CAPE WINELANDS EDUCATION DISTRICT

GRADE 12 GEOGRAPHY SURVIVAL KIT

GEOGRAPHY PAPER 1

CLIMATE & WEATHER AND GEOMORPHOLOGY

PASS YOUR GEOGRAPHY AS EAZY AS ...

PIE!

Western Cape Government

2022 The year of learning

transform to perform WCED

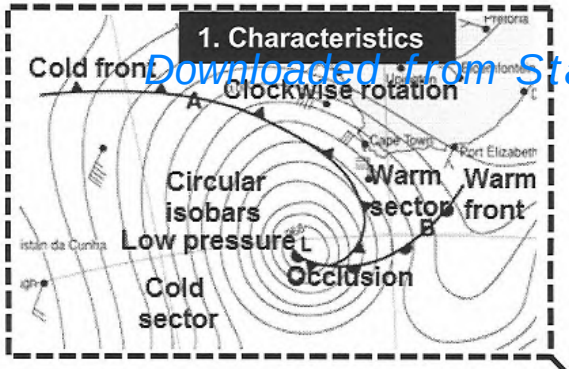
Adapted & compiled by: Hyran Gillion & Mike Eksteen

Acknowledgements: Glenn Samaai

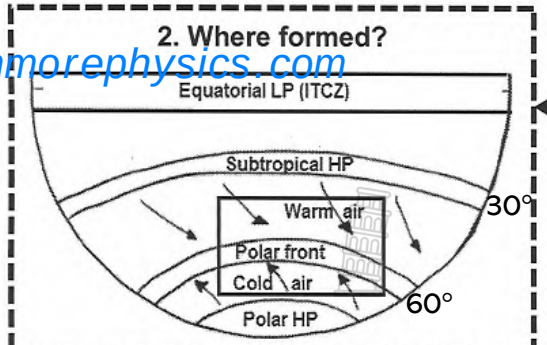
CLIMATE & WEATHER

MID-LATITUDE CYCLONES

1. Characteristics



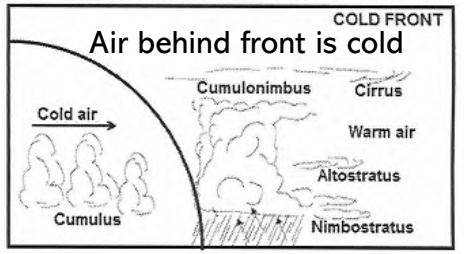
2. Where formed?

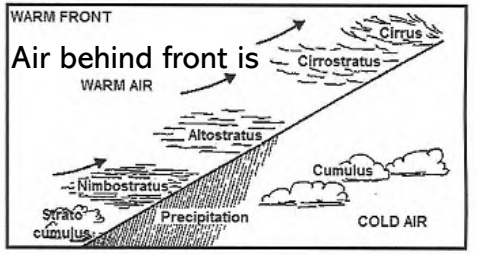


3. Conditions

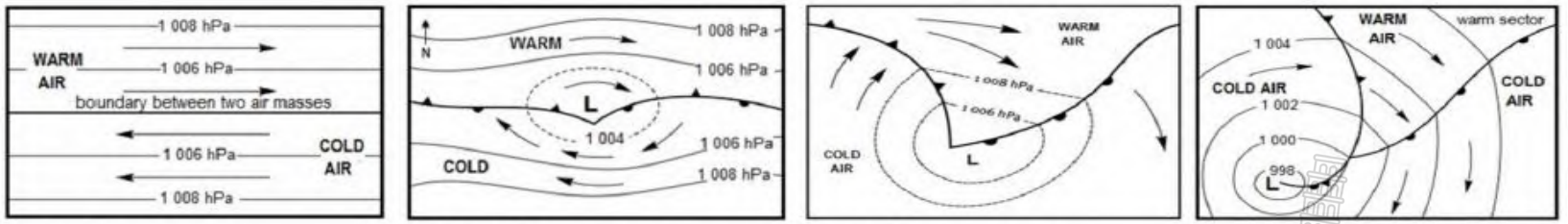
- Two large high pressure systems.
- Subtropical HP - warm, moist air mass.
- Polar HP contains cold dry air.
- The air masses meet at the polar front.
- Warm air is forced upwards and cold air flows in.

4. Cold and warm fronts





5. Stages



1. Initial stage
Cold and warm air meet at the polar front.

2. Development stage
Wave develops along the polar front.

3. Mature stage
Clear low pressure with distinct cold and warm fronts.

4. Occluded stage
Cold front catches up with warm front.

6. Weather patterns

	Cold front	Warm front
Temp	Sudden drop	Sudden rise
Air pressure	Increases	At lowest
Wind change	NW to SW	NE to N / NW
Cloud cover	Thick	Decreases
Rainfall	Heavy	Stops

7. Impact

- Flooding
- Snow hazards in high-lying areas
- Loss of livestock
- Negative impact on economy

8.

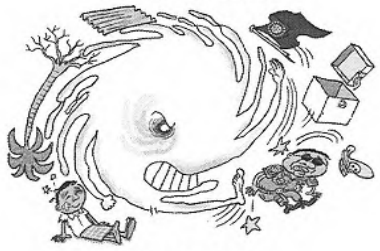
- **GENERAL DIRECTION OF MOVEMENT:** west to east
- **REASON:** driven by westerly winds therefore moves eastwards

TIP:

You must be able to:

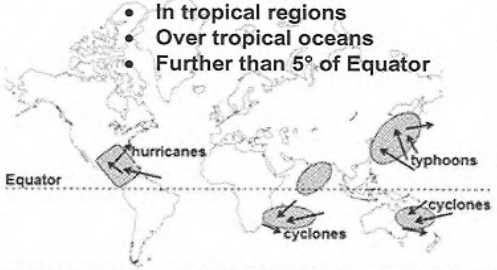
- **Recognise/Identify** a cold, warm, occlusion front, wind direction, cloud cover, temperature, cloud types and stages of formation (sources1, 4 & 5)
- **Name** the general direction of movement and give a reason for it (source 8)
- **Define** a cold and warm front (source 4)
- **Describe** where & why it forms there (sources 2 & 3)
- **State/Describe** changes in weather caused by a cold front (source 6)
- **Draw** a labelled cross-section of a cold, warm and occlusion front (source 4 & ask teacher)
- **State/Describe** the impact of the cold front (source 7)
- **Suggest** strategies to reduce the impact (see class notes)

TROPICAL CYCLONES



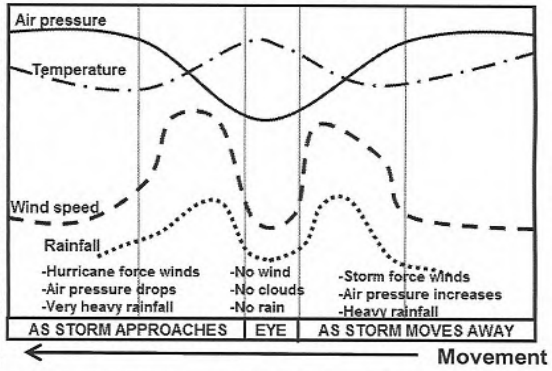
1. General characteristics
- Intense low pressures.
- Named in alphabetical order.
- During late summer or autumn.
- Move from EAST to WEST. AWAY from the equator. Turns EAST at 30°.
- Causes destruction by hurricane force winds, storm surges and heavy rainfall.

2. Where formed?
- In tropical regions
- Over tropical oceans
- Further than 5° of Equator

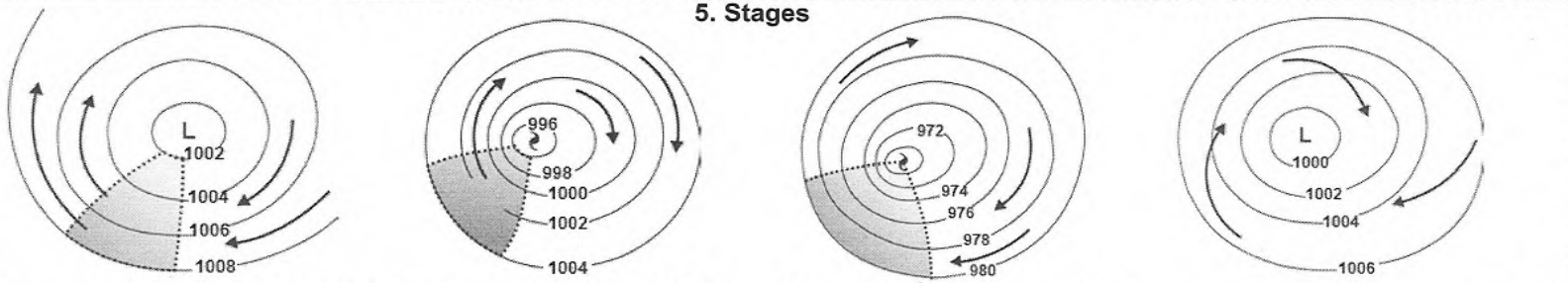


3. Conditions
- Sea temperature at least 26°C.
- High humidity.
- Unstable air.
- Little surface friction.
- Light variable winds
- Air pressure below 950 hPa
- Air divergence in upper levels

4. Weather patterns



5. Stages



1 Formative stage(above 1000hpa) 2 Immature stage(below 1000hPa) 3 Mature stage(far below 1000hPa) 4 Degenerating stage(rises 1000hPa)

6. Impact
- *Infrastructure*: Roads/bridges/pipelines
- *Economy*: Business/crops/costs
- *Social*: Deaths/property damaged
- *Environment*: Erosion/water polluted

7. Strategies
- Good weather forecasts.
- Keep public informed by tracking storm
- Early warning systems.
- Medical- and rescue services on alert.
- Build houses with strong materials.
- Evacuation routes and procedures
- Avoid crossing strongly flowing rivers

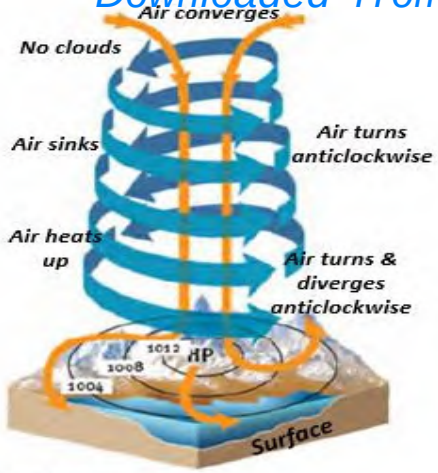
8.
- **GENERAL DIRECTION OF MOVEMENT:** east to west
- **REASON:** driven by easterly winds therefore moves westwards

TIP:

You must be able to:

- **Recognise/Identify** a tropical cyclone and the stages of formation (source 5)
- **Name** the general direction of movement and give a **reason** for it (sources 1 & 8)
- **Name/Describe** the general characteristics (source 1)
- **State/Describe** where & why it forms there (sources 2 and 3)
- **State/Describe** changes in the weather as the storm approaches and the eye passes over (source 4)
- **State/Describe** the impact (source 6)
- **Suggest** strategies to reduce the impact (source 7)
- **State/Describe** how it is named (source 1)
- **Explain** why wind speeds decrease or increase (ask you teacher)

3.



