KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

CURRICULUM GRADE 10 -12 DIRECTORATE

NCS (CAPS)

JUST IN TIME DOCUMENT

GRADE 10

GEOGRAPHY

2024

LEARNER DOCUMENT

PREAMBLE

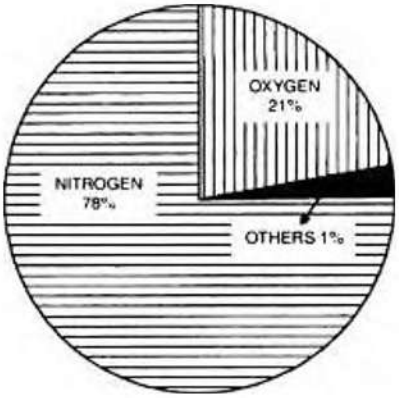
This support document serves to assist Geography Grade 10 learners in dealing with curriculum content gaps and learning losses. Activities serve as a guide on how various topics are assessed at different cognitive levels and prepare learners for informal and formal tasks in Geography.

THE ATMOSPHERE

What is the atmosphere? It is a gaseous layer that surrounds the earth.

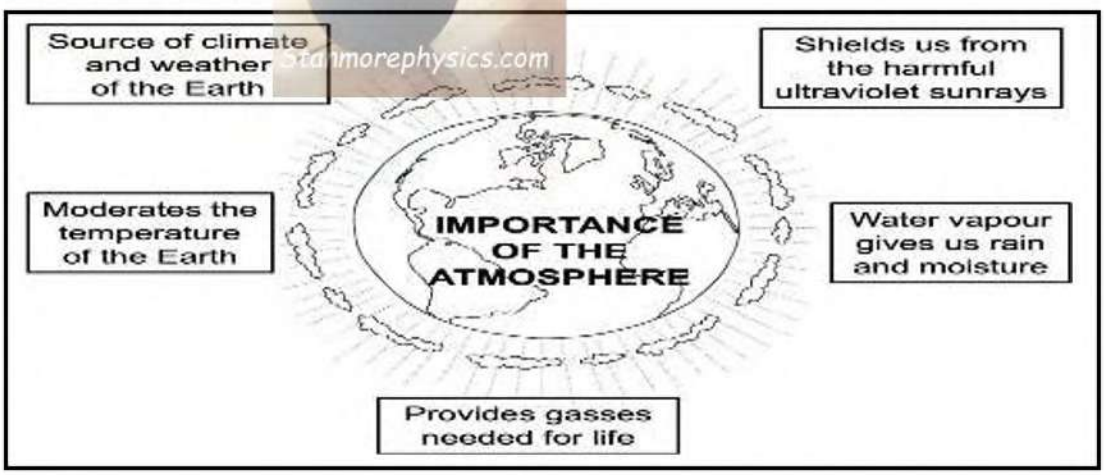
What is the Composition of the Atmosphere?

Types of gas	Gas
Permanent	Nitrogen, Oxygen and Argon
Variable	Water vapour and carbon dioxide



[www.learninsta.com]

Figure 1: Importance of Atmosphere



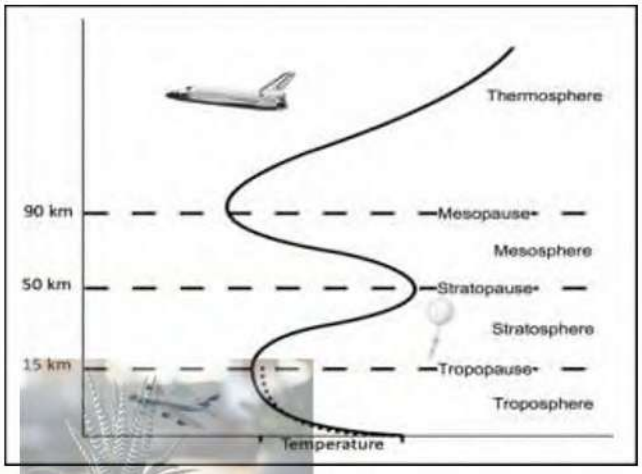
[www.learninsta.com]

Atmosphere consists of four distinct layers:

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere

ACTIVITY 1.1: STRUCTURE OF THE ATMOSPHERE

Study FIGURE 1.1 above and answer the following questions.



Source:https://www.scribd.com/document/208782645/atmosphere

1.1. The lowest layer the atmosphere is ……

A stratosphere

B mesosphere

C thermosphere

D troposphere (1x1) (1)

1.2. Meteors burn in this layer……

A stratosphere

B mesosphere

C thermosphere

D troposphere (1x1) (1)

1.3. Jet planes fly in the lower…

A stratosphere

B mesosphere

C thermosphere

D troposphere (1x1) (1)

1.4. A significant quantity of sulfur is released into the atmosphere through…

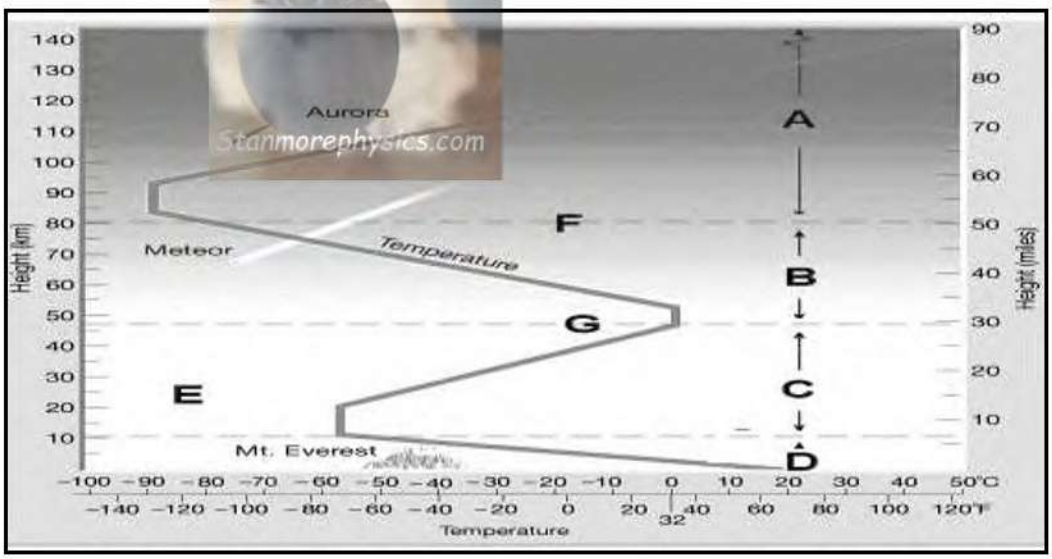
A storm

B burning of wood

C burning of fossil fuels

D lightning (1x1) (1)

1.5 Refer to FIGURE 1.5 showing the layers of the atmosphere.



Source:https://www.scribd.com/document/208782645/atmosphere

1.5.1 Name layer D which supports people, plants and animals. (1x1) (1)

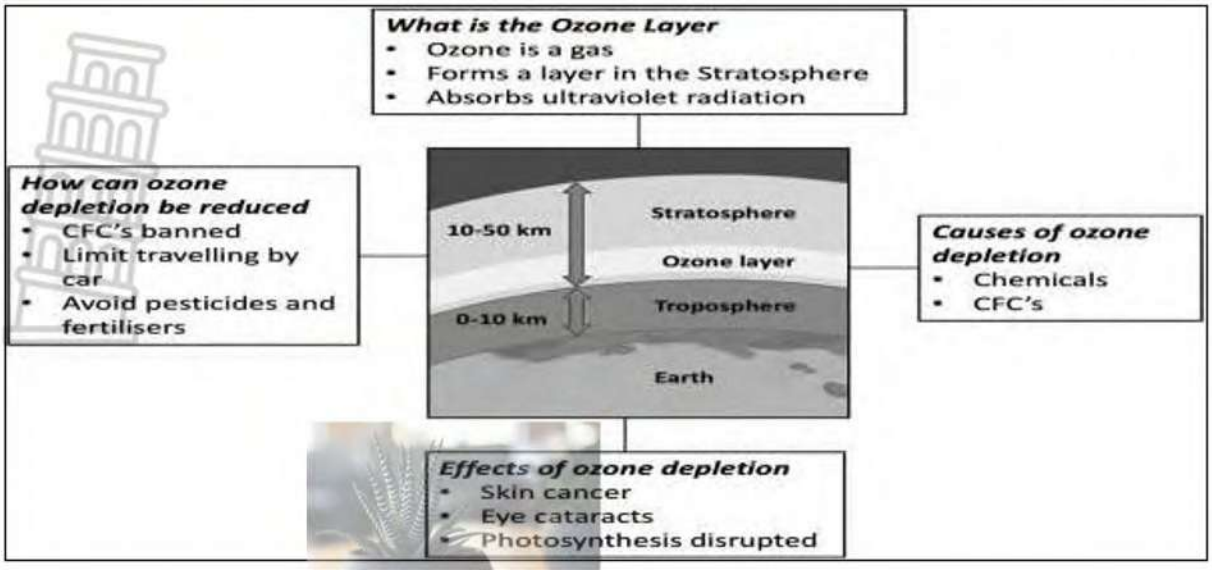
1.5.2 Layer G is called the … (1x1) (1)

1.5.3 E indicates the location of the … layer. (1x1) (1)

1.5.4 The temperature decreases with altitude in layer D and … (1x1) (1)

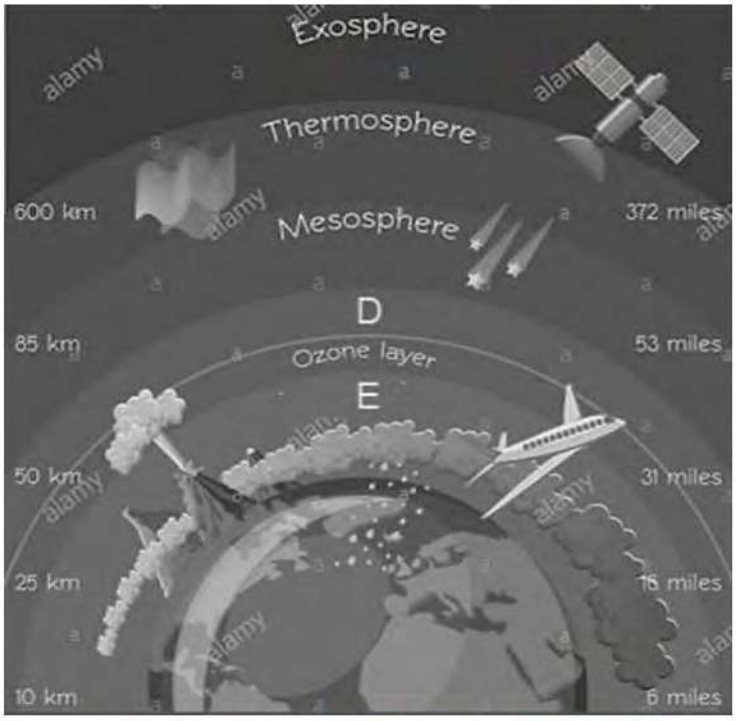
1.5.5 Name the TWO layers in which temperatures increases with altitude. (2x1) (2)

THE OZONE LAYER



ACTIVITY 1.2: OZONE LAYER

1.2 Study the figure below and answer the following questions.



Source: https://images.app.goo.gl/vddzAAiZGyrV3RxZ9

1.2.1 Define the ozone layer. (1 x 2) (2)

1.2.2 Name the layer in which the ozone layer occurs. (1 x 1) (1)

1.2.3 State the importance of the ozone layer for life on Earth. (1 x 2) (2)

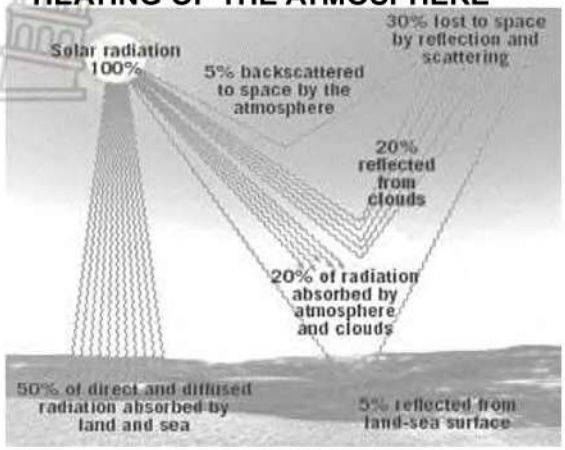
1.2.4 In a paragraph of approximately EIGHT lines discuss the Social and environmental effects of ozone depletion. (4 x 2) (8)

EATING OF THE ATMOSPHERE AND TRANSFER OF HEAT IN THE ATMOSPHERE

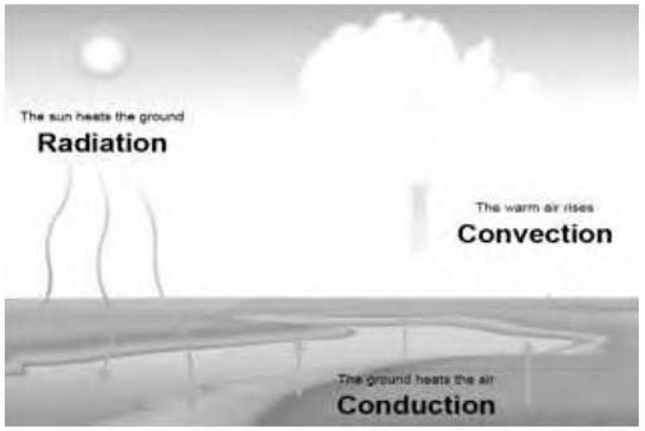
HEATING OF THE ATMOSPHERE

SOLAR RADIATION:

- The amount of sun's energy/heat given off by the sun.
- Only 46% of the sun's energy reaches the Earth's surface because it moves in short waves
- 54% is lost by scattering, absorption and reflection.



TRANSFER OF HEAT IN THE ATMOSPHERE



PROCESSES HEATING THE ATMOSPHERE

SCATTERING

Occurs when small particles and gases diffuse (split up) the sun's rays in random directions without altering the wavelength at all

About 8% of heat is scattered by dust, smoke, and air particles before the sun's heat reaches the surface.

REFLECTION

The act of sending the sun's energy back in the direction it came from without much absorption.

Clouds appear white because they reflect a lot of light.

ABSORPTION

The process whereby clouds, and solid matter absorb energy

About 24% is absorbed by water vapor, carbon dioxide, smoke and dust particles

PROCESSES TRANSFERING HEAT

CONVECTION

Earth's surface warms up, expands, gets lighter and rises.

As air rise it cools and sinks again to earth's surface

CONDUCTION

The transfer of heat between substances that are in direct contact.

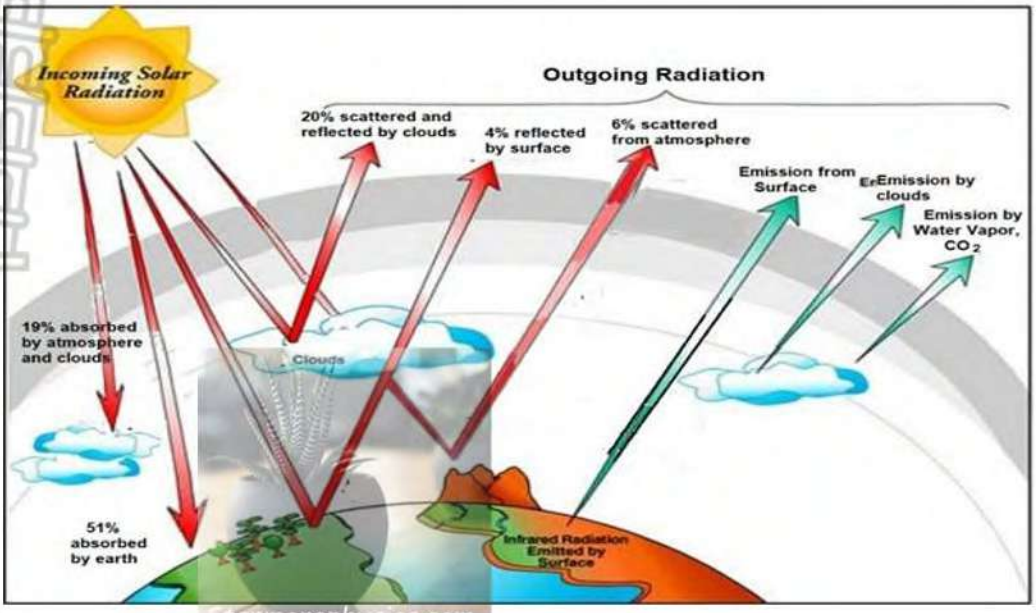
When air touch the warm surface of the Earth.

TERRESTRIAL RADIATION

The earth's surface is heated by means of radiation from the sun.
This radiation is in the form of short waves.
The atmosphere in turn is heated by radiation from the earth
Long wave radiation from the sun is called **Terrestrial Radiation**

ACTIVITY 1.3: HEATING OF THE ATMOSPHERE AND TRANSFER OF HEAT

1.3 Refer to figure 1.3 and answer the following questions.



https://i.prcdn.co/img?regionKey=9AqloDD0d6I2py

1.3.1 Define the term insolation. (1x2) (2)

1.3.2 Name the main source of insolation for earth shown in figure 1.3. (1x1) (1)

1.3.3 What is terrestrial radiation? (1x2) (2)

1.3.4 Discuss THREE processes responsible for the heating of the atmosphere. (3x2) (6)

1.3.5 Explain how an overcast day will influence the percentage of insolation received by the earth. (2x2) (4)

[15]

FACTORS AFFECTING TEMPERATURE DIFFERENCE.

Why do different places around the world experience different temperatures?

HORIZONTAL VARIATION IN TEMPERATURE

- **LATITUDE**

The further you go away from the equator the colder it gets. That's because of the oblique rays over a larger surface area and a greater distribution of heat, resulting in lower temperatures. Places that are closer to the equator are warmer due to direct rays of the sun over a smaller area. Resulting in higher temperatures.

- **OCEAN CURRENTS**

Warm ocean currents raise the temperature of coastal areas and cold ocean currents drop the temperature of coastal areas.

- **DISTANCE FROM THE OCEAN**

Places along the coast experience moderate temperatures while places in the interior experience extreme temperatures. Since solids heat and cool faster than liquids

VERTICAL VARIATION IN TEMPERATURE

- **Lapse rate**- Refers to how temperature varies with height.
  - This could be positive/stationary/environmental lapse rate (decrease in temperature with height of about 0.6^0C per 100m.
  - Negative lapse rate (increase in temperature with height. This is called temperature inversion.
  - Adiabatic lapse rate can be dry adiabatic or wet adiabatic lapse rate.

- **Altitude-** Temperature decreases with altitude in the troposphere. This is because the atmosphere is mainly heated through terrestrial radiation, so lower levels are warmer.

ACTIVITY 1.4 DIFFERENCE IN TEMPERATURE

[www.slideshare.com]

Mount Kilimanjaro in Kenya lies near the equator yet it is covered in snow for most of the year. We learnt that places near the equator are very hot.

With reference to the above statement answer the following questions.

1.4.1 Identify the factor that explains the difference in temperatures between the equator and the poles. (1x1) (1)

1.4.2 Differentiate between the heating of the equatorial region and the polar region in terms of:

(a) Temperature

(b) Latitude

(c) Angle of the sun's rays. (3x2) (6)

1.4.3 State the factor affecting the temperature at Mount Kilimanjaro. (1x1) (1)

1.4.4 Explain why warmer temperatures are closer to the surface as compared to the summit of Mount Kilimanjaro. (2x2) (4)

1.4.5 Name the ocean current along South Africa's west coast. (1x1) (1)

1.4.6 Explain the relationship between cold ocean currents and rainfall along the west coast. (1x2) (2)

[15]

THE GREENHOUSE EFFECT

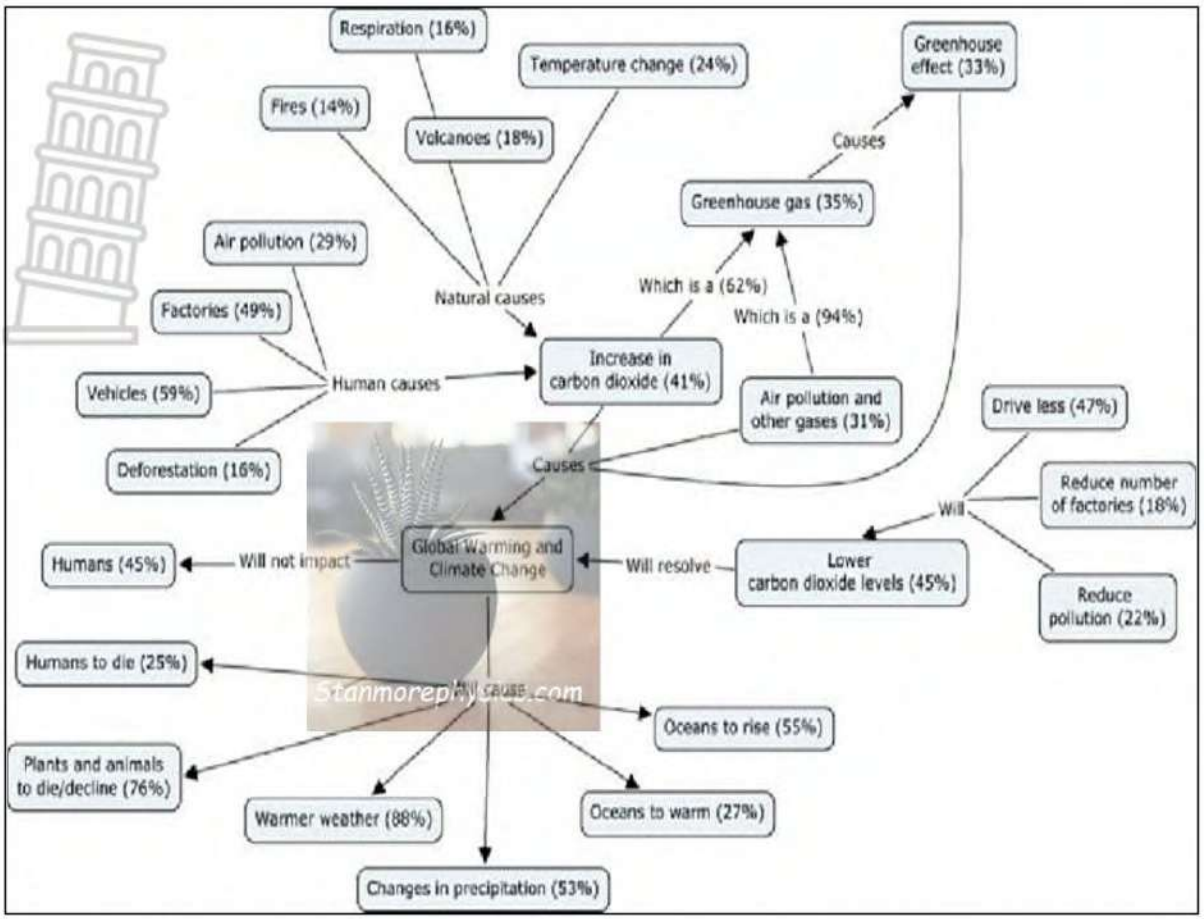


Figure extracted from www.reasearchgate.com

Definition – is the process through which heat is trapped near the earth's surface by substances known as greenhouse gases.

