the map to identify the places that are frequented by each type of rainfall.* ***Conclusion*** • *chalkboard summary notes* • *Assessment taken from the guide provided.*	• Identification of the different types of clouds using pictures/chart • Outdoor observation of the distribution of clouds, identifying type, shape and possible weather • Identification of the forms of precipitation using pictures	

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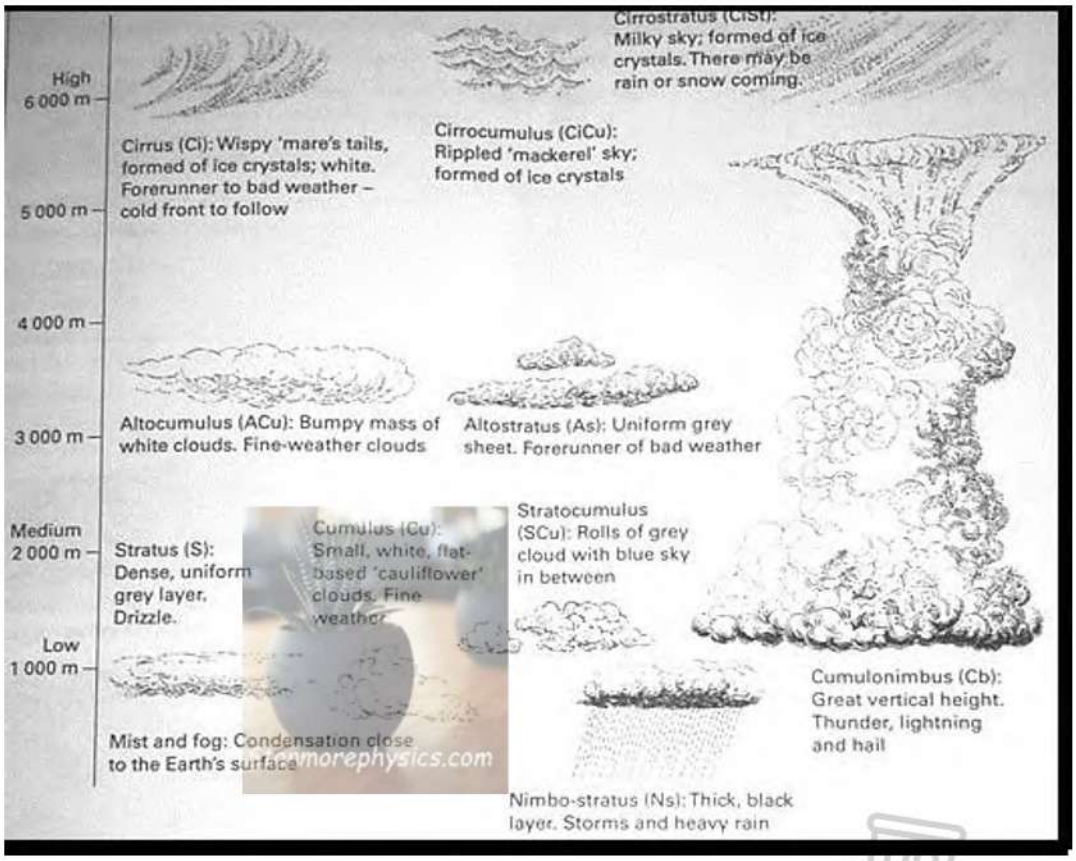
MOISTURE IN THE ATMOSPHERE

DIIFERENT TYPES OF CLOUDS

Clouds can be described according to their appearance and height

- Cirrus
- Cirrostratus
- Altocumulus
- Stratus
- Cumulus
- Cumulonimbus
- nimbostratus



DIFFERENT TYPES OF PRECIPITATION

- Precipitation – any form (could be liquid in the form of rain or solid in the form of snow/ hail) of water coming from cloud
- Snow
- Rain
- Hail
- Frost
- Dew

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	7	TOPIC	READING AND INTERPRETING SYNOPTIC WEATHER MAPS AND GIS

SUBTOPICS:	• Weather elements-temperature, dew point temperature, cloud cover, wind direction, wind speed and atmospheric pressure. • Weather conditions-eg. Rain, drizzle, thunderstorms, hail and snow as illustrated on station models • Concept of GIS • Reasons for the development of GIS • Concept of remote sensing • How remote sensing works; and • Satellite images related to meteorology and climatology • Using maps and other graphical representations: atlases, synoptic weather maps and temperature graphs;
RELATED CONCEPTS:	Synoptic weather map, station model , Weather symbols , Atmospheric pressure, Isobars ,Isobaric interval, warm front, cold front , high pressure (anti-cyclones), low pressure (cyclone) light/ less dense and rises (ascends), Geographic Information System (GIS), Remote Sensing , Data , Satellite images, Sensor Hardware ,Software, user, method
PRIOR/BACKGROUND KNOWLEDGE:	Heat transfer (NS Grade 7) Composition of the atmosphere, Cloud names and associated weather conditions , Different forms of precipitation- hail, snow, rain, dew and frost.
ERRORS AND MISCONCEPTIONS:	• Learners are confusing isobars with contour lines. • Confusion of defining GIS and writing the abbreviation in full • Struggling to differentiate concepts

DATE STARTED:		**DATE COMPLETED:**	
LESSON OBJECTIVES	• ***Learners should know :*** How to interpret the synoptic weather maps • Seasons • Precipitation • Isobaric interval and • Temperature and cloud cover		

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METHODOLOGY	• Display of synoptic weather map and synoptic weather station information for the identification of all the features on the map • Definition of related concepts e.g. GIS • Displaying pictures showing different components of GIS and ask them to identify each component. • Explanation of GIS and how an ordinary computer differs from a GIS computer • Outlining reasons for the development of GIS • Enumeration of Advantages and disadvantages of GIS over paper maps • Explanation of remote Sensing • Explanation on how remote sensing works • Distribution of pictures (satellite image and aerial view photograph) • Enumeration of the advantages and disadvantages of remote sensing

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** Brainstorm around different types of clouds Introduce different form of precipitation ***Main Body (Lesson presentation)*** • *Name and dicuss different type of clouds such as cumulonimbus and nimbostratus* • *Discuss hail, snow, dew, frost with learners* • *Discuss the mechanism behind the formation of convectional rain, frontal rain and orographic or relief rain.* • *Use the map to identify the places that are frequented by each type of rainfall.* ***Conclusion*** • *chalkboard summary notes* • *Assessment taken from the guide provided.*	• Displaying a synoptic weather map for the analysis and interpretation of weather information • Definition of related concepts e.g. GIS • A displayed computer to identify components (hardware) • Explanation on how a GIS differs from it • Display of pictures showing components of a GIS • Discussion on the reasons for the development of a GIS • Discussion on the concept of remote sensing and how remote sensing works • Discussion on the advantages and disadvantages : GIS and Remote sensing	• *Textbooks* • *Map of South Africa* • *Working guide* • *Past Exam question papers* • *News papers, websites,*

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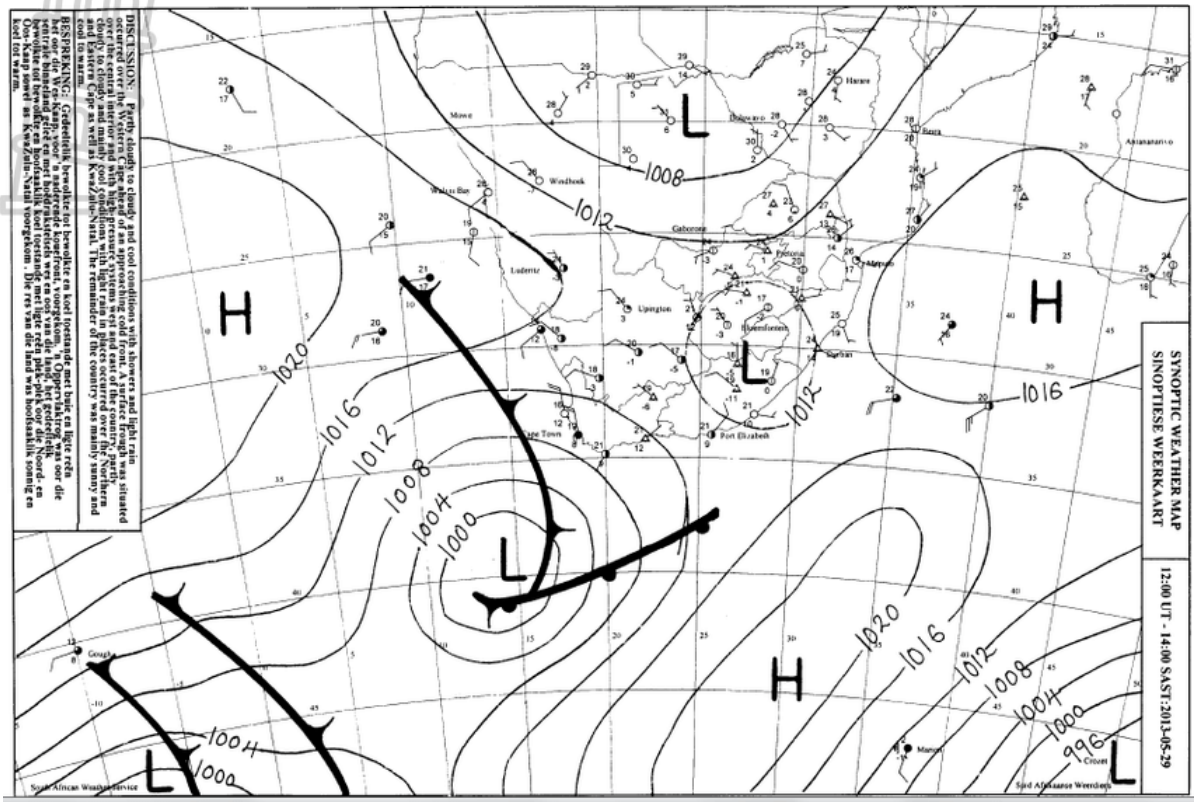
SYNOPTIC WEATHER MAP



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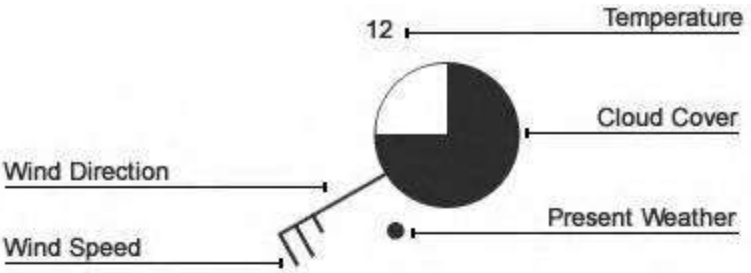

Symbols used on a weather chart

Symbol	Precipitation	Circles	Cloud Cover	Circles	Wind Speed
,	Drizzle	○	Clear Sky	◎	Calm
▽	Shower	◫	One Okta	○—	1 - 2 Knots
●	Rain	◔	Two Oktas	○—	5 Knots
✸	Snow	◑	Three Oktas	○—	10 Knots
△	Hail	◑	Four Oktas	○—	15 Knots
⊼	Thunderstorm	◑	Five Oktas	○—	20 Knots
		◕	Six Oktas	○—	50 Knots or more
⁂	Heavy Rain	◐	Seven Oktas		
✸	Sleet	●	Eight Oktas		
✸	Snow Shower	⊗	Sky Obscured		
=	Mist				
≡	Fog				

Important aspects of synoptic weather map

- Letter L in the interior of the continent indicate summer conditions
- Letter H in the interior indicates winter conditions
- Dates and weather station models also give clue about season of the map
- Cyclones also give clue about the map season e.g. tropical cyclones in the Mozambique Channel indicate summer.