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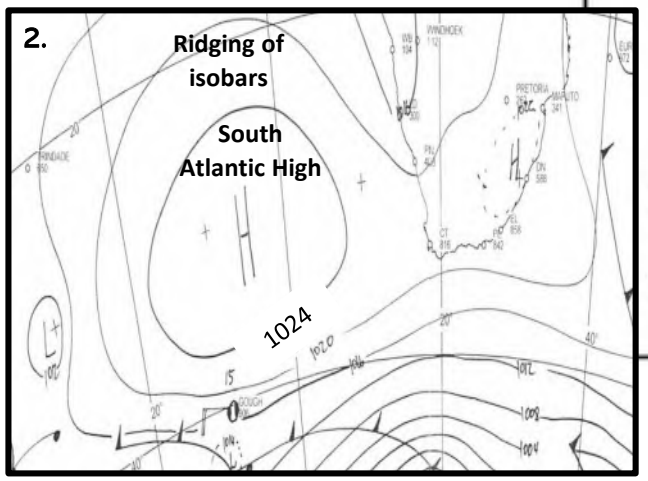
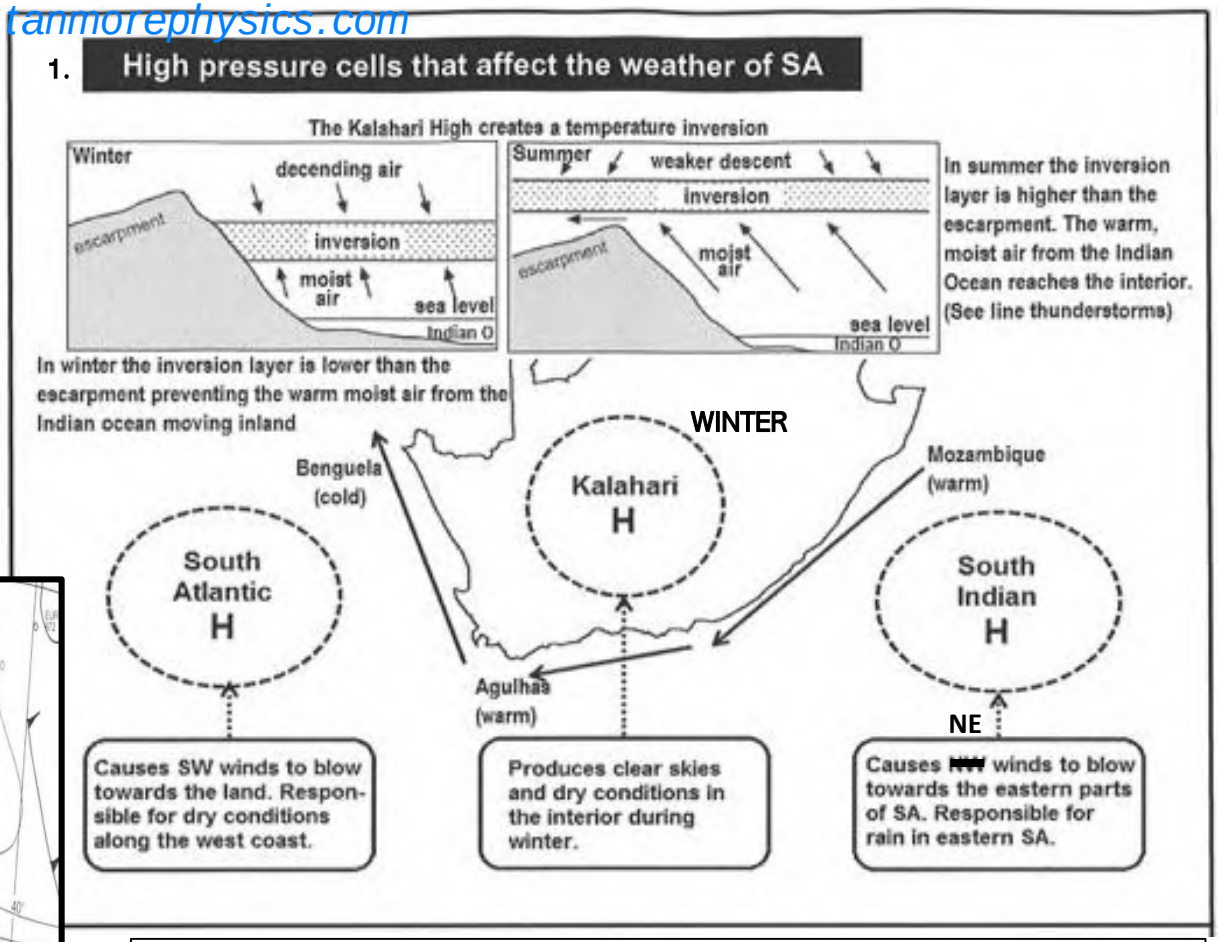


1. **High pressure cells that affect the weather of SA**



4.

- **INVERSION** – a layer of air in the atmosphere in which temperature increases with height preventing air below it from rising (see source 1). The inversion is lower than the escarpment in winter due to the strong sinking air of the Kalahari high. In summer, the land heats up and a heat low-pressure forms where the Kalahari high is, which makes the inversion rise higher than the escarpment (see source 1).
- **RIDGING** – outward extension/bulging of isobars away from the high-pressure centre (see source 2).

TIP:

You must be able to:

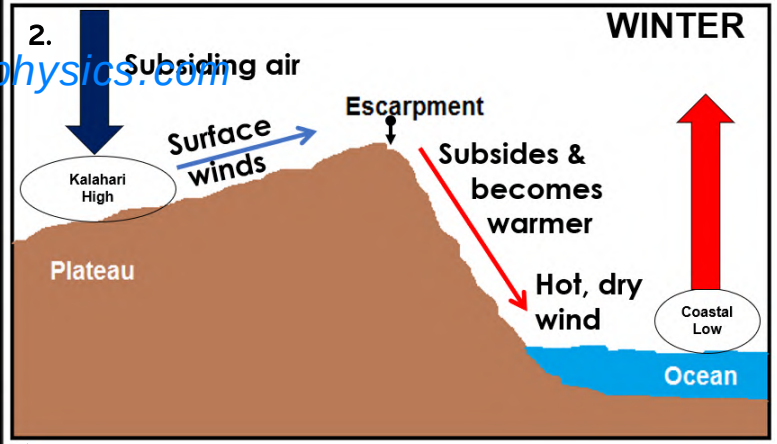
- **Recognise/Identify** the 3 high-pressure cells on maps (source 1 & 2)
- **Name** the 3 high-pressure cells that influence the weather of South Africa (source 1)
- **Define** an inversion and ridging (source 4)
- **Recognise/Identify** ridging of a high pressure on a synoptic map (source 2)
- **Identify** the season (winter) by looking for the presence of the Kalahari high over the land (source 1)
- **Describe** the seasonal movement of the Kalahari high and give a **reason** for it e.g., Kalahari High is replaced by a Heat Low in summer because the land is warm (source 1)
- **Name/Describe** the general characteristics of a high-pressure cell (source 3)
- **Name/Describe** how these 3 high-pressure cells influence the weather (source 1)
- **Describe & Explain** how the height of the inversion along the escarpment changes in winter and summer (source 1 & 4)

1. **Record-breaking heatwave hits East London**

Matthew Field
18 March 2021

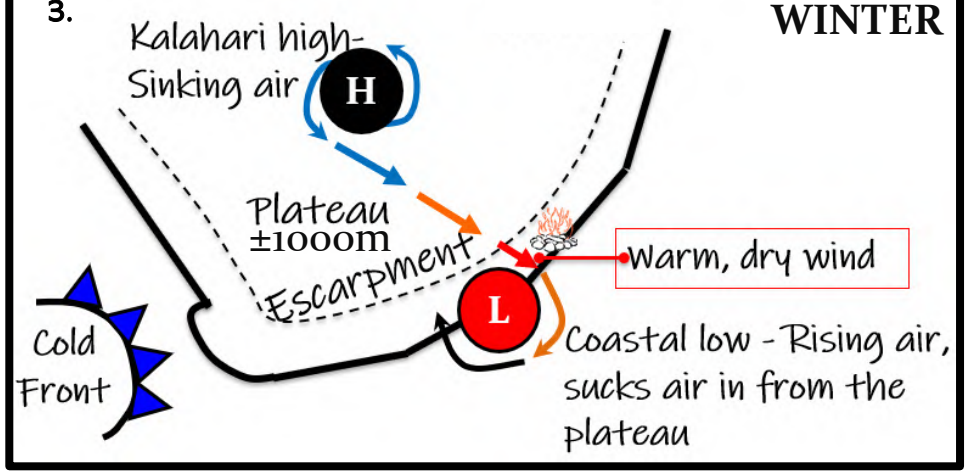
East London residents were subject to sweltering heat last Saturday after a record-breaking heatwave resulted in a peak temperature of 43,9 °C. According to the South African Weather Service (SAWS), the heatwave was a result of berg wind conditions, when hot dry winds blow down to the coast from the country's high central plateau.

2.



BERG WINDS

3.



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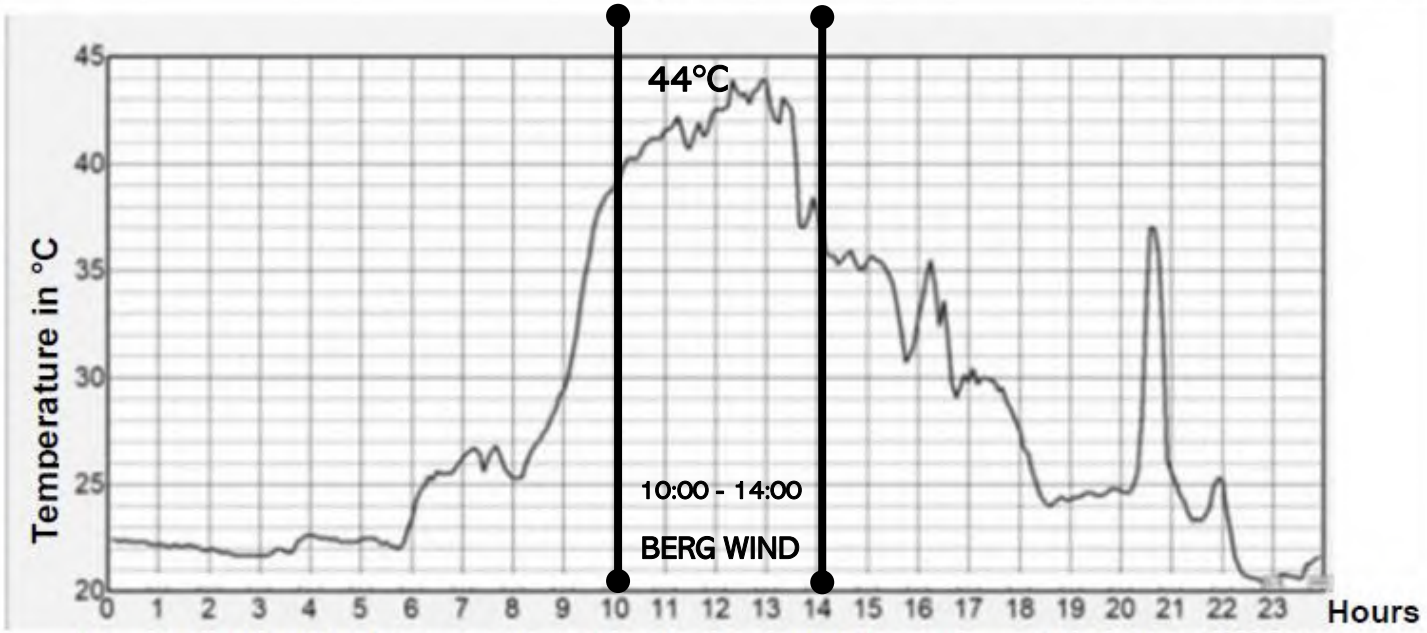