Greenhouse gases – are gases in the atmosphere that absorb the long wave radiation from the sun (these gases allows the atmosphere to be warm, and prevents the earth from being a frozen wasteland).

Greenhouse gases are: carbon dioxide, methane, nitrous oxide, CFCs, and water vapor.

Result of greenhouse

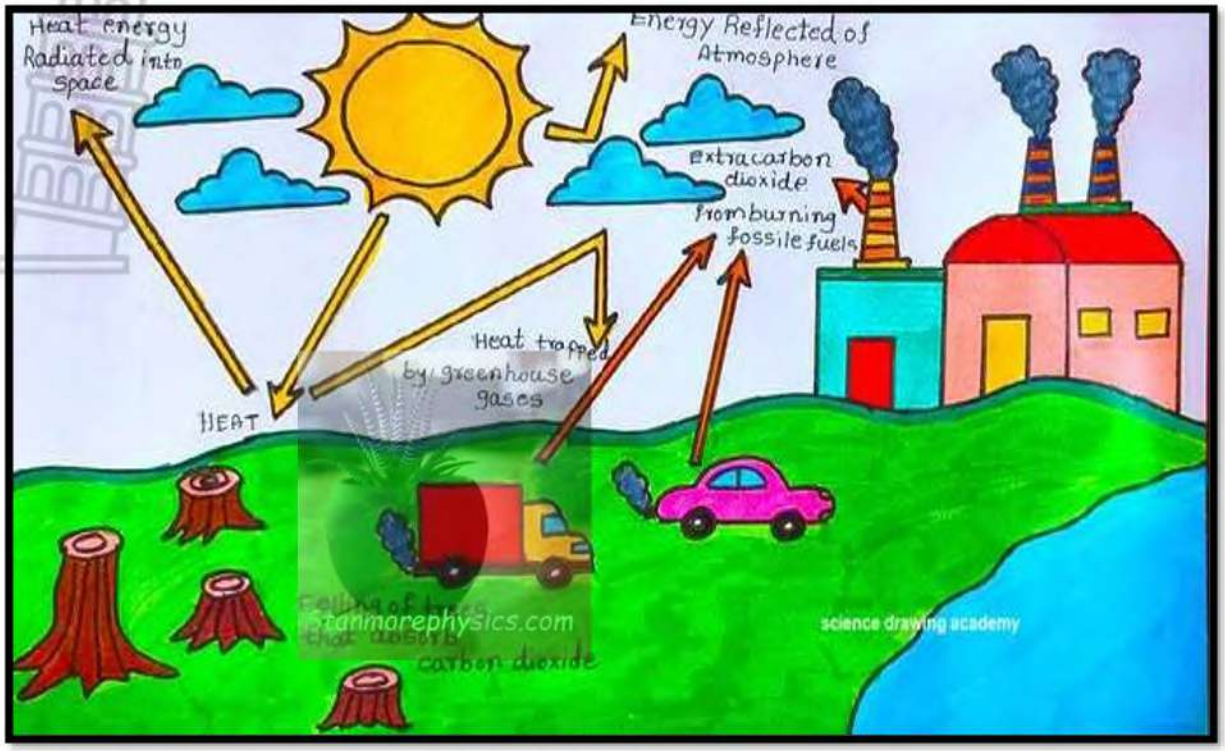
Over the years more and more heat is being trapped and this makes the earth warmer than it should be and we refer to this as **global warming**.

Strategies to reduce greenhouse effect

- Reduce greenhouse gases.
- Plant more trees.
- Use of solar and wind energy.
- Regulate the release of gases from industries.

ACTIVITY 1.5: THE GREENHOUSE EFFECT

Study the following figure on greenhouse effect and answer the following questions.



Source: https://images.app.goo.gl/jHv6dJALu3idvr2L9

1.5.1	What is greenhouse effect?	(1x2)	(2)
1.5.2	Name ONE greenhouse gas.	(1x1)	(1)
1.5.3	Explain how humans contribute to the greenhouse effect.	(2x2)	(4)
1.5.4	In a paragraph of approximately EIGHT lines, discuss strategies that can be used to reduce the impact of greenhouse effect.	(4x2)	(8)

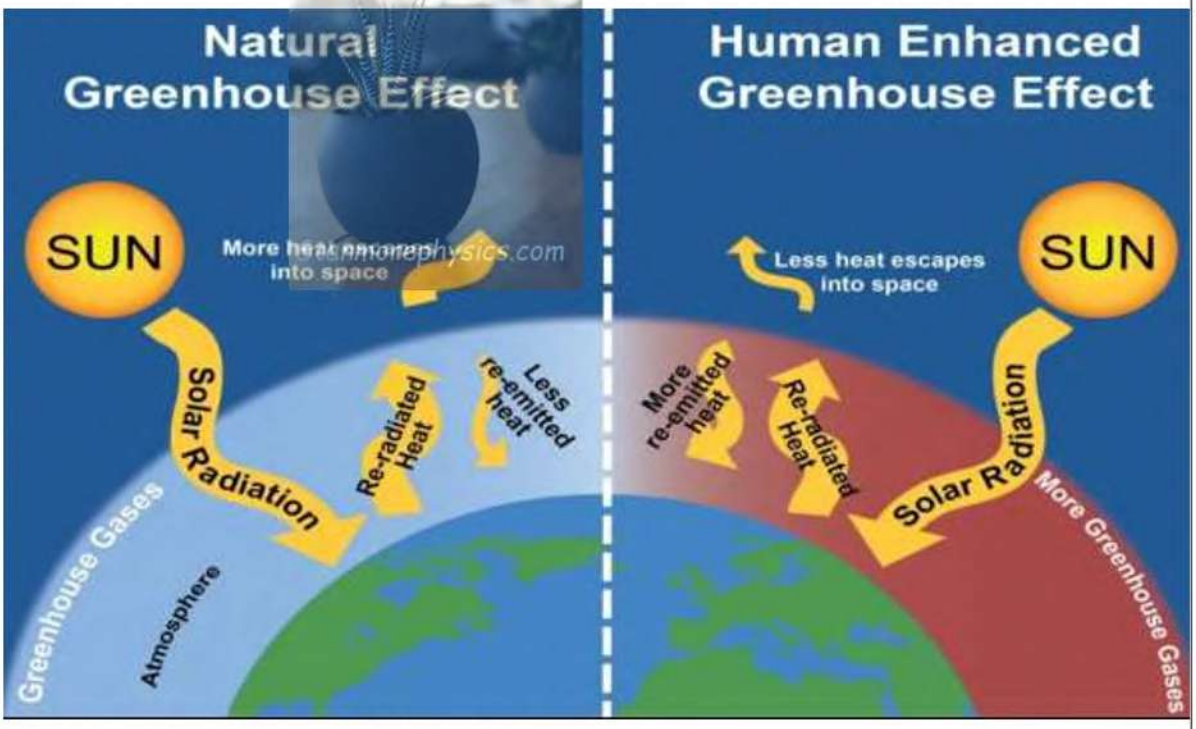
GLOBAL WARMING

Definition: It refers to an increase in the average temperatures of the planet (as a result on an enhanced greenhouse effect).

Causes: Burning of fossil fuels, deforestation, and destruction of ozone layer.

Impacts: Increase in global temperatures, melting of polar ice-caps, rising sea levels, spread of desertification and increase in diseases such as malaria

Strategies to reduce: use renewable energy, stop deforestation, etc.



https://images.app.gpp.gl/mVTs2SWvQj8evhnb7

ACTIVITY 1.6 GLOBAL WARMING

Source: *https://www.istockphoto.com*

1.6 Study Figure 1.6 above and answer the following questions.

1.6.1 What climatological issue is the cartoonist depicting in this drawing? (1 x 1) (1)

1.6.2 Why is the polar bear feeling "too hot" (2 x 2) (2)

1.6.3 What is the impact of this climatological issue on the polar bear? (3 x 2) (6)

IMPACT OF CLIMATE CHANGE

Climate change has a negative impact on people, the environment and the economy. Some of the effects of climate change have been seen in increasing deserticiation, prolonged drought and floods.

Picture shows damage done by flooding. April 2021, Springtown, Durban.

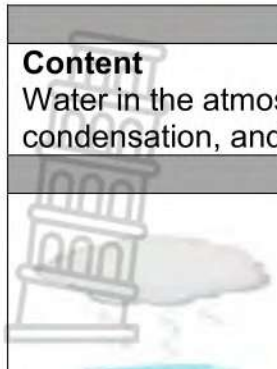
[www.edition.cnn.com/south africa/severly damaged homes/floods]

TOPIC: MOISTURE IN THE ATMOSPHERE

Content

Water in the atmosphere in different forms, Processes associated with evaporation, condensation, and precipitation

FORMS OF WATER IN THE ATMOSPHERE



GAS

- Water in a gaseous form is called **water vapor**.
- Water vapor is a tasteless, odorless, and transparent gas found in the atmosphere.
- Temperature controls the amount of the water vapor the air parcel can hold. Warm air holds more water vapor as compared to cold air.
- Water vapor is in high concentration in summer than in winter.
- The amount of water vapor in the air is referred to as **humidity**.
- 99% of water vapor is found in the troposphere.
- Water vapor quantity keeps changing from one area to another.

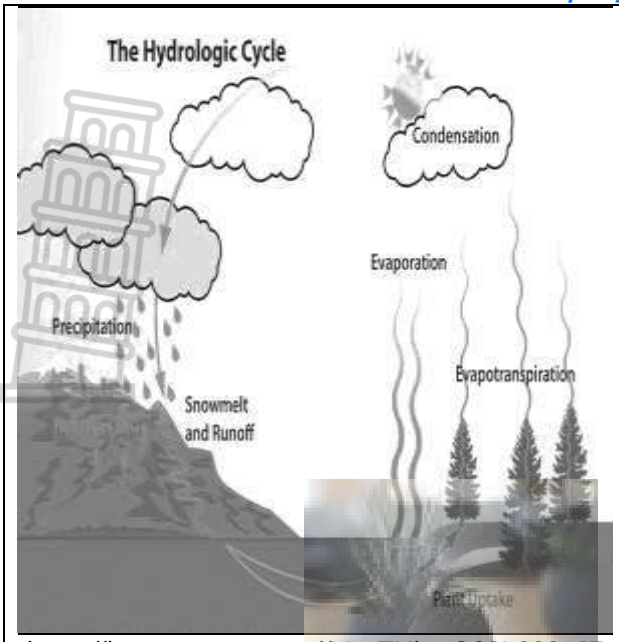
LIQUID

- Liquid water is found in the atmosphere when air saturated with water vapour is cooled sufficiently for the water vapour to condense and tiny water droplets.
- These tiny water droplets collide and grow together while circulating in a cloud until they become large and heavy enough to fall.
- Clouds or rain are the form of liquid water.

SOLID

- Water is solid when ice forms. Ice forms when temperatures in the air or water falls below freezing point (0°C).
- When rain drops freeze as they fall, they result to hail and when water vapor **sublimates** it results to snow.

Source: https://www.bing.com/images/search?view=detailV2&ccid



https://images.app.goo.gl/VvuTUhmQ39L823pJ7

- **Evaporation** refers to a process by which a liquid is converted to the gaseous (water vapor) state by the addition of latent heat. This process only occurs when temperatures are high.
- **Transpiration** refers to transfer of moisture from living plants to the atmosphere by emission of water vapor, primarily from leaf pores.
- **Condensation** refers to a process by which water vapor is converted to liquid during which latent heat is released. Condensation occurs when temperatures are cooled.
- **Precipitation** is water in a liquid or solid form that falls from the atmosphere and reaches the earth's surface.

TOPIC: READING AND INTERPRETING SYNOPTIC WEATHER MAPS	
CONTENT	Dew-point temperature, condensation level, humidity and relative humidity, How and why clouds form, Cloud names and associated weather conditions

Dew point and condensation level:

- Refers to the temperature at which an air mass becomes saturated and condense.
- The cooling of air below the dew point temperature that brings about condensation that precedes any precipitation.
- Condensation happens some height above sea-level.
- The height at which condensation occurs is known as **condensation level.**

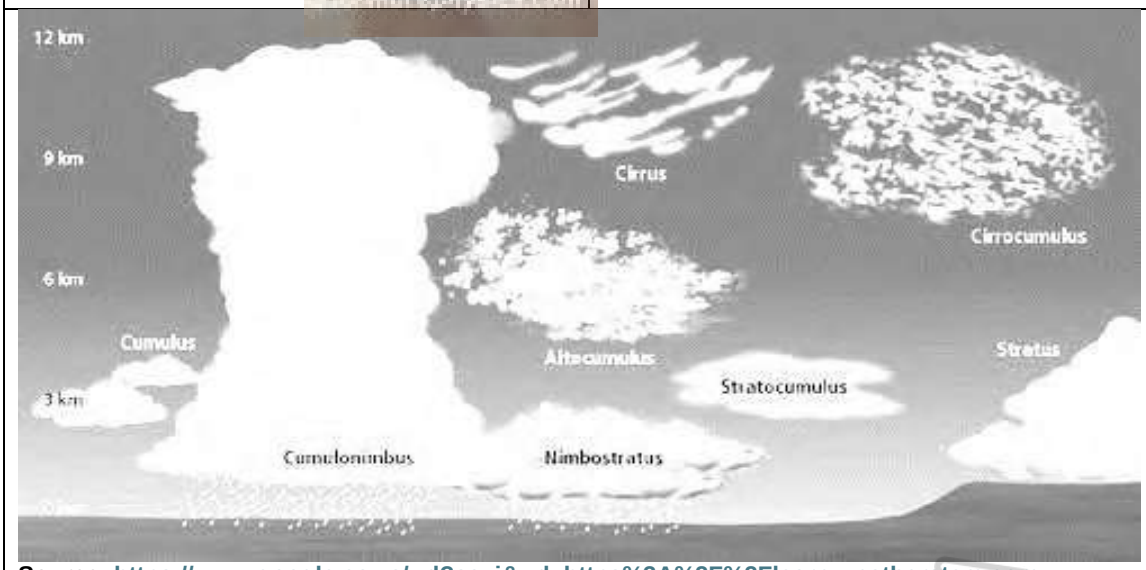
Humidity and relative humidity:

- Humidity refers to the amount of water vapor in the air at any time and place.
- There are three common ways of measuring humidity:
  1. Absolute humidity – the measure of the mass of water vapor that exist within a given volume of air.
  2. Specific humidity – the mass of water vapor per mass of air.
  3. Relative humidity – The amount of water vapor in the air compared to how much it could contain at a given temperature.
  4. **Relative Humidity**

- Relative humidity is expressed in percentage, indicating how close the air is to be saturated.
- Relative humidity is influenced by air temperature and the amount of moisture already in the air.
- If air temperature goes up or down, or the amount of moisture in the air goes up or down the relative humidity will also change.
- Warm air can hold more water vapor than cold air.

Relative humidity is expressed in percentage. $RH = \frac{ACTUAL\ HUMIDITY}{WATER\ CAPACITY} \times 100$

CLOUDS	How and why clouds form:
• **Clouds are** a visible mass of particles of condensed water vapor (such as water or ice) suspended in the atmosphere. • Clouds are the source of all precipitation. • Clouds are composed of billions of tiny water droplets and/or ice crystals so small that they remain suspended in the atmosphere. • Clouds are named in terms of shape (cirrus, stratus and cumulus) and height where they form (**strato**- lower level clouds; **alto**- middle level clouds and **cirro**- high level clouds) • Clouds that have nimbus result in rainfall.	• **Clouds** form because of water vapor condensing in the atmosphere. • An air parcel rise and it cools down to form a cloud. • The rising air will expand as it encounters decreasing atmosphere with altitude. This results to the air parcel cooling down and condensing at a dew point temperature. • The condensation occurs on tiny solid particles such as dust, ash, pollen, smoke, salt crystals and pollution called **condensation nuclei.**



Source: https://www.google.co.za/url?sa=i&url=https%3A%2F%2Flearn.weatherstem.com

- Cloud forms at very high altitudes (8 km and above) and made of ice crystals**.**
- They are thin, stringy, white clouds that trail like feathers across the sky in the direction of the wind.
- It is associated with fair weather.

Cumulus

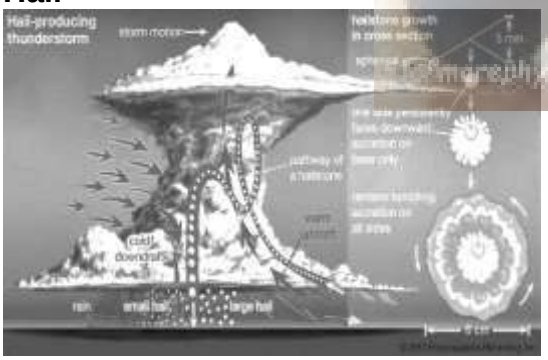
- Clouds are puffy and rounded, usually with a flat base.
- They develop vertically rather than forming a horizontal structure.
- Can create rain/hail.

Stratus

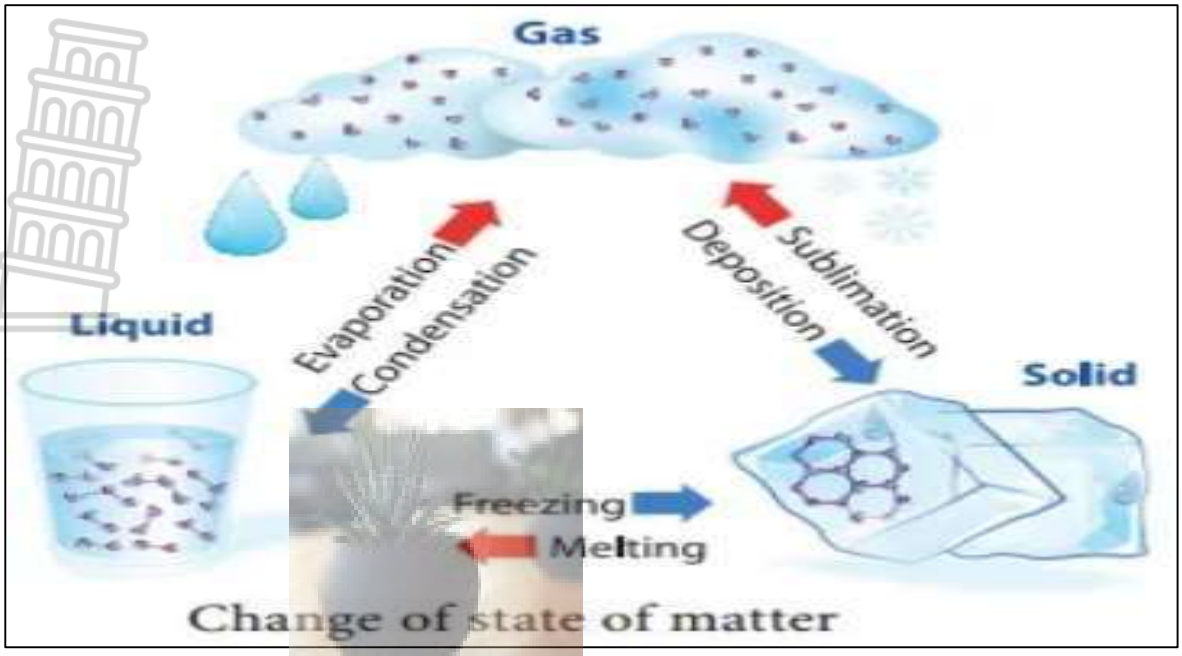
- Flat hazy featureless.
- Occur in stable atmospheric conditions which inhibit vertical development.
- Nimbostratus may produce long lasting drizzle.

Cumulonimbus

- It is a tall (8-10km) and thick dark grey thunderstorm cloud.
- Cumulonimbus clouds are the source of many atmospheric concerns including strong winds, torrential rains, lightning hail, and possibly tornadoes.

FORMS OF PRECIPITATION	
Rain  https://www.google.co.za/imgres	• Rain is droplets of water that falls from the atmosphere. • Rain drops vary in size but are generally about 2-5 millimeters. • It forms when water vapor condenses at dew point temperature above freezing point in the atmosphere. • Small droplets of water collide and coalesce to form large and heavy droplets. • Large and heavy droplets fall as rain • When the temperature an air mass is slightly below its initial dew point, raindrops may be very small. • Drizzle is an example of a fine mist.
Hail  https://www.google.co.za/url?sa=i&url=https%3A%2F%	• Hail forms in cumulonimbus clouds. • Hail forms when ice crystals are lifted by strong updrafts in cumulonimbus cloud. • As ice crystals circulate within the cloud, they collide with super cooled water droplets that freeze onto the ice, which grows into accumulating layers.
Snow 	• It forms when water vapor freezes into solid without first passing into liquid state. • It forms when temperatures are below freezing point. • The ice crystals fall as snowflakes. • If temperatures increase, they melt and fall as rain.

ACTIVITY 1.7: FORMS OF WATER



[Source: https://images.app.goo.gl/TXe5XmLUJLKgBDh88]

Match the descriptions below with the terms/concepts provided in the diagram above. Write only the correct term next to the question number.

