Western Cape Government
Education

Directorate: Curriculum FET

TELEMATICS 2016

GEOGRAPHY
Grade 12

Dear Grade 12 Learner

The Telematics Teaching Project stems from cooperation between the Western Cape Education Department and the Stellenbosch University.

To be able to have success at the end of the year it will be very important to keep on learning and applying the prescribed key concepts/processes and process skills in the different knowledge areas throughout the year. Make sure that you are able to analyse and interpret geography related concepts in newspapers and magazines to the concepts and content you have discussed in the classroom. In addition spend at least a few hours per week studying / reading / making summaries about the four components in the theory section and attempt to integrate it with the mapwork section.

This resource pack includes the following:

- **Theory**: Mindmaps of the lessons that will be broadcasted. This is a good summary of your class notes and can help you with your examination preparation.
- **Mapwork**: Questions and answers as well as a guideline to calculations.
- **GIS**: Notes and applications of important GIS concepts and a guide as to how to use GIS in a given situation or scenario.

TELEMATICS TEACHING SCHEDULE FOR 2016

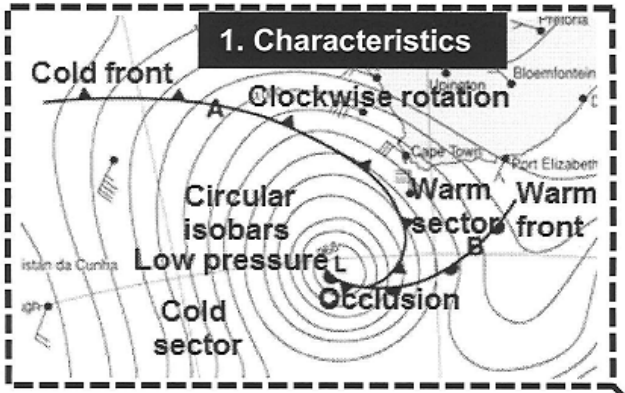
GRADE 12 GEOGRAPHY SUPPORT – FIRST TERM			
DATE		**TIME**	**TOPIC**
Tuesday	2 February	16:00 – 17:00	Climate
Tuesday	1 March	16:00 – 17:00	Geomorphology

GRADE 12 GEOGRAPHY SUPPORT – SECOND TERM			
DATE		**TIME**	**TOPIC**
Thursday	14 April	16:00 – 17:00	GIS

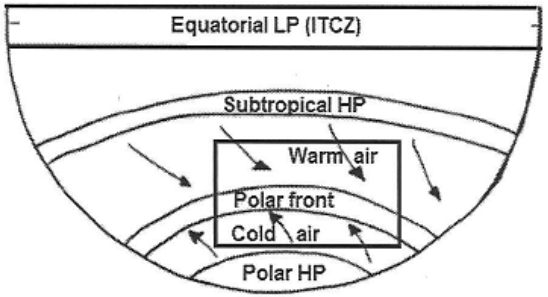
GRADE 12 GEOGRAPHY SUPPORT – THIRD TERM			
DATE		**TIME**	**TOPIC**
Tuesday	19 July	16:00 – 17:00	GIS
Wednesday	17 August	16:00 – 17:00	Mapwork

MID-LATITUDE CYCLONES

1. Characteristics



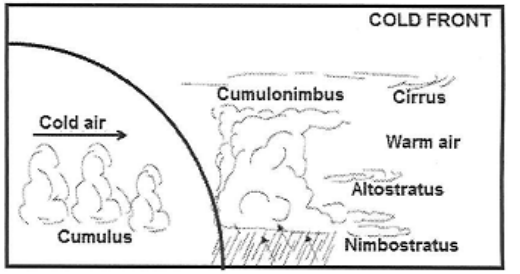
2. Where formed?