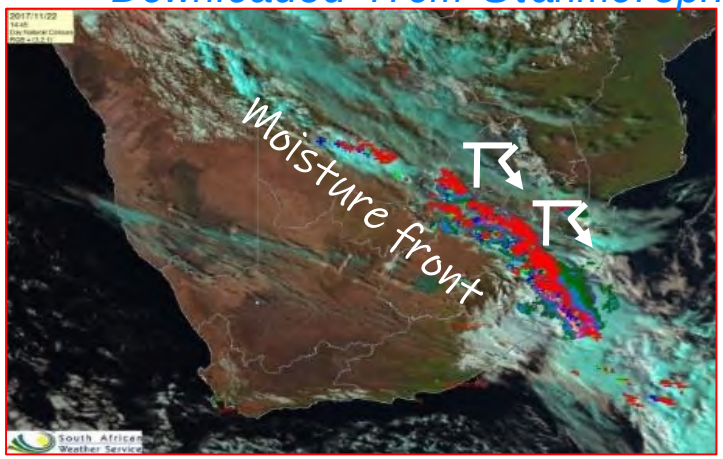
A graph tracking the temperature in East London over the course of Saturday 13 March
Picture: SA Weather Service

You must be able to:

- **Identify and Name** the 3 pressure cells that are necessary for berg winds to form/develop (source 3)
- **Describe** how berg winds form/develop (source 2 and 3)
- **Define** a berg wind (source 1)
- **Explain** the role of the escarpment in increasing the temperature of berg winds (source 2)
- **State** why berg winds occur in winter (source 3)
- **Read** the temperature and the time of a bergwind from a graph (source 4)
- **Describe** the impacts (2-4 facts) of bergwinds on the natural environment e.g., veldfires destroy natural vegetation or ash of veldfires fertilise the soil (see your class notes)
- **Suggest** strategies (2-4 facts) how to reduce/manage the impact (see your class notes)

MOISTURE FRONT AND LINE THUNDERSTORMS

1.



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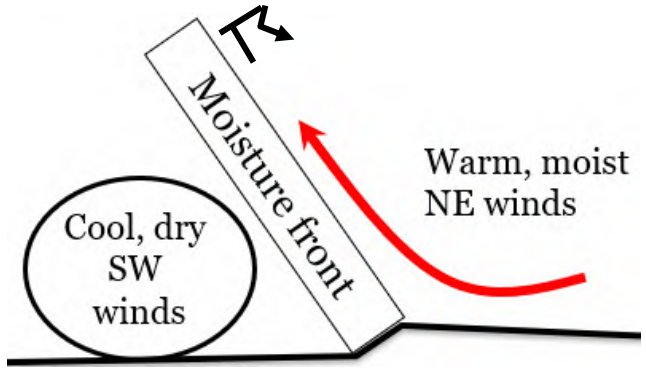
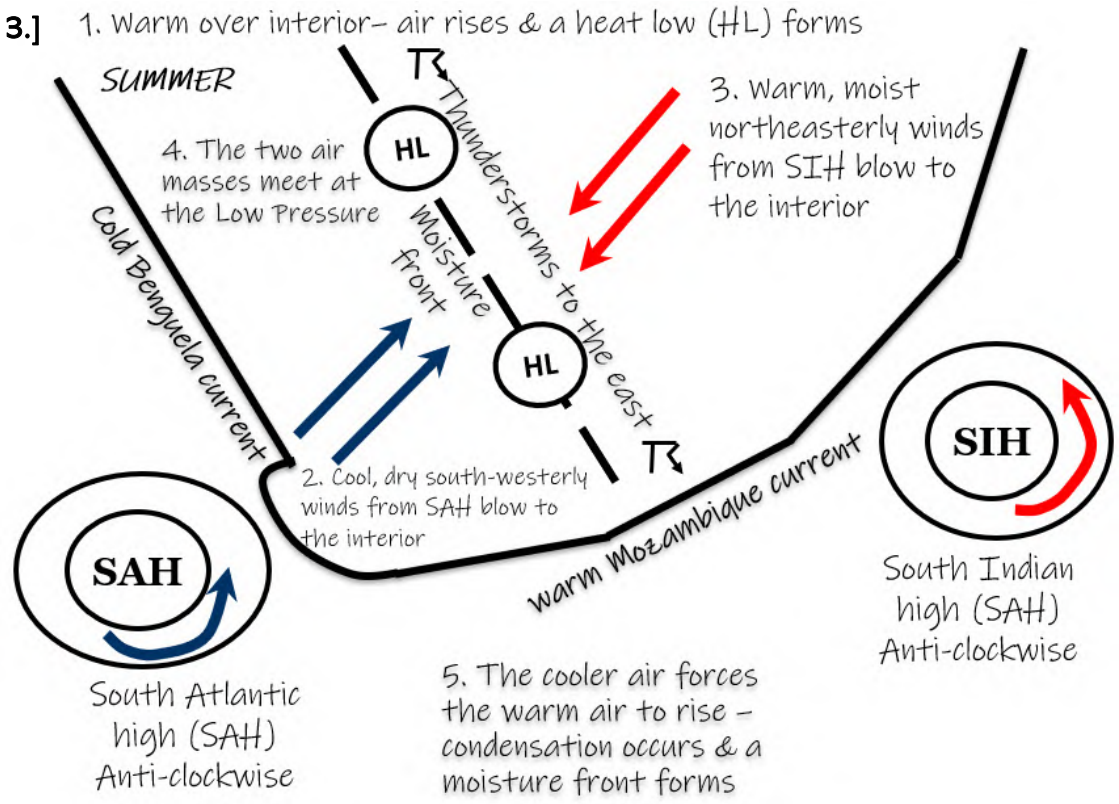


Cool, dry air forces the warm, moist air to rise.

3.]



4.

Line Thunderstorm: A thunderstorm that happens in a line on the eastern side of the moisture front where the warm, moist air is forced to rise.

Moisture front: A contact zone between two air masses with different moisture content. Dry air & moist air creates a front.

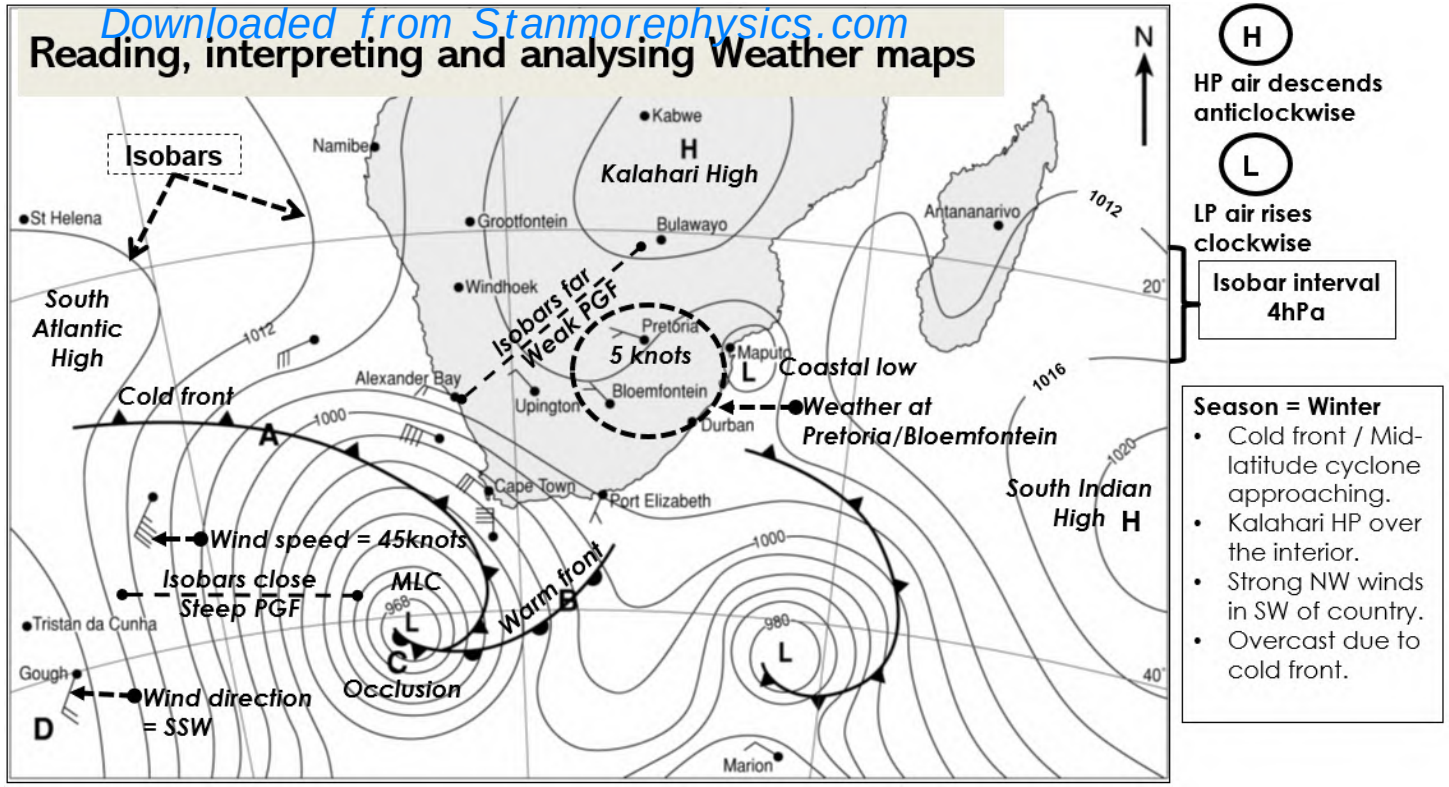
5. **IMPACT:**

Heavy rainfall causes flooding which lead to loss of natural vegetation/habitats.
Lightning can cause fires that destroys natural vegetation/habitats.
Heavy rainfall causes widespread soil erosion/loss of fertile soil.
Hail causes damage to natural vegetation / habitats.