1.7.1 The process where by an ice changes directly into gas.

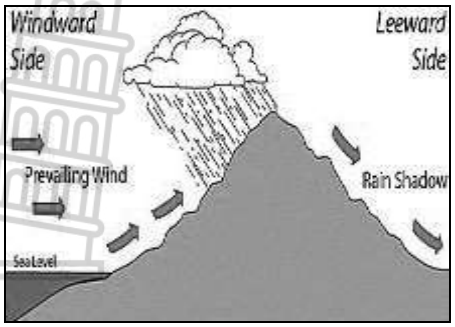
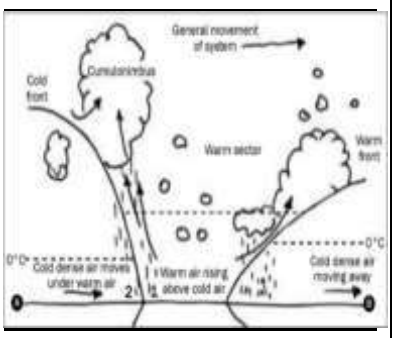
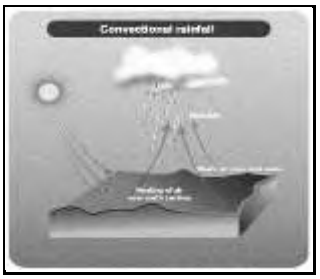
1.7.2 The process where by a liquid change to solid.

1.7.3 The process where by a liquid change to gas.

1.7.4 The process where by a solid change to liquid.

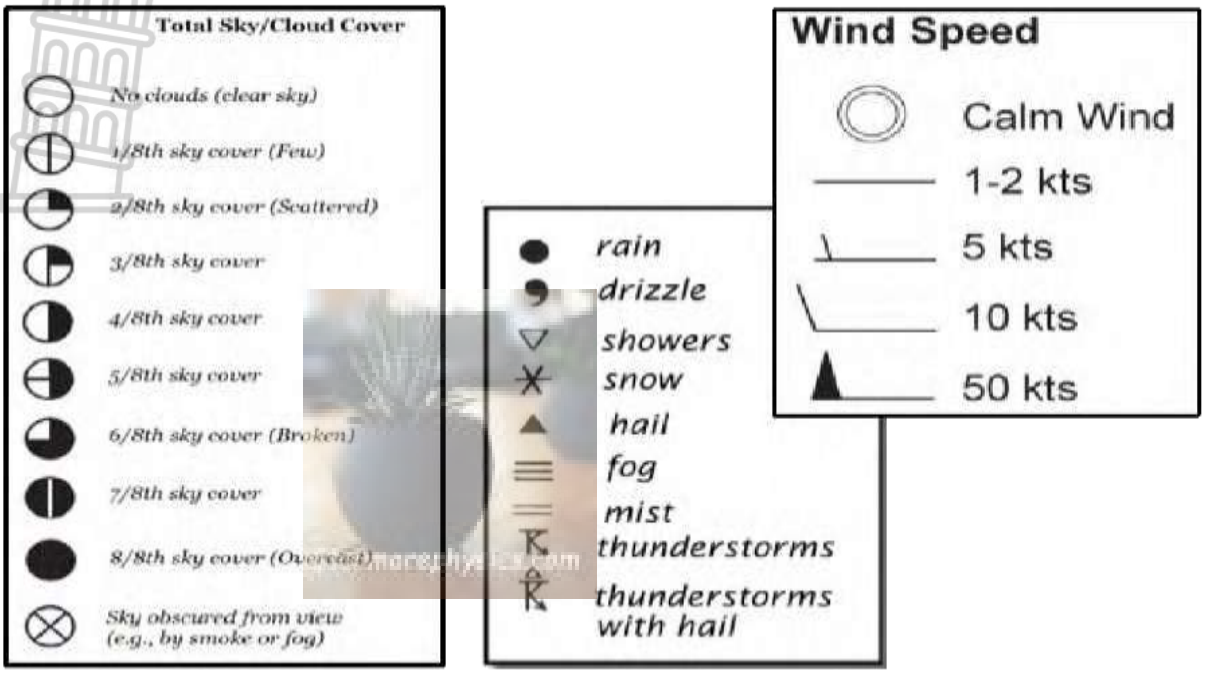
1.7.5 The process where by a gas changes to solid.

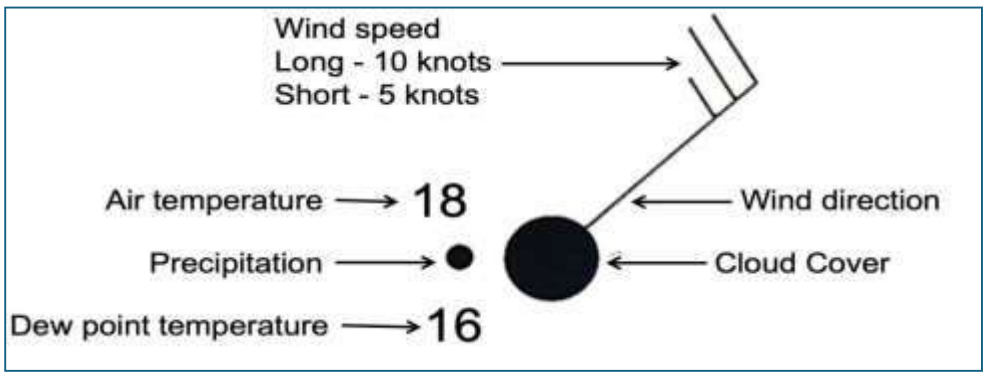
1.7.6 The process where by a gas changes to liquid. (6x1) (6)

TYPES OF RAIN			
OROGRAPHIC/RELIEF RAINFALL  https://www.google.co.za/imgres?imgurl=https		**FRONTAL RAINFALL**  Source: Mind the Gap	**CONVECTIONAL RAINFALL**  https://www.google.co.za/imgres?
DEFINITION	Rainfall that occurs when warm moist air rises over a mountain. Cause thick clouds with drizzle rain.	Rainfall that forms when warm moist air rise up a cold front when cold dense air wedges itself underneath it.	• A rainfall that occurs due to intense heating of the Earth's surface especially during summer.
FORMATION	Forms when a mass of air is forced to rise against a mountain on the windward side. As air rises, it cools down at a dry adiabatic lapse rate (DALR) of 1°C/100m. Condensation takes place resulting to precipitation. Air continues to rise and cools down at a wet adiabatic lapse rate (WALR) of 0.5°C/100m. The other side of the mountain is drier and called the leeward side.	Warm moist air collides with cold air and is uplifted against cold air. The zone of contact between the two air masses is called a front. Warm moist air condenses along the cold front. Frontal rainfall is common with Mid-latitude cyclone that mostly affect western cape.	Convention occurs when air is heated near the surface of the earth, expands, becomes lighter and rise. Air becomes moist because heat evaporates water on the surface. Air will condense and release latent heat causing more condensation. This results to the formation of cumulonimbus cloud causing heavy rainfall.

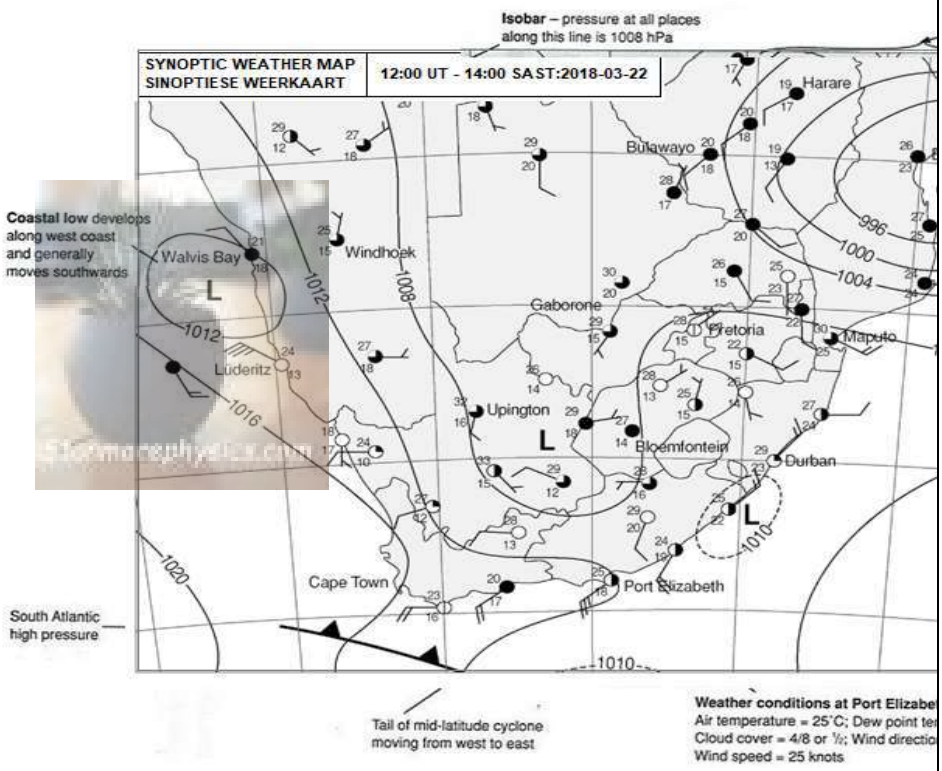
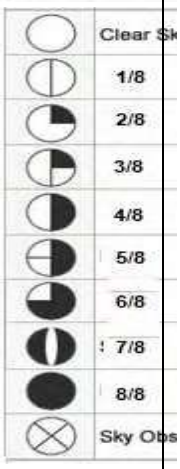
RESOURCES

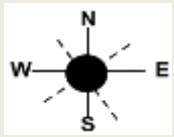
SYNOPTIC WEATHER STATION INFORMATION



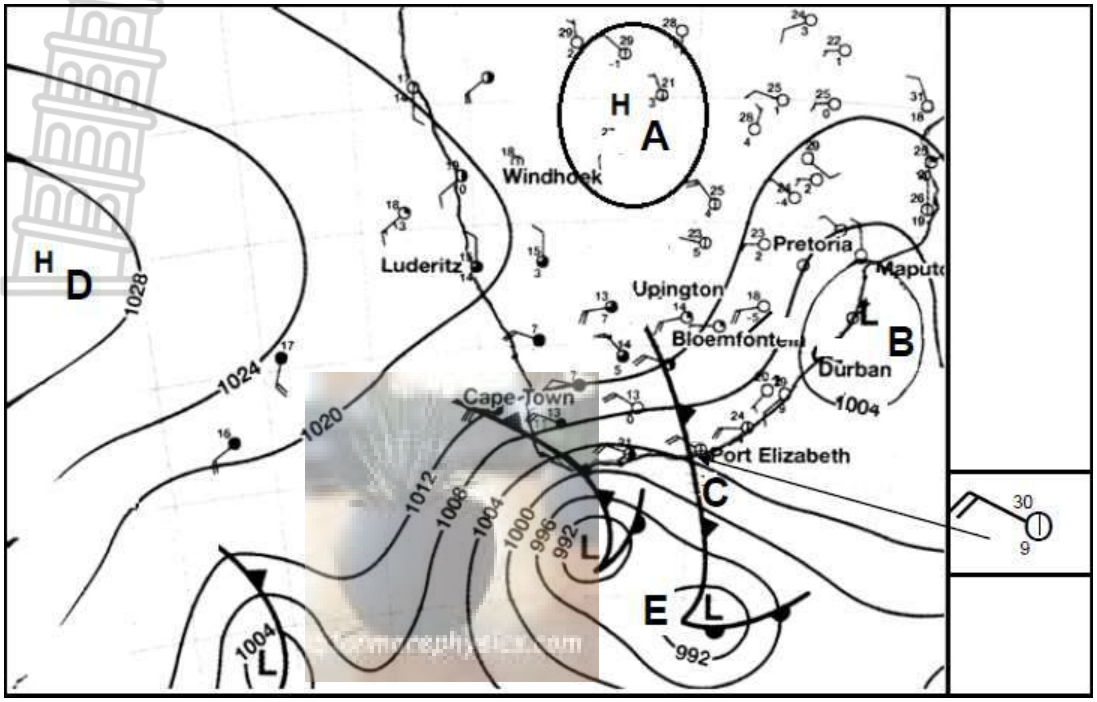


Source: Western Cape Education Department, Geography Revision Booklet

WEATHER SYMBOLS	DIAGRAM
PRESIPITATION 	**Summer and winter conditions:** Identify by looking at the temperature of places on the map and the position of the pressure system **Weather symbols:** Represent weather conditions at a particular place. **Standard symbols** are used to represent information about each of the weather elements 
CLOUD COVER 	

WIND DIRECTION	FRONTS	WIND SPEED	PRESSURE SYSTEMS
			H High pressure system L Low pressure system

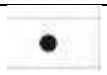
ACTIVITY 1.8: SYNOPTIC WEATHER MAP



[Source: hhttps://learn.mindset.africa/sites/default/files/resourcelib/emshare-show-note-asset/LXWS_Gr12Geography_Climatology_01July2014.pdf]

1.8.1 What is a synoptic weather map (1x2) (2)

1.8.2 Identify the following types of precipitations

Symbol	Name
(a) 	
(b) 	
(C) 	
(D) 	

(4x1) (4)

1.8.4 Use the following element of weather to describe the weather conditions experienced in Port Elizabeth (Station enlarge on the synoptic weather)

(a) Air temperature

(b) Dew point temperature

(c) Cloud cover

(d) Precipitation

(e) Wind speed

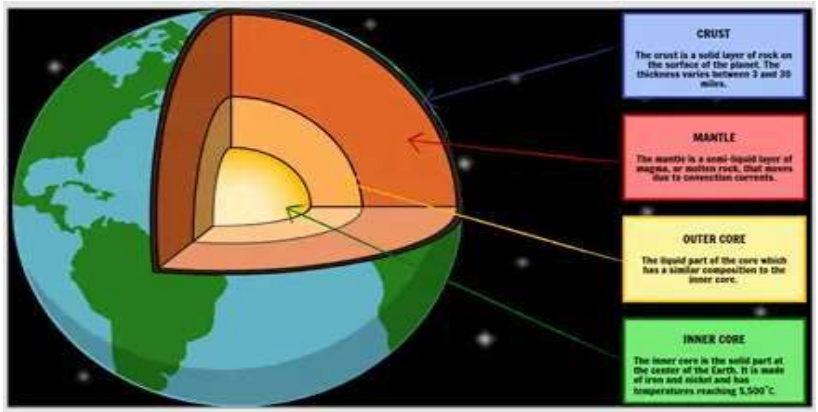
(f) Wind direction (6x1) (6)

GEOMORPHOLOGY

TERMINOLOGY

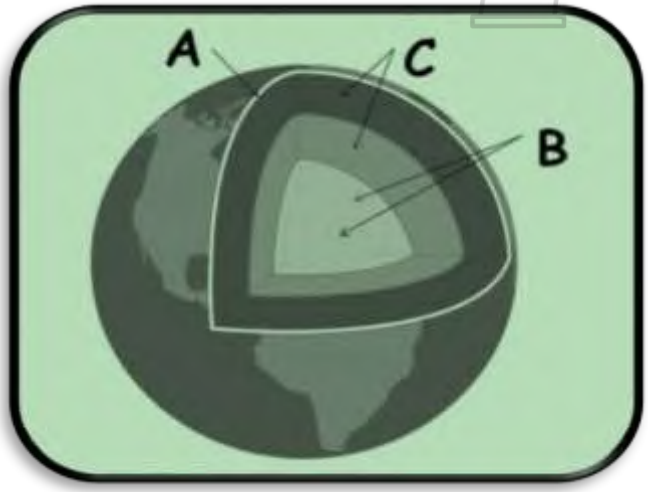
Anticline:	Downward fold	**Core:**	Central extremely hot layer of the Earth.
Fault line:	Line along the surface of the earth where a fault occurs.	**Crust:**	Outer layer of the earth.
Faulting:	Cracks in rocks formed due to tension and compression forces.	**Folding:**	Bending of rocks into folds due to strong compressional forces from the side.
Magma:	Rock in a liquid form inside the Earth.	**Sill:**	layers of rock along When magma intrudes horizontally between a bedding plane.
Mantle:	A hot plastic layer of the Earth located beneath the crust.	**Syncline:**	Upward fold
Laccolith:	Mushroom shaped intrusion which forms when magma forces the overlying strata upwards.	**Lava:**	Liquid rock that flows on the surface of the Earth.
Lopolith:	Saucer shaped intrusion	**Sill:**	When magma intrudes horizontally between layers of rock along a bedding plane.
Fossils:	Remains of a dead plant or animal which have been preserved in rock.	**Dyke:**	Forms when magma intrudes vertically between layers of rock.
		Strata:	The horizontal layers of sedimentary rock.

STRUCTURE OF THE EARTH

What does it look like?	What is it?
Layers of the Earth The structure of the Earth resembles the layers of an orange. The Moho is the boundary that separates crust from mantle.  [Source: www.storyboardthat.com/lesson-plans/structure-of-the-earth/label-diagram]	Earth is made up of **four** distinct layers: • A solid outer crust • A solid mantle • A liquid outer core • A solid inner core **THE CONTINENTAL CRUST:** • The outermost layer of solid rock, on which we live. • Thicker under the continents and thinner under the oceans. • Broken into smaller segments, called plates, which float on the mantle. • It is 6-90 km thick (solid rock) **THE MANTLE:** • Beneath the crust. • 2 900 km thick, consisting of hot, plastic rock. • Temperatures may reach up to 5 000˚C. **THE OUTER CORE:** • Very dense but liquid due to extremely high temperatures. • 2 250 km thick and consists of nickel (Ni) and iron (Fe) known as NiFe. **THE INNER CORE:** • Is extremely hot. • Solid because of extreme pressure. • 1 200 km thick.

ACTIVITY 2.1

2.1 study the number below on the structure of the earth and answer the questions that follow.

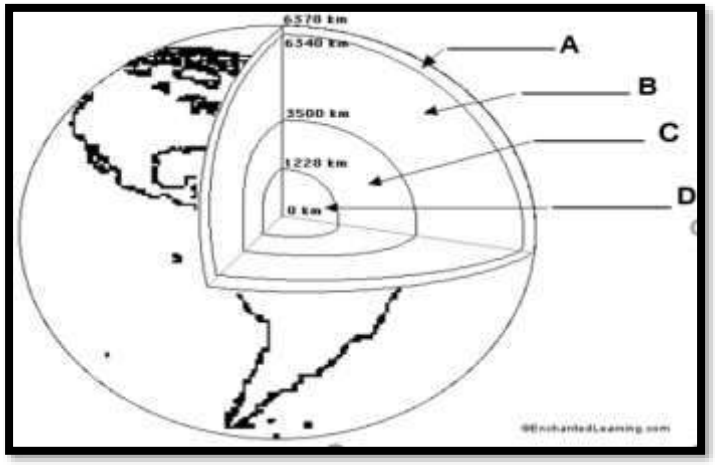


[Source: www.storyboardthat.com/lesson-plans/structure-of-the-earth/label-diagram]

2.1.1	Identify the layers labelled A, B and C.	(3X1)	(3)
2.1.2	In what state does material in each of the layers labelled A, B and C exist.	(3X1)	(3)
2.1.3	Describe the temperature change as one moves from layer C to layer A.	(2X1)	(2)
2.1.4	Discuss in a paragraph of approximately EIGHT lines the characteristics of layer A that are important to sustain life on earth.	(4X2)	(8)
			[16]

ACTIVITY 2.2

Study 2.2 and answer the following questions on the structure of the earth.



[Source: www.storyboardthat.com/lesson-plans/structure-of-the-earth/label-diagram]

2.2.1	State the layers A, B, and D on figure 1.2.	(3X1)	(3)
2.2.2	Name TWO layers of the earth which are in solid form?	(2X1)	(2)
2.2.3	Which layer of the earth experiences the highest temperature? Motivate you answer.	(1+2)	(3)
2.2.4	Explain how continental and oceanic crust differ.	(3X2)	(6)
			[14]

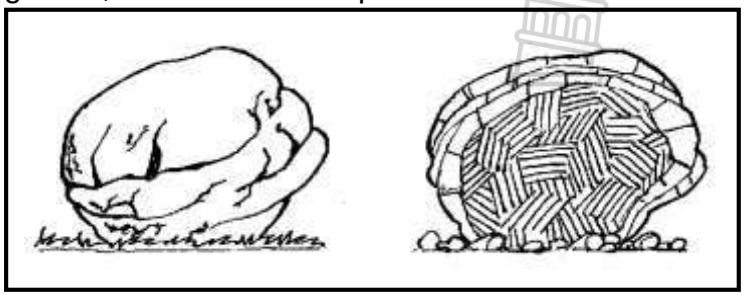
CLASSIFICATION OF ROCKS

Type	1. Igneous	2. Sedimentary	3. Metamorphic
What does it looks like	 [Source: https://australian.museam/learn/minerals/shaping-earth/igneous-rock-types]	 [Source: sundayadoga.com.ng/blog/rocks-types-use-examples-classes-stone-as-traditional-material-in-civil-engineering]	 Source: https://australian.museam/learn/minerals/shaping-earth/imetamorphiv-rock-types]
How do they form?	• Forms when magma cools and solidifies either within the crust or on the surface. • Magma that penetrates the crust via fissures or cracks can cool and solidify within the crust forming plutonic (intrusive) igneous rocks, e.g granite. • Magma that reaches the surface cools and solidifies to form volcanic (extrusive) igneous rocks, e.g basalt.	• Form from particles of sand, shells, pebbles and other fragments of material. • Weathering and erosion cause sediments to be transported by wind and water to low lying areas where they are deposited. • Sediments accumulates & compresses over a long period of time hardens into rock.	• Metamorphic rocks are formed by great heat and pressure. • Generally, found inside earth's crust. • Forms from existing rocks (known as protolith) that become physically and chemically changed when exposed to excessive temperatures and pressures from the mantle.