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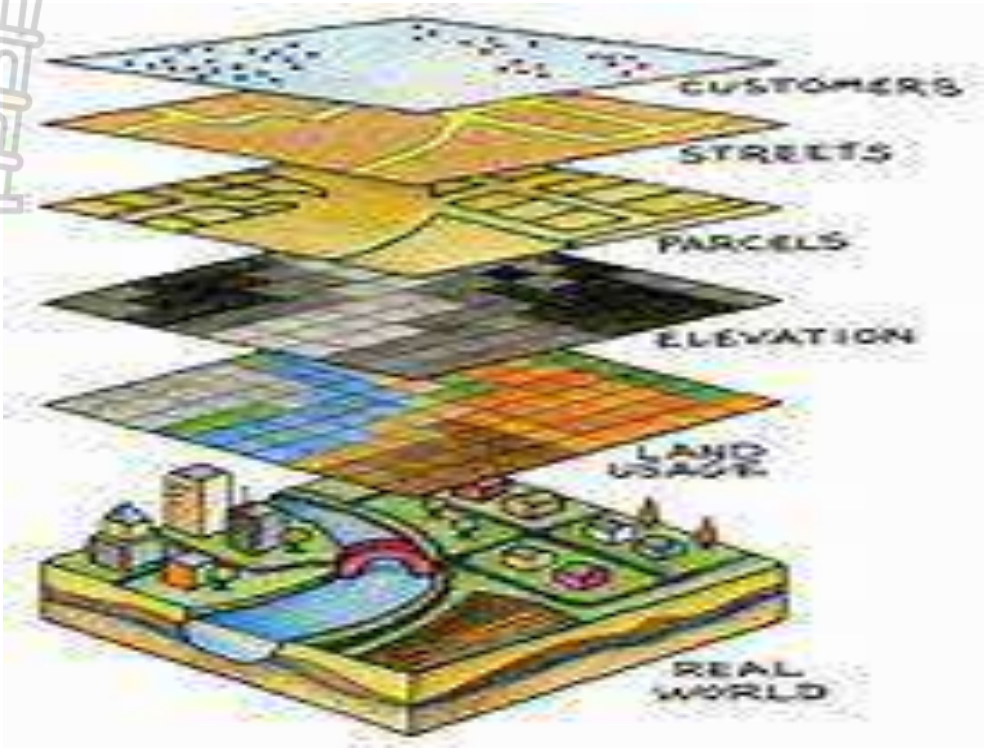
GEOGRAPHIC INFORMATION SYSTEM



GEOGRAPHIC INFORMATION SYSTEM

It is a computer technology used to capture, store, analyse, manipulate and display geographic data.

Components of GIS are hardware, software, data and user.

Remote sensing means the process of capturing data from distance. Data captured by satellites orbiting the earth is then directed receiving station located on earth.

REASONS FOR DEVELOPMENT OF GIS

GIS is able to collect data even in spaces where humans cannot reach

It can store complex of data

It is a tool that helps people making correct decisions.

It can identify changes that are taking place of time. Some those changes people cannot see with their eyes. GIS is useful to all business such as farming.

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	8	TOPIC	STRUCTURE OF THE EARTH /PLATE TECTONICS

SUBTOPICS:	• The internal structure of the Earth. • Classification of rocks – igneous, sedimentary and metamorphic. • Changes in the position of continents over time; plate tectonics-an explanation for the movement of continents
RELATED CONCEPTS:	Geomorphology, Geological time , Crust, Mantle, Core ,Magma, Lava , Rock Volcanism , Igneous Rock, Sediments, Fossils, Sedimentary Rocks, Strata, Bedding Plane, Metamorphic Rock, Continental drift, Fossils, Tectonic plate, Plate Boundary, Convergent Plate Boundary, Divergent Plate Boundary, Transform Plate Boundary, Constructive Plate Boundary, Destructive Plate Boundary
PRIOR/BACKGROUND KNOWLEDGE:	• Grade 7: the structure of the Earth • Grade 9: Natural Science, Lithosphere; the rock cycle
ERRORS AND MISCONCEPTIONS:	• Confusion between different type of plate tectonic concepts. • Poor understanding of geological process occurring over time.

DATE STARTED:		**DATE COMPLETED:**	
LESSON OBJECTIVES	*At the end of this lesson the learner must be able to:* • *Define related concepts* • *Classification of rocks: igneous, sedimentary and metamorphic*		

Methodology:

- Brainstorm around the structure of the Earth using simple language.
- Definition of concepts related to the structure of the Earth

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- Demonstration of the layers of the Earth using OVH/Chart/Satellite Photographs
- Annotation (label) a sketch representing the structure of the Earth on worksheets provided.
- Demonstration of rock types
- Classification of the rock samples according to characteristics and appearance

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction • Feedback on previous assessment (formal) • link of the external structure of the atmosphere with the structure of the earth **Main Body (Lesson presentation)** • Demonstration of the structure of the Earth using OVH /chart/satellite photographs • Questioning learners to label the layers of the structure of the earth on a given boiled egg • Ask learners to give the different types of rocks • Assign learners to classify the types of rocks brought in class • Write the learners responses on the board and discuss them. • Summarise the learners' responses and write the correct answers to the misconceptions **Conclusion** Summarise the lesson and refer learners to an activity	• The learners respond to the previous activity • Label the layers of the structure of the earth using the boiled egg • Give the different types of rocks • Classify the types of rocks brought to class • Attempt an activity given to them	• Textbooks • Video clips • Newspaper articles • Diagrams/ illustrations • Satellite images • Internet • Globe • Boiled eggs • Rock pieces (types of rocks) • Atlases/world map • Chalk board • Charts

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GRADE 10 SUMMARY NOTES [TERM 2]	TOPIC: STRUCTURE OF THE EARTH /PLATE TECTONICS

RELATED CONCEPTS

- Geomorphology- The study of the earth's physical features and processes that formed them.
- Geological time – Number of years in the past that rocks and landforms were formed.
- Crust – the outer layer of the Earth, formed of solid rock.
- Mantle – Layer of the earth found between the crust and the core composed of soft rocks.
- Core – The inner most layer of the Earth composed soft and solid rocks.
- Magma – Liquid rock inside the Earth.
- Lava – Magma that comes out onto the Earth's surface.
- Rock – It is a mixture of minerals.
- Volcanism – Transfer of magma within or onto the surface.
- Igneous Rock – Forms when Magma cools and solidifies.
- Sediments – Pieces of rocks, clay and other substances from eroded rocks.
- Fossils – Remains of dead plants or animals preserved in rocks.
- Sedimentary Rocks – Rocks which from layers of compressed sediments.
- Strata – Layers of rocks
- Bedding Plane – Plane separating layers of rocks.
- Metamorphic Rock – Rocks that form when igneous or sedimentary rock change due to extreme heat and pressure.
- Continental drift – Is a theory that continents were once one landmass, but they have drifted apart overtime.
- Fossils – Remains of dead plants or animals preserved in rocks.

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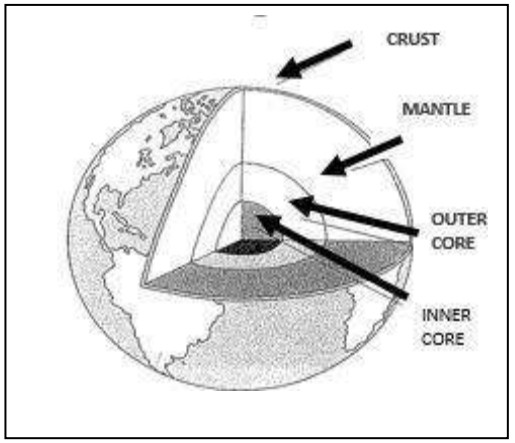
- Tectonic plate – A section of the Earth's crust which can move on the mantle.
- Plate Boundary – The edge of a tectonic plate.
- Convergent Plate Boundary – A plate boundary where plates are moving towards each other.
- Divergent Plate Boundary – A boundary where plates are moving apart from each other.
- Transform Plate Boundary – Where plates slide or grind past each other.
- Constructive Plate Boundary – A plate boundary where new land is forming.
- Destructive Plate Boundary – A plate boundary where is being destroyed.

EARTH'S STRUCTURE

- All three forms of matter – solids, liquids and gases – make up the Earth.
- The Earth is made up of four distinct layers, a solid outer crust, a solid mantle, a liquid
- outer core and a solid inner core.
- The Earth is 4,56 billion years old.



Continental crust

- The crust is the outermost layer of solid rock, on which we live. It is thicker under the continents and thinner under the oceans.
- The lithosphere consists of the crust and the solid top part of the mantle.
- The crust is broken into smaller segments, called plates, which float on the mantle.
- The crust is 6-90 km thick (solid rock).
- The temperature increases with depth.

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Mantle

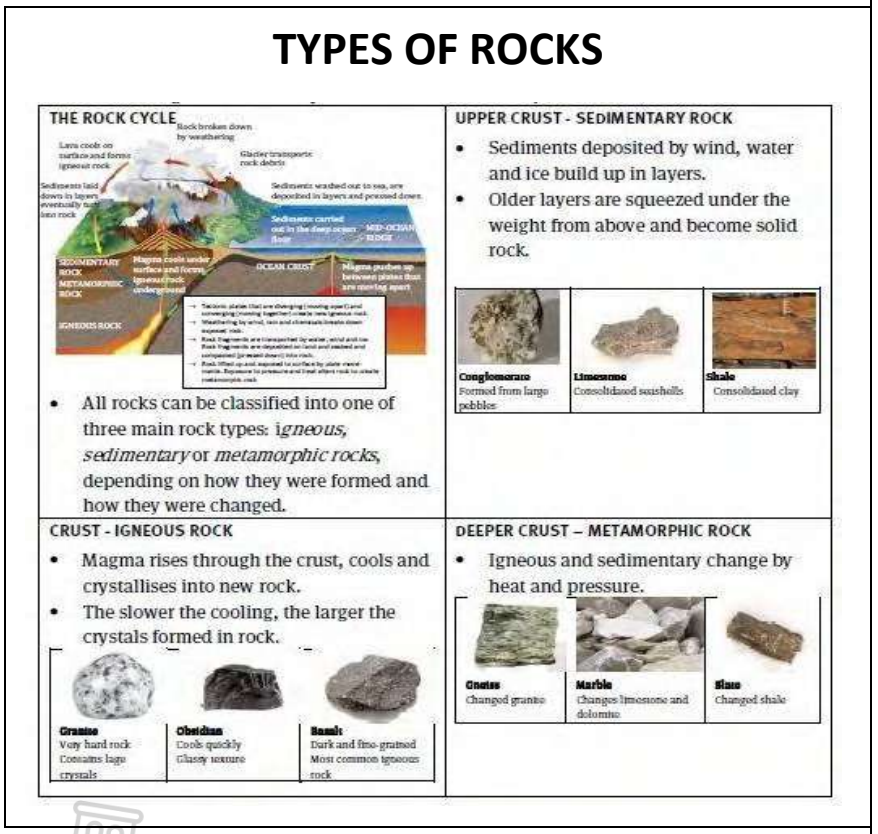
- The mantle is beneath the crust.
- It is 2 900 km thick, consisting of hot and plastic but solid rock. Temperatures may reach 5 000°C.
- The Moho discontinuity is the boundary between the crust and the mantle.

Outer core

- The outer core layer is very dense but liquid due to extremely high temperatures.
- It is 2 250 km thick.
- It consists of nickel (Ni) and iron (Fe). Known as NiFe.

Inner core

- The inner core is extremely hot.
- It is solid because of extreme pressure
- It is 1200 km thick.