TIP:

You must be able to:

- **Identify and Name** the season and the 3 pressure cells that are necessary for line thunderstorms to form/develop (source 3)
- **Identify** the wind directions of the 2 high pressure cells (source 3)
- **Define** a line thunderstorm and a moisture front (source 4)
- **Explain** how the moisture front is formed when air of the SAH and SIH meet over the interior (source 2 & point 5 on source 3)
- **State** why the thunderstorms form to the east of the moisture front (source 2 & point 3 on source 3)
- **State** why the air of the SAH is dry while the air of the SIH is moist (source 3)
- **State** why the air of the SAH forces the air of the SIH to rise when it meets over the interior (source 3)
- **Describe** the impacts (2-4 facts) on the natural environment (source 5)
- **Suggest** strategies (2-4 facts) how to reduce/manage the impact (see your class notes)



H
HP air descends anticlockwise

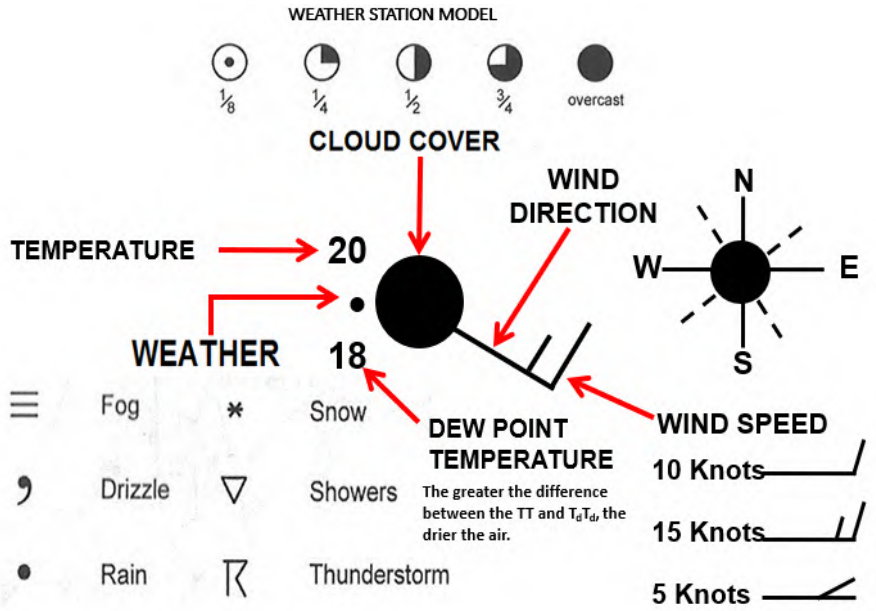
L
LP air rises clockwise

Isobar interval 4hPa

Season = Winter

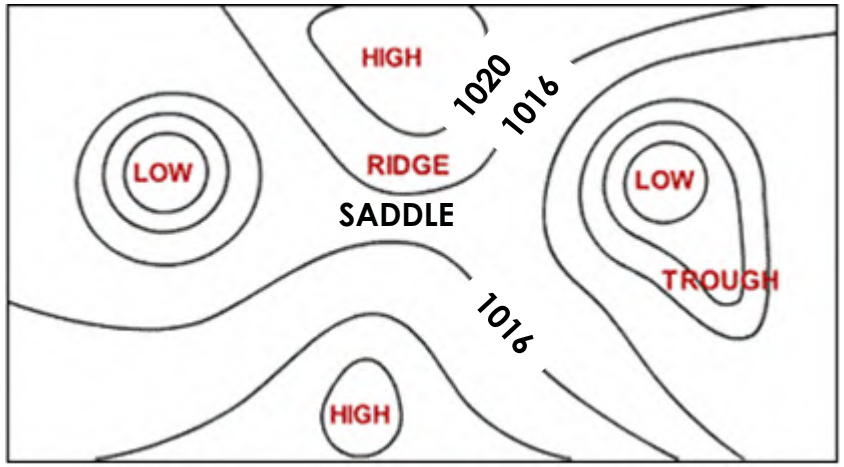
- Cold front / Mid-latitude cyclone approaching.
- Kalahari HP over the interior.
- Strong NW winds in SW of country.
- Overcast due to cold front.

HOW TO READ A WEATHER STATION SYMBOL



Isobar Patterns:

- Ridge
- Saddle
- Trough

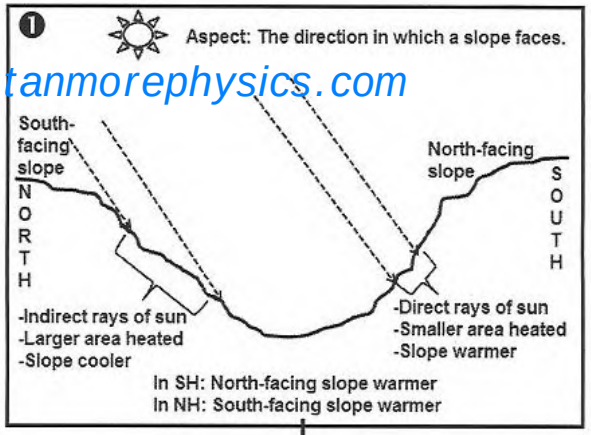


Isobar Patterns:

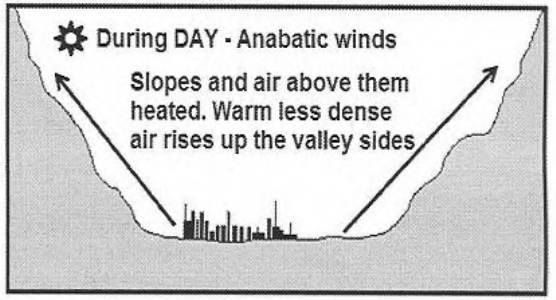
- Ridge - outward extension/bulging of isobars away from the high-pressure centre.
- Saddle – area of constant pressure between 2 high pressures or low pressures
- Trough - outward extension/bulging of isobars away from the low-pressure centre.

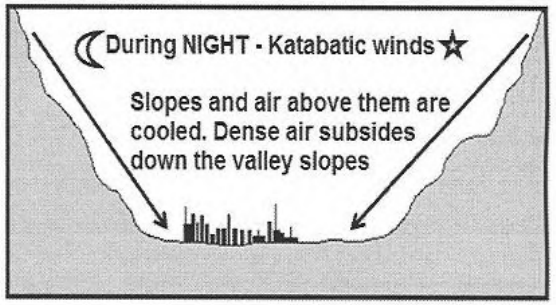
VALLEY CLIMATES

❶ Aspect: The direction in which a slope faces.



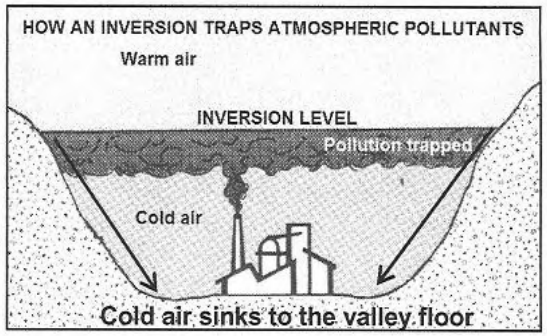
❷ Anabatic and Katabatic winds





❸ Inversions

- Inversions form when the normal pattern of air temperature is reversed.
- Air closer to the ground is cooler than the air above it.
- Happens on calm cloudless winter nights.
- Upper slopes cool rapidly.
- Cold air sinks down slopes to the valley.
- The colder air is trapped under warmer air
- Temperature increases with altitude in The valley
- Polluted air gets trapped and cannot rise.



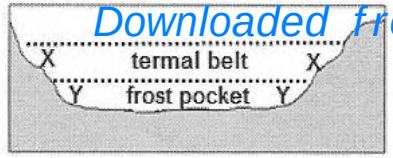
❹ Frost Pockets

- Cold air moves down slope.
- Temp drops below freezing point.
- Frost forms on valley floor.
- Frost resistant crops are planted on valley floor.
- Crops sensitive to frost are planted higher up the slope (See impact on human activities)

❺ Radiation fog

- Formed as a result of radiation from the Earth's surface.
- Formed in valleys when nights are cold, clear and cloudless.
- Earth's surface and layer of air above it cools rapidly.
- Condensation occurs tiny droplets formed
- Small droplets are suspended in the air
- Disappears after insolation starts

❻ Impact on human activities



SETTLEMENT
- Develop on mid-slope (X) in thermal belt
- Night time temperatures will be higher.
- Cold air sinks to valley floor

FARMING
- In SA vineyards planted on warmer north-facing slopes.
- Frost-resistant crops planted in frost pocket (Y)
- Crops sensitive to low temperatures planted in thermal belt (X)

MAPWORK TIP - You must be able to:

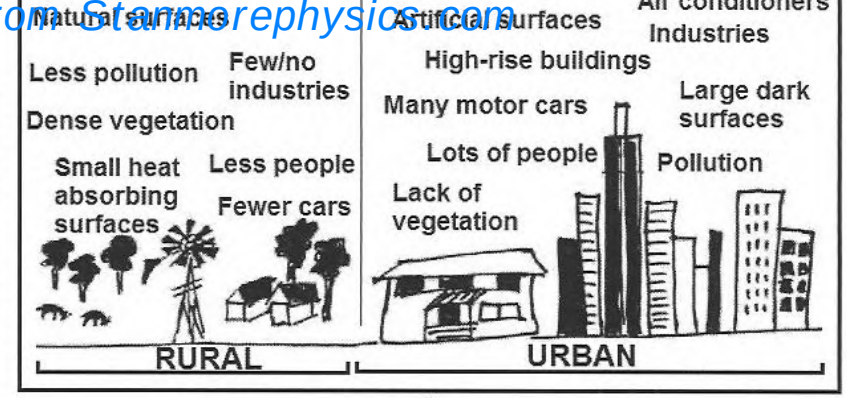
- **Identify** slope aspect, thermal belts, katabatic and anabatic winds, frost pockets and radiation fog

TIP:

You must be able to:

- **Identify and Name** the warmer & cooler slope (source 1)
- **Explain** why slopes are warmer & cooler (source 1)
- **Define** slope aspect, katabatic and anabatic winds, an inversion, frost pocket and radiation fog (sources 1 - 5)
- **Identify and Name** a Katabatic and Anabatic wind (source 2)
- **State** when Katabatic and Anabatic winds form and why they form (source 2)
- **Describe** how Katabatic winds cause valley inversions (source 3)
- **Describe** how Katabatic winds cause frost pockets on the valley floor (source 4)
- **Describe** how radiation fog forms (source 5)
- **State** the impact of slope aspect, katabatic and anabatic winds, inversions, frost pockets and radiation fog on human activities (source 6)
- **Draw** a labelled diagram of a katabatic and anabatic winds (source 2)

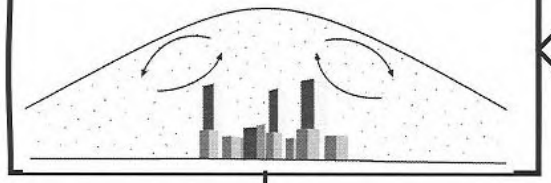
1 Why are cities warmer than rural areas?



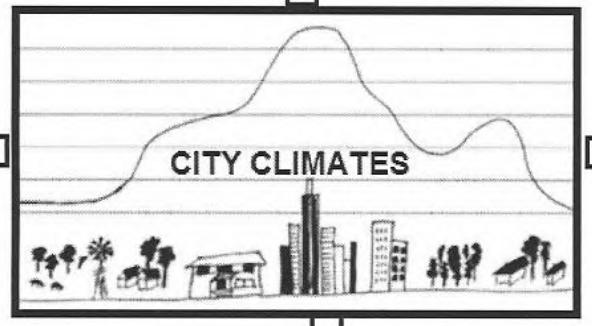
CAUSES
Caused by air pollution from
- Industries
- Domestic fires
- Car exhaust fumes.
- Burning of fossil fuels
- Inversions that trap pollution

CAUSES
- Building materials: Concrete, tar, brick absorb heat.
- Tall buildings trap heat.
- Air pollution helps to trap heat.
- Burning of fuels.
- Transport
- Industries release heat.
- Central heating from shops.
- Large concentration of people.