What are the characteristics?	• They make up the largest percentage of rock on the earth's crust. • These rocks are dark in color (due to iron and magnesium) • They have a fine texture. • Classified as a primary rock as all other rock types are formed from igneous rocks.	• Layered appearance. • Contain mineral (fossil) fuels such as natural gas, petroleum, crude oil and coal. • Coarse- or fine-grained texture. • Fairly soft and may break apart or crumble easily. • Contains organic material (very fertile).	• Hardest and oldest rocks in the crust. • Brittle. • Streaky in appearance.
Examples	• Andesite (volcanic igneous), Dolerite (intrusive igneous), Gabbro (coarse grained plutonic), Obsidian (very fine-grained volcanic rock-like glass), Kimberlite& Pumice	• Chalk, coal, limestone, dolomite, flint or grit stone, lignite, mudstone, shale, sandstone.	• Anthracite (mad from coal), slate (from shale), marble (from limestone), gneiss (from granite), quartzite (from sandstone)
What are they used for?	• Building and construction. • Monuments / tombstones • Floor covering • Valuable minerals (such as gold & diamonds) and ores • Weathered rock produces fertile soil	• dolomite for cement. • Coal used as a fuel. • Building blocks.	• Decorative processes in construction. • Flooring • Slate for roof tiles • Marble for statues.

ACTIVITY 2.3

Study the following diagram that shows the weathering process in granite, and answer the questions that follow.



[Source: https:nion.ac.in/media/documents/316couresE/ch2.pdf]

2.31.	To which type of rock does granite belong?	(1X1)	(1)
2.3.2.	The largest crystals forms (close to / deep under) the surface?	(1X1)	(1)
2.3.3	Describe the difference between intrusive and extrusive examples of this type of rocks.	(2X1)	(2)
2.3.4	Describe TWO characteristics of the rock type mentioned in question 1 above.	(2X2)	(4)
2.3.5	Explain the importance of this rock for human activities.	(1X2)	(2)
2.3.6	Briefly explain how this rock type is formed.	(3X2)	(6)

ACTIVITY 2.4

Choose between sedimentary, metamorphic or igneous rocks to make the following statements TRUE.

2.4.1 These rocks are made up of different minerals.

2.4.2 Rock examples used for flooring.

2.4.3 These rocks are used for monuments and tombstones.

2.4.4 Rock formation which is a source of crude oil and coal.

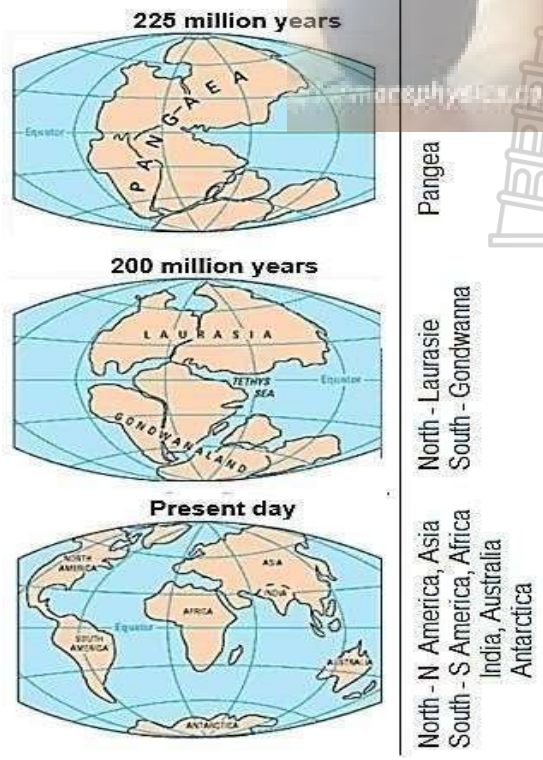
2.4.5 Statues are created from this rock type.

2.4.6 The type of rock that is used for counter tops.

2.4.7 The type of rocks used as building blocks.

2.4.8 Builders use their rocks for roof tiles. (8X1) (8)

DIAGRAM OVER TIME



[Source: www.entoto-natural-park.org/2018/09/the-eucalyptus-problem.html]

EVIDENCE OF CONTINENTAL DRIFT

CONTINENTAL FIT

- Coastlines of South America and West Africa fit together like a jigsaw puzzle
- Rocks of similar age and sequence are found on both continents
- Mountain belts are the same on both continents
- Ore reserves match up across continents

FOSSIL MATCH

- Fossils of the same animals are found in South America and Africa,
- Some fossils are only found in Antarctica, India, South America, South Africa, and Australia
- Some of the fossils can only be found in Antarctica, India, and South Africa

SEA FLOOR SPREADING

- The age of the seafloor rocks is younger than the age of the continental rocks
- Ocean floor is new and is being added to on a regular basis
- Age of rocks on either side of the mid oceanic ridge mirror each other
- The youngest rocks are found closest to the ridges and the oldest rocks closest to the continents

GLACIAL DEPOSITS

- Similar glacial deposits are found in Antarctica, Africa, South America, India, and Australia
- Glacial striations show the direction of movement from the continents

What is the plate boundary types?

CONVERGING

[Source: https://www.tes.com/teaching-resource/shop/Ayse_Unk?p=2]

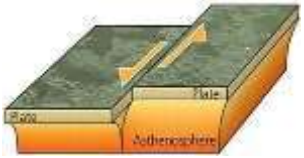
- Plates move towards each other
- One plate is forced beneath the other into the mantle and melts
- **Activities**: Earthquakes and volcanoes

DIVERGING

[Source: https://www.tes.com/teaching-resource/shop/Ayse_Unk?p=2]

- Plates move away from each other
- Molten material forced up from mantle
- Creates new crust
- **Activities:** Earthquakes and volcanoes

TRANSFORMING



[Source: https://www.tes.com/teaching-resource/shop/Ayse_Unk?p=2]

- Plates move past each other
- No new crust is made or destroyed
- Conservative boundary
- **Activities:** Earthquakes

ACTIVITY: 2.5

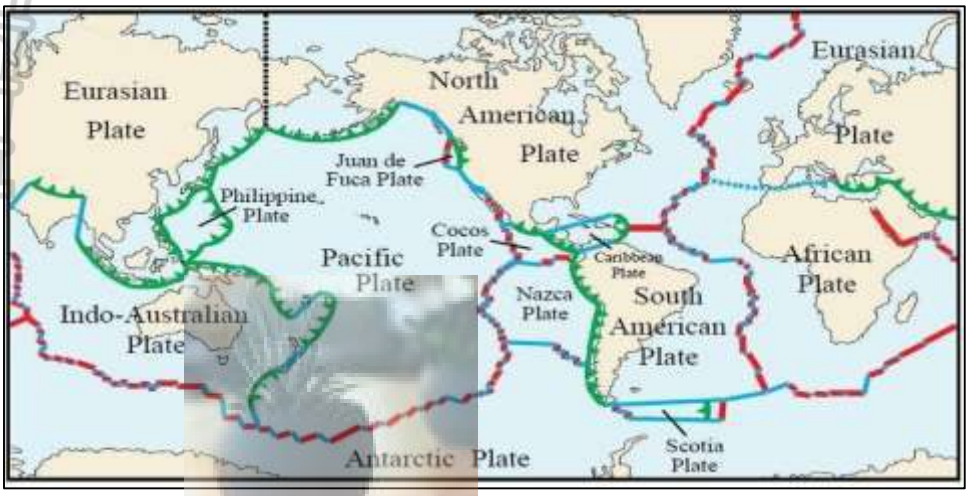
Study the diagram and answer the questions that follow.

[Source: https://www.vectorstock.com/royalty-free-vector/map-of-pangea-vector40274543]

2.5.1	Who is the "father" of the continental drift theory?	(1x1)	(1)
2.5.2	Recall the large water mass that existed 250 million years ago	(1x1)	(1)
2.5.3	Name the large landmass that existed 250 million years ago	(1x1)	(1)
2.5.4	Name the **TWO** landmasses found in the north and south respectively when this large landmass split.	(2x1)	(2)
2.5.5	Locate any **TWO** of the present-day continents that used to be part of Gondwanaland	(2x1)	(2)
2.5.6	Identify the present-day country that broke away from the southern continents to join the northern continents of today.	(1x1)	(1)

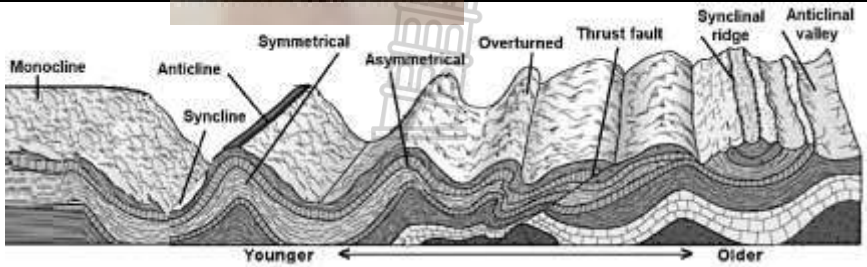
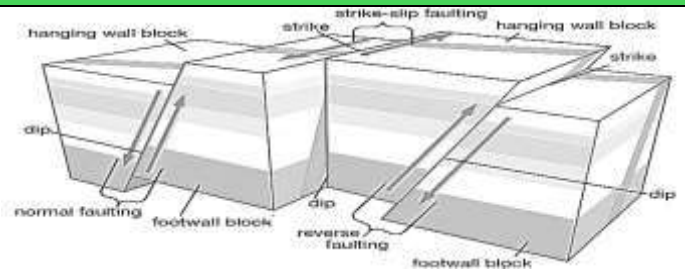
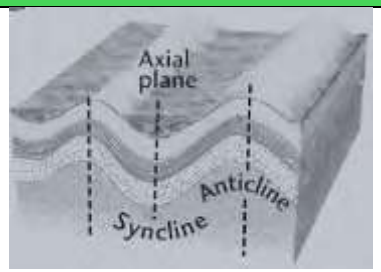
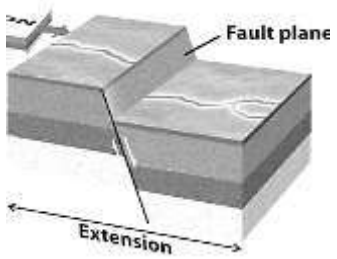
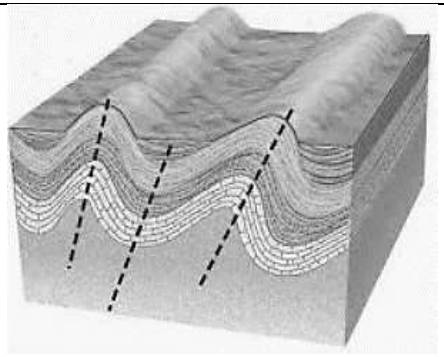
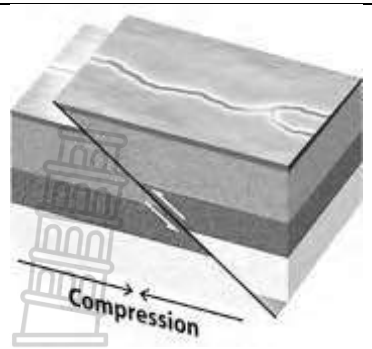
ACTIVITY:2.6

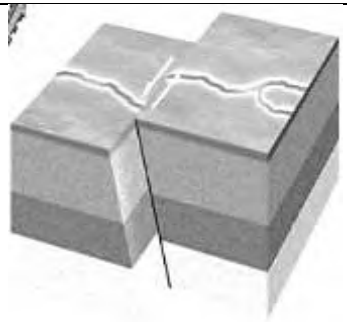
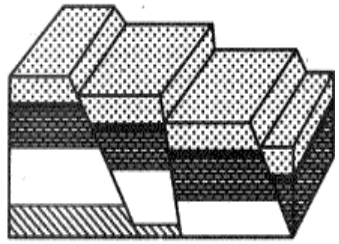
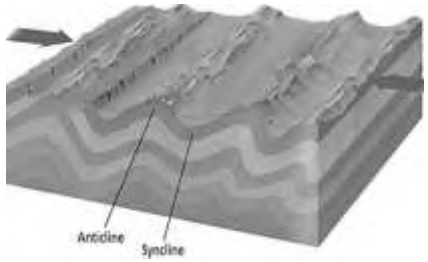
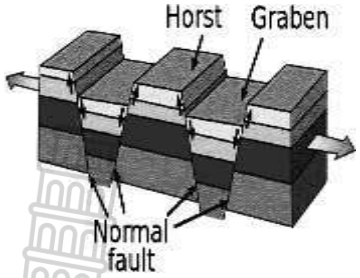
Study the diagram and answer the questions that follow.



[Source: https://www.scribd.com/document/524383092/COMPREHENSION]

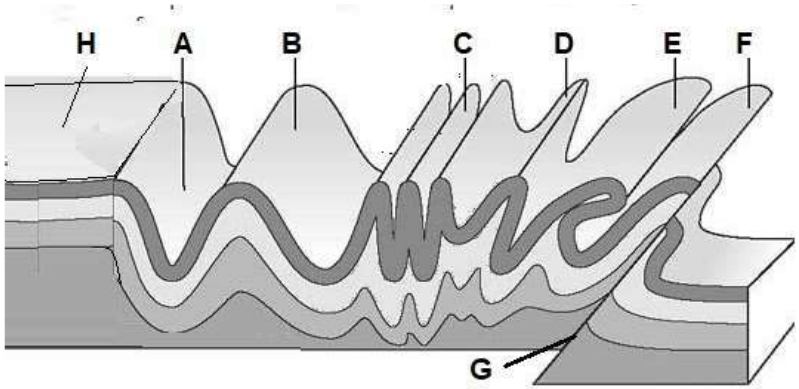
2.6.1	All the continents and adjacent water masses are divided into tectonic plates. What is a tectonic plate?	(1x1)	(1)
2.6.2	Name the plates found on either side of the plate boundary on the west coast of South America?	(1x1)	(1)
2.6.3	Name this type of plate boundary	(1x1)	(1)
2.6.4	Briefly explain how the continents move	(2x1)	(2)
2.6.5	Summarize, in a paragraph of approximately EIGHT lines, evidence that scientists use to prove the continents of Africa, Antarctica and South America were once joined.	(2x1)	(2)

Type	FOLDING			FAULTING		
WHAT IS THE STRUCTURE						
IDENTIFY THE DIFFERENT TYPES	**DIAGRAM**	**TYPE**	**TYPE OF STRESS**	**DIAGRAM**	**TYPE**	**TYPE OF STRESS**
		**SYMMETRICAL**	Equal pressure from both sides		**NORMAL**	Tension Hanging wall drops relative to foot wall
		**ASYMMETRICAL**	Pressure greater from one side Fold leans to one side		**REVERSE**	Compression Hanging wall is pushed up over the footwall

		**OVER FOLD**	Pressure even greater on one side One limb very steep		**TRANSFORM**	Shear Movement in the opposite direction
		**OVER THRUST**	Pressure from one side results in a break in the Earth's crust		**PARALLEL**	Tension
LANDFORMS		**Fold mountains**: At these colliding, compressing boundaries, rocks and debris are warped and **folded** into rocky outcrops, hills, **mountains**, and entire **mountain** ranges.			*Horst* and *Graben* are always formed together. *Graben* are usually represented by low-lying areas such as rifts and river valleys whereas horsts represent the ridges between or on either side of these valleys.	

ACTIVITY 2.7

2.7 Study the illustration below showing different types of folding that can occur if crustal layers of the earth bend or fold.



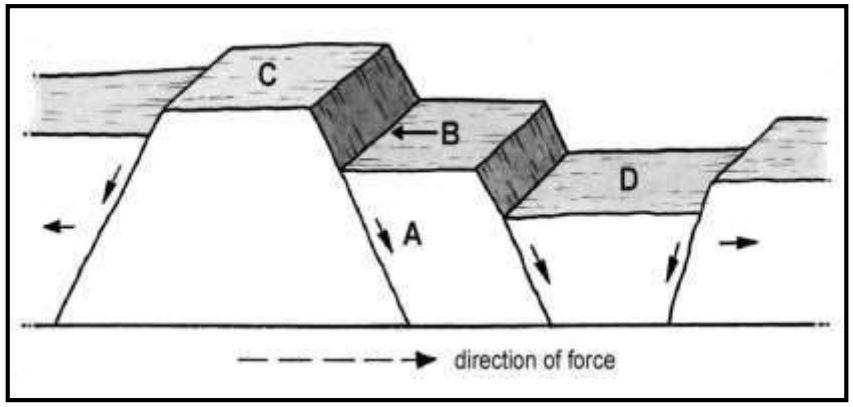
[Source: https://www.studocu.com/en-za/document/university-of-south-africa/bed-intermediate-phase/folds-and-faults/85928551]

2.7.1 Which letter on the diagram represents an over thrust fold?
2.7.2 Write the letter on the diagram which represents an over fold.
2.7.3 Which letter represents an asymmetrical fold?
2.7.4 The force which forms folds is (compressional / tensional).
2.7.5 The part of the fold indicated by letter 'A' represents a/an (anticline / syncline).
2.7.6 The part of the fold indicated by letter 'A' represents a/an (anticline / syncline).
2.7.7 A Monocline is indicated by letter …

(7X1) (7)

ACTIVITY 2.8

2.8 Study the diagram below and then answer the questions that follow.



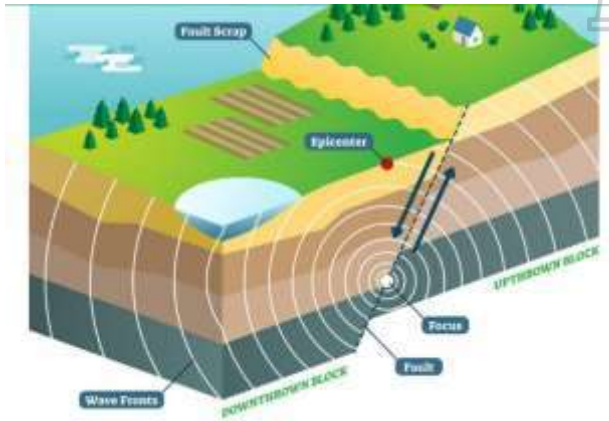
[Source: https://onlinelibrary.wiley.com/doi/full/10.1111/bre.12487]

2.8.1 Name the fault labelled **A**. (1X1) (1)
2.8.2 Briefly explain how feature **C** formed. (2X2) (4)
2.8.3 Give **ONE** use of the landform labelled D. (1X1) (1)
2.8.4 Outline how feature **D** formed. (2X2) (4)
2.8.5 Identify the land formation illustrated at **D** on the diagram. (1X1) (1)
2.8.6 Identify the part of the fault labelled **B**. (1x1) (1)

EARTHQUAKES

HOW DOES IT OCCUR?

A Sudden and violent movement of the Earth's crust because of a sudden release of energy.



[Source: https://www.internetgeography.net/igcse-geography/the-natural-environment-igcse-geography/the-main-feature-of-earthquakes]

FOCUS:

Exact point beneath the Earth's surface where the plates shift

EPICENTER:

Point directly above the focus on the Earth's surface.

FAULT SCARP:

The steep exposed rock face.

FAULT:

Crack in the Earth's crust resulting from the movement of rock.

HOW IS IT MEASURED?

- **RICHTER SCALE:** Method to allocate a magnitude number to qualify the energy released by an earthquake.
- **SEISMOGRAPH:** Instrument used to measure and record an earthquake.
- **SEISMOGRAM:** A graph output from a seismograph.

WHAT IS THE IMPACT OF AN EARTHQUAKE?

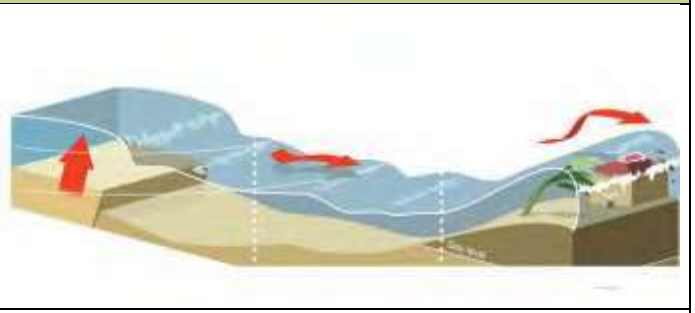
PEOPLE:

- Injuries and/or death of people and animals
- Destruction of infrastructure: roads, houses
- Transport and communication disrupted
- Landslides flatten and destroy buildings
- Burst water pipes reduce availability of fresh water
- Contaminated water cause health issues: cholera
- Gas pipe leaks cause fires

ENVIRONMENT:

- Disruption of habitat
- Destruction of vegetation

WHAT IS THE IMPACT OF A TSUNAMI?



[Source: http://www.geoolympiad.org/fass/geoolympiad/2016]

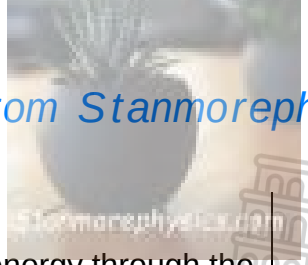
PEOPLE:

- Results in flooding
- Injuries to people
- Destroys infrastructure
- Contaminates food and water
- Waterborne diseases develop

ENVIRONMENT:

- Salinization of rivers, lakes, and groundwater
- Flooding causes sewerage contamination of freshwater resources
- Pollute wetlands, coastal areas, agricultural fields, and forests
- Deposition of sediments lead to changes in habitats and species

What strategies can be implemented to reduce the impact of Earthquakes and Tsunamis'?



WAVE FRONTS: Seismic waves releasing energy through the crust. **SEISMIC WAVES:** A wave of energy generated by an earthquake.	• Landslides, mudslides • Soil liquefaction • Contamination of natural resources e.g. water, soil **ECONOMIC:** • Businesses destroyed • Reduce employment • Expenses to rebuild/fix damages to infrastructure • Developing countries are more affected because of lower economic growth • A **TSUNAMI** can develop. A large wave produced by an Earthquake under the ocean	• Develop early warning systems e.g. electronic media • Upgrade the infrastructure e.g. buildings, sea walls • Improved communication systems must be in place • Disaster management program must be in place • Coordinated rescue teams • Unified plan of action for local services e.g. army, medical personnel, police • Education of the population

ACTIVITY: 2.9

Study the article below based on earthquake in Indonesia below.