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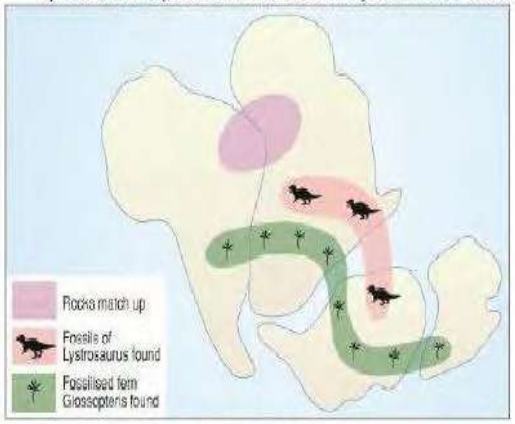
CHANGES IN THE POSITION OF CONTINENTS OVER TIME; PLATE TECTONICS-AN EXPLANATION FOR THE MOVEMENT OF CONTINENTS

EVIDENCE SUPPORTINF THE MOVEMENT OD CONTINENTS OVER TIME

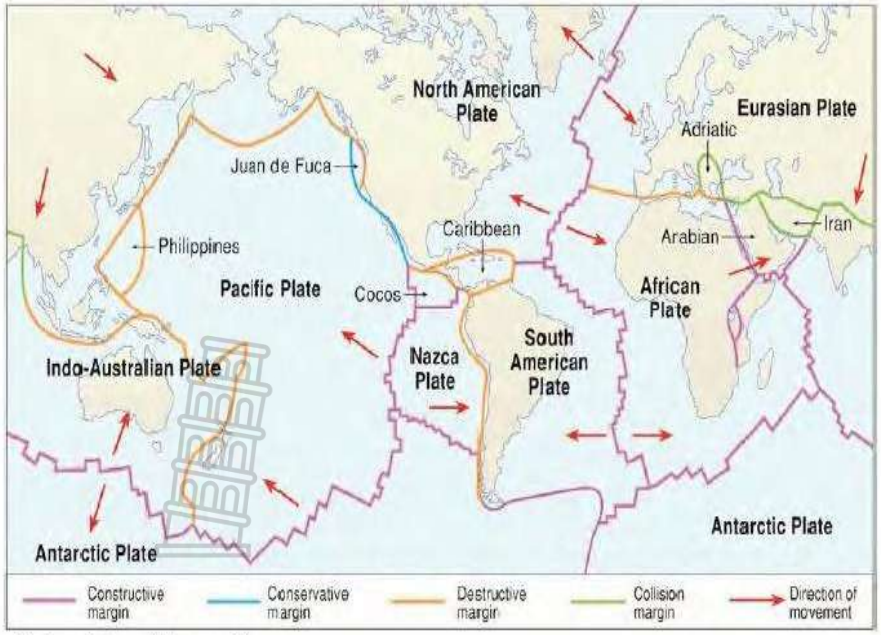
- The east coast of South America fits the west coast of Africa almost perfectly at 2 000 m below sea level, except for geologically recent submarine deltas like the Niger and Orange River.
- Geology and fossils of Africa and South America are similar.
- Glacial deposits in Brazil match those in West Africa.
- Rock formations along South Africa's west coastline match those along South America's east coastline.
- Similar coal deposits are found in the same stratigraphic positions in Antarctica, South America, India, Africa and Australia
- Lystrosaurus (which could not swim) fossils are found in Africa, India and Antarctica.



Evidence of continental drift

2.2 Plate tectonics

The Earth is divided into a series of plates which fit together like a jigsaw puzzle and float on the plastic rock of the upper mantle. They move at various rates, up to 30 cm per year, because convection currents in the solid (but putty-like) mantle push them in different directions.



Major plates of the world

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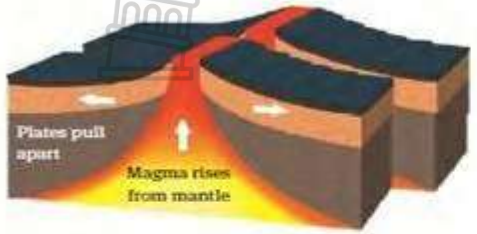
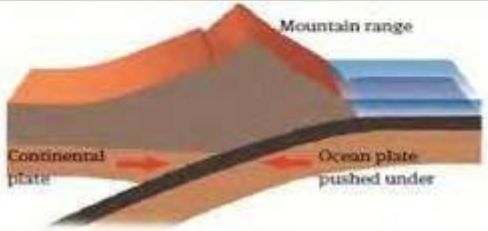
	**CONSTRUCTIVE MARGINS** Two plates move away from one another. Molten rock (magma) rises to fill the space. New oceanic crust and mid-ocean ridges form. Gentle volcanoes and earthquakes. Example: Mid Atlantic Ridge
	**DESTRUCTIVE MARGINS** Ocean crust moves towards continental crust. Ocean crust sinks. Deep-sea trenches and volcanic islands arcs (a string of islands) occur. Can trigger violent earthquakes and violent volcanic eruptions. Example: Japan
	**CONSERVATIVE MARGINS** Two plates slide past each other slowly. No crust is formed or destroyed. If the plates stick, pressure builds up and severe earthquakes result, moving the plates again. There are no volcanic eruptions. Example: San Andreas fault in California
	**COLLISION MARGINS** Two plates consisting of continental crust collide. Rocks between the plates are forced upward to form fold mountains. Can cause strong earthquakes. No volcanoes. Example: Himalayas

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	2	TOPIC	FOLDING AND FAULTING

SUBTOPICS:	• The process of rock folding-link to plate movement • The process of faulting-link to plate movement • Different types of faults • Landforms associated with faulting, such as rift valleys and block mountains • Use of photographs of landscape
RELATED CONCEPTS:	Faulting, Folding, Anticline, Overfold, Limb, Symmetrical fold, Asymmetrical fold, Overthrust fold, Fault line, Normal fault, Reverse (thrust) fault, Transform / tear / strike-slip fault, Fault scarp
PRIOR/BACKGROUND KNOWLEDGE:	Grade 7: Plate tectonics
ERRORS AND MISCONCEPTIONS:	• Confusion between folding and faulting. • Struggling to differentiate types of folds and faults.

DATE STARTED:		**DATE COMPLETED:**	
LESSON OBJECTIVES	*At the end of this lesson the learner must be able to:* • *Define related concepts* • *Understand the processes of folding and faulting as well as related landforms*		

Methodology:

- Brainstorming around folding and faulting using simple language
- Definition of concepts related to folding and faulting
- **The process of rock folding – link to plate movement:** demonstrating folding using tablecloth or A4 sheet to show different types of folding
- **Landforms associated with folding.** (e.g. anticlinal ridge, synclinal valley and fold mountain)
- Ask learners to identify different types of folding during demonstration.
- **The process of faulting – link to plate movement:** *make use of square boxes to illustrate different types of faults*

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- **Different types of faults and their uses- make** use of square boxes to illustrate different types of faults

Landforms associated with faulting, e.g. rift valleys and block mountains- *Ask leaners to identify the different landforms (rift valley, block mountain) making use of square boxes*

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction • Recap on previous lesson • Feedback/corrections on previous activity • Assigning learners to brainstorm on the concepts of folding and faulting **Main Body (Lesson presentation)** • Explaining to them in details the process of folding and faulting • Demonstrating folding using tablecloth or A4 sheet. • Assign learners to identify different types of folding during demonstration • Demonstrating by the use of square boxes the different types of faults • Assign learners to identify different landforms associated with faulting making use of square boxes **Conclusion** Summarise the lesson and refer learners to an activity	• Write correct responses in relation to the previous activity • Brainstorm the concepts of folding and faulting • Identify the different types of folding from the demonstration • Identify the different types of faulting from the demonstration	• Textbooks • Diagrams/ illustrations • Video clips • Internet • Atlases/world map • Orthophoto maps • Topographical map • Chalk board • Tablecloth • A4 sheet • Newspaper articles • Charts

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GRADE 10 SUMMARY NOTES [TERM 2]	TOPIC: FOLDING AND FAULTING

RELATED CONCEPTS

- Faulting: cracking of rock layers when they are pushed or pulled apart by disturbances in the earth's crust.
- Folding: is the bending of rock layers when they are pushed together by disturbances in the earth's crust.
- Syncline: downward bend of a folded rock
- Anticline: upward bend of folded rock
- Overfold: is a fold where one limb of fold is steeper than the other.
- Limb: the side of the fold
- Symmetrical fold: is the fold that have limps of equal angles
- Asymmetrical fold: is the fold that have limps of different angles.
- Overthrust fold: when one limb is pushed forward over the other limb
- Fault line: the line along the surface of Earth where fault occurs.
- Normal fault: a crack that forms when rock is under tension; on block of rock drops down.
- Reverse (thrust) fault: a crack that forms when rock is compressed, one block is pushed up.
- Transform / tear / strike-slip fault: a crack that forms when rock is sheared and one block slides sideways past the other.
- Fault scarp: a steep slope which forms along a fault line when rocks slide up or down

FOLDING

FORMATION OF FOLDS

- Sediments laid down in horizontal layers form sedimentary rocks.
- Folds form when tectonic plates push together, placing the rock layers under tremendous pressure.
- The rock layers compress and form fold features. These range from simple folds to heavily compressed folds, which also feature fractured rock.
- Fold mountains are normally formed on the edges of colliding plates. For instance, the colliding Indian and Eurasian plates form the Himalaya mountains

TYPES OF FOLDS

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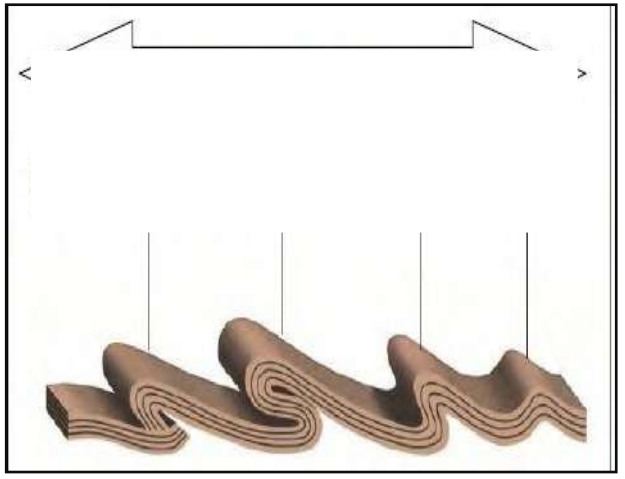
Overthrust fold

- Also called a Nappe.
- Pressure is very great.
- Fold breaks/fractures – faulting occurs.
- One limb is pushed forward over the other limb.

Recumbent fold

- Occurs under extreme pressure.
- Result is the limbs become nearly horizontal.



Overfold

- Similar to an anticline fold.
- Except that the one limb is more steeply inclined than the other.

Monocline

- Is the simplest fold.
- Step-like fold in rock strata.
- Consists of an area of steeply sloping rock strata in an area of otherwise gently sloping rock strata.

Syncline and anticline

- A syncline fold is where rock layers fold downwards in a U shape.
- An anticline fold is where rock layers fold upward in a ∩∩ shape.

Fold mountains

Famous fold mountains

Alps, Rockies, Himalayas, Cape Fold Belt mountains in South Africa, Atlas in north Africa, Mount Everest (8 850 m above sea level).

South Africa's fold mountain treasure

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Cape Fold Belt mountains – 23 ranges. Highest peak 2 325 m above sea level. Older than the Alps and Himalayas.

Effects of mountains on people

- Often sparsely populated.
- Cattle, sheep and goat farming is suitable for mountainous areas. In the foothills crops can be grown – terrace farming.
- Tourism is popular in fold mountains, for instance, in the Alps, Rockies, Himalayas and
- Andes – eco-tourism, cultural tourism, photography, skiing and relaxation activities.
- Forestry – deforestation results in soil erosion.
- Steep slopes with fast flowing rivers – hydroelectric power.

FAULTING

CAUSE OF FAULTS

Under great pressure, rocks can crack or fracture.

- One section of rock may then slide alongside or over another. The fracture is called a
- fault.
- Faulting can be caused by either lateral (sideways) or vertical (up and down) forces.
- The forces may be caused by tension (rock layers being stretched or pulled apart) or
- compression (the rocks being squeezed or pushed together).
- A normal fault is caused by tension.
- If one part of the crust is being compressed, then another part is under tension (being stretched).
- Rocks under tension usually fault.
- Rocks under compression may fault or fold – softer rocks will fold, but harder rocks that are brittle, will fault.

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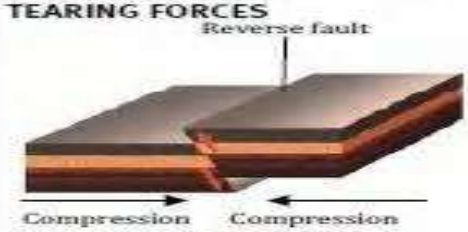
NORMAL FAULTS

A normal fault is caused by tension (A). This is how the area looks after erosion has taken place (B)

REVERSE FAULTS AND LATERAL TEARING FORCES



A reverse fault is caused by compression.

A strike slip fault is caused by lateral, horizontal forces.

LANDFORMS ASSOCIATED WITH FAULTS

- Earth movements sometimes cause rectangular-shaped blocks of rock to be pushed up or down.
- Results in block mountains (horsts) and rift valleys (grabens).

BLOCK MOUNTAINS

- Tourist attractions.
- Often sparsely populated.
- Can provide site of protection, lookouts, forts.