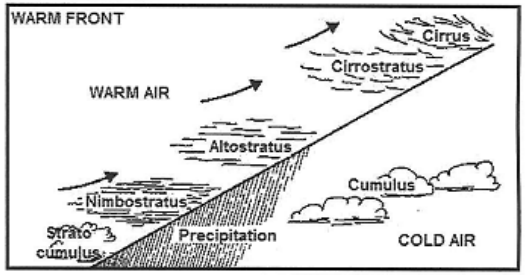


3. Conditions

- 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





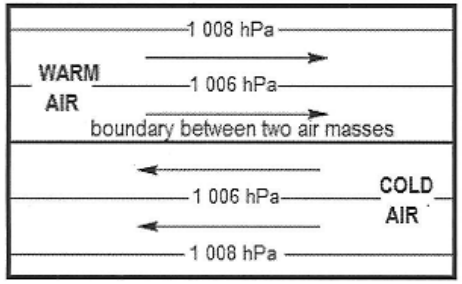
7. Impact

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

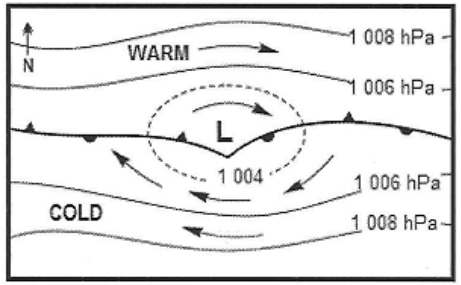
6. Weather patterns

	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

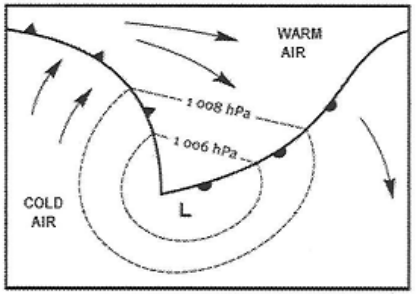
5. Stages



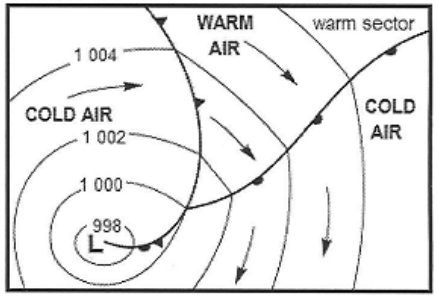
1 Initial stage



2 Development stage



3 Mature stage



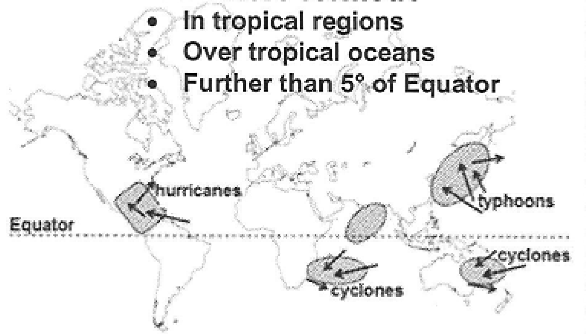
4 Occlusion

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?

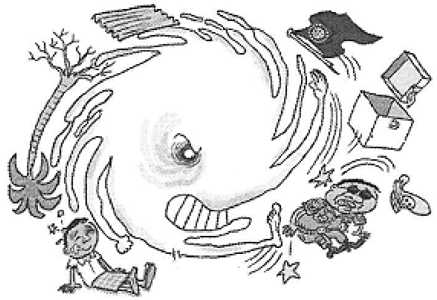
- In tropical regions
- Over tropical oceans
- Further than 5° of Equator