Indonesia earthquake: at least 98 dead after quake struck Lombok

At least 98 people have been confirmed dead and more than 236 severely injured in a 6.9 magnitude earthquake that rocked the Indonesian tourist island of Lombok on Sunday evening.

The damage in northern Lombok was 'massive', a spokesman for the National Disaster Mitigation Agency said. In several districts, more than half the homes were destroyed or severely damaged.

The death toll is expected to rise, as rescuers are yet to reach some areas. Rescue efforts have been hampered by power outages, broken bridges, and a lack of phone reception in some areas. More than 100 aftershocks have hit the area since the quake that struck the island at 6.46pm local time on Sunday.

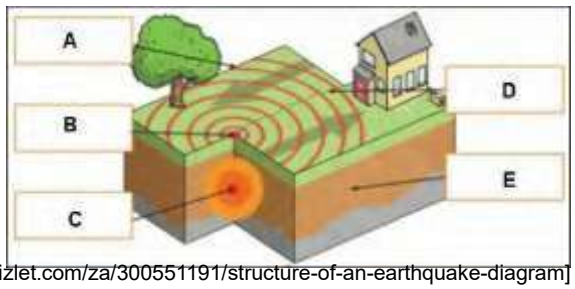
The United States Geological Survey said the epicenter of the quake was on land on Lombok, though initial reports put it just off the coast. The focus was at a depth of 3,1 km.

[Source: The Guardian, 6 August 2018 (adapted)]

2.9.1	The earthquake struck at a depth of 3,1 km. What does one call this point of origin of an earthquake?	(1x1)	(1)
2.9.2	Mention TWO ways in which the earthquake caused 'massive' damage in Indonesia	(2x1)	(2)
2.9.3	Why was it not necessary to issue a tsunami warning once the earthquake struck?	(1x2)	(2)
2.9.4	Provide ONE possible reason why the death toll is expected to rise long after the earthquake struck	(1x2)	(2)
2.9.5	In a paragraph of approximately EIGHT lines, demonstrate how the government of Indonesia can plan for, and reduce the impact of an earthquake that may strike in future.	(4x2)	(8)

ACTIVITY: 2.10

Study the diagram and select a term from the information block to identification labelled A-E

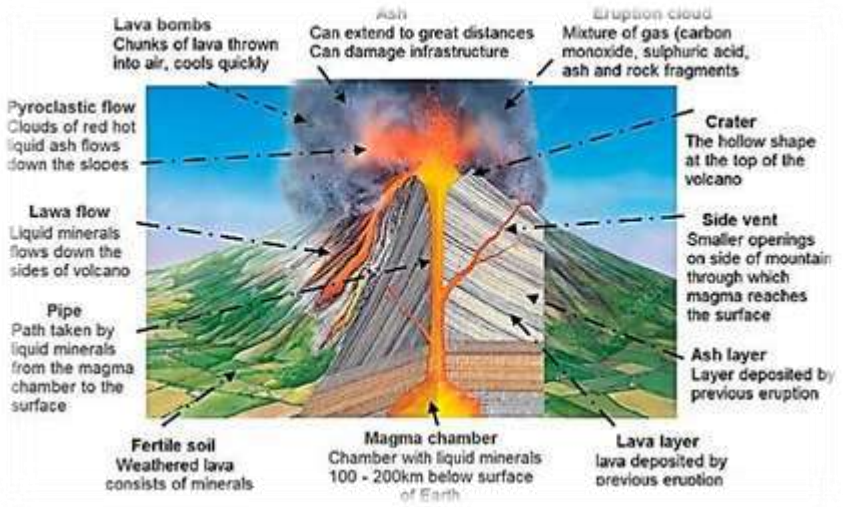


[Source:https://quizlet.com/za/300551191/structure-of-an-earthquake-diagram]

Focus,	Seismic Waves,	Epicenter,	Fault Line,	Crust,	Mantle

WEEK 9 : VOLCANOES

- A **volcano** is an opening in the earth's crust Through which lava, ash and gas are ejected.
- **Volcanism** is the process where molten magma from the mantle moves to the crust.
- **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 molten material found below the earth's surface.
- **Lava** is molten material that is found on the earth's surface.



[Source: https://www.slideshare.net/AshmitaMuksherjee1/all-about-volcanoes-237713812]

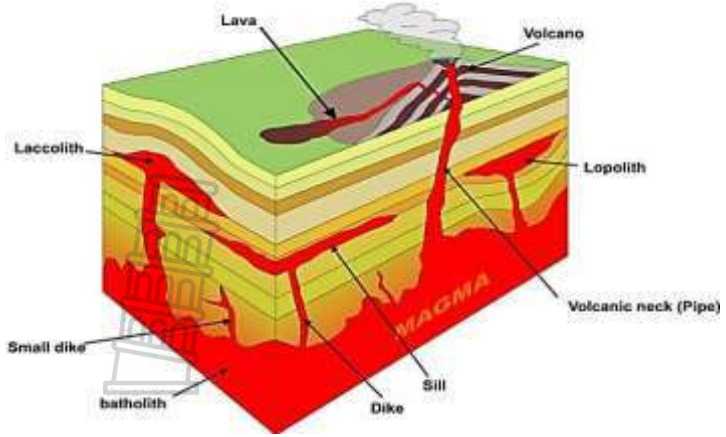
CAUSES

- Destructive plate margins
- Constructive plate margins
- Fissure eruptions – a weak spot like a fault causes lava to break through

CLASSIFICATION OF VOLCANOES

- **Active** – volcanoes that erupt regularly – even present day
- **Dormant** – volcanoes that have not erupted for a long time but can still do so.
- **Extinct** – volcanoes that have not erupted for a long time and are not expected to do so again.

INTRUSIVE FEATURES OF VOLCANISM



[Source: https://commons.wikimedea.org/wiki/file.intrusion_types_PL.svg]

TYPES OF VOLCANOES

Cinder

[Source: https://slideplayer.com/slide/5996013]

Cone shaped volcanoes

- Slopes are steep
- Smaller than stratovolcano
- Large, bowl shaped crater
- Mainly rock and ash deposits, less lava flow

Composite / stratovolcano

[Source: https://slideplayer.com/slide/5996013]

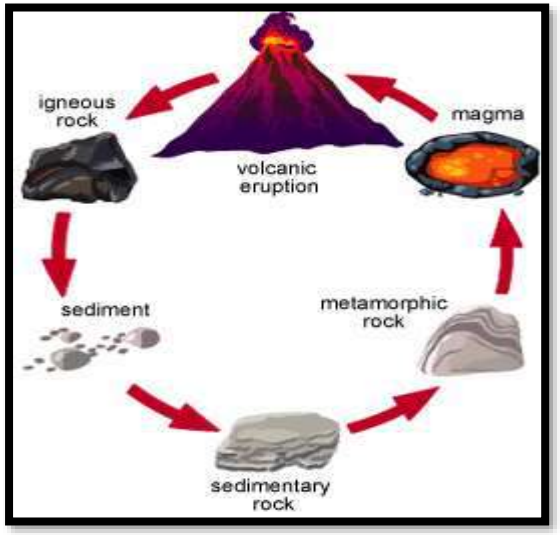
- Tall steep sided
- Alternating layers of lava and ash
- Explosive volcanoes
- Small crater
- Lava highly viscous does not flow far before it hardens

Shield

[Source: https://slideplayer.com/slide/5996013]

- Wide with gentle slopes
- Low viscosity, lava flow slow and far before it hardens
- Forms a shield-like mound
- Volcanic islands

THE ROCK CYCLE



[Source: https://www.learner.org/wp-content/interactive/rockcycle/imndex.html]

Impacts of volcanoes on people and the environment

Positive impacts

- Ash and lava weather to form fertile soil
- Tourist attraction
- Hot springs
- Generation of geothermal energy
- Produce minerals e.g diamonds, gold, copper, zinc

Negative impacts

- Lava burns property and destroys farmland
- Pyroclastic flows kills living creatures
- Can triggers thunderstorms, floods, mudflows

ACTIVITY 2.11

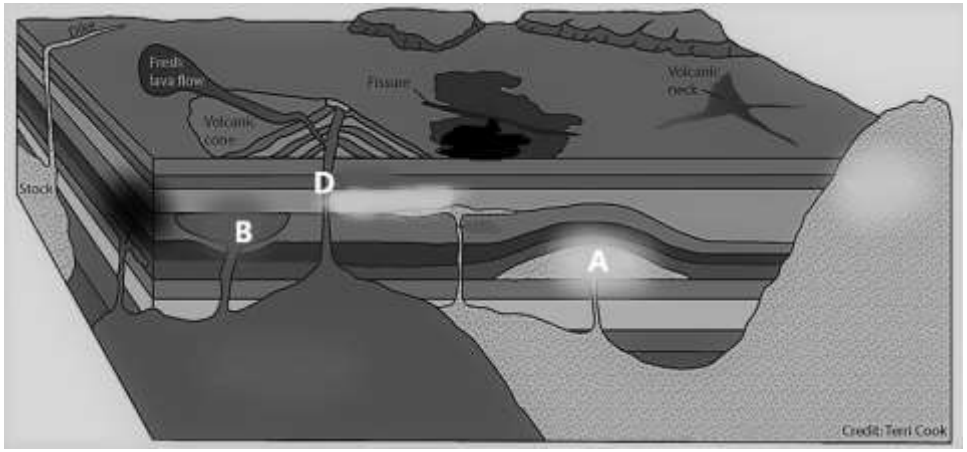
Match the statement in column A with the correct concept in column B. write only the correct answer next to the question number.

	Column A		Column B
2.11.1	Molten minerals underneath the earth's surface.	A	batholith
2.11.2	A volcano that consists of soft liquid lava, which rapidly flows outwards.	B	dormant
2.11.3	A volcanic cone built up by ash, leading to concave slopes forms a……..volcano.	C	lopolith
2.11.4	Mushroom-shaped volcanic intrusion.	D	extinct
2.11.5	An intrusion that cuts horizontally along the crustal layers.	E	laccolith
2.11.6	The largest volcanic intrusion is called…….	F	active
2.11.7	A volcano that hasn't erupted in recent years.	G	magma
2.11.8	Volcano that has not erupted in recorded history.	H	composite
		I	shield
		J	sill

(8X1) (8)

ACTIVITY 2.12

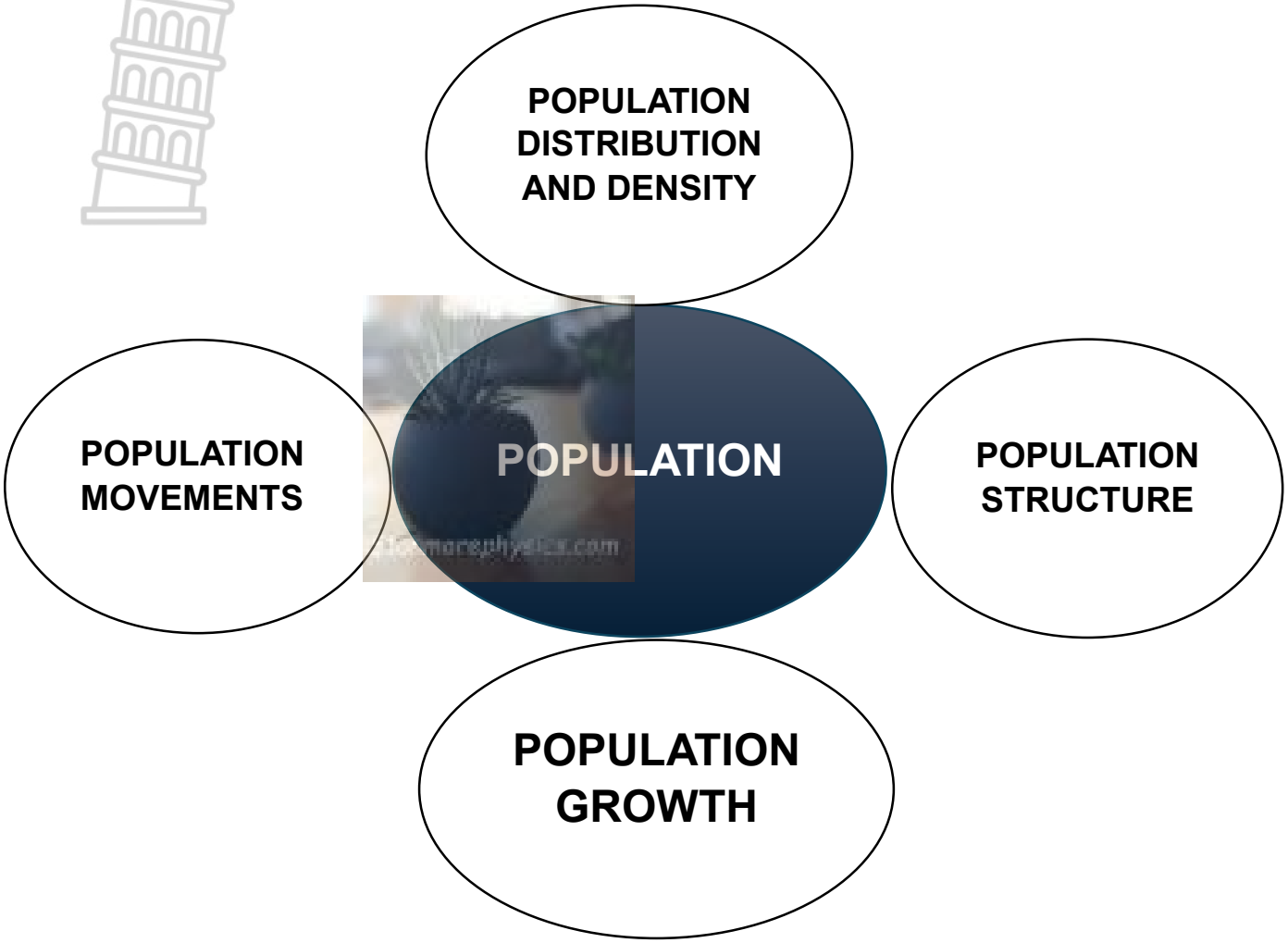
Study the diagram below and answer the questions that follow.



[Source: https://geology.com/rocks/igneous-and-volcanic-structures]

2.12.1	Differentiate between intrusive and extrusive volcanisms.	(2X1)	(2)
2.12.2.	Label features at A and B respectively.	(2X1)	(2)
2.12.3.	Name a valuable mineral that could be mined at D.	(1X1)	(1)
2.12.4.	Identify the type of volcano shown in the figure above. Give a reason for your answer.	(1+2)	(3)
2.12.5.	In a paragraph of approximately EIGHT lines explain the positive and negative impacts of volcanoes on people and the environment.	(4X2)	(8)

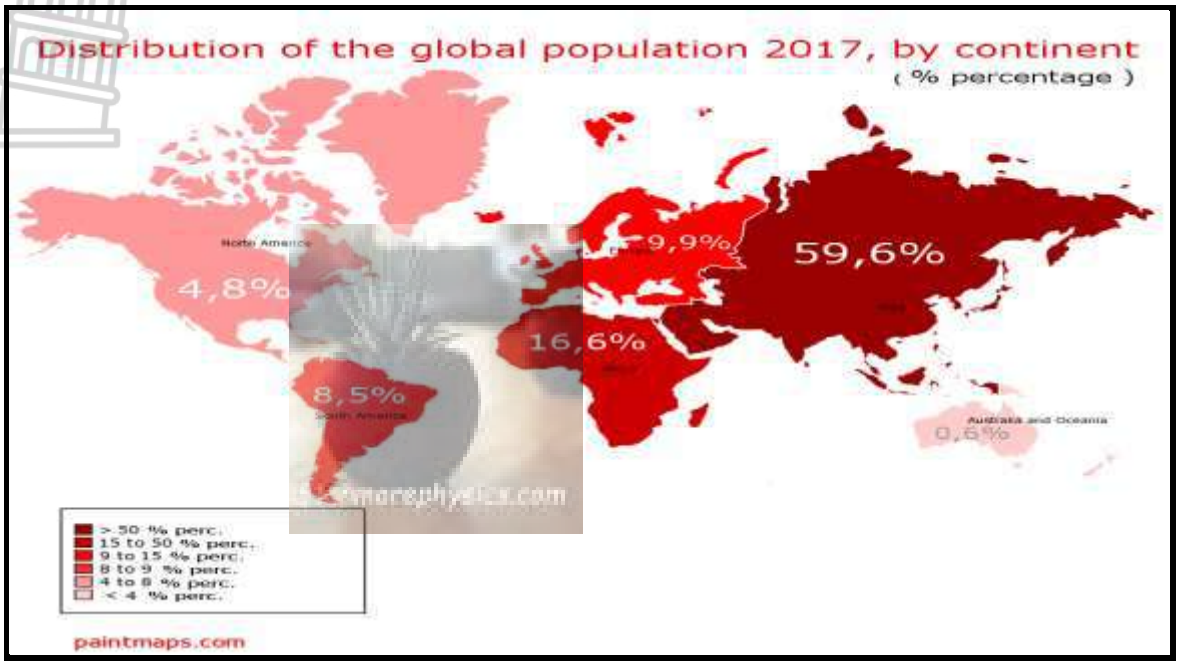
[16]



TERM	EXPLANATION
Population	Refers to people within a given area
Population distribution	Refers to how people are spread out over a region
Population density	The number of people per square kilometre
Migration	Movement of people from one area to another
International migration	Movement of people between countries
Emigration	movement of people out of their home country to another country.
Immigration	Movement of people into a new country
Regional migration	Movement of people within the country

POPULATION DISTRIBUTION

- This refers to how people are spread across a region
- People are not equally distributed on Earth.
- Some areas have large populations while others have small populations

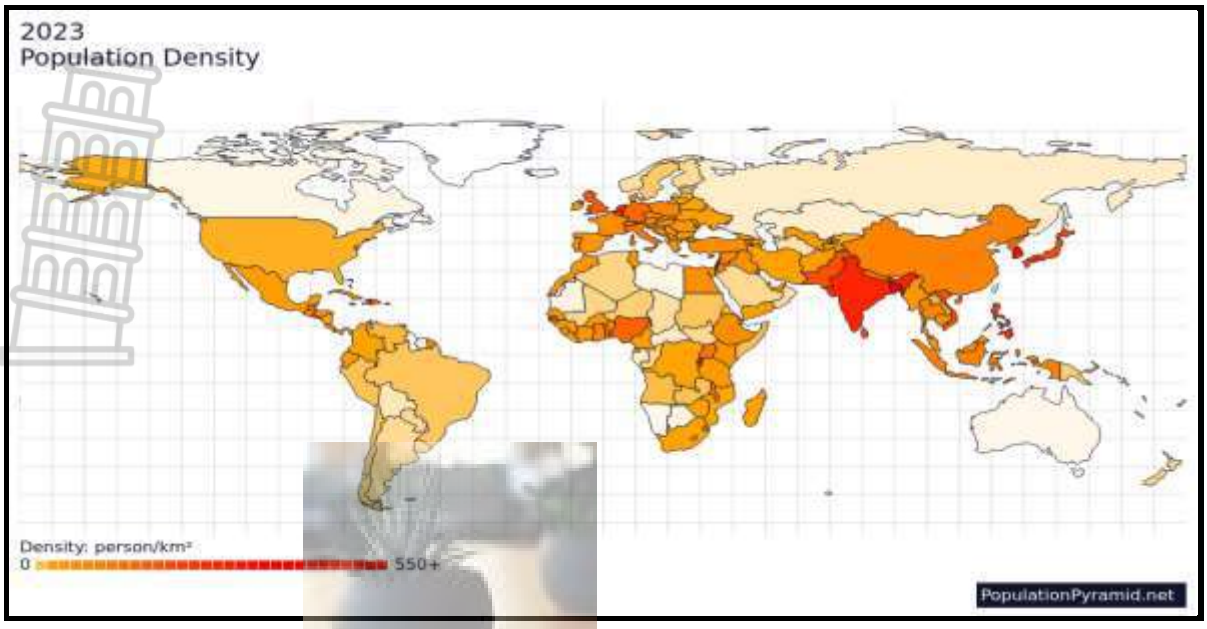


Source: [Distribution of the Global Population by continent (% perc.). : r/Map Porn (reddit.com)]

- The map above shows that almost 60% of world's population is in Asia
- Australia and Oceania are the regions on Earth with the least number of people at less than 1% of the total world's population

POPULATION DENSITY

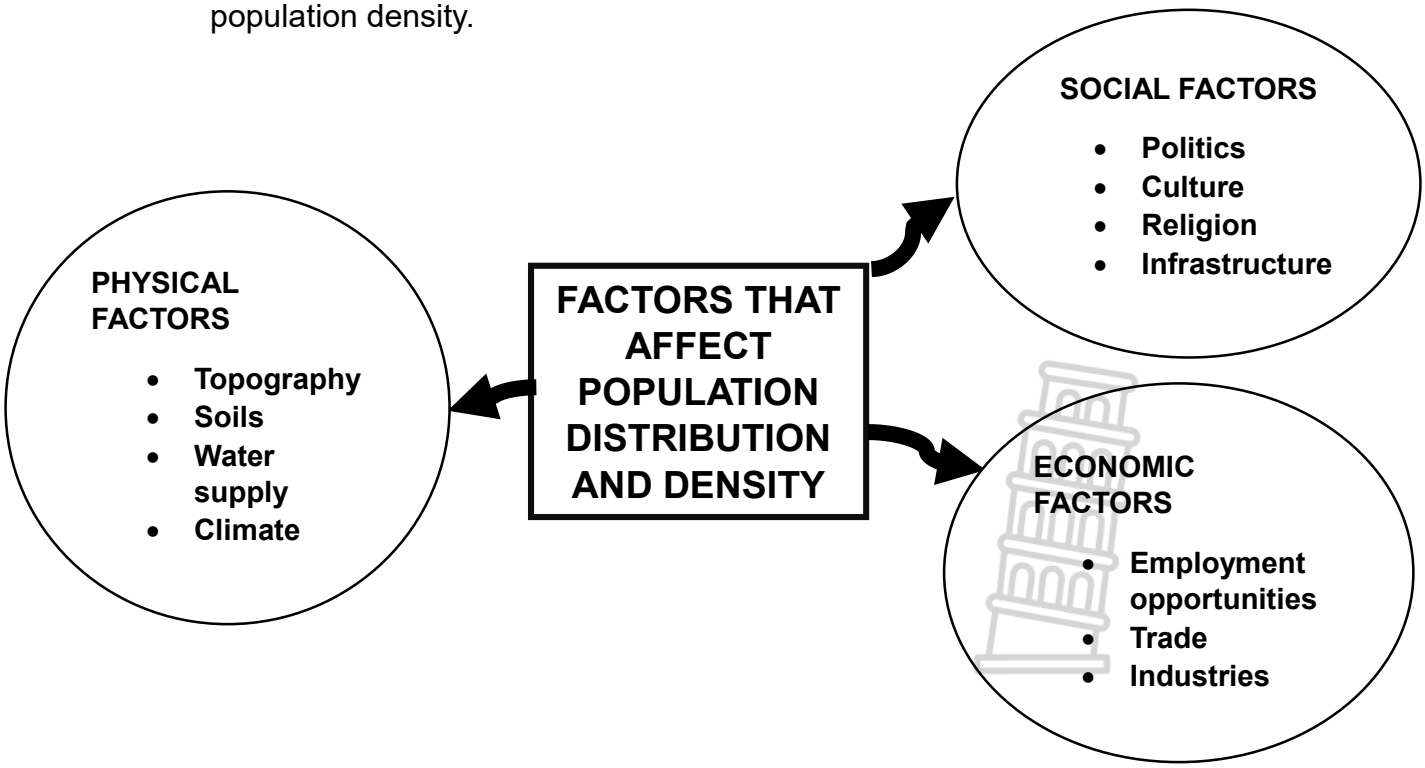
- This is the number of people per square kilometer
- Population density varies from place to place due to physical, social and economic factors.
- Population density is calculated by dividing total population by area of land in km^2



Source: Population Density 2023 (populationpyramid.net)

FACTORS THAT AFFECT POPULATION DISTRIBUTION AND DENSITY

- Population distribution and density is affected by a combination of physical, economic, and social factors.
- Some factors promote high population density while others promote low population density.