RIFT VALLEYS

- Steep sides called fault scarps.
- Eroding highlands make the valley fertile.
- Buried sediments – preserves fossils.
- Scenic for tourists.
- Example: East African Rift valley

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	10	TOPIC	EARTHQUAKES AND VOLCANOES
Date started			**Date completed:**				
LESSON OBJECTIVES:	**EARTHQUAKES AND TSUNAMIS:** • Define earthquake. • When and how earthquakes occur. • Able to give the effects of earthquakes. • To understand the strategies that can be adopted to lessen the impact of earthquakes and tsunamis. • Be able to analyse and interpret the case studies on earthquakes and tsunamis to increase their knowledge on these phenomena. **VOLCANOES:** • Must be able to identify and explain the different types of volcanoes. • Be able to identify and analyse the structures of different types of volcanoes. • Must know the impact of volcanoes on people and environment and strategies that can be used to curb their devastating effects. Be able to analyse and interpret the case studies on volcanoes to increase their knowledge on this phenomenon						
SUBTOPICS:	**EARTHQUAKES AND TSUNAMIS** - how and when earthquakes occur - Measuring and predicting earthquakes - How earthquakes and tsunamis affect people and settlement –differences and vulnerability - Strategies to reduce the impact of earthquakes - Case examples of the effects of selected earthquakes **VOLCANOES** - Types of volcanoes - Structure of volcanoes - Impact of volcanoes on people and the environment - Case studies						
RELATED CONCEPTS:	**EARTHQUAKES**: Earthquakes, Focus, Epicentre, seismic waves, seismograph, seismogram, seismometer, Richter scale, Tsunami, P, S and L waves **VOLCANOES**: Volcanism, volcano, intrusive volcanism, extrusive volcanism, magma, lava, pipe, vent, fissure, crater, active volcano, dormant volcano, extinct volcano, cinder cone, shield volcano, stratovolcano/composite volcano, batholith, laccolith, lopolith, dykes, sills, pluton, volcanic plugs, calderas, lava lakes, lava plateau, geysers.						
PRIOR/BACKGROUND KNOWLEDGE:	EARTHQUAKES: - Grade 7 Social Sciences -Plate tectonics/ plate movement - Faulting						

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	VOLCANOES: - Endogenic forces (SS Grade 7) - Plate tectonics (Geography Grade 10)
ERRORS AND MISCONCEPTIONS:	• Failing to differentiate between focus and epicentre • Unable to distinguish between earthquakes and tsunami • Unable to differentiate between P and S waves and L waves • Concepts related to volcanic eruptions: Unable to differentiate between lava and magma. • All other related concepts on volcanoes since aren't a common phenomenon in the South African context.

METHODOLOGY:

EARTHQUAKES AND TSUNAMIS

- Brainstorming around earthquakes and tsunamis using simple language.
- Definition of concepts related to earthquakes and tsunamis.
- Relate earthquakes to plate movement and faulting.
- Make use of a diagrams showing the structure of an earthquake to identify its features.
- Make use of case studies to identify the impacts of earthquakes and tsunamis on human and settlements and how earthquakes are measured.

VOLCANOES

- Brainstorm around volcanoes using simple English language.
- Definition of concepts related to volcanoes.
- **Types of volcanoes**: - Explain and clarify the types of volcanoes i.e. extrusive, intrusive, active, dormant and extinct.
- **Structure of the volcanoes**: Explain the structure of the volcano by means of the diagram and also using photos to explain volcanic landforms.
- **Impact of volcanoes on people and the environment (Positive and negative):** Discuss with learners the impact of volcanoes on people and the environment**.**
- **Case studies of different volcanic eruptions:** Engaging learners in a discussion by means of reading the case study on volcanic eruption. **Conduct an experiment to illustrate volcanic eruption (enrichment).**

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TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Baseline assessment:*** **EARTHQUAKES AND TSUNAMIS:** • What are earthquakes and Tsunamis? • Differentiate between the earthquakes and Tsunamis. • Where do they normally occur? • What are the effects of earthquakes and Tsunamis on people and the environment? **VOLCANOES:** • What is a volcano? • What are different types of volcanoes? • ***2.2** Main **Body (Lesson presentation)*** • **EARTHQUAKES AND TSUNAMIS:**	• Learners define what are earthquakes and Tsunamis. • Learners give the differences between the earthquakes and Tsunamis. • Learners give examples of the areas or the places when they occur. • Learners define what is a volcano. • Lists different types of volcanoes.	• Textbooks • Atlases • Working guide • News papers • Videos/simulations • Case studies
• Definition of concept: earthquake and tsunami • Show learners using a map, areas where earthquakes and tsunamis usually occur. • Using illustrations (diagrams) to show how earthquakes and tsunamis occur. • Discuss with learners the impact of earthquakes and tsunamis on people and environment through case studies. • Discussing strategies that can be adopted to reduce the impact of earthquakes and tsunamis on people and environment. **VOLCANOES:** • Define the concept of a volcano and volcanism. • List the different types of volcanoes (including intrusive and extrusive). • Use illustrations(diagrams) to show different structures of volcanoes.	• Refer to the summary notes/ take down summary notes on the board. • View and interpret the map. • Label the diagrams. • Read and analyse the impact of earthquakes and tsunamis from the given case study.	

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• *Discuss with learners the impact (positive and negative) of volcanoes on people and environment through case studies.* • *Discussing strategies that can be adopted to reduce the impact of volcanoes on people and environment.* **MAPWORK SKILLS INTERGRATION** • Use atlas index to locate places where earthquakes, tsunamis and volcanoes occur. • Explain the importance of GIS in predicting, monitoring and mitigating the occurrence/impact of earthquakes, tsunamis and volcanoes.	• Refer to the summary notes/ take down summary notes on the board. • View and interpret the illustrations showing types of volcanoes. • Label the diagrams. • Read and analyse the impact of volcanoes from the given case study. • Refer to the summary notes/ take down summary notes on the board.	
Conclusion • Recap of the entire lesson and emphasis on the most important/key concepts. • Handing out of the assessment taken from the working guide below.	• Classwork/Homework	

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GRADE 10 SUMMARY NOTES (TERM 2) TOPIC: EARTHQUAKES AND TSUNAMIS

IMPORTANT RELATED CONCEPTS

Earthquake: is a violent and sudden shaking of the earth.
Focus: is the point where fault movement takes place/ earthquake starts
Epicentre: the place directly above the focus at the surface of the Earth
Seismic wave: a wave of energy which passes through the Earth crust from the focus of the earthquake to the surface.
Seismograph: the instrument that was traditional used to measure the location and the size of the earthquake
Seismogram: the graph showing the strength of the seismic waves.
Seismometer: the machine that is used to measure the location and the size of earthquakes
Richter scale: is the scale of numbers used to measure the power/ magnitude of earthquakes
Tsunami: is a big ocean wave created by the large earthquake on the sea level.
P and S waves: seismic waves that travel from the focus of the earthquakes through the earth crust beneath earth surface.
L-waves: seismic waves that travel across earth surface outward from the epicentre of the earthquakes.
Volcanism- is the process where molten magma from the mantle moves to the crust.
Volcano- is an opening in the earth's crust through which lava, ash and gas are ejected.
Intrusive volcanism- occurs when magma cools and solidifies within the earth's crust.
Extrusive volcanism- occurs when magma (lava) cools and solidifies on the earth's surface.
Magma- is a molten material found below the earth's surface.
L Pipe – magma passageway through the volcano.
Vent -The area where the pipe opens on to the surface.
Fissure- a linear volcanic vent (cracks) through which lava erupts, usually without any explosive activity.
Crater- the hollow/ depression at the top of the volcano.
Active volcano- volcano that erupts regularly.
Dormant volcano- a volcano that has not erupted for a long time.
Extinct volcano - a volcano that no longer erupts.
Cinder cone - cone shaped volcano (on steep slope).
Shield volcano - lava flowing out in all directions from a central vent gives shield volcanoes (on a gentle slope)
Stratovolcano/composite volcano- tall, steep volcano built up of layers of lava and ash.
Lava- is molten material that is found on the earth's surface
Batholith - a very large igneous intrusion extending to an unknown depth in the earth's crust (still connected to the liquid mantle underneath while the rest of it has solidifies into a dome shape).
Laccolith - magma enters weak zones/ fissures in the crust and pushes the rock upwards, they may form small, mushroom shaped features.
Lopolith - forms when the weight of the rocks pushes the magma downwards to form a saucer shape.
Dykes - these features are formed when magma is deposited vertically.
Sills - refers to horizontal deposition of magma in the crust.
Pluton-is the body of intrusive igneous rock that is crystallised from magma slowly cooling below the surface of the earth.
Volcanic plugs- solidified lava in the pipe of the volcano.
Calderas- a large bowl-shaped depressions or hollows that forms when a lava plug blast off the top of the volcano, or when the top collapses (old calderas can fill up with water to form lakes).
Lava lakes- is the crater filled with either molten or solidified lava.
Lava plateau- thick, flat mass of lava.
Geysers- a hot spring that produces jets of steam.

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	11	TOPIC	MAP SKILLS
SUBTOPICS:	• Mapwork skills • Locating exact position- degrees, minutes and seconds • Scale-word, ratio, fraction and line scale						
RELATED CONCEPTS:	Lines of longitude, Lines of latitudes, Co-ordinates, Cardinal points, Grid Referencing Map Scale						
PRIOR/BACKGROUND KNOWLEDGE:	• Grade 8: SS-Maps and globes • Grade 9: Orthophoto maps						
ERRORS AND MISCONCEPTIONS:	• Confusion in differentiating latitudes and longitudes • Struggling to locate exact position of features (determining seconds)						
DATE STARTED:		**DATE COMPLETED:**					
LESSON OBJECTIVES	*At the end of this lesson the learner must be able to:* • *Define related concepts* • *Determine the exact location of a geographical feature on a map* • *Differentiate between types of scales*						
Methodology: • Demonstration on the chalkboard • Referring on the topographical map (identification of the map code and meaning) • Demonstration on topographical maps given (coordinates) • Referring to chart/ drawing (types of scales)							

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction • Recap on previous lesson • Feedback /corrections on previous activity **Main Body (Lesson presentation)**	• Write correction on previous lesson • State the meaning of the map code from the topographical map	• Textbooks • Atlases/world map

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• Distribution of topographical maps • Asking learners to state the meaning of the map code (latitudes and longitudes) from the topographical map • Demonstration on the chalkboard the determination of exact location of geographical features • Assign learners to determine the exact location of geographical features from the topographical maps • Ask learners to list the types of scales and identify them on the chart/drawing as well as on maps given • Assign learners to convert the scales from one form to the other **Conclusion** Summarise the lesson and refer learners to an activity	• Determine the exact location of geographical features from the topographical maps given • List and identify the types of scales from the chart/drawing as well as on maps given • Convert the scales from one form to the other • Attempt an activity given	• Orthophoto maps • Topographical map • Chalk board • Calculator • Ruler

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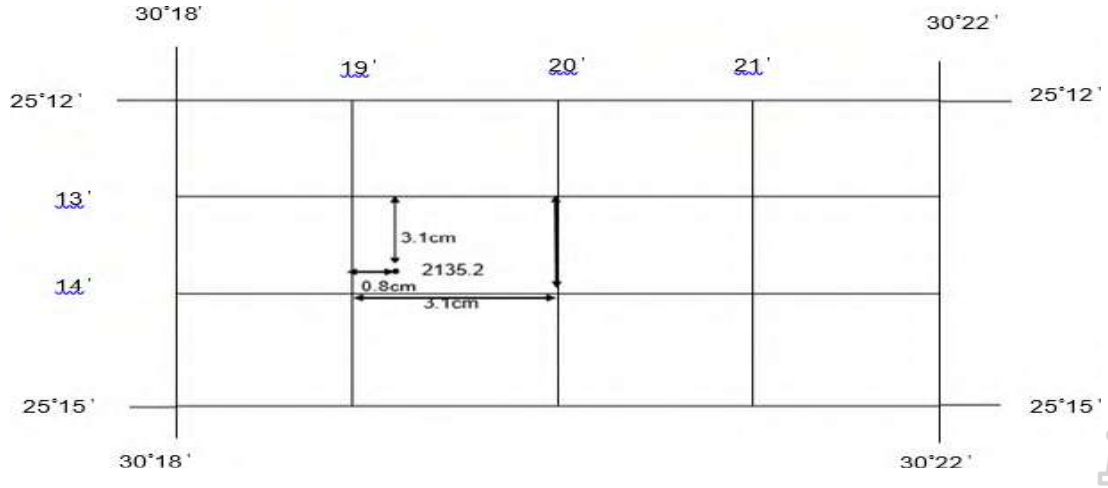
GRADE 10 SUMMARY NOTES [TERM 2] **TOPIC: MAP SKILLS**

RELATED CONCEPTS

- **Lines of longitude** – imaginary lines that run from north to south. Also called meridians.
- **Lines of latitudes** – imaginary lines that run from east to west. Also called parallels.
- **Co-ordinates** – exact position using the lines of latitude and longitudes.
- **Cardinal points** – compass point that indicate direction
- **Grid Referencing** - Refers to the location of places using degrees, minutes and seconds.
- **Map Scale** -the relationship (or ratio) between distance on a map and the corresponding distance on the ground

LOCATING EXACT LOCATIONS



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- **Basic steps to determine the grid reference**
  - Identify the line of latitude and read off the measurement (degrees and minutes)
  - Identify the line of longitude and read off the measurement (degrees and minutes
- **Identify the line of latitude** - $25^{\circ}13'$

Convert 3.1 cm to seconds $\frac{3.1\ cm}{3.7\ cm} \times 60$

$50''$

$=25^{\circ}13'50''S$

- **Identify the line of longitude** - $30^{\circ}19'$

Convert 0.8 cm to seconds: $\frac{0.8\ cm}{3.1\ cm} \times 60$

$15''$

$30^{\circ}19^{1}15^{11}E$

Co-ordinates: $25^{\circ}13'50''S, 30^{\circ}19^{1}15''E$

SCALE

Scale is the comparison between the distance on a map and the associated or corresponding distance on the earth's surface.