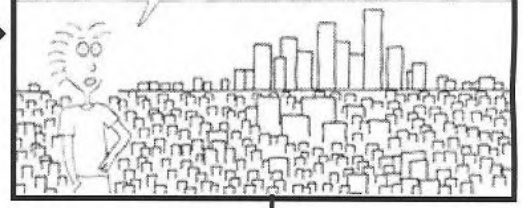
3 POLLUTION DOME
Trapped mass of polluted air over the city



EFFECTS
- Insolation blocked during day.
- Precipitation increases as pollutants act as condensation nuclei.
- Triggers allergic reactions, breathing difficulties and asthma attacks.
- Lead poisoning from petrol fumes.
- Cause smog which reduces visibility.
- Global climate change



2 An urban HEAT ISLAND is when the city has warmer temperatures than the surrounding rural areas



EFFECTS
- Human discomfort.
- Heat stress and death.
- Release of Greenhouse gasses.
- Increased smog concentration.
- Reduces visibility
- Increased use of energy in summer.
- Pollution levels increase.

4 HOW REDUCED?
- Energy saving strategies
- Green belts
- Roof gardens
- Public transport
- Use lighter-coloured materials
- Shade parking areas

MAPWORK TIP - You must be able to:

- **Identify** urban heat islands and cooler rural areas
- **Give** reasons for the presence of urban heat islands or cooler rural areas (source 1 and causes of source 2)

TIP:

You must be able to:

- **Identify** an urban heat island on graphs, maps and **Read** the temperature (middle of source)
- **Define** an urban heat island and a pollution dome (source 2 & 3)
- **Explain** why cities (urban heat islands) are warmer and rural areas cooler (source 1 & 2)
- **State** the effects/impacts of urban heat islands (source 2)
- **Suggest** strategies (2-4 facts) to reduce the impacts of urban heat islands (source 4)
- **Describe** the causes of pollution domes over cities (source 3)
- **State** the effects/impacts of pollution domes (source 3)

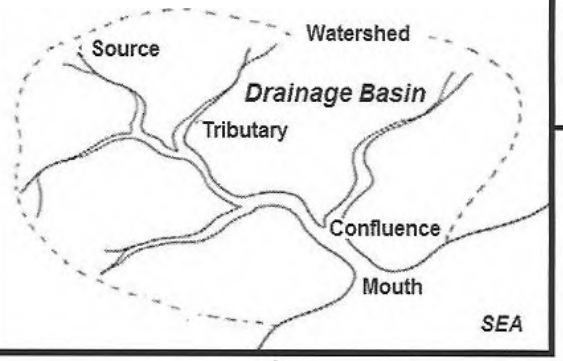
GEOMORPHOLOGY

1 FEATURES

Catchment area	Area over which rain falls and is caught by a drainage basin	Watershed	High lying area separating two drainage basins
Infiltration	Movement of water through soil into the ground	Water table	Upper level of underground saturated rock
Confluence	Place where two rivers join	Run-off	The surface flow of water
Tributary	A river that joins a larger river	Groundwater	Water found under the ground
River mouth	Sea or lake where river ends	Interfluve	High lying are between two river valleys
Source	Where river begins	River system	Main river with all its tributaries

DRAINAGE BASINS

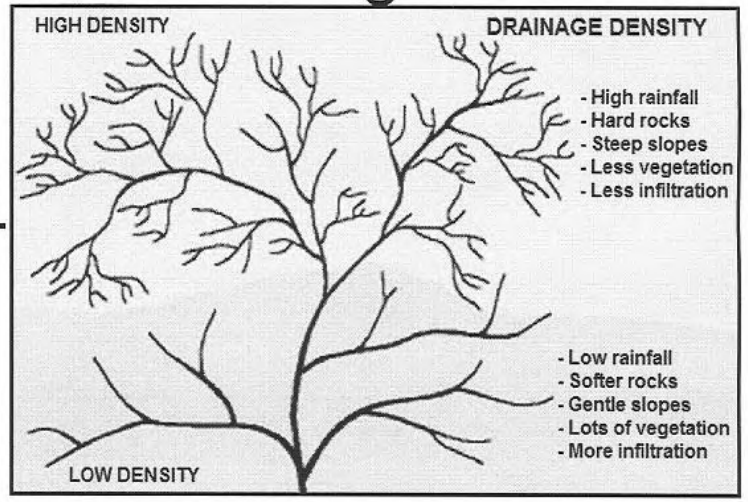
Total area drained by a river system



2 TYPES OF RIVERS

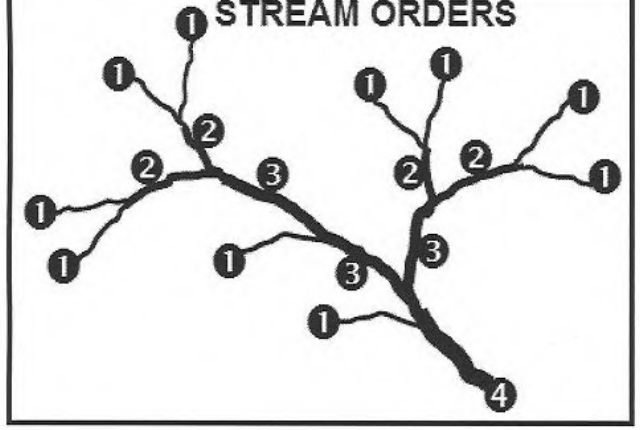
Type	Description	Example
Permanent	Flows all year	Amazon
Periodic	Flows in rainy season	Limpopo
Episodic	Flow after heavy rainfall	Auob Nossob
Exotic	Spans two types of climatic regions	Nile Orange

3



The relationship between the length of streams in a drainage basin and the size of the drainage basin.

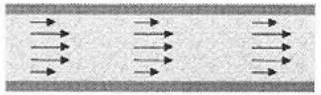
4 STREAM ORDERS



1+1=2
2+1=2
2+2=3
3+1=3
3+2=3
3+3=4
and so on

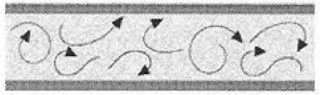
5 RIVER DISCHARGE

Laminar flow



- Water flows as parallel sheets
- River bed is even
- Less erosion **[- lower course]**

Turbulent flow



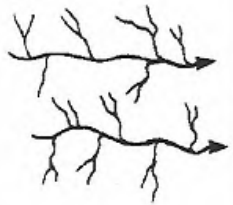
- Water flows bubbling/turbulent
- River bed is uneven
- More erosion **[- upper course]**

TIP:

You must be able to:

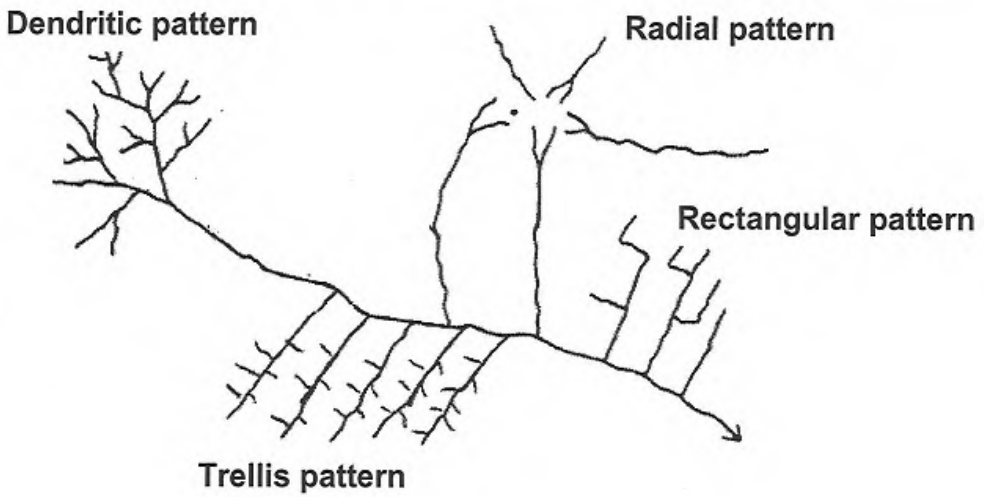
- **Define** a drainage basin and all the features (source 1), types of rivers (source 2), drainage density (source 3), turbulent and laminar flow (source 5)
- **Identify** the watershed, interfluve, source, confluence, tributary and mouth on diagrams and on maps (source 1)
- **Identify and Describe** types of rivers on maps (source 2)
- **Identify** and **describe** the 2 drainage densities (source 3)
- **Give** reasons for high and low drainage density (source 3)
- **Determine** stream order (source 4)
- **Give** reasons for turbulent and laminar flow (source 5)
- **Describe** the impact of turbulent and laminar flow (source 5)

DRAINAGE PATTERNS

Pattern	Dendritic	Trellis	Radial	Rectangular	Centripetal	Deranged	Parallel
Diagram							
Description	Looks like branches of a tree. Tributaries join at acute angles.	Strong main stream joined by short tributaries at right angles	Looks like spokes of a wheel when viewed from above	Tributaries join at right angles and have bends of 90°	Opposite of radial pattern.	Small streams that have no specific pattern	Streams flow parallel to each other
Underlying structures	Uniform rocks of similar hardness	Gently sloping alternating layers of hard and soft rock	Rivers flow away from a high central point such like a butte or mesa	In areas with hard rock that is well jointed.	Streams flow towards a central basin such as a marsh or lake	Very flat areas that have experienced recent glaciation	Common along a ridge or hills.

You must be in a position to do the following:

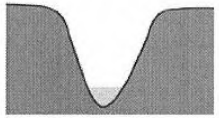
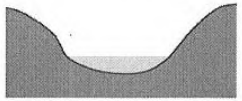
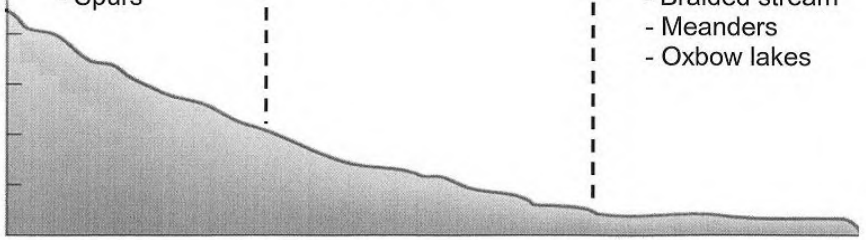
- Identify each of the patterns on diagrams.
- Identify stream patterns on topographic maps.
- Give a description of the patterns.
- Describe the underlying structures that caused the stream pattern.