POPULATION INDICATORS

- Population indicators are statistics that indicate (show) how population is changing.
- Population is always changing: **Growing** (increasing) or **declining** (decreasing).
- Population indicators are very important for government, town planners and geographers when making future plans.
- Government use population indicators to determine **how many people need grants**, **houses, water, and other basic services.**

INDICATORS OF FERTILITY	**INDICATORS OF MORTALITY**
CRUDE BIRTH RATE – The number of live babies born in a year per 1000 people.	**CRUDE DEATH RATE** – Number of deaths in a year per 1000 people
TOTAL FERTILITY RATE – The number of children born to each woman in her childbearing years	**LIFE EXPETANCY** – The number of years a person is expected to live
REPLACEMENT RATE – Total fertility of 2.1 children (meaning the children will replace their parents when they die)	**INFANT MORTALITY** RATE – The number of deaths of infants less than 1 year old per 1000 live births in a given year.
• **NATURAL POPULATION INCREASE** – The rate at which the country's population is growing (birth rate minus death rate. NI excludes immigration. • **DOUBLING TIME** – The number of years it takes for the population to double its size.	
COMPARING POPULATION INDICATORS IN DEVELOPING AND DEVELOPED COUNTRIES	
DEVELOPING COUNTRIES	**DEVELOPED COUNTRIES**
• Crude birth rate is high • High total fertility rate • High crude death rate • High infant mortality rate • Low life expectancy	• Low Crude birth rate • Low total fertility rate • Low crude death rate • Low infant mortality rate • High life expectancy

FACTORS THAT AFFECT POPULATION INDICATORS

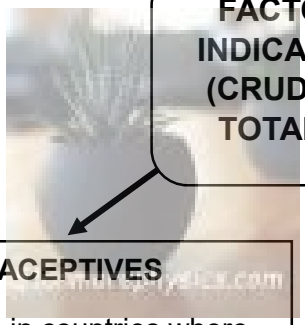
LEVEL OF EDUCATION

- In places where young women are highly educated, both birth and total fertility rates will be low
- Birth and total fertility rate increase when women are uneducated

LAWS ON ABORTION

- If abortion is illegal, birth and total fertility rate is high
- In places where it is legal, birth and total fertility rates decreases

FACTORS THAT AFFECT INDICATORS OF FERTILITY (CRUDE BIRTH RATE AND TOTAL FERTILITY RATE)



AVAILABILITY OF CONTRACEPTIVES

- Birth rates increases in countries where contraceptives are not easily accessible.
- In countries where contraceptives are available, birth rates tend to be low

WARS

- In times of wars, men usually die which decreases birth and fertility rate.

FACTORS AFFECTING INDICATORS OF MORTALITY

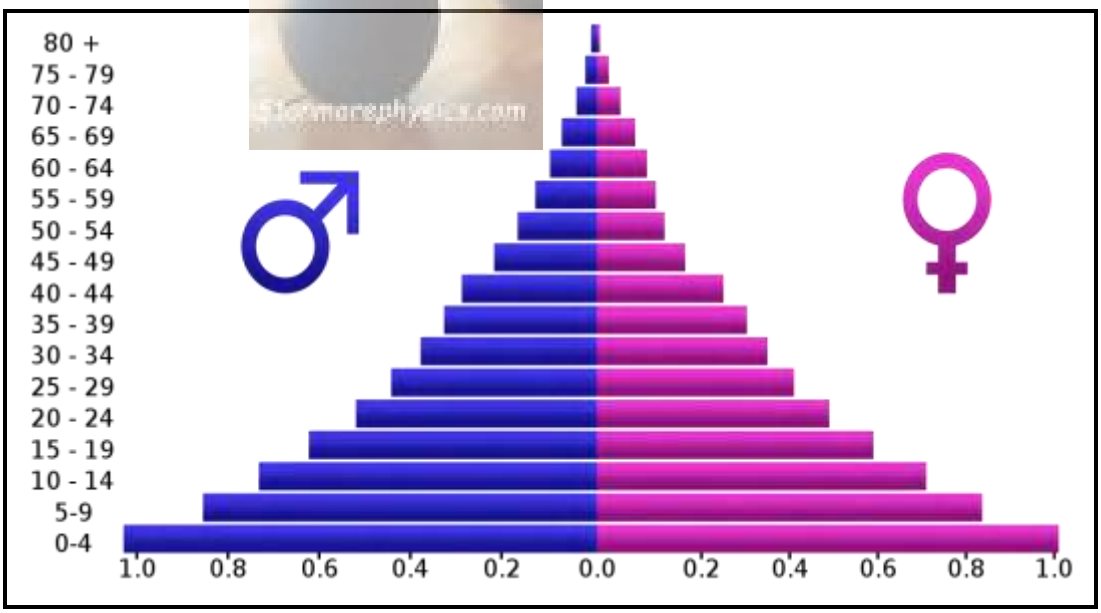
HIGH MORTALITY	LOW MORTALITY
• **Poor healthcare system** in a country can increase death rates and lower the life expectancy of citizens • **Poor education** where people are not literate about important of hygiene and eating nutritious food • **Poor Access to vaccines** and **immunisation** can increase death rates and infant mortality rate	• **Good health care system** prevents people from dying and prolong their lives • **Better education** enables citizens to prioritise hygiene and nutrition. Better education allows people to respond appropriately the outbreak of diseases. • **Better access to vaccines** and **immunisation** prevents the death of people from various diseases.

POPULATION STRUCTURE

- In every population there are people of different genders and ages.
- Population structure shows how men and women are distributed across different age groups in a population.
- Population structure also reflects birth and death rate as well as life expectancy in a population.

POPULATION PYRAMID

- This is a special kind of graph that shows population structure of a particular country.
- Population pyramid shows sex and age structure of the population.
- Population pyramids also reflects birth, death, infant mortality rates as well as life expectancy.



Source: Population pyramid - Wikipedia

- Wide base indicates high birth rates
- Narrow top indicates low life expectancy and high death rates
- Big step between the lowest age group and second lowest indicates high infant mortality rates.

ACTIVITY 3.1 POPULATION DENSITY AND DISTRIBUTION]

3.1 The table below shows population density and distribution

COUNTRY	POPULATION	DENSITY (P/KM^2)	LAND AREA (KM^2)	FERTILITY AREA
CHINA	1 439 323 776	153	9 388 211	1.7
INDIA	1 380 004 385	464	2 973 190	2.2
USA	331 002 651	36	9 147 420	1.8
INDONESIA	273 523 615	151	1 811 570	2.3

[Source: www.bbc.co.uk]

3.1.1 Define the term population density (1 × 2) (2)

3.1.2 Determine the population density in China and India. (2 × 1) (2)

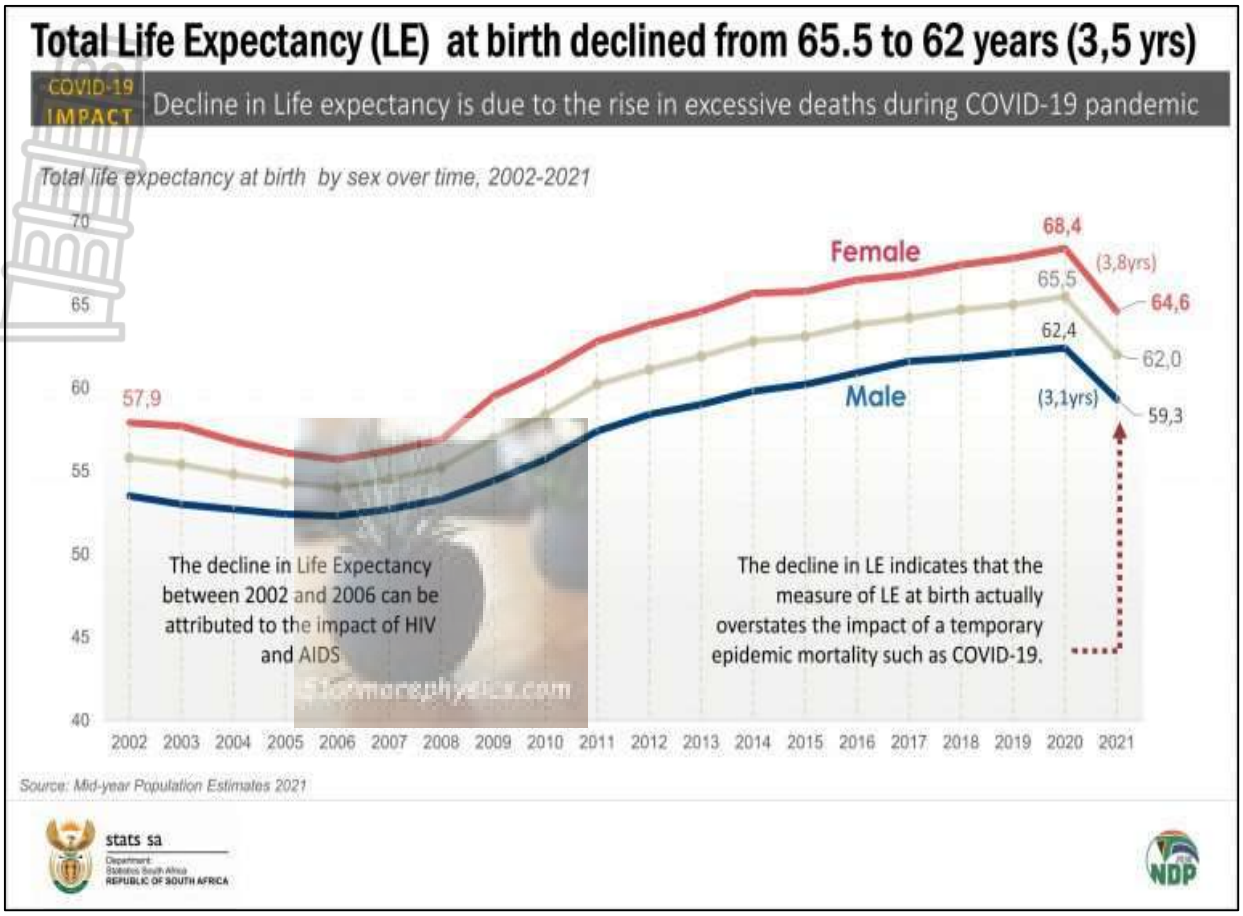
3.1.3 Explain why India has high population density than China despite having smaller population compared to that of China. (1 × 2) (2)

3.1.4 Discuss why places with steeper gradient, insufficient water supply favour low population density. (2 × 2) (4)

[10]

ACTIVITY 3.2 [POPULATION INDICATORS]

3.2 The graph below shows total life expectancy at birth by sex over time



Source: COVID-19 epidemic reduces life expectancy in 2021 | Statistics South Africa (statssa.gov.za)

3.2.1 Define the term life expectancy (1 × 2) (2)

3.2.2 Determine the number of years by which life expectancy females declined from 2020 to 2021. (1 × 1) (1)

3.2.3 According to the information provided on the graph, what was the main reason for decline in life expectancy of females from 2020 to 2021? (1 × 2) (2)

3.2.4 Discuss how lack of education increases death rate during times of pandemics. (2 × 2) (4)

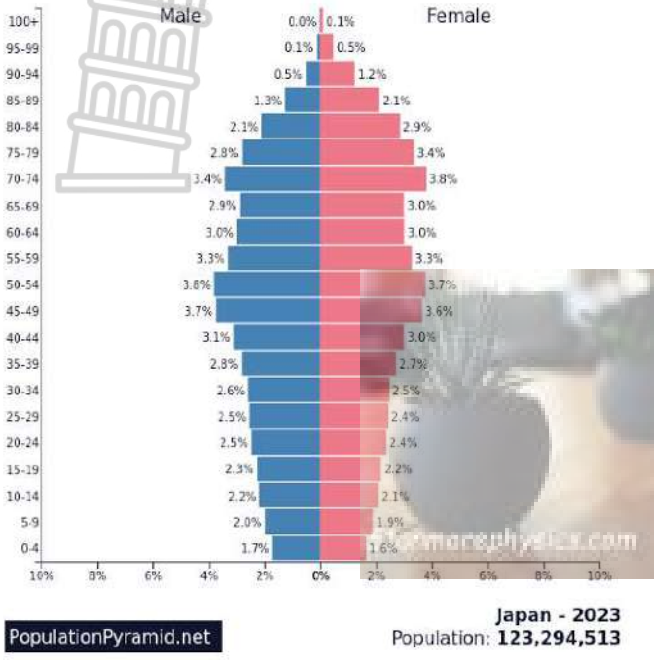
3.2.5 Propose TWO measures that the government of South Africa can put in place to increase life expectancy of South Africans. (3 × 2) (6)

[15]

ACTIVITY 3.3 POPULATION INDICATORS

3.3 Refer to the population pyramids of a developed and developing country below.

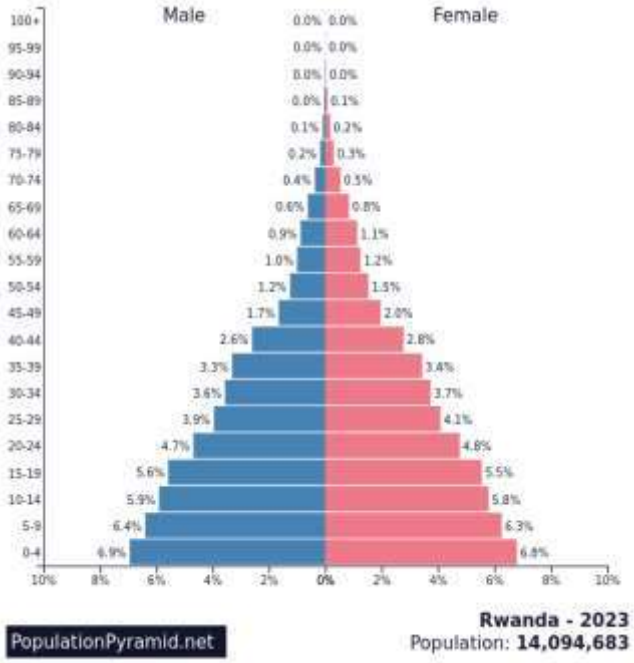
A



Source:

Population of Japan 2022 - PopulationPyramid.net

B



Source:

Population of Rwanda 2022 - PopulationPyramid.net

3.3.1 State TWO characteristics of a population that population pyramid above reflects (shows) (2 × 1) (2)

3.3.2 Which population pyramid shows characteristics of a developed country? (1 × 1) (1)

3.3.3 Identify TWO points of evidence from the population pyramid mentioned in QUESSTION 1.1.2 to support your answer. (2 × 2) (4)

3.3.4 Explain how statistics from population pyramid can be useful to the government. (2 × 2) (4)

[11]

THE WORLD'S POPULATION GROWTH OVER TIME

- The world's population is changing over time.
- Recently the world's population is growing faster.
- The rapid growth of the world's population over a short period of time is known as exponential growth.
- Population explosion is the rapid increase in the world's population.

DEMOGRAPHIC TRANSITION MODEL

- **Demographic Transition Model** refers to a model explaining how a country's population change over time.
- **Demography** refers to the study of population, population structure births, deaths, population distribution, and population density.
- Transition refers to a process of change.
- Demographic Transition Model has four stages.

Stage 1 – High Stationary Phase	Stage 2 – Early Expanding Phase
• Birth Rate and Death Rate are high.	• Birth Rate remains at high level.
• Total population is low.	• Infant Mortality Rate and Death Rate start to decline due to improved medical services, nutrition, peace and stability, etcetera.
• Birth Rate is high because of lack of birth control.	• Life Expectancy increases and total population starts to grow.
• Death Rate and Infant Mortality Rate are high due to disease, famine, malnutrition, and all factors affecting death rate.	• This stage is called population explosion.

Stage 3 – Late Expanding Phase	Stage 4 – Low Stationary Phase
• Death Rate continues to decline at low level, and Birth Rate begins to drop.	• Birth Rate stabilizes at low levels.
• Total population continues to rise to upper level.	• Death Rate remains at low levels.
• Birth Rate decreases to low level due to urbanization and industrialization.	• Total Population remains at high levels.
• Total Population begins to level out.	• If Birth Rate declines below Death Rate, there is a negative Natural Increase and the population decreases.

CONCEPT OF OVERPOPULATION: MANAGING POPULATION GROWTH CONTRACEPTION

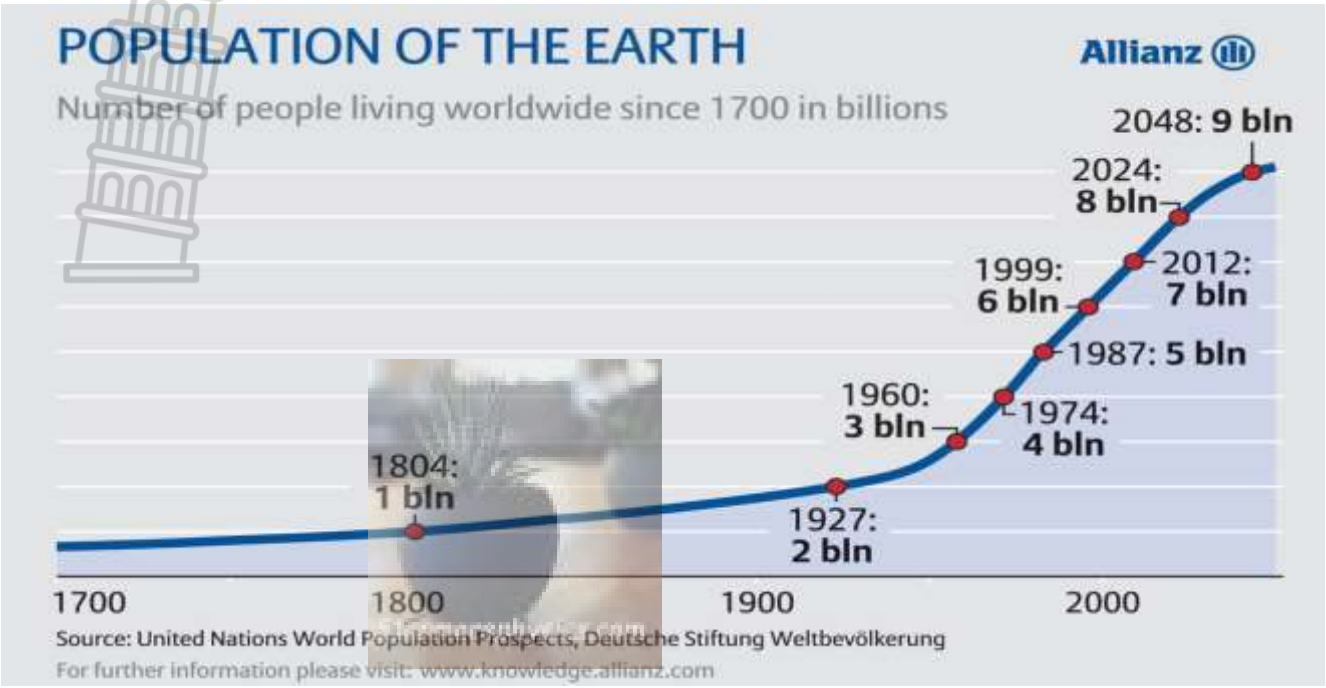
- **Contraception** is a technique of using contraceptives to prevent woman from becoming pregnant.
- **Contraceptive** is a pill or device that is used to prevent unwanted pregnancy.

Commonly used contraceptives:	
Tablets/pills	administered orally by women
Injection	administered muscularly by women
Loop	device inserted per vagina
Condom	worn by men during sexual intercourse
Femidom	inserted per vagina by women during sexual intercourse

Other Methods of Managing Population Growth	
Sterilization	• Sterilization refers to an act of making a person to be unable to produce bear children.
Vasectomy – male operation	• Vasectomy refers to a surgical operation that is done in order to sterilize a man by cutting off the tube that carries sperm cells to the penis. • Vasectomy denotes a medical procedure of cutting off the small tube that carries sperm cells done to make a man unable to produce children.
Tubectomy – female operation	• Tubectomy means a medical operation a woman does by cutting off her fallopian tube so that she may be permanent sterile. • Tubal ligation denotes a surgical procedure in which a woman's fallopian tubes are clamped and block to stop the passing of egg cells.
Son preference	• Son preference means when a country prefers to have boy children over girl children. In the case of girl child is born, she is immediately killed.
Infanticide	• Infanticide denotes a practice of poisoning with an intention to kill an in infant soon after birth.
Aborting	• Abortion means an act of terminating pregnancy before the period is completed. • Abortion refers to a practice of stopping the development of a child during pregnancy.
Neglecting	• Neglect denotes an act of leaving an infant without attention and care so that it can die.
One Child Policy	• One child policy means the measure to control population that was introduced by China to force couples to give birth only to one child.