Scale can be represented in three ways:

- **Ratio scale or Representative Fraction** for example, 1 : 50 000 or 1/50 000
- **Word scale or Statement Scale**, for example, one centimetre on the map represents fifty thousand centimetres in reality.
- **Linear scale or Line scale**, for example, a line marked off in centimetre markings, showing what unit of measurement each centimetre represents on the ground.

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	22	TOPIC	POPULATION DISTRIBUTION
LESSON SUMMARY FOR: DATE STARTED:				DATE COMPLETED:			

SUB TOPICS	Meaning of population and population density World population density and distribution • Factors that affect distribution and density of the world's population
RELATED CONCEPTS	• **Population** – a group of people occupying a particular area or country etc. • **Population geography**-the study of the size, distribution, composition, migration and growth of world population • **Demography -**The study of population statistics • **Population density** -the number of people occupying an area of land • **Population distribution** -the pattern of where people live on Earth • **Ecumene -**Parts of Earth that are suitable for people to live in • **Nonecumene -**parts of Earth that are not suitable for people to live in
PRIOR/BACKGROUND KNOWLEDGE:	• Places where people live (SS Grade 4) • Population (Grade 6) and • Population growth and change-focus SA and world (Grade 7)
ERRORS AND MISCONCEPTIONS :	• Confusion in differentiating immigration and emigration • Population density and distribution • Urbanisation and rural urban migration. • Difficulty in differentiating physical factors and social factors • Level and rate of urbanisation
LESSON OBJECTIVES	• Brain storming- unpacking a topic in simple language by distinguishing main concepts (population distribution and population density) • Vocabulary –through defining concepts • Illustrations – Showing population distribution • Case Study - population distribution/ population density • Maps- demonstrating population distribution and density • Cartoons – comparing population of various areas

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	METHODOLOGY: • Learners will be asked to define the term Population density and also to account for reason of people being densely populated in certain part of the world (geographical area). • The teacher will give learners a diagram or an atlas of global population density • Learners will be required to brainstorm on factors that affect the distribution and density of the world's population. Educator will be expected to give a clear explanation how factors such as climate, Water, Soil, Relief etc.

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
• Recap on population distribution and integrate introduction with previous knowledge from lower grades. • Teacher will lead the brainstorm around factors influencing population indicators using simple language. • Teacher will provide definition of concepts related to population structure. • **Population indicators**: - demonstrating relationship between population indicators using line graphs and tables • **Factors that affect birth rate and death rate –** in LEDCs and MEDCs • **Factors that affect fertility rate, life expectancy and natural increase** - demonstrating using line graphs and tables - Use of pictures and cartoons to demonstrate factors affecting such indicators - Possible reading and analysis of case studies	• Refer to the illustrations/ map showing population distribution and population density • Brainstorm around factors influencing population indicators using simple language. • Refer to recent statistical graph on world's population	• *Work sheet with terminology list* • *CAPS TEXT BOOKS* • *Geography dictionaries* • *Morden technology* (projectors, internet)

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GRADE	10	SUBJECT	GEOGRAPHY	WEEK	Week 23	TOPIC	POPULATION STRUCTURE
LESSON SUMMARY FOR: DATE STARTED:				DATE COMPLETED:			

SUB TOPICS	• Population indicators-birth rates, death rates, life expectancy, fertility rate and natural increase • Factors that influence population indicators • Population structure-age, gender represented as population pyramids
RELATED CONCEPTS	• **Population indicators-** different measurements which give information about a country's population characteristics • **Birth rate -** the number of babies born per 1000 of the population per year • **Death rate-** number of deaths per 1000 of the population per year • **Life expectancy –** average number of years a person can expect to live • **Infant Mortality Rate** – the number of infant deaths per 1000 live births • **Natural increase –** the rate at which a country's population is growing • **Fertility rate –** the average number of children an average woman would have if she were to live to the end of her childbearing years • **Literacy rate-** the percentage of the total population who can read and write • **GDP per capita-** the gross domestic product per person • **Population structure**- how a country's population is made up • **Population pyramid** – a type of a graph showing a country's population according to age groups and gender • **Dependency ratio**- a population indicator which shows how many people in a country need to be supported because they are not economically active • **Zero population growth** -when a population remains stable where the number of births and immigrants is equivalent to that of deaths and emigrants
PRIOR/BACKGROUND KNOWLEDGE:	• Population (Grade 6) • Population growth and change-focus SA and world (Grade 7) • Development issues (Grade 9)
ERRORS AND MISCONCEPTIONS:	• Confusion in differentiating literacy and life expectancy • Difficulty in determining death rate(mortality) and birth rate (natality) • Confusion in differentiating factors affecting birth rate and those affecting death rate • Difficulty in reading and interpreting graphs as well as population pyramids
LESSON OBJECTIVES	• Brain storming- unpacking a topic in simple language (factors influencing population indicators)

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	• Vocabulary –through defining concepts • Illustrations – Showing population pyramids • Case Study -On population indicators • Graphs – Showing the relationship between population indicators (e.g. deaths and births) as well as the relationship between gender and age (population pyramid) • Pictures – viewing pictures showing population indicators e.g. literacy • Cartoons – reading, analysing and interpreting cartoons i.e. factors affecting fertility rate **METHODOLOGY:** • Recap on population distribution and integrate introduction with previous knowledge from lower grades. • Brainstorm around factors influencing population indicators using simple language. • Definition of concepts related to population structure. • Population indicators: • demonstrating relationship between population indicators using line graphs and tables • Factors that affect birth rate and death rate – in LEDCs and MEDCs • Factors that affect fertility rate, life expectancy and natural increase • demonstrating using line graphs and tables • Use of pictures and cartoons to demonstrate factors affecting such indicators • Possible reading and analysis of case studies

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	• Population pyramids • Demonstration through comparative population pyramids for developing and developed countries, the relationship between age and gender

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
• The teacher will recap from the previous lesson • The teacher will guide learners in discussing how factors impact on the population indicators such as birth rate and death rate. • Teacher provides case studies, to identify different strategies to reduce death rate, high birth rate etc.	• Allow learners to discuss how factors impact on the population indicators such as birth rate and death rate. • Use different case studies, to identify different strategies to reduce death rate, high birth rate etc.	• *Illustrations* • *Graphs* • *Pictures* • *Internet* • *Textbooks* • *Case studies*

GRADE	10	SUBJECT	GEOGRAPHY	WEEK	Week 24	TOPIC	POPULATION GROWTH

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LESSON SUMMARY FOR: DATE STARTED:		DATE COMPLETED:	

SUB TOPICS	• World population growth over time • Demographic transition model • Managing population growth
RELATED CONCEPTS	• ***Population growth*** *– the increase in the number of people in a population* • ***Exponential growth*** *-ever more rapid growth of a population over a short period of time* • ***Demographic transition model*** *– a model explaining how a country's population changes over time* • ***Contraception*** *– method of birth control* • ***Sterilisation*** *– a permanent form of contraception* • ***One child policy****- strategy to control birth rate*
PRIOR/BACKGROUND KNOWLEDGE:	• ***Places where people live (SS Grade 4)*** • ***Population (Grade 6)*** • ***Population growth and change (focusing in SA and world Grade 7)*** • ***Development issues (Grade 9)***
ERRORS AND MISCONCEPTIONS:	• **Confusion with the concept of diminishing population and exponential growth** • **Difficulty in understanding the stages of the demographic transition model** • **Applying geographical knowledge in the analysis of a cartoon**
LESSON OBJECTIVES	**METHODOLOGY:** • **Recap on population structure and integrate previous knowledge from lower grades with introductory statement** • **Refer to graph showing world population growth over time**

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TEACHER ACTIVITIES	LEARNER ACTIVITIES		RESOURCES NEEDED
• *Teacher will provide graphs reflecting/indicating world's population/ demographic transition model)* • *Case study-managing population growth*	. • *Interpretation of graphs (line graph- trend on world's population/ demographic transition model)* • *Case study-managing population growth*		• *Charts/ diagrams* • *Cartoon images* • *Google* • *Textbooks* • *Chalkboard*

Name of Teacher_____

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Date: _____

GRADE	10	SUBJECT	GEOGRAPHY	WEEK	25	TOPIC	POPULATION MOVEMENTS
LESSON SUMMARY FOR: DATE STARTED:				DATE COMPLETED:			

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SUB TOPICS	• *Kinds of population movement- international migration, emigration, immigration* • *Regional migration, rural-urban migration, urbanisation, voluntary and forced migration* • *Causes and effects of population movement* • *Temporary and permanent movements including migrant labour, economic migrants, political migrants and refugees* • *Attitudes to migrants and refugees*
RELATED CONCEPTS	• ***Migration** – the movement of people from one place to another* • ***Genocide** – the deliberate killing of people from a certain ethnic group or nation* • ***Voluntary migration**- when a person chooses to migrate* • ***Forced migration**- when a person is forced to migrate because of religion or political factors etc.* • ***International migration**- movement of people across a country's boarders* • ***Emigration**- movement of people out of their home country to another country* • ***Immigration**- movement of people into a new country of residence* • ***Regional migration**- movement of people within a region* • ***Urbanisation**- process by which an increasing percentage of the world's population live in urban areas* • ***Globalisation** - the integration and connection of countries* • ***Rural-urban migration**- movement of people from farms to cities* • ***Urban-rural migration/ counter-migration**-* • ***Depopulation** – a decline in the number of people living in an area* • ***Push factors** – factors that force people to leave rural areas* • ***Pull factors**- factors that draw people to urban areas* • ***Centrifugal forces**- forces that cause people to leave rural areas* • ***Centripetal forces**- forces that attract people to urban areas* • ***Migrant worker**- a person who migrates specifically to find work* • ***Economic migrant**- a migrant worker* • ***Political migrant**- a person who migrates for political reasons*
PRIOR/BACKGROUND KNOWLEDGE:	• Places where people live (SS Grade 4 • Population (Grade 6) • Population growth and change-focus SA and world (Grade 7) • Development issues (Grade 9) • Resource use and sustainability (Grade 9)

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ERRORS AND MISCONCEPTIONS:	• Confusion on definitions of the type of migrants • Confusion on differentiating (immigration and emigration) ; (centrifugal and centripetal forces); (Rural-urban migration and rural depopulation); (rural-urban migration and urbanisation)
	METHODOLOGY: • Recap on population growth and link previous content from lower grades with introductory statement • Mind map chart- clarity of geographical concepts • Cartoons/ pictures - rural-urban migration/ rural depopulation • Case studies- causes of population movements, xenophobia etc
LESSON OBJECTIVES	**Language skill – Interpretation skills** • Diagrams and illustrations • Vocabulary –through defining concepts • Listening and writing Presentation

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TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
. • *Teacher recap from the previous lesson* • *Teacher guide learners in completing worksheet – matching concepts* • *Teacher provide learners with Cartoons/ pictures about - rural-urban migration/ rural depopulation/ refugees and instruct them to illustrate* • *Teacher provide learners with Case studies- types of migrants, xenophobia etc*	• *Completing worksheet – matching concepts* • *Cartoons/ pictures- rural-urban migration/ rural depopulation/ refugees* • *Case studies- types of migrants, xenophobia etc*	• *Chart* • *pictures* • *Textbooks* • *Chalkboard* • *Case studies*