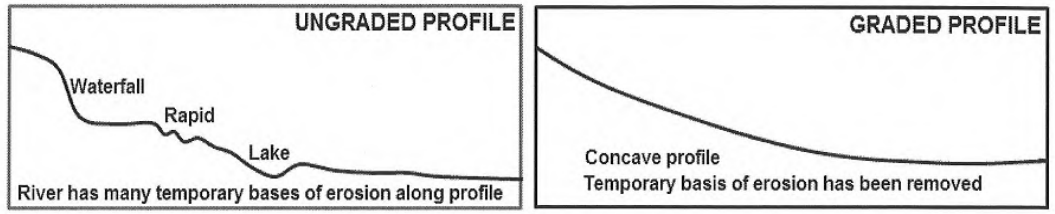
LONGITUDINAL- AND CROSS PROFILES

Longitudinal profile: The 'side view' of a river from its source to its mouth

Cross profile: The shape of the river valley from one bank to the opposite bank

COURSE/ STAGE	UPPER COURSE (YOUNG STAGE)	MIDDLE COURSE (MATURE STAGE)	LOWER COURSE (OLD STAGE)
CROSS PROFILE			
GRADIENT	Steep	Gradual	Almost flat
SPEED	Flows fast	Flows slower	Flows very slowly
PROCESSES	Downward erosion	Lateral erosion	Deposition
LANDFORMS	- Waterfalls - Rapids - Spurs	- Meanders - Spurs	- Sandbanks - Marshes - Braided stream - Meanders - Oxbow lakes
LONGI-TUDINAL PROFILE			
VIEWED FROM ABOVE			

GRADED AND UNGRADED RIVER PROFILES

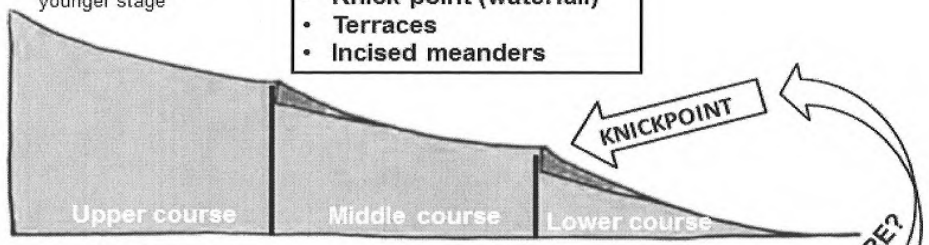


RIVER REJUVENATION

When there is an increase in the speed and erosive power of a river. It has more energy to erode downwards, causing a new valley in the old one.

REJUVENATED:
Made to look younger. River showing renewed characteristics of a younger stage

FEATURES/LANDFORMS
- Knick point (waterfall)
- Terraces
- Incised meanders



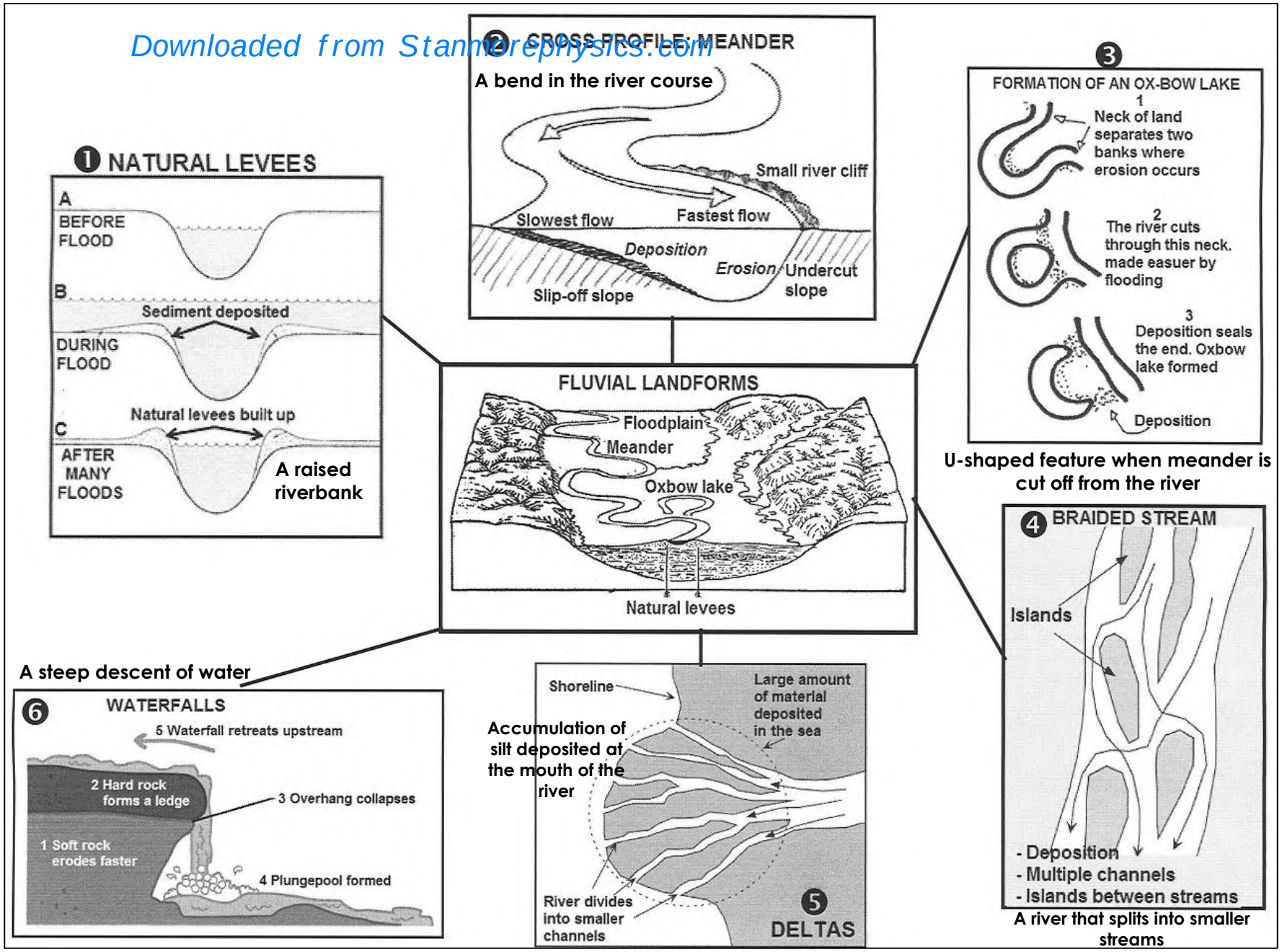
Young river flows fast | Mature river flows slower | Old river flows very slow

REJUVENATION
River starts to flow faster. Has renewed energy and increased erosion.

HOW?

- Drop in sea level
- Land rises
- Increase in rainfall
- Fast flowing tributary
- Stream piracy

You must be in a position to do/answer the following:
- Identify the process of rejuvenation on a diagram.
- Define the concept, rejuvenation.
- Explain how rejuvenation occurs.
- Identify/describe the features/landforms of rejuvenation.



TIP:

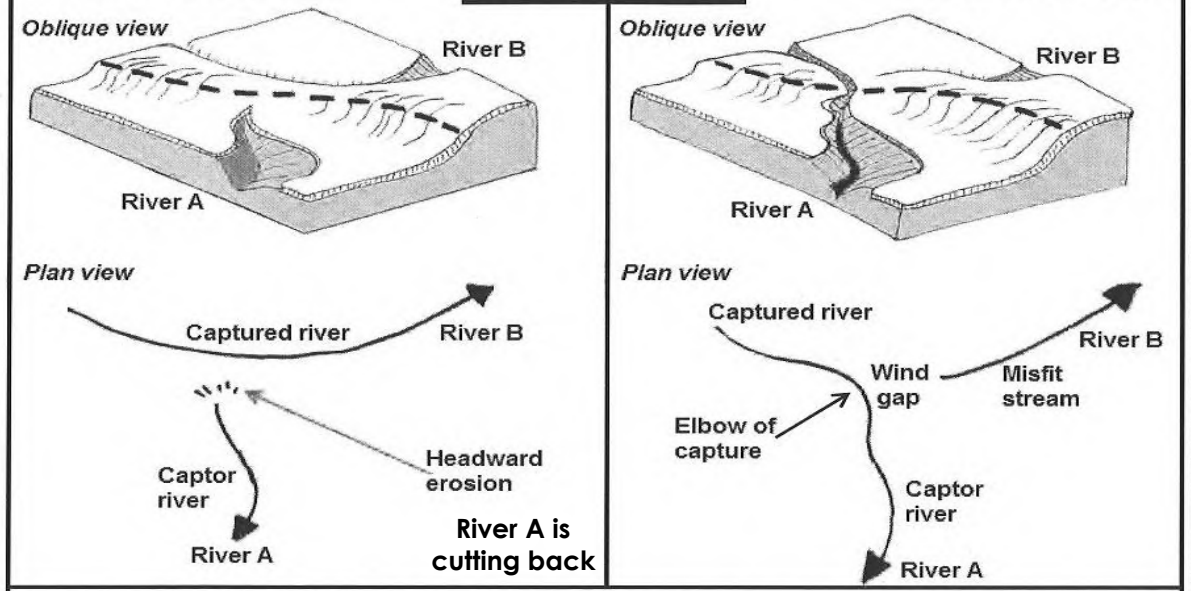
You must be able to:

- **Define** a natural levee, meander, oxbow lake, braided stream, delta and a waterfall (source 1-6)
- **Identify** all 6 fluvial landforms/features on diagrams and maps e.g., topographic maps (source 1-6)
- **Describe** how all 6 features develop/form (source 1-6)
- **Draw** a correct labelled cross-section of a meander (source 2)

STREAM PIRACY

1. *Stream piracy (river capture) takes place when the energetic stream (captor stream) cuts back and intercepts (takes) the water from the other river (captured/beheaded river).*

2. BEFORE CAPTURE — STREAM PIRACY — 3. AFTER CAPTURE

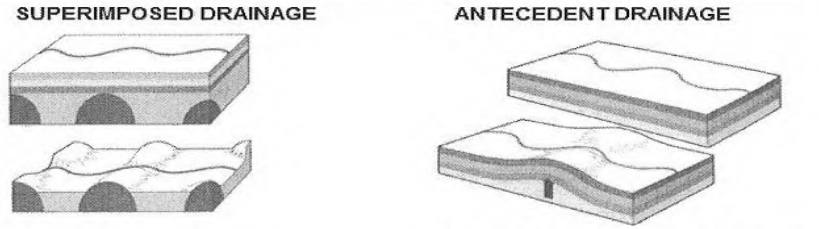


Headward erosion at river A resulted in the capturing of the water of river B.

4.

FEATURE	EXPLANATION
Captor river	The energetic stream that intercepts (takes) the water of the other river.
Captured river	The river which water was intercepted (taken) by the captor river.
Misfit stream	The river that has lost its water. (Also called beheaded stream)
Elbow of capture	The place where stream piracy has taken place
Wind gap	The dry river valley between the elbow of capture and the misfit stream
Waterfall	May form at the point where the captured river flows into the captor river

5. **SUPERIMPOSED AND ANTECEDENT DRAINAGE**



The river is younger than the features it flows over and erodes into.