ACTIVITY 3.4 POPULATION GROWTH

3.4 The graph below shows population growth over time



Source: Population Growth – Teaches (humfteaches.com)

3.4.1	Define the term overpopulation	(1 × 2)	(2)
3.4.2	State the year in which world's population reached 7 billion.	(1 × 1)	(1)
3.4.3	The graph above shows slow population growth between 1700 and 1960s. Discuss TWO possible reasons for this slow growth.	(2 × 2)	(4)
3.4.4	Account for rapid population growth visible on the graph from 1960s.	(2 × 2)	(4)
			[11]

ACTIVITY 3.5 POPULATION GROWTH

3.5 The case study below is based on China's population control policy

China's Population Control Policy

The Chinese government has used several methods to control population growth. In 1979, China started the 'one child per family policy'. The policy stated that citizen must obtain a birth certificate before the birth of their children. The citizens would be offered special benefits if they agreed to have one child. Citizens who did have more than one child would either be taxed an amount up to 50% of their income, or punished by loss of employment or other benefits. Furthermore, unplanned pregnancies or pregnancies without proper authorization would need to be terminated. In 1980, the birth-quota system was established to monitor population growth. Under this system, the government set target goals for each region. Local officials were mainly held responsible for making sure that population growth totals did not exceed target goals. If target goals were not met, the local officials were punished by law or by loss of privileges.

Other methods that have been used by the Chinese government to restrict rising population totals include birth control programmes and economic changes. In early 80's, sterilization target goals were set and made mandatory for people who had two children. at its peak in 1983, tubal ligation, vasectomies and abortions amounted to 35% of the total birth control methods. In addition, the economy changed from primarily one of agriculture to industry. The government used this to its advantage, spreading the view that economic growth would hinder population growth.

(Source: *Solutions For All. p 260-261)*

3.5.1	Identify ONE population growth policy that was implemented by the China in 1979 - 1980.	(1 × 1)	(1)
3.5.2	How the population growth policies between 1979 and 1980 were implemented?	(2 × 2)	(4)
3.5.3	State TWO alternative methods the Chinese government introduce to control population growth?	(2 × 2)	(4)
3.5.4	Discuss the negative socio-economic impact of overpopulation for a country.	(2 × 2)	(4)
			[13]

POPULATION MOVEMENTS

- People are always on the move.
- People move from one country to another or within their own country
- Movement of people is triggered (caused) by a combination of different factor.

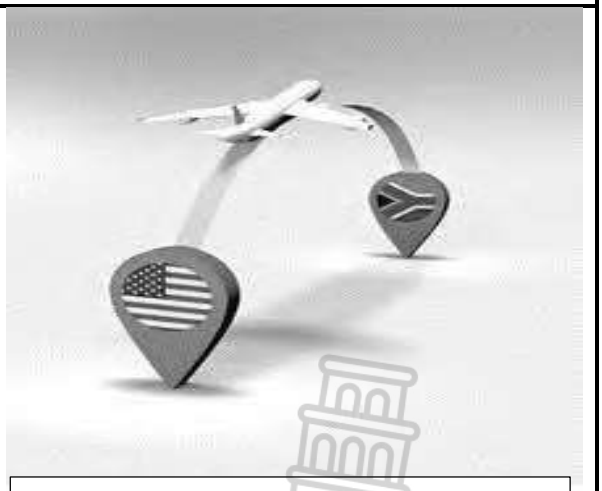
KINDS OF POPULATION MOVEMENT

- Migration can be classified into different categories.

INTERNATIONAL MIGRATION

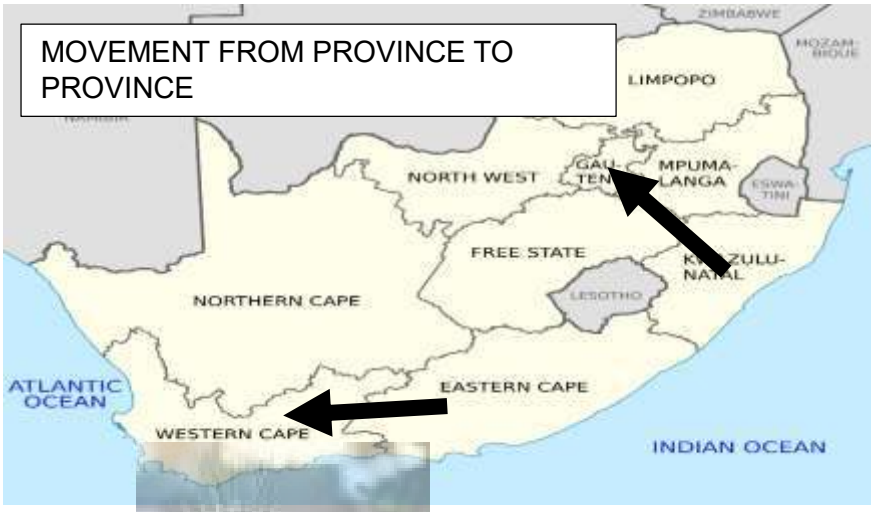
- This refers to the movement of people between countries.
- International migration can be classified into **immigration** and **emigration**.
- Immigration is the movement of people into a country.
- Emigration is the movement of people out of a country.
- International migration is controlled by governments. They may encourage or discourage migration into their country. Illegal migrants will be returned to their country of origin (deported).

IMMIGRATION AND EMIGRATION IN SOUTH AFRICA

EMIGRATION	IMMIGRATION
	
MOVEMENT OUT OF SOUTH	MOVEMENT INTO SOUTH AFRICA

REGIONAL MIGRATION

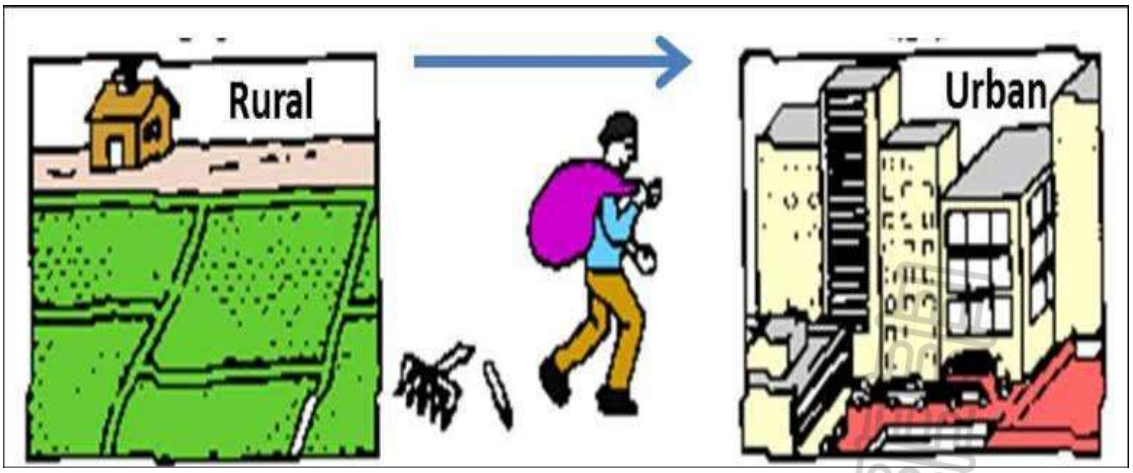
- Regional migration refers to the movement of people within a country.
- Moving from one province to another and from rural areas to urban areas is an example of regional migration.



[Source: https://upload.wikimedia.org/wikipedia/commons/1/1e/map_of_south_africa_with_english_label.svg]

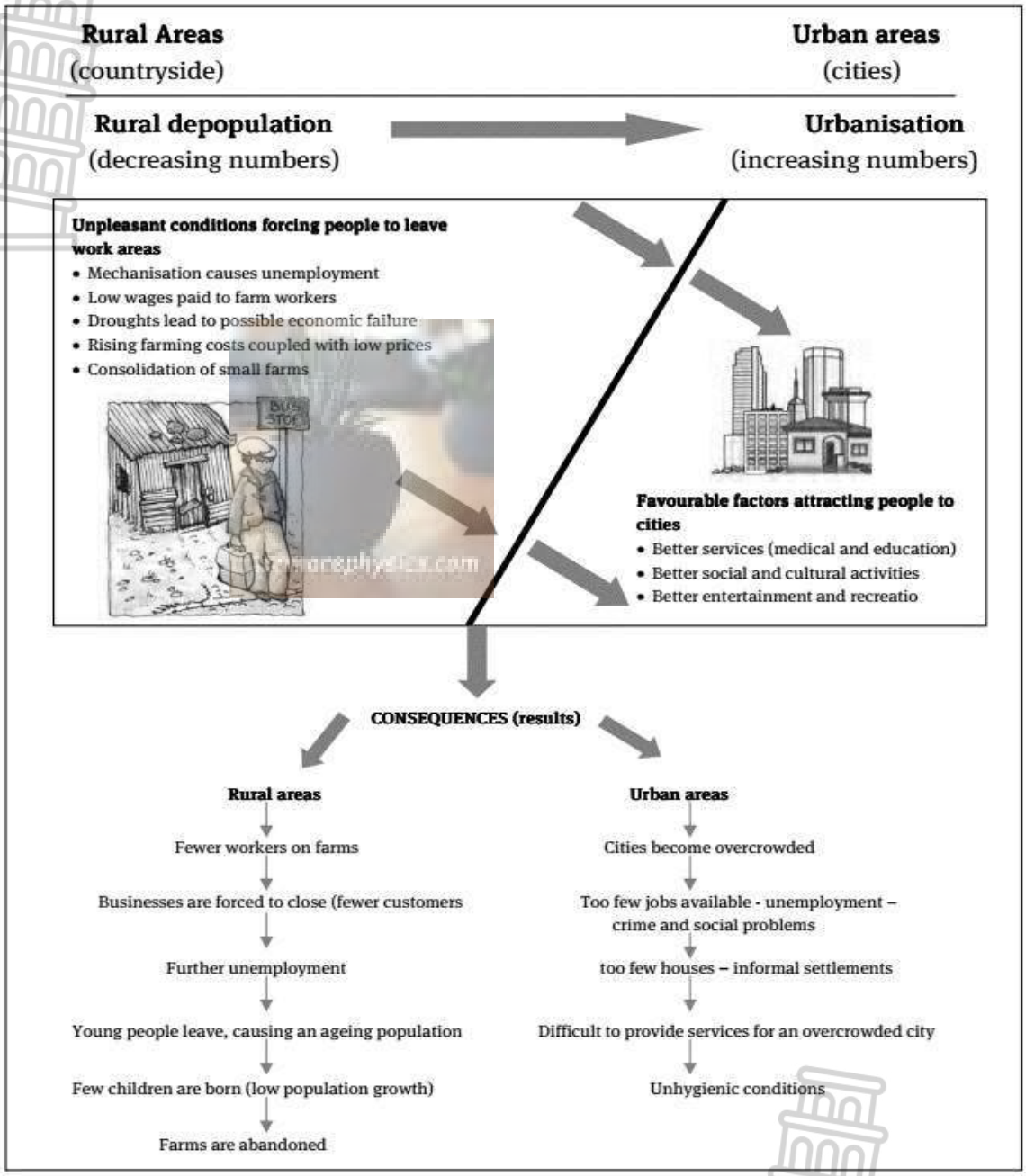
RURAL-URBAN MIGRATION

- This is the movement of people from rural areas to urban areas.
- People move from rural areas in search of employment and better opportunities in urban areas
- Rural – Urban migration increases the percentage of people living in urban areas and decrease the number of people living in rural areas.
- Decrease in the number of people living in rural areas is called **Rural Depopulation**.
- **Urbanisation** is the increase in the percentage of people living in urban areas.



Source: Model of a migrant from rural area (origin) to urban area (destination). | Download Scientific Diagram (researchgate.net)

CAUSES, IMPACT AND CONSEQUENCES OF RURAL URBAN MIGRATION



Factors responsible for rural depopulation

VOLUNTARY AND FORCED MIGRATION

VOLUNTARY MIGRATION	FORCED MIGRATION
• Movement of people from area to another by choice • Rural – urban migration is an example of voluntary migration.	• Movement of people from one area to another by force. • Wars and natural disasters are causes of forced migration

FACTORS WHICH MAY CAUSE PEOPLE TO MIGRATE

- **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 practice their religious beliefs.
- **Physical factors** – people may move to avoid physical dangers, a harsh climate or infertile soil.

OTHER MOVEMENTS

TEMPORARY MIGRATION	PERMANENT MIGRATION
• 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.	• People who move to a place and decide to stay permanently – no plans to leave. • Depending on government policy, migrant labourers sometimes settle permanently in their area of work or employment. • Approximately 75% of countries have agreed to protect refugees and not return them to their home country. • Accepted refugees have a clear legal status – protected by the United Nation's High Commission for Refugees (UNHCR). • At times, people move because of policies and projects (large scale infrastructural projects like building dams, roads, airports) aimed at developing underdeveloped areas.

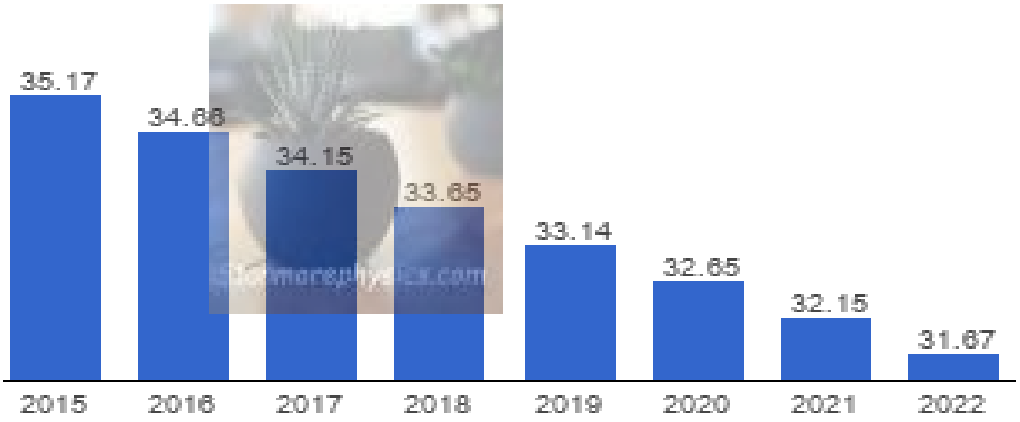
ATTITUDE TOWARDS MIGRANTS

- 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)

ACTIVITY 3.6 POPULATION MOVEMENTS

3.6 The graph below shows percentage of rural population from 2015 to 2022 in South Africa



Source: South Africa Rural population, percent - data, chart | TheGlobalEconomy.com

3.6.1 Define the term rural depopulation (1 × 2) (2)

3.6.2 Describe the trend depicted (shown) on the bar graph above. (1 × 2) (2)

3.6.3 Determine the total percentage of rural population in 2022. (1 × 1) (1)

3.6.4 Discuss TWO social factors that push people to move away from rural areas. (2 × 2) (4)

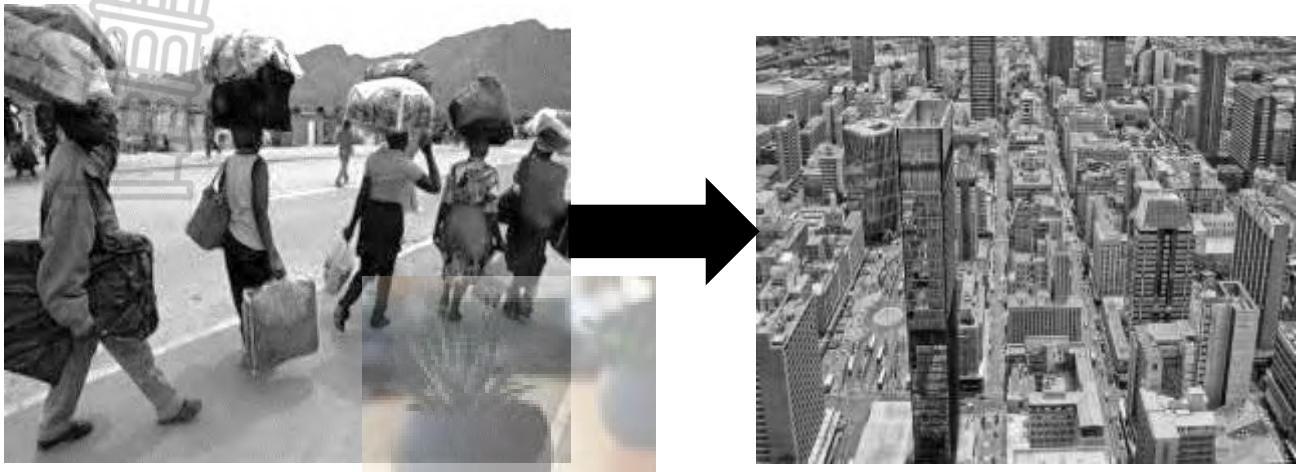
3.6.5 Evaluate the negative impact of rural depopulation on rural economy. (3 × 2) (6)

[15]

ACTIVITY 3.7 POPULATION MOVEMENTS

3.7 Refer to the sketch below showing rural – urban migration

RURAL AREA **URBAN AREA**



Source: Visit Johannesburg, South Africa | Tailor-made Trips | Audley Travel UK

3.7.1 Define the term rural – urban migration (1 × 2) (2)

3.7.2 How does rural – urban migration give rise to rural depopulation (1 × 2) (2)

3.7.3 What is the negative economic impact of rural – urban migration in rural areas. (2 × 2) (4)

3.7.4 Propose THREE measures that the government can put in place to solve the problem of rural – urban migration. (3 × 2) (6)

[14]

Topic: Water management- Water Resource

Subtopic: Water Management in South Africa

Water Resources are natural and artificial resources of water which can be used by humans for various purposes.

Natural and artificial water resources.

Water Resources	Examples	Definition	Image
1.**Natural water resources**	• River	A long natural flow of water across the land into sea, lake or another river.	
	• Lake	A large body of water that is surrounded by land	
	• Ground water	Water found beneath the earth's surface	
2. Artificial water resources	• Dam	A wall built across a river to block the flow of water	

THE SIGNIFICANT ROLE OF RESERVOIR

- Store and supply water for domestic, agricultural & industrial use
- Flood control
- To generate hydro electricity
- Recreational use e.g. boating, paddling Swimming etc

FACTORS INFLUENCING THE AVAILABILTY OF WATER IN SOUTH AFRICA.

Human Factors	**Physical factors**
• Population growth • Urbanisation • Irrigation in agriculture • Industrialization • Water pollution	• Rate of rainfall • Evaporation rate • Alien vegetation • Climate change
Wastewater Irrigation System: Sprinkler	**Distribution of annual rainfall in South Africa.**
 [Source: https://images.app.goo.gl/bkGWdxyYHY3Mm3PCy8]	 ***Source**:https:images.app.goo.gl/YMxP8vHPPLPufZkH9*

THE CHALLENGES OF PROVIDING BASIC WATER

RURAL CHALLENGES

- Dispersed rural settlement
- Illegal connections
- The cost of building new dams and purification works.
- Over extraction of ground water for irrigation

URBAN CHALLENGES

- Increase in population
- Growing number of informal settlements
- Lack of payment for services put financial strain on water delivery
- The cost of maintaing the existing sysems

Case study: Lesotho Highlands Water Project

The Lesotho Highlands Wather Project is a long-term project designed to supply the growing demand for water in the densely populated industrial centres of Gauteng. It is Africa;s largest water-transfer scheme. The project involves building five dams, 200 kilometres of tunnels, and hydro-electric power station. Water from the Senqu River and other drainage basins in Lesotho will be transferred through a series of dams and tunnels into the Vaal Dam in South Africa. Phase 1 has already been completed. Two other phases are planned.

Katse Dam in Lesotho

Source: *Platinum Geography Learners Book*

TOPIC: WATER MANAGEMENT

ACTIVITITY 4.1

4.1.1 According to the extract, name the province in South Africa that import water from Lesotho (1X1) (1)

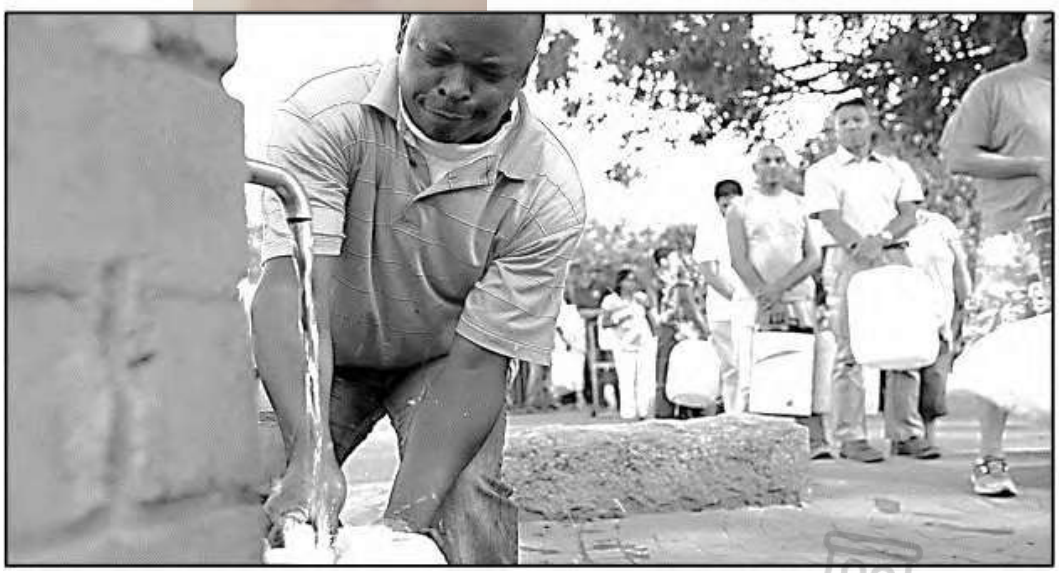
4.1.2 What is hydro electricity? (1X1) (2)

4.1.3 Suggest TWO recreational activities that can be done in Katse dam (2X1) (2)

4.1.4 Give one economic advantages of Katse dam in Lesotho. (1X2) (2)

4.1.5 In a paragraphy of approximately **EIGHT** lines, discuss human factors that influences the availability of water in South Africa (4X2) (8)

(15)



[Source: https://howandwhen.org/wp.content/uploads/2021/08/GEOGRAPHY-P2-GR10-ANNEX-NOV2020_english.pdf]

Daily Maverick: 29 January 2018
Marelise Van Der Merwe
Cape Water Gate Explainer: What do we know about Cape Town's disaster management plan?