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GRADE	10	SUBJECT	geography	WEEK	Week 26	TOPIC	GEOGRAPHICAL INFORMATION SYSTEM
LESSON SUMMARY FOR: DATE STARTED:				DATE COMPLETED:			

SUB TOPICS	Satellite images, Map skills, Map referencing, Conventional signs, True bearing, Magnetic bearing and Cross section
RELATED CONCEPTS	• ***GIS*** *– Is a system for capturing storing analysing and displaying Geographical data.* • ***Data*** *– It is facts about reality that has been observed and measured.* • ***Information*** *– It is data that is stringed together.* • ***Spatial data*** *– It refers to the position of an object.* • ***Attribute data*** *– It refers to the data that describes the characteristics of spatial data.* • ***Vector data*** *– It refers to the representation of an area using points, lines and polygons.* • ***Raster data*** *– It refers to the representation of an area using grid cells referred to as pixels.* • ***Resolution*** *– It refers to the degree of clarity of an image.* • ***Spatial resolution*** *– It refers to the detail with which a map shows a location and shape of geographical feature.* • ***Spectral resolution*** *– It refers to the different kinds of information that can be collected.* • ***Remote sensing*** *– It refers to the capturing of data on objects from a distance.* • ***Data integration*** *– Combining of different types of data on a single map.* • ***Buffering*** *– It refers to a line used to demarcate an area around a spatial feature.* • ***Map referencing*** *– Identifying a point on the surface of the earth by relating it to information appearing on a map.* • ***True bearing*** *– It is an angle measured from the true north.* • ***Magnetic bearing*** *– It is an angle measured from the magnetic north.*
PRIOR/BACKGROUND KNOWLEDGE:	• Population (Grade 6) • Population growth and change-focus SA and world (Grade 7) • Recap from previous knowledge (grade 9)
ERRORS AND MISCONCEPTIONS:	True bearing – difficulty on the use of a protector

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	METHODOLOGY: • Learners will be asked to define Geographical Information System. • Learners will be asked to mention the components of GIS. • Learners will explain the importance of GIS. • Learners will give the differences between terms e.g. • Spatial and Attribute data, Vector and Raster data, Spatial and Spectral resolution • Learners will be asked to identify features on a map using the conventional sings. • Learners will give direction using the cardinal points. • Learners will calculate the magnetic bearing starting from finding True bearing and calculation of magnetic declination.
LESSON OBJECTIVES	• Lesson should be taught using simple English as a medium of instruction • Geographical terms should be defined using geographical terminology. • The use of correct geographical term when explaining.

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
• Teacher recaps from the previous knowledge. • Teacher will draw 16 cardinal points in the chalkboard. • Conventional sings are confused with their names because there are TWO in a row and two names as evident from the reference of the topographical map.	Giving the correct direction using the 16 cardinal points. Conventional sings are confused with their names because there are TWO in a row and two names as evident from the reference of the topographical map.	• Overhead projector • Topographical maps and Orthophoto maps • Textbooks • Chalkboard

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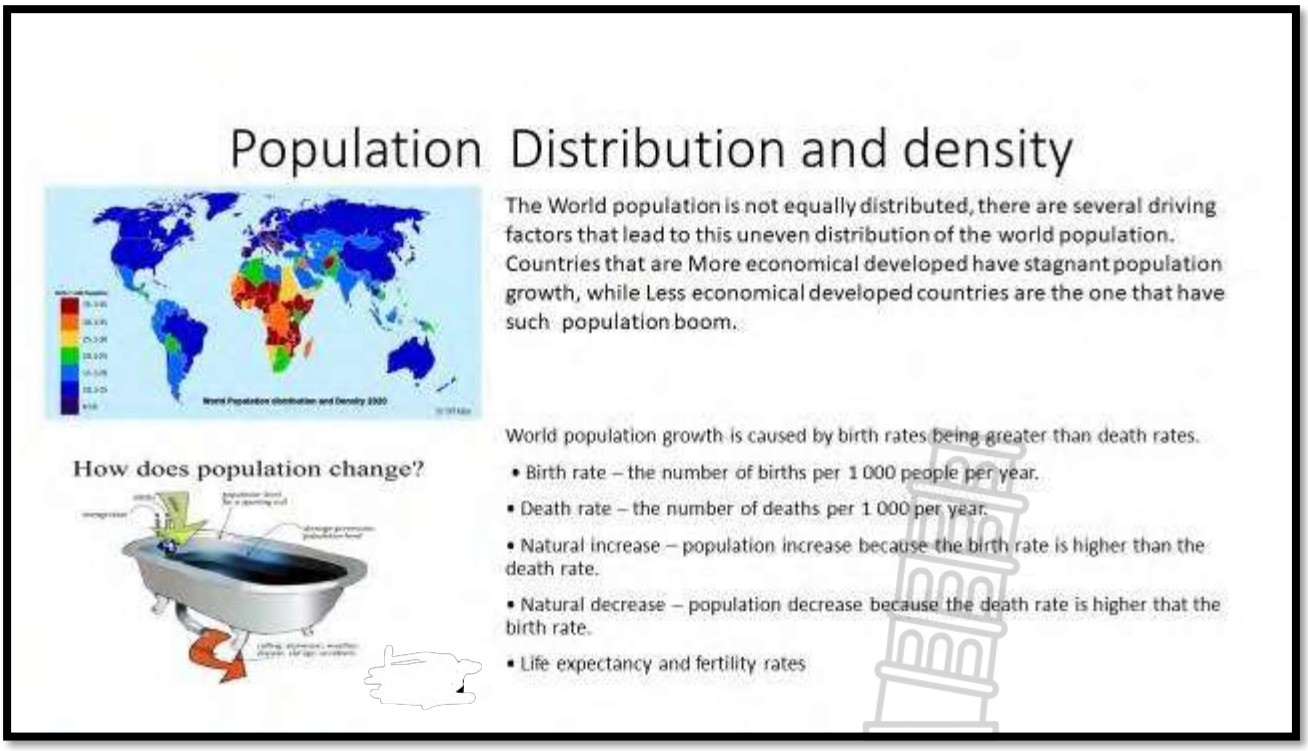
ADDITIONAL NOTES

POPULATION GEOGRAPHY: Distribution and density, Structure, Growth & Movements

POPULATION DISTRIBUTION AND DENSITY

- **Population distribution** describes how people are spread out on the Earth.
- The population of the world is spread out unevenly.
- **Population density** is the measurement of how many people there are in an area.
- Low population densities is associated with mountainous regions, cold regions, densely forested tropical regions, and desert areas.
- **Population distribution** – the arrangement or spread of people living in a given area, also how the population is arranged according to variables such as race, age and sex
- **Arithmetic density** – distribution map showing how many people live in an area by means of dots and usually these dots represent different numbers and their sizes are not the same. An area with fewer dots would show less concentration of the population; while bigger dots will represent a large proportion population



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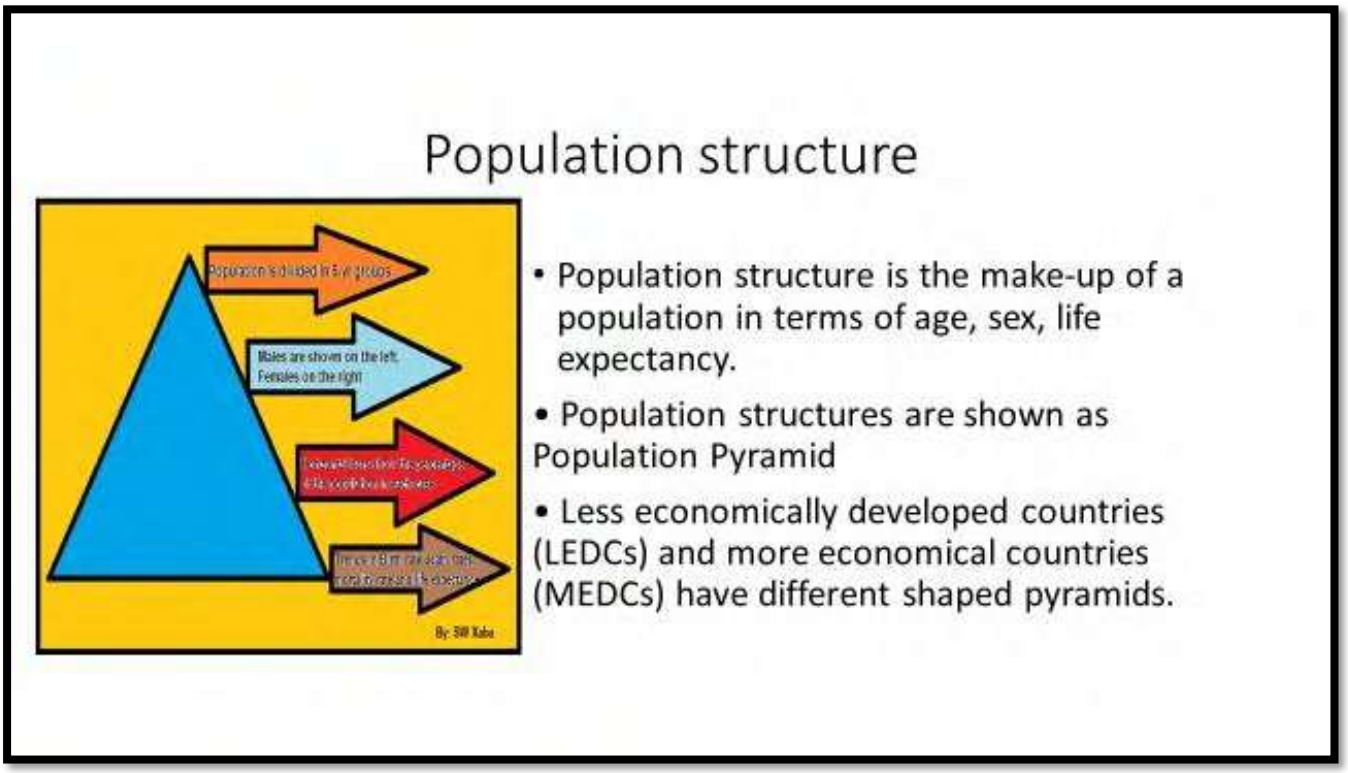
POPULATION DISTRIBUTION AND DENSITY

Factors affecting population density and distribution

- **Physical factors**: includes relief (whether the area is it mountainous or flat), Resources (that include coal, oil, wood and fishing), Climate (areas with temperate climates tend to be densely populated)
- **Human factors**: Includes Human; Politics (areas that have political instability tend to have less population as civil wars push people away to migrate), Social (in most of SA communities they are inter-related),
- **Economic Factors**: which are densely populated is usually because of good job opportunities.