The river is older than the structures it flows over

TIP:

You must be able to:

- **Define** stream piracy (source 1)
- **Define** headward erosion, captor river, captured river, misfit stream, elbow of capture, wind gap and waterfall (source 4)
- **Identify** where headward erosion occurs, where the captor river, captured river, misfit stream, elbow of capture and wind gap is (source 2)
- **Draw** a labelled line sketch/plan view of stream piracy after capture has taken place (source 3)
- **Define** superimposed and antecedent drainage (source 5)
- **Describe** superimposed and antecedent drainage (source 5)

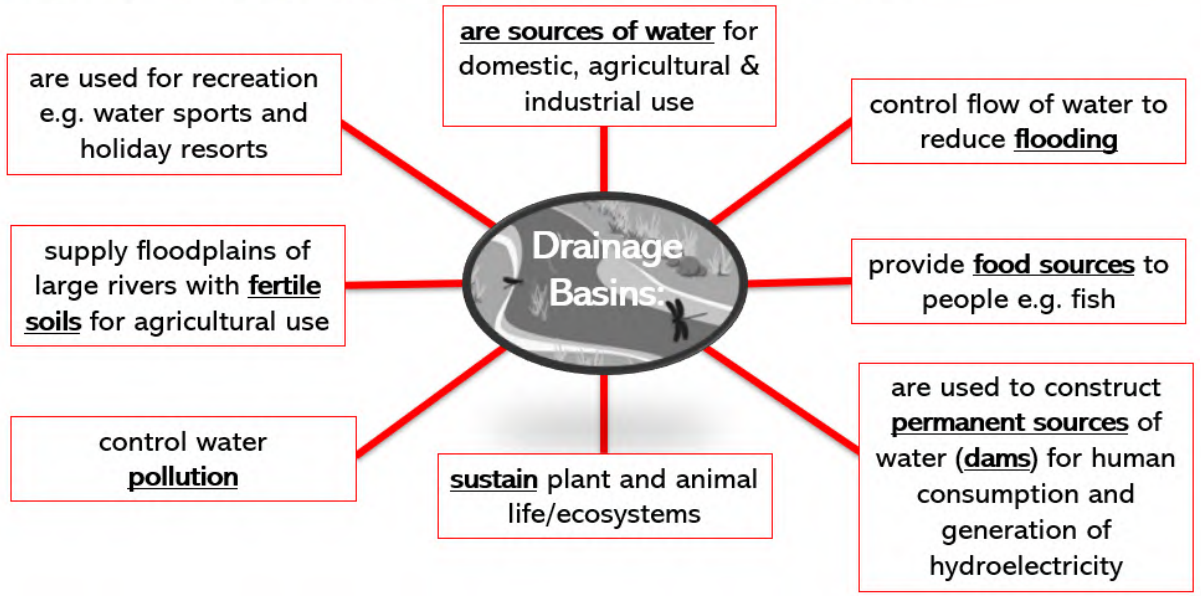
4. CATCHMENT AND RIVER MANAGEMENT

What is it? What is the impact? How can it be managed?

Why is it important to manage drainage basins and catchment areas?

See mind map

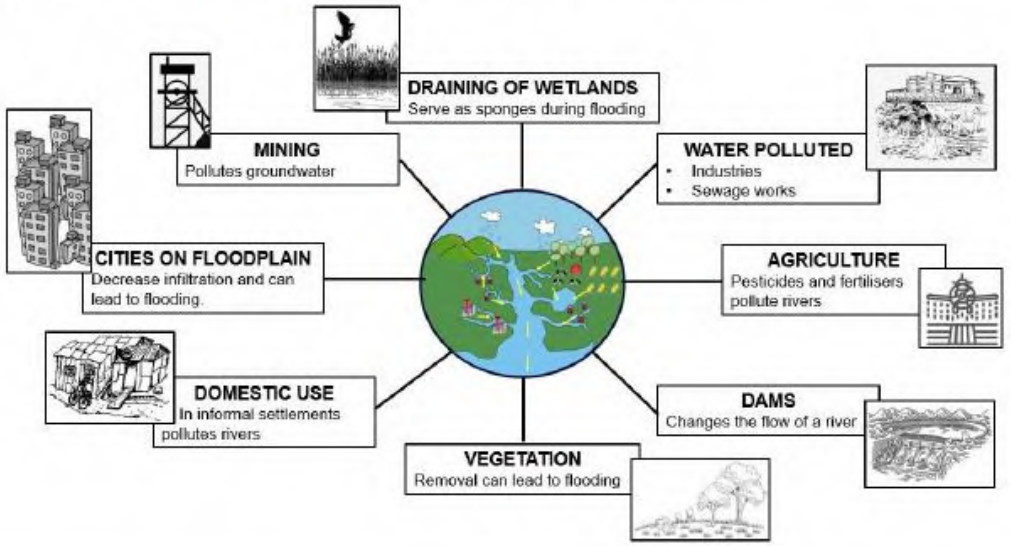
Importance of managing drainage basins and catchment areas



What is the impact of people on drainage basins and catchment areas?

There are of course more impacts. You must be able to identify the impacts of people on diagrams or in case studies

Impact of people on drainage basins and Catchment areas



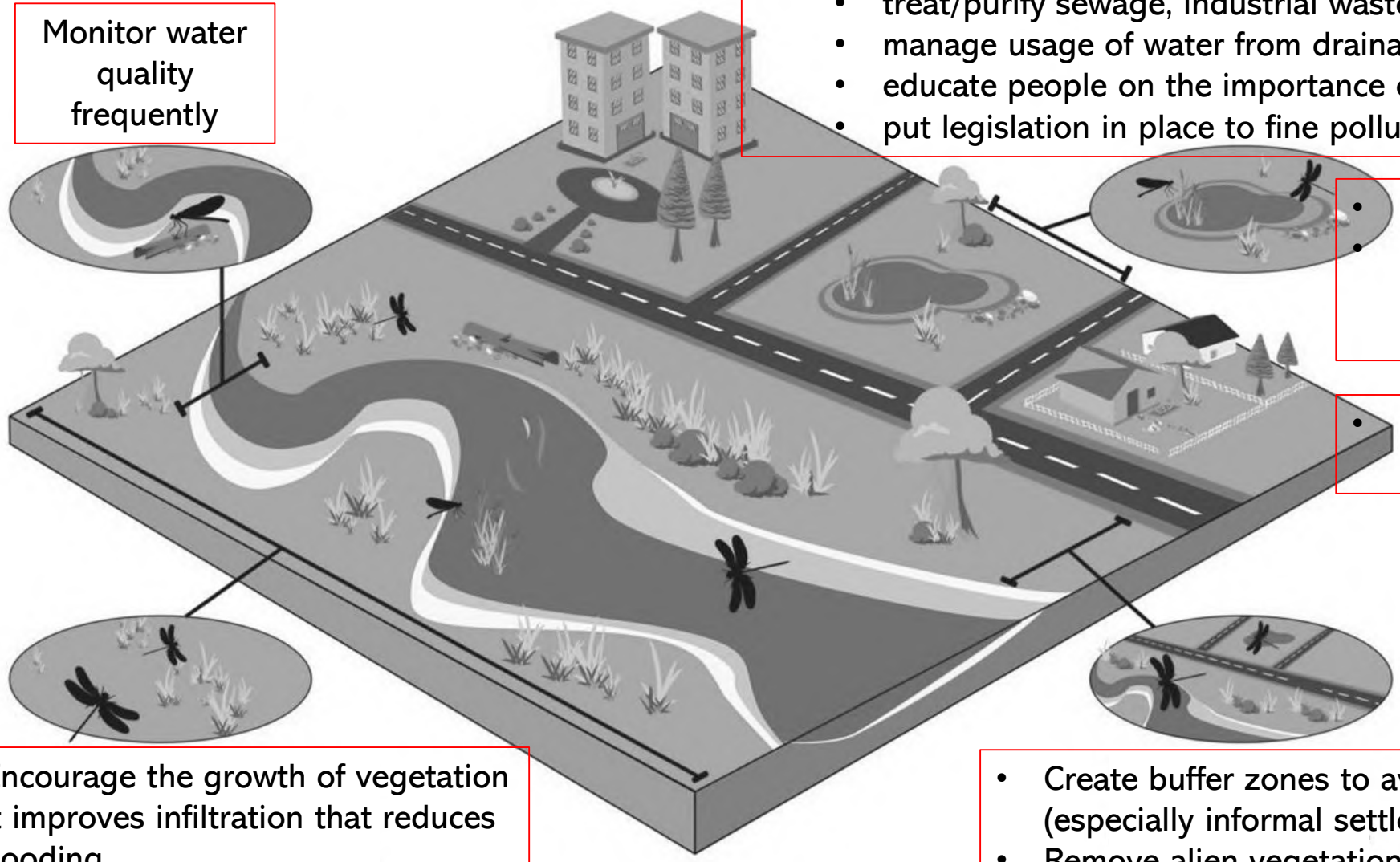
How must we manage drainage basins and catchment areas?

STRATEGIES:

Monitor water quality frequently

Municipalities must:

- treat/purify sewage, industrial waste water for re-use
- manage usage of water from drainage basins
- educate people on the importance of drainage basins
- put legislation in place to fine polluters



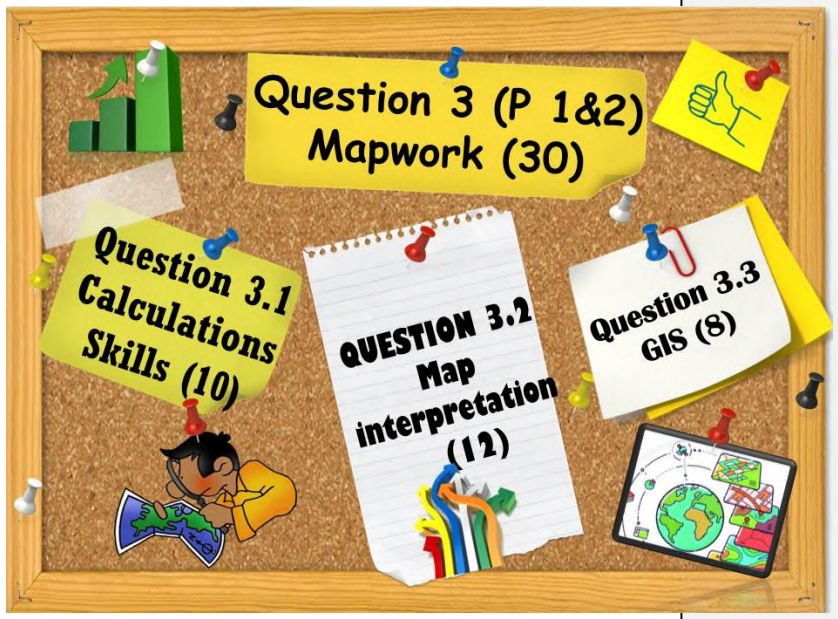
- Protect wetland areas
- It acts as a sponge - slowly releases water reducing flooding

- Monitor overgrazing to reduce erosion

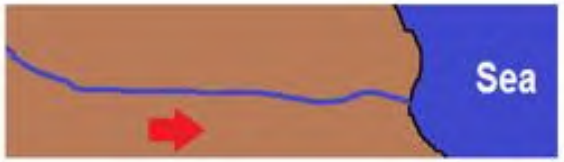
- Encourage the growth of vegetation
- It improves infiltration that reduces flooding

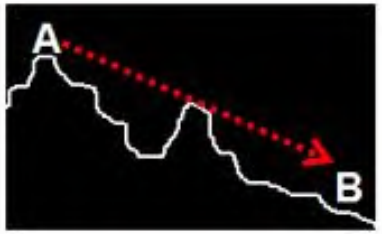
- Create buffer zones to avoid development (especially informal settlements) too close to rivers
- Remove alien vegetation – it uses lots of water