On Sunday morning, officials gathered at the disaster Risk Management Centre in Goodwood, Cape Town, to brief media on preparations for day Zero. This followed hot on the heels of the launch of the #Defeat Day Zero campaign in Athlone the previous week. Information is trickling in bit by bit.

The date, as we know, can shift, but City officials have confirmed that it will kick in when dam levels hit 13.5%. The member of Safety and Security said it would take approximately two weeks to shut down water systems and similarly take a couple of weeks to activate the water points and other disaster management systems, so those two processes would overlap, although preparations were already underway.

It should be noted that Day Zero is not the day Cape Town 'runs out' of water. It is the day officials move from Phase One preservation restrictions to Phase Two, what the City has termed disaster restrictions.

TOPIC: WATER MANAGEMENT

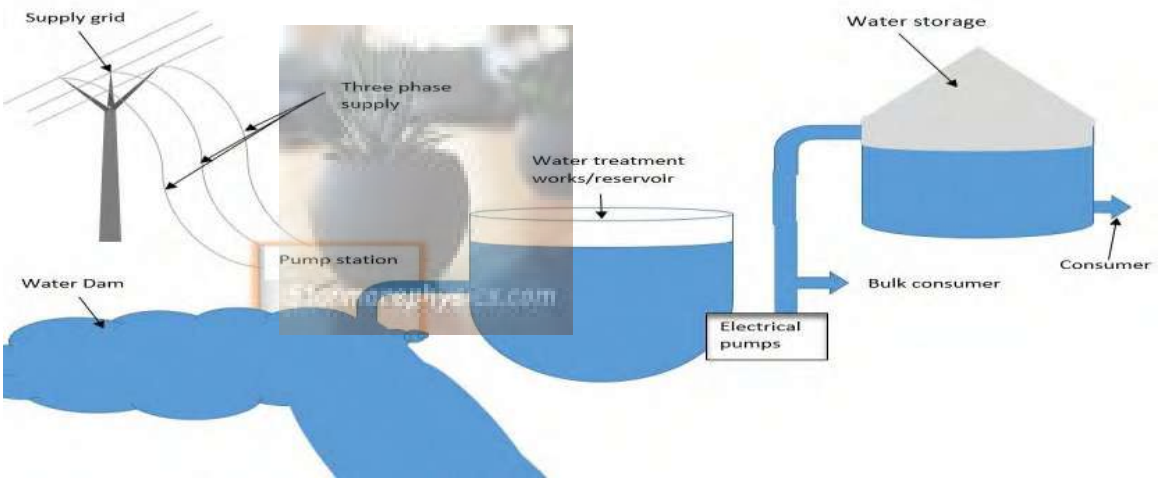
ACTIVITITY 4.2

4.2.1	Provide the name of the campaign for water management that was launched in Cape Town.	(1 x 1) (1)
4.2.2	According to the article, what is Day Zero?	(1 x 2) (2)
4.2.3	Why do the people illustrated in the article look so desperate?	(2 x 2) (4)
4.2.4	In a paragraph of approximately eight lines, provide strategies that the people of Cape Town and the municipalities of the region should implement to reduce water shortages	(4 x 2) (8)
		[15]

Water management in South Africa

Role of municipalities in water purification and provision

- Municipalities buy the water from the government. They then provide it to users in their municipal area.
- Figure 1.1 shows what municipalities need to do to get water from dam to consumers:



https://www.researchgate.net/profile/Kanzumba-Kusakana/publication/328149486/figure/fig2/AS:679537151049729@1539025690222/Proposed-water-system-schematic.ppm

There are **three** levels of water supply and sanitation.

- National Government (Department of Water Affairs) provides policies that manage water resources, sanitation, plans for new dams, and inter-basin transfer schemes.
- Water purification involves removal of microbes and certain dissolved chemicals in water.
- Qualified chemists and engineers must see to it that water that is piped for distribution to consumers is of good quality.

- Water Boards operate dams, offer retail services and run some waste-water treatment plants. Fifteen water boards supply water to nearly half of South Africa's population in 90 municipalities. (Examples: Rand Water, Umgeni Water).
- Municipalities buy water from Water Boards, purify it and sell it to customers, sending out accounts. Some municipalities own their own dams. (Example: Rand Water Customers are mines, industries, local and metropolitan municipalities.)

Activity 4.3

4.3 Refer to **FIGURE 4.3a** and **FIGURE 4.3b** to answer the questions that follow.

FIGURE 4.3 WATER CRISIS IN MAKHANDA, EASTERN CAPE

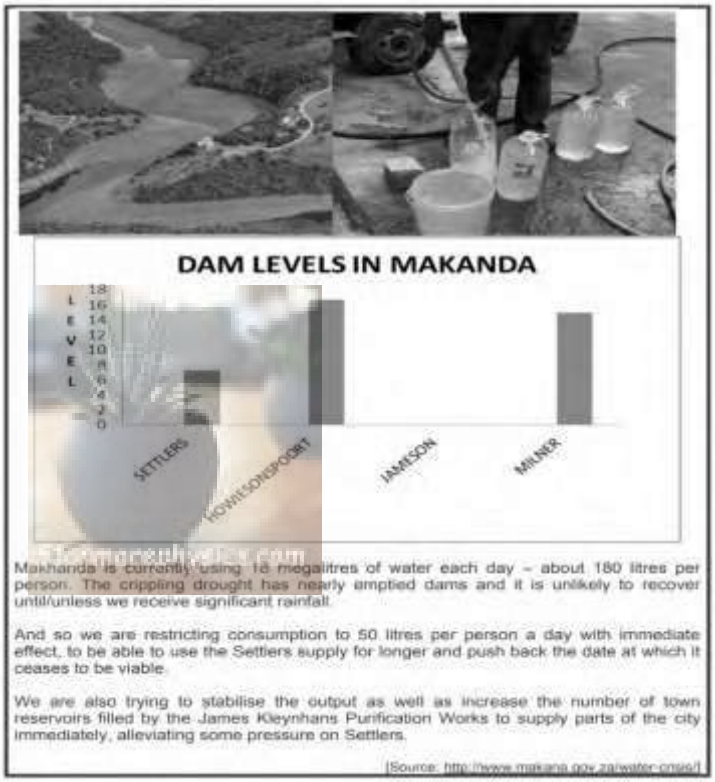
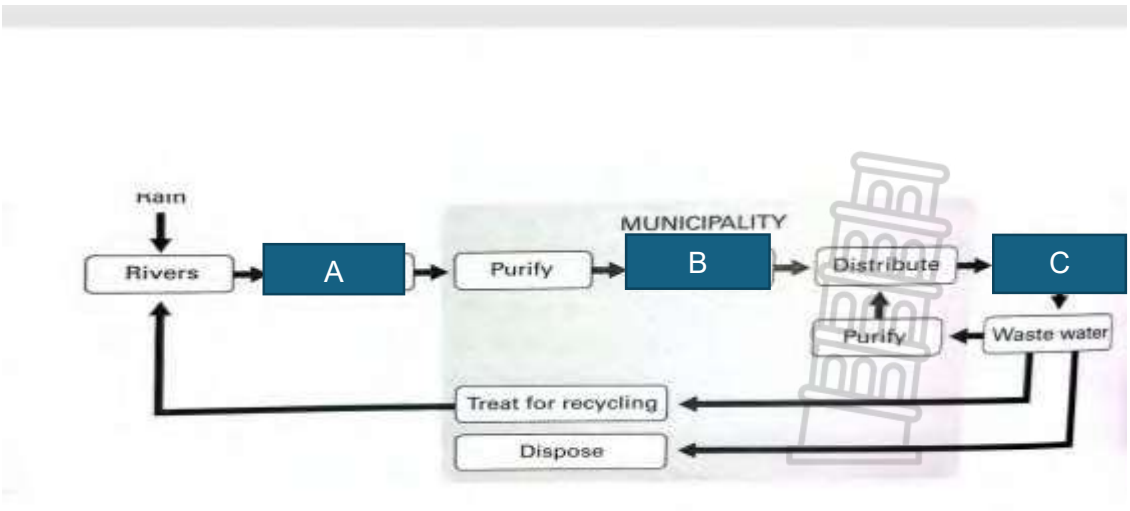


FIGURE 4.3b Water purification flow chart



[Image: Geography Focus –learners book grade 10]

TOPIC: WATER MANAGEMENT

ACTIVITITY 4.3

4.3.1 1 Refer to the bar graph and write down the following:

(a) The driest dam (1X1) (1)

(b) The fullest dam (1X1) (1)

4.3.2 List TWO ways Makhanda Municipality is currently using to manage the water crisis. (2 x 1) (2)

4.3.3 Explain TWO uses of dams. (2X2) (4)

4.3.4 Study the flow chart ON FIGURE **4.3 b** and replace numbers with the correct process through water purification from dams to consumers. (3X1) (3)

4.3.5 With reference from infographic in FIGURE **4.3 a**, quote TWO pieces of evidence that the volume of water in Makhanda dams is decreasing. (2X2) (4)

[15]

Strategies to sustainable use of water

Sustainable water use is using water resources in a way and at a rate that prevents the long-term loss of water.

- Recycle water – purification or sewage treatment plants provide safe, quality water.
- Do not waste water – reduce use of water.
- Do not pollute – affects water supplies.
- Restore wetlands – they reduce erosion, encourage wildlife, store and purify water.
- Remove alien vegetation – high water consumption.
- Fix dripping taps and leaks.
- Close taps when not using water

Government strategies to increase national water supply

THE ORANGE RIVER PROJECT	THE LESOTHO HIGHLANDS WATER PROJECT
• Water from the Orange River at the Gariep Dam goes through tunnels and canals to the Sundays River and then to the Fish River in the Eastern Cape. • Provides water for irrigation and urban use in Port Elizabeth. • The Gariep and Vanderkloof Dams generate hydro-electric power. • Prevents flooding in the lower Orange River.	• Africa's largest water transfer scheme. • Supplies water from Lesotho to Gauteng from a system of large dams and tunnels across Lesotho and central South Africa. • The water runs north from the Katse Dam on the Orange River into the Vaal River basin. • The scheme provides hydro-electrical power in Lesotho – source of income.
THE BERG RIVER SCHEME	**THE TUGELA-VAAL SCHEME**
• Water is transferred from the Theewaterskloof Dam on the Sonderend River to the Berg River (which has a new dam). • Will capture high winter rainfall and store it for the dry summer months for Cape Town's urban and industrial use.	• A pumped storage scheme that supplies water from the Tugela to the Vaal Dam. Water is pumped through the Drakensberg mountain range. • Supplies 11 million people, irrigation, house-holds, and industries in Pretoria, Witwatersrand and Vereeniging.

Individual strategies to increase domestic supply

RAIN WATER HARVESTING	
❖ People can use tanks or barrels to collect rain water from the roofs of homes. ❖ They can then use this rain water for washing, flushing toilets or watering gardens.	 *[https://i1.sndcdn.com/artworks-DrAFZBJ9CnboMPeU-xQ0byA-t500x500.jpg]*

GREY WATER

- Grey water is used water which is still quiet clean.
- It includes water from baths, showers, sinks, washing machines.
- This water is suitable for watering plants and flushing toilets

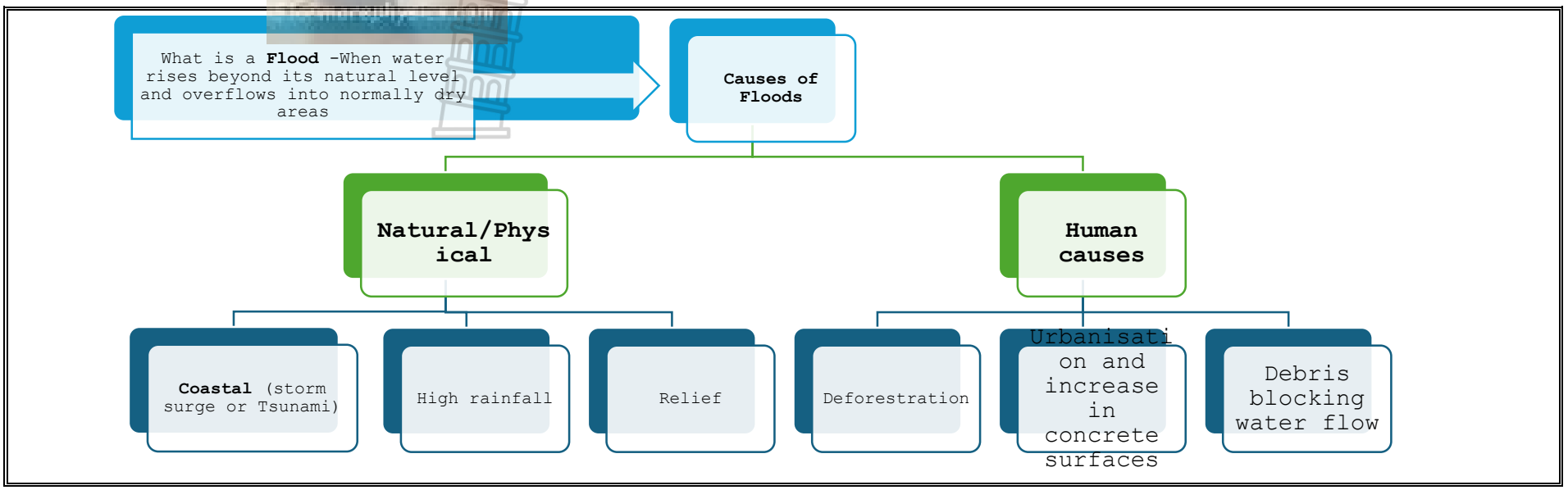
[data:image/png;base64]

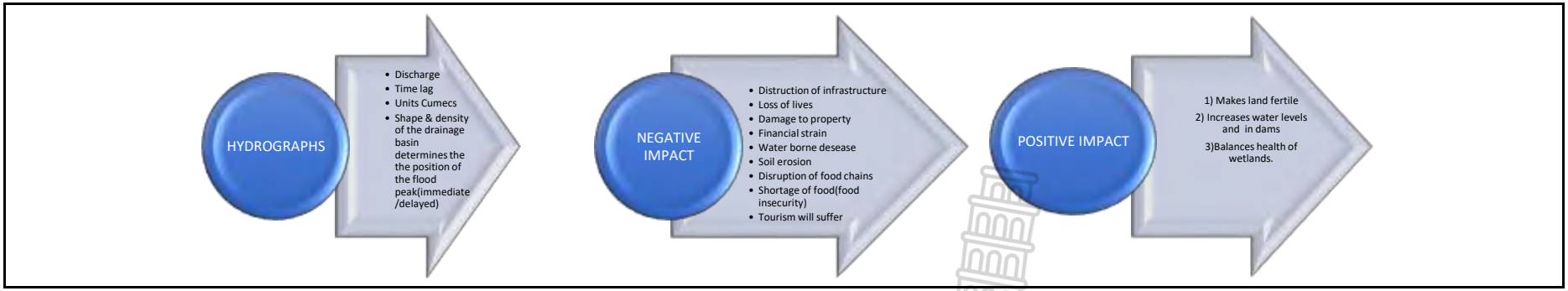
TOPIC: WATER MANAGEMENT

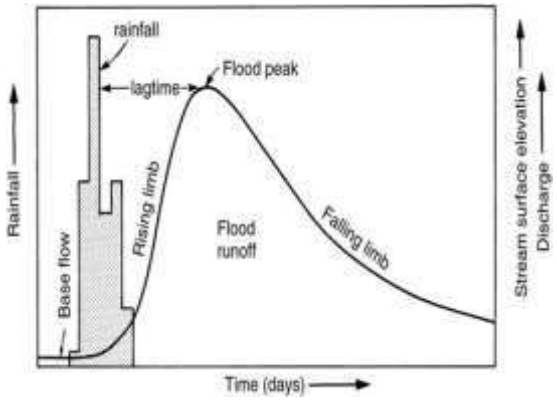
ACTIVITITY 4.4

4.4.1	Define the term grey water.	(2x1)	(2)
4.4.2	List TWO ways in which grey water can be used.	(2x1)	(2)
4.4.3	In a paragraph of approximately EIGHT lines, discuss how people can sustainably save water at home.	(4x2)	(8)

TOPIC: WATER MANAGEMENT-FLOODS



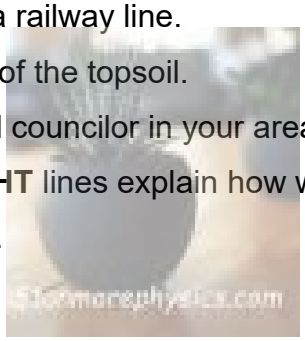


Impact of floods (Negative)	On the economy	ON THE ENVIRONMENT	On human beings
	• Destruction of infrastructure • Loss of fertile agricultural land • Destruction of the tourism industry • Increase in food prices. • Costly insurance claims. • Closing of businesses.	• Disruption of ecosystems • Soil erosion • Destruction of natural vegetation	• Loss of lives. • Waterborne diseases. • Shortage of food (food insecurity) • Mass movements (landslides, • rock falls landslides etc.) • Job losses
Characteristics of floods: HYDROGRAPH	**Managing floods in rural areas**	**Managing floods in urban areas**	**Managing floods in informal settlements**
	• Planting more vegetation (afforestation). • Straightening of the river channel. • People living near flood plane to relocate to elevated areas. • Improved farming methods to reduce surface runoff (no overgrazing, contour ploughing). • Keep wetlands in their natural state	• Better drainage systems. • Building barriers to raise natural river banks(levees). • Enough green belt areas to promote infiltration. • Evacuation plans and warning systems to be put in place. • Stocking canned food and fresh water. • Sandbagging the river channel • Dam construction.	• Providing adequate housing with drainage systems. • Preventing settlement along the river • Keeping rivers clear of sediments and rubbish. • Upgrading rural areas so that people don't leave rural areas.

TOPIC: WATER MANAGEMENT

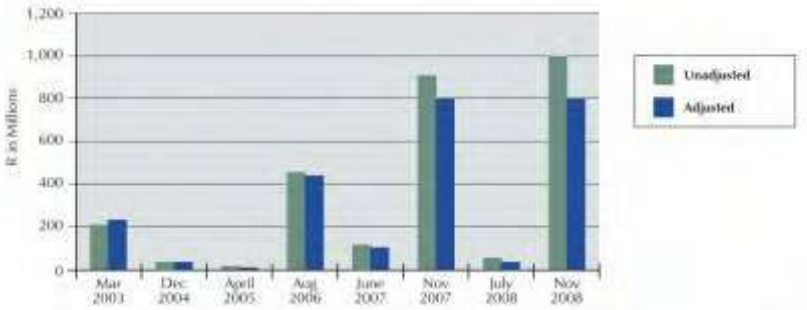
ACTIVITITY 4.5

4.5.1.	Define floods.	(1x1)	(1)
4.5.2	What is the difference between the natural flood and the human induced (human made) flood?	(2x2)	(4)
4.5.3.	Classify the following impact of floods as either *environmental Impact* or *economic Impact*:		
4.5.3(a)	Destruction of a railway line.	(1x1)	(1)
4.5.3(b)	Washing away of the topsoil.	(1x1)	(1)
4.5.4.	You are a Ward councilor in your area, in a paragraph on not more than **EIGHT** lines explain how would you assist your people after the floods.	(4x2)	(8)
			[15]



ACTIVITY 4.6: FLOODS

Study the infographic about on FIGURE 4.6 below and answer the questions that follow:



This graph shows direct damage costs in the Western Cape associated with cut-off low weather systems. It compares damage costs before adjustments for inflation with those that have been inflation-adjusted to 2005 values. The sizeable losses (in 2003, 2006, 2007 and 2008) reflect particularly severe 'transboundary' events that affected more than one district municipality.

29 Sep 2023: **Cape Town assesses damage and continues mop-up operations after devastating floods**

Heavy rains and strong winds caused havoc in parts of the Western Cape over the long weekend, leading to ongoing mop-up operations in Cape Town.Approximately 16 000 people have been impacted, with around 7 100 informal structures affected.7000 Eskom customers are still without electricity supply across the Western Cape.

"Our humanitarian agency partners, like Sassa, the Department of Social Development, NGOs, and various community-based organisations have been assisting with humanitarian relief – [such as] hot meals, food parcels, blankets, and mattresses – to more than 10 000 affected people," Powell said. The City's Roads and Infrastructure Management Department has provided building materials and sandbags in many of the affected areas

The Western Cape government estimates nearly R1.4 billion in damages in the agriculture sector following flooding in the province.

Benton Geach/Gallo Images

TOPIC: WATER MANAGEMENT

ACTIVITITY 4.6

4.6.1 According to the above infographic, how many residents in informal settlements were affected by floods in the Western Cape between the years 2011 to 2014? (1x1) (1)

4.6.2. How much money did the municipalities of Western Cape loose over the period of 2011 - 2014? (1x1) (1)

4.6.3. During which month was 'unadjusted cost' of damage highest in the Western Cape? (1x2) (2)

4.6.4. Quote from the infographic evidence of the destruction of infrastructure as a results of floods around the date of 29 September 2023 (1x2) (2)

4.6.5. There seemed to be means of managing the negative impact of floods in the communities ,provide *two* examples of flood *management strategies* effected around the date of 23 September 2023 (2x2) (4)

4.6.6. Briefly explain how will the economy of Western Cape be affected by the damage caused by floods in the agricultural sector (R1.4 billion (3x2) (6)