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

TROPICAL CYCLONES



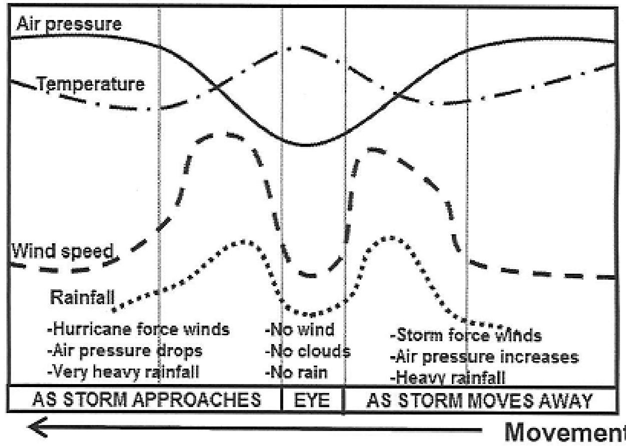
7. Strategies

- 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

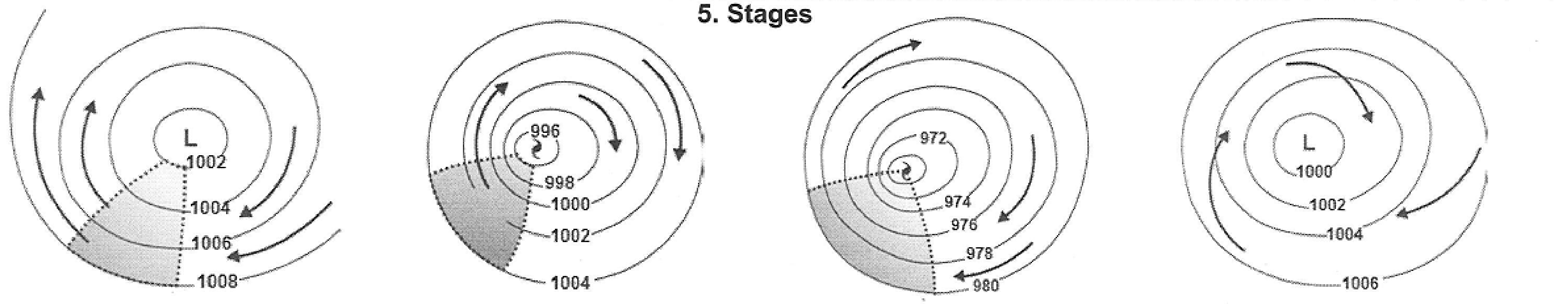
6. Impact

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

4. Weather patterns

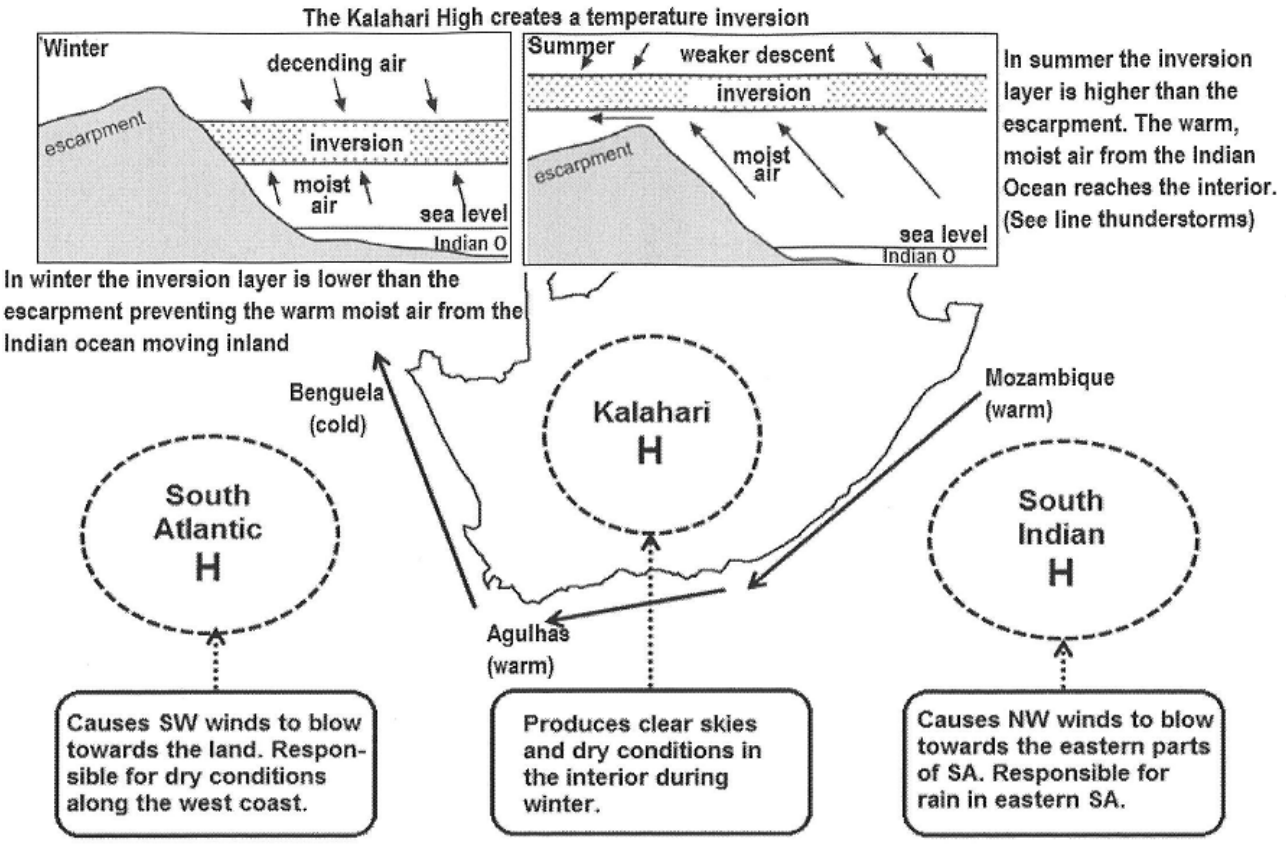


5. Stages

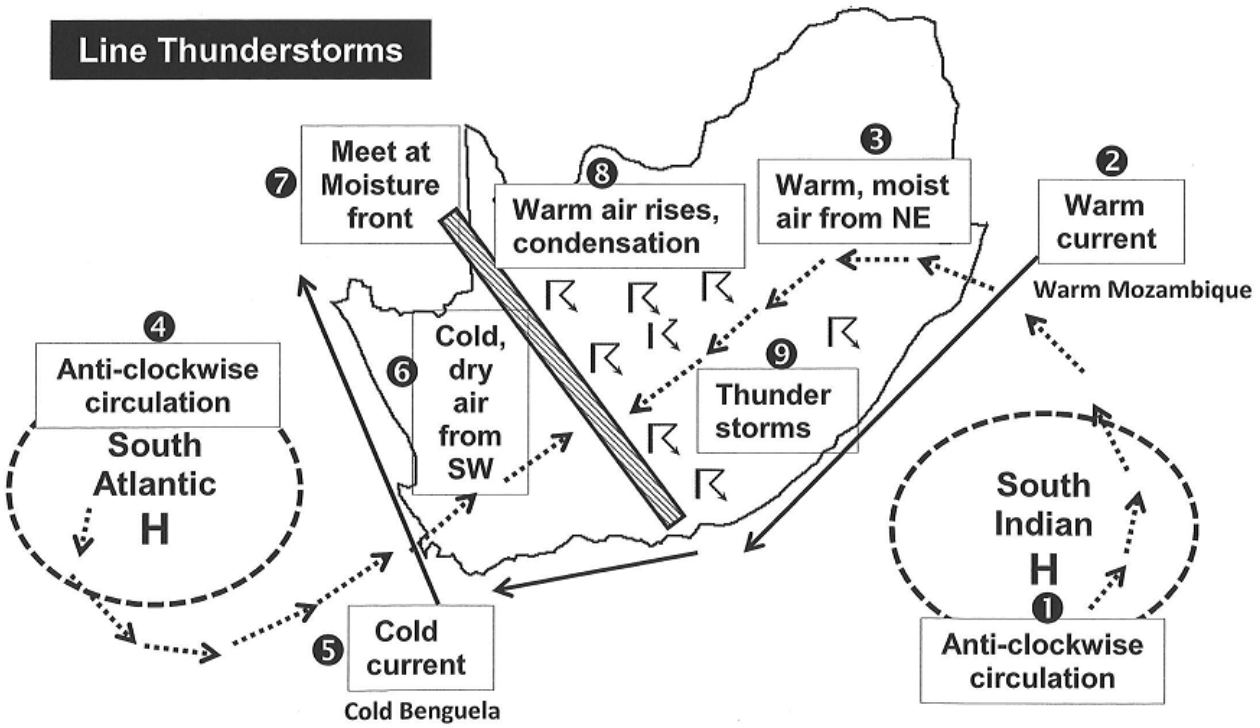