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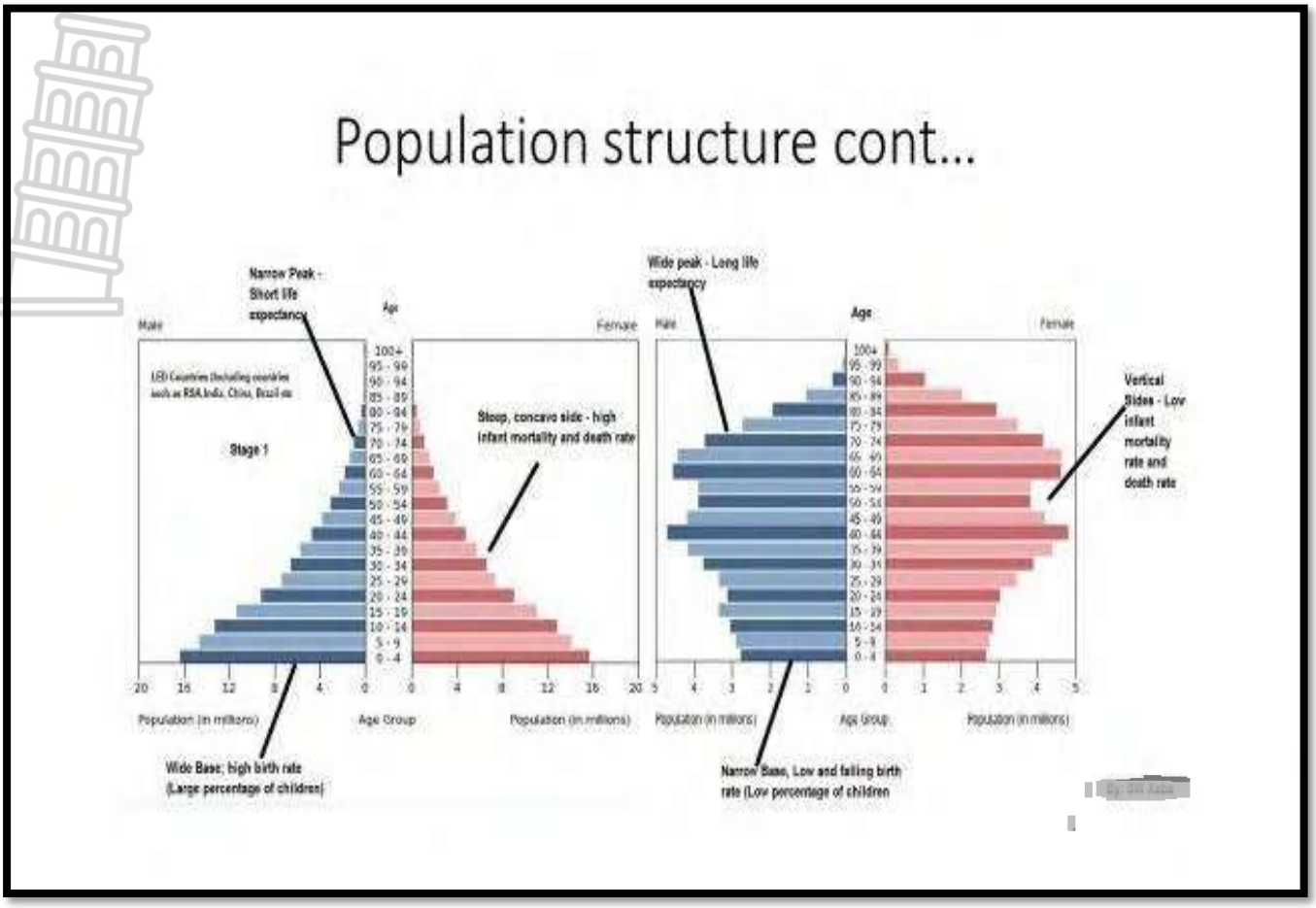

- For most of human history the world's population remained steady. It took until 1800 for it to reach one billion. Today the world's population is over six billion.
- This rapid growth in world population is called the population explosion and is the result of reduced death rates due to improvements in medicine.
- Global population growth is now beginning to slow. It is predicted the population will stabilise at 10, 4 billion in 2200.
- Population growth is not spread equally between countries – 95% of growth is in LEDCs.
- MEDCs have reached a replacement level of population growth or are experiencing a decrease.
- The following diagram represents the difference in growth rate between developed (MEDCs) and developing (LEDCs) countries.

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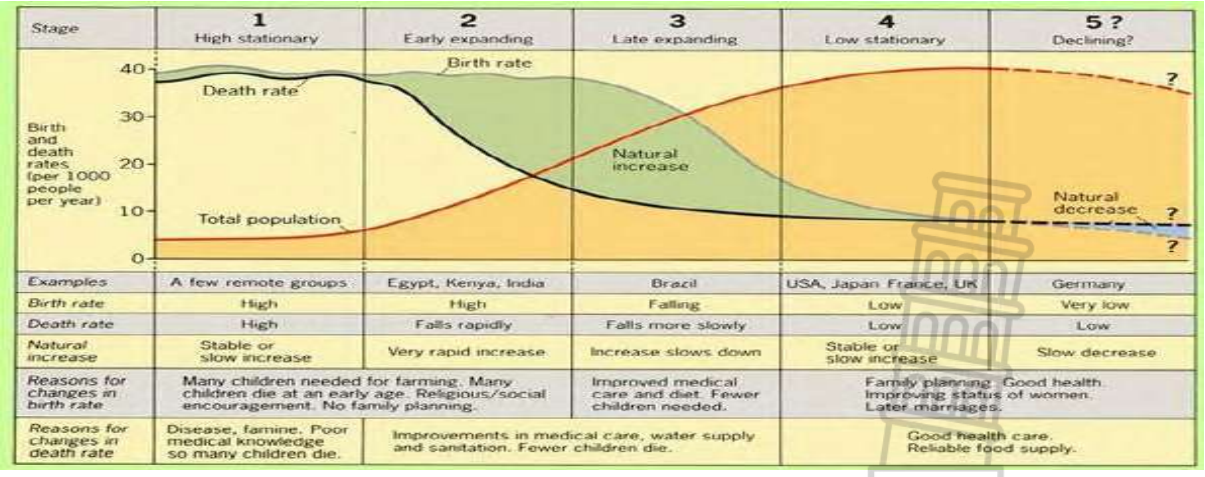
Less Economical Developed Country	More Economical Developed Country
Characterised by fastest population growth – population is increasing 6× faster than the growth rate in developed countries.	Very slow population growth.
86% of the world's population lives in Africa, Asia and South America.	Some countries in north-west Europe have a zero growth rate.
HIV/AIDS affecting population growth – will limit growth in Africa in next 20 years.	Europe's population is decreasing by 1 million people per year. Australia, Japan, New Zealand and North America – natural increase of about 2,1 million people per year.
99% of total natural increase occurs here – contains 81% of the world's population.	
90% of the world's births per year – higher infant deaths.	On average, natural Increase is 1,4%.

DEMOGRAPHIC TRANSITION MODEL

What is the demographic transition model?

- The demographic transition model shows how changes in birth rates and death rates affect population growth in countries at different stages of development.
- The model may be used to explain population change in five stages (see diagram below).
- MEDCs (more economically developed countries) are entering a fifth stage where death rates exceed birth rates and populations are falling.

REPRESENTATION OF A DEMOGRAPHIC TRANSITION MODEL



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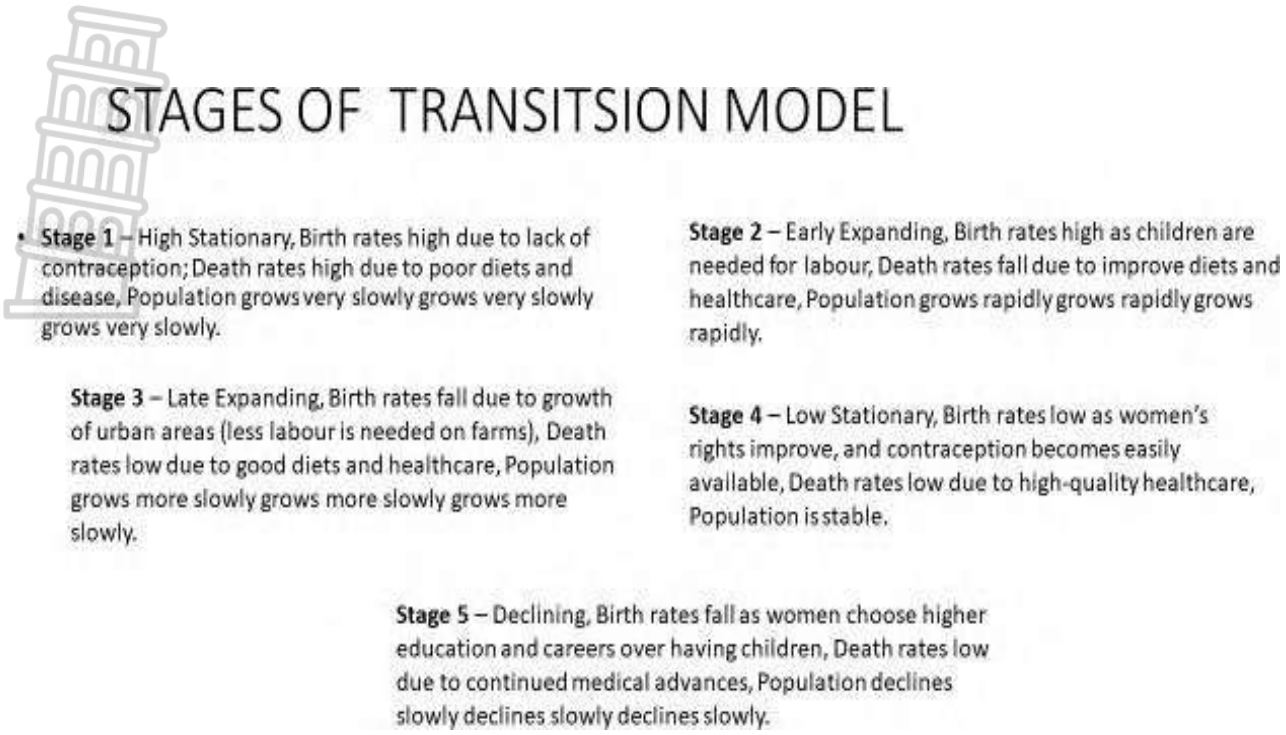

MANAGEMENT OF POPULATION GROWTH

- Contraception – Implementation of birth control methods.
- Advertising – attempting to change religion stereotypes attitudes and culture.
- Financial – offering bonuses to those with small families.
- Education – teaching women about family planning.
- Healthcare – reducing the infant mortality rate by providing primary health care facilities.
- Policies / Law – e.g. rules limiting the number of children (China: One child policy)

POPULATION MOVEMENTS

Migration refers to the movement of people from one country to another.

Migration can be classified into different categories.

- Immigration is the movement of people into a country.
- Emigration is the movement of people out of a country.
- Rural - urban migration is the movement from rural to urban areas.
- International migration is controlled by governments. They may encourage or discourage migration into their country. Illegal migrants can be returned to their country of origin (deported).

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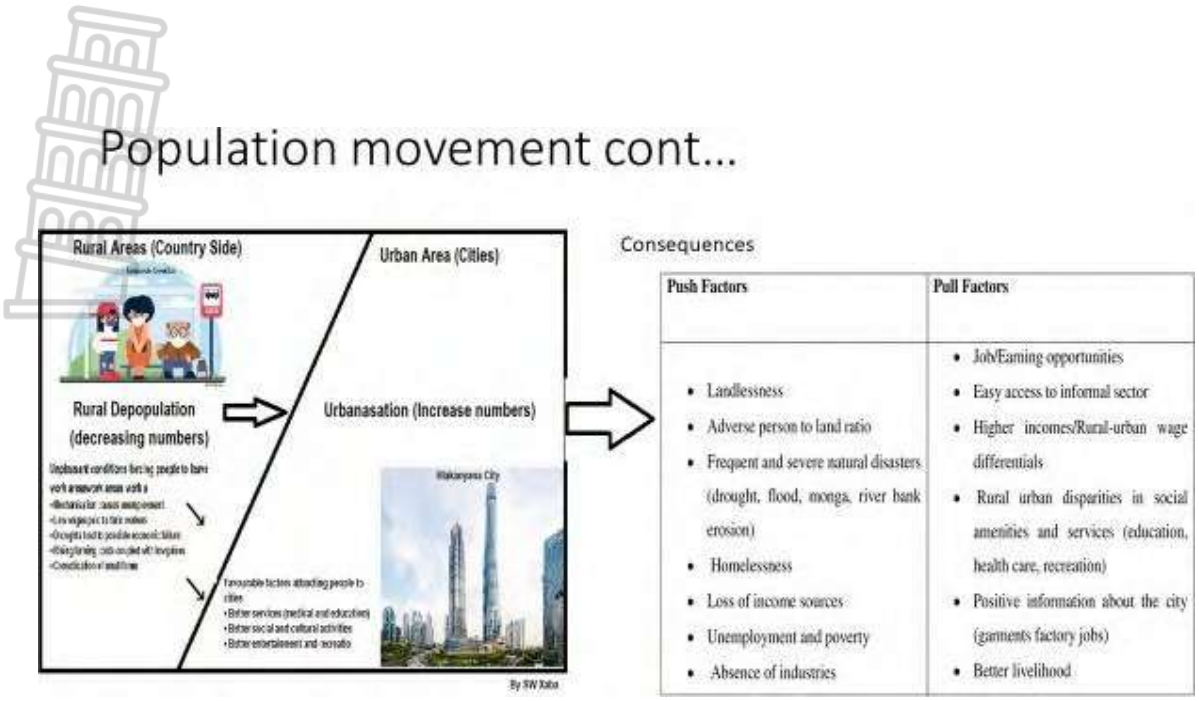

Factors which influence migration

• Social factors – the desire to live a better life, housing, environment, improved living conditions, improved services, facilities, activities, relationships.

• Political factors – people move because they are unhappy with the political system, mainly a push factor.

• Economic factors – seeking a better job from business or industry.

• Religious factors – people may move to avoid being persecuted because of their religion. Move to where they can practise their religious beliefs.