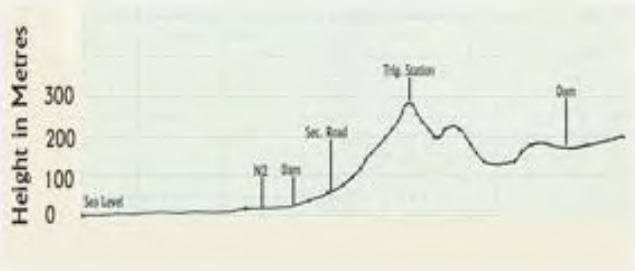
Question 3
Mapwork

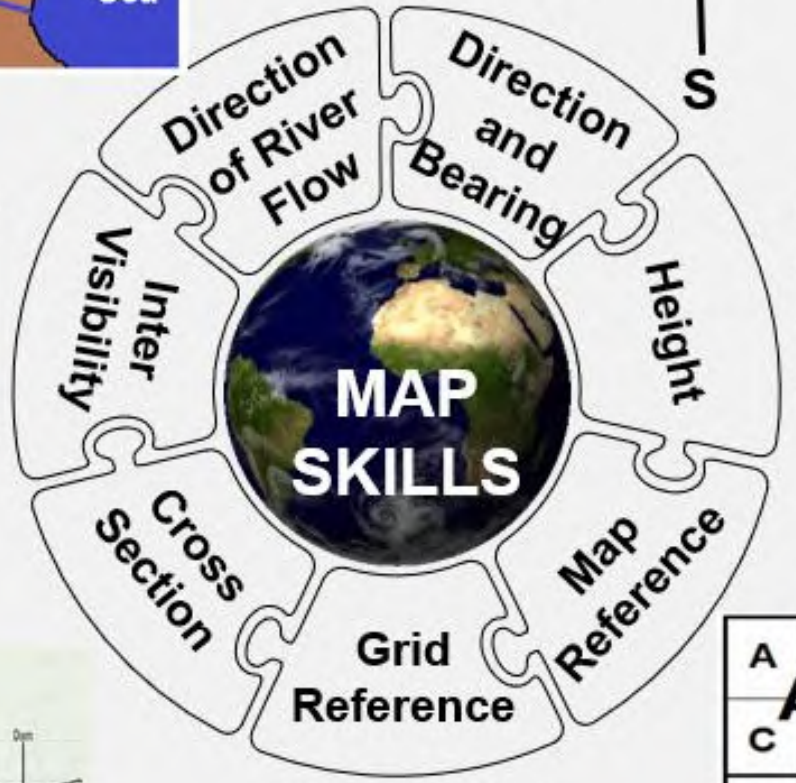


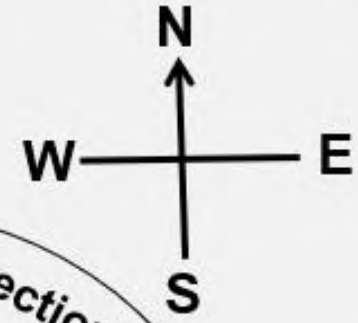
You must be able to do these map skills to answer Question 3





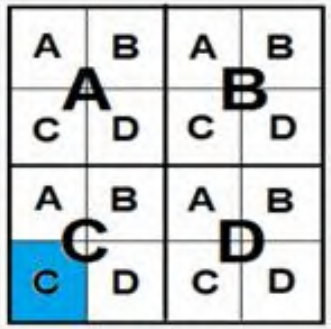






- Contours
- Trig. Stations
- Spot heights
- Benchmarks

33° 22' 18" S
18° 34' 42" E



Calculations

DISTANCE

$$\frac{\text{Map distance x Scale}}{100\,000}$$

Answer in km

1

AREA

L x b

Answer in km²

2

GRADIENT

$$\frac{\text{VI (Height)}}{\text{HE (Distance)}}$$

No units (1:23)

3

MAGNETIC DECLINATION

4

MAGNETIC BEARING

Magnetic declination

+

Bearing

5

VERTICAL EXAGGERATION

6

$$\frac{\text{Vertical scale}}{\text{Horizontal scale}}$$

Answer = X Times

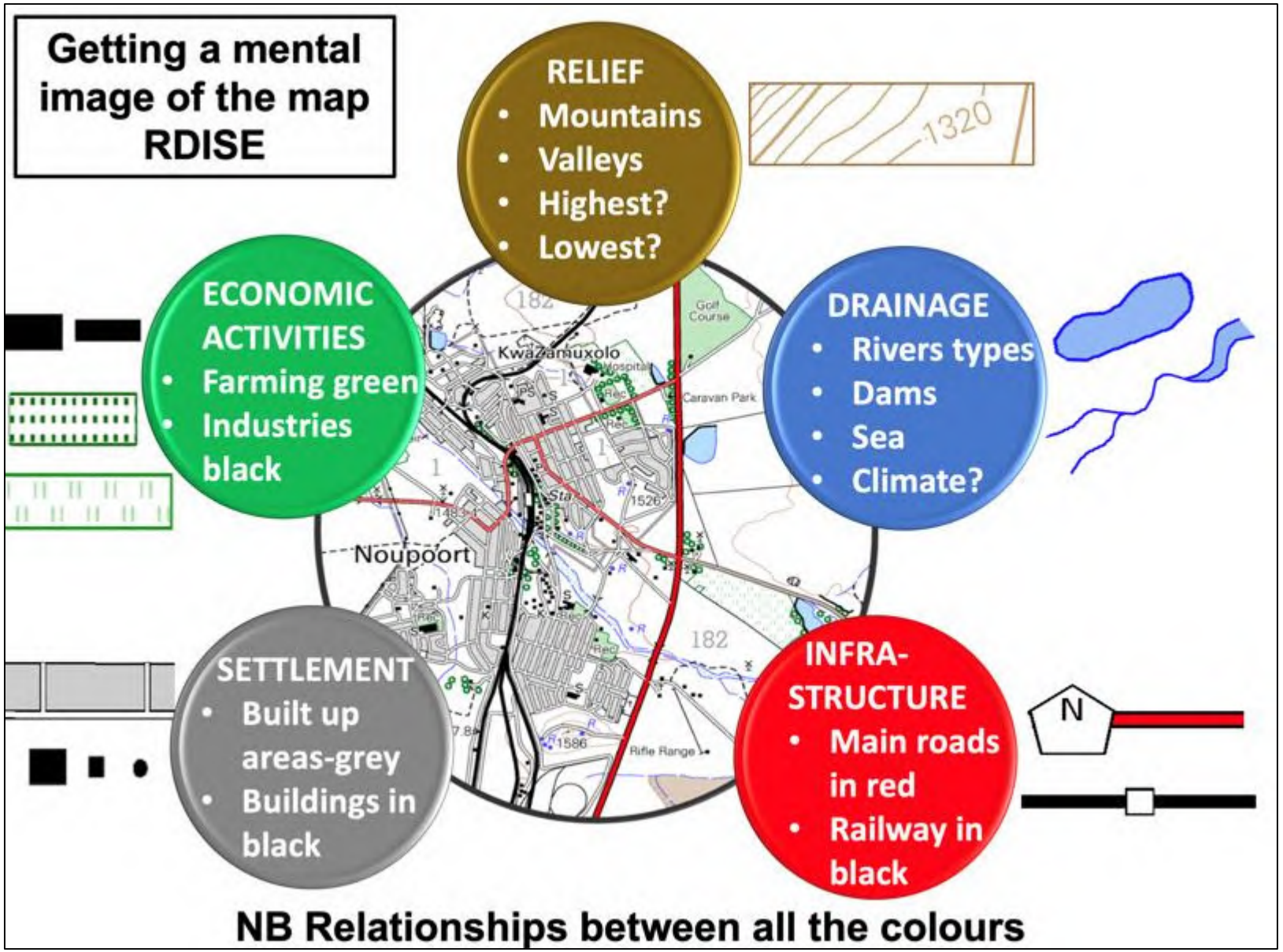
Make sure that you can do all these calculations for Paper 1

CALCULATION TIP:

Make sure you:

- Know the formula
- Write down the formula
- Measure in the correct unit as taught
- Show all steps in your calculations
- Indicate the unit of measurement in your final answer for distance, area and magnetic bearing
- Indicate **Times** (X) in your final answer for vertical exaggeration e.g., 20 times
- Indicate only ° & ` in your final answer for magnetic bearing
- Indicate ° & ` and west of true north in your final answer for magnetic declination

Map Interpretation



TIP:

You must be able to identify and apply the content of … on the map.

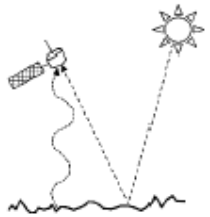
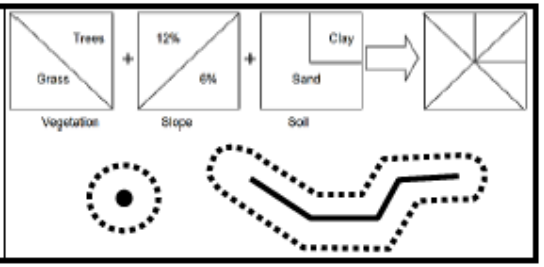
- Valley climates
- Urban climates
- Drainage basins
- Types of rivers
- Laminar and turbulent flow patterns
- Stream ordering
- Drainage density
- Drainage patterns
- Stages of a river (upper, middle, lower course)
- Fluvial landforms

1 Know the definition of GIS
2 Know all concepts and terminology.

Geographic Information Systems

Start with the definition and systematically work your way to the right and downwards.

DEFINITION: A computer system of hardware, software and methods (1) where spatial data (georeferenced) (2) together with non-spatial data (attributes) (3) are captured, managed, manipulated, analysed, modelled and displayed in order to (4) solve complex planning and management problems. (5)

Components ❶	Hardware, software, data, people and methods	Computer and GIS programme, screen, keyboard, mouse, printer, scanner and digitizing table	Capturing, importing, managing and display of data	• *Capturing*: keyboard, digitizing, scanning • *Importing*: digital products • *managing*: accuracy and integrity, data sharing, data standardisation and data security
Data ❷	**Data sources** • Topographic maps • Satellite images • Aerial photos • Fieldwork • Administrative records	**Remote sensing** 	• the collecting of information • about the earth's surface • With sensors on platforms such as weather balloons, aeroplanes or satellites • using the sun's energy that is reflected or emitted by the earth's surface *without being in physical contact with the object*	**Resolution** refers to the ability of the sensor to create a sharp and clear image *Spatial resolution*: quantity of detail that can be detected - determined by the pixel size e.g.0,5m ; 10m; 30m *Spectral resolution*: sensor detects over several spectral bands e.g. blue, green, red,
	Data types Spatial dataspatially linked data/geo-referenced data)	All geographic objects on the earth's surface. *Maps*: point, line, area (PLA) *GIS*: node, vector, polygon (NVP)	Two data structure types	**Raster** (pixels) **Vector** (PLA=NVP)
				High resolution • Small pixels • Many pixels • High quality image **Low resolution** • Large pixels • Few pixels • Poor quality image
	Non-spatial data (attribute data)	Characteristics, features, description of the spatial (geographic) objects	In table format: qualitative and quantitative	Used for querying and analyses
Functions ❸	capturing, managing, manipulater, analyse, model and display	*Data manipulation* (change/alter)	• Integration(1) • Querying(2) • Buffering(3)	• (1) Combining two or more layers in order to create new layer • (2) Solving a geographic problem • (3) A zone around a certain geographic object at a specified distance to "something in or out".
				
People ❹	• GIS technician	Data capturers, data processors, GIS programmers and Data managers	• Capturing, importing and managing	Data sharing, data standardisation and data security becomes highly important Organisations such as: municipalities, nature conservation, government departments, developers, police and defence force, mines, etc.
	• GIS users	All users of spatial products	• Maps. Orthophotos, aerial photos and satellite images • Attribute analyses and statistics	
Purpose ❺	to solve complex planning and management problems	Answers/solutions for geographic questions	Who, what, where, why, when, how	

GIS TIP:

- Make sure you know all your GIS concepts.
- Make sure you can apply some of the GIS concepts on the map e.g., buffering.