• Physical factors – people may move to avoid physical dangers, a harsh climate or infertile soil.

OTHER POPULATION MOVEMENTS

Seasonal movements

• Transhumance is the seasonal movement of people with their livestock over relatively short distances, usually to higher pastures in summer and to lower valleys in winter.

• The traditional economy of the Basotho in Lesotho – seasonal migration between the valleys and high plateaus of the Maluti mountains to increase the number of cattle.

Daily movements

• From home to work.

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Temporary movements

• People stay in a place temporarily – for a short time only. Migrant labourers move to another area temporarily to seek employment.

• Many migrant labourers are men who return home with their savings or later have their family join them.

• Refugees who leave for political reasons may migrate temporarily to another area either temporarily or permanently when lives are in danger. The Rwandan civil war in early 1990s created more than 1,5 million refugees.

• Some people's beliefs (religion, political) may differ with the current status quo.

• Tourism, short contract work, business travel, conferences and conventions are also examples of temporary movements.

Attitudes to refugees and immigrants (xenophobia) Negative attitudes towards immigrants are attributed to various factors:

• Refugees are people who have been forced to leave their home country because of war, persecution or natural disaster. The United Nations estimates there are over 13 million refugees spread throughout 140 countries.

• Perceptions people have of immigrants taking away jobs that only citizens are entitled to, especially where jobs are in short supply.

• Foreign traditions and practices that are different from those of local people.

• Fear or hatred for foreigners – local people attack immigrants.

• Pressure on existing services (water, electricity, housing, food).

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GRADE	10	SUBJECT	Geography	WEEK	35	TOPIC	WATER RESOURCES

LESSON SUMMARY FOR: DATE STARTED:		DATE COMPLETED:	

SUB TOPICS	**Water management in South Africa** • River; Dams; *Rivers lakes and dams in South Africa.* • Factors influencing the availability of water in South Africa • Challenges of providing free basic water to rural and urban communities in South Africa • The role of the government – initiatives towards: securing water, inter-basin transfers, building dams • Role of municipalities - Provision and water purification • Strategies towards sustainable use of water - role of government, role of individuals
RELATED CONCEPTS	Lake; Hydro-electricity; Water transfer scheme/ inter-basin transfer scheme; Free basic water, sustainability, alien vegetation, desalination
PRIOR/ BACKGROUND KNOWLEDGE:	• Ways in which we use water? • What causes a place to have too much or too little water?
ERRORS AND MISCONCEPTIONS	Physical and human factors
LESSON OBJECTIVES	At the end of the lesson learner: • Must be able to define concepts related to water management. • Must be able to identify strategies of water management. **Methodology:** • *Explanation and supply of terminology list* • *Give an overview of topics and concepts to be covered using a mind map*

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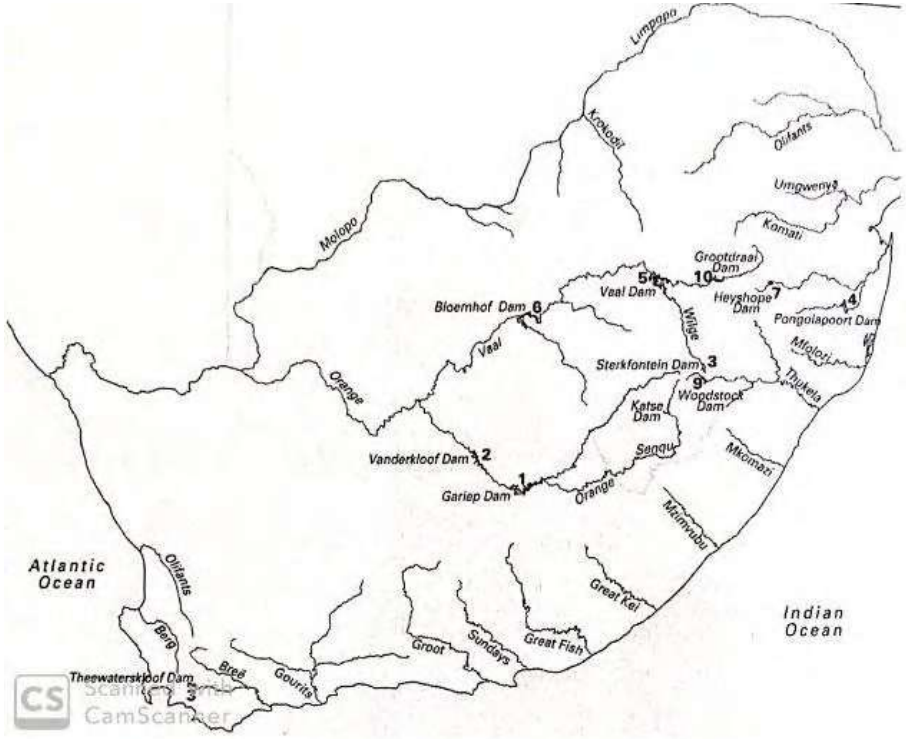
TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
Introduction ***Display/show images of different water bodies (lakes, rivers, dams)*** • *Teacher guide learners in defining the related concepts.* • *Learners supplied with possible answers to the definitions or terminologies* ***Main body*** ***The main rivers and dams in South Africa: Source*** ***[Focus geography grade 10: 266]*** •  ***The main uses of dams***	• Learners define the following concepts: River; Dams; Lake; Hydroelectricity; Water transfer scheme/ inter-basin transfer scheme; Free • Learner completes a mind map of water management strategies.	• *Text books* • *Projector* • *google*

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- *Store water for cities*
- *Control floods*
- *Provide irrigation water to farms*
- *Generate hydro-electricity*

Factors influencing the availability of water in South Africa

1. **Human factors**
   - Population growth
   - Increase demand for food
   - Urbanisation
   - Mining factors
   - Pollution of water sources
   - Agriculture

2. **Physical factors**
   - Rainfall
   - Alien vegetation
   - Climate change

Strategies towards sustainable use of water- role of government and individuals

Government strategies	**Individual strategies**
Construction of dams	Rain water harvesting
Desalination	Grey water
Recycling	Save water at home
Controlling leaks	

Conclusion

- Summary
- Learners supplied with possible answers to the definitions or terminology

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GRADE	10	SUBJECT	Geography	WEEK	36	TOPIC	FLOODS

LESSON SUMMARY FOR: DATE STARTED:		DATE COMPLETED:	

SUB TOPICS	• Causes of flooding – physical and human • Characteristics of floods – analysis and interpretation of flood hydrographs. • Managing flooding in urban, rural and informal settlement areas • Case study of flood in South Africa
RELATED CONCEPTS	**Floods** – sudden overflow of water which covers land that is usually dry **Hydrograph** – a graph showing a rivers discharge over time **Discharge**'- amount of water across the width of a river flowing past a given point. **Drainage basin**- total area drained by a river system. **Source**- where a river begins **Tributary**- a rivulet (small river) entering the main river **Watershed** – high-lying area separating two drainage basins **Mouth**- where a river enters the sea/ocean **El Nino**- a warm current which replaces the normal cold current on the west coast of South America every few years, bringing drier conditions to South America and Africa **La Nina**- a cold current which normally flows off the west coast of South America, bringing more rain to South America and Africa
PRIOR/ BACKGROUND KNOWLEDGE:	• Causes of floods • When do floods occur?
ERRORS AND MISCONCEPTION	Physical and human causes El Nino La Nina

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LESSON OBJECTIVES	• *The learners must be able to identify factors that causes floods* • *They must be able to differentiate between different types of floods* **Methodology:** • *Explanation and supply of terminology list* • *Give an overview of floods how they affect people*

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES NEEDED
• ***Introduction*** • *Teacher guide learners in defining the related concepts.* • *Learners guided on formulating strategies to minimise the effects of floods* ***Main body*** • ***To identify characteristics of floods*** • ***Using hydrographs identify characteristics of floods***	• Learners define the following concepts: floods, dams, lakes, confluence, watershed ,tributary, source, mouth, drainage basin • Learners answer questions based on floods	• *Text books* • *Projector* • *google*

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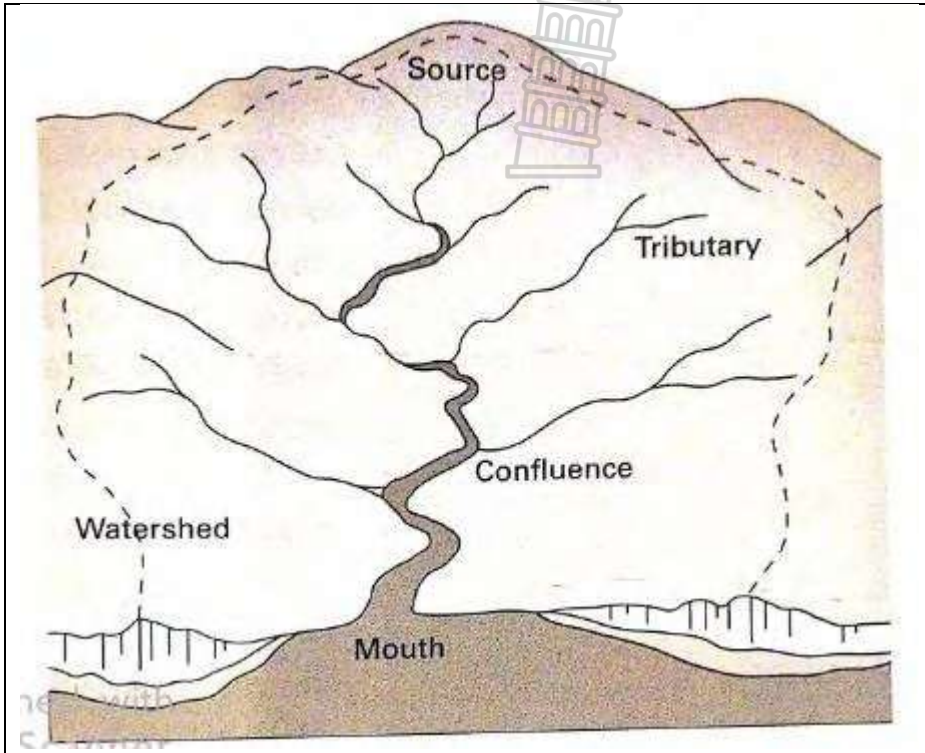

SOURCE: Adapted from Focus Geography grade 10: 279

Types of floods

- Coastal floods/ river floods

Effects of river floods

- Destroy crops
- Drown people and livestock
- Wash away top soil
- Damage homes

Effects of coastal floods

- Destroy infrastructure along the coastal areas

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- Negative impact on tourism

Human causes of floods

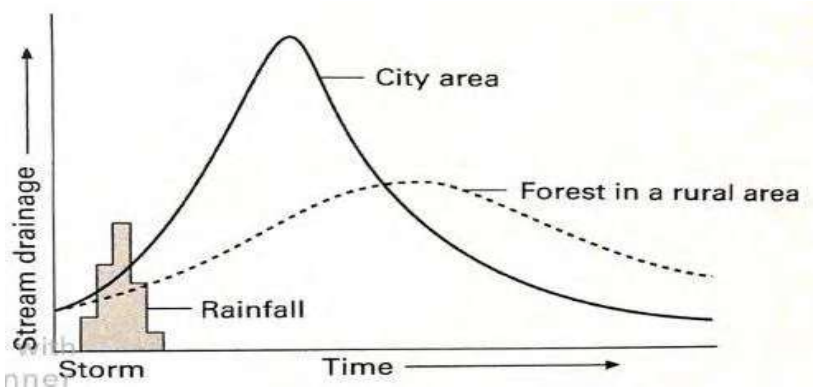
- Landuse of the river basin
- Human activities – deforestation, overgrazing, clearing of vegetation

Physical causes of floods

- Type and the amount of precipitation
- Types of soils
- Types of rocks
- Vegetation cover
- Gradient/ slope

Charecteristics of floods

Using hydrographs to identify the characteristics of floods



- River discharge rises soon after the rain storm put water into the river drainage basin
- The peak of the hydrograph shows the highest flow in cubic meiters per second.

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• There is a lag between the rainstorm peak and the discharge peak **Managing flooding in urban,rural and informal settlement areas** **Rural areas** • **Planting more vegetation** • **Raising the levees** • **Straightning the river channel** • **Relocate people living near the flood plans** **Urban areas** • **Insert sandbags along the coastal areas and rivers** • **Dam construction** **Informal settlement** • **Building proper settlements with drainage systems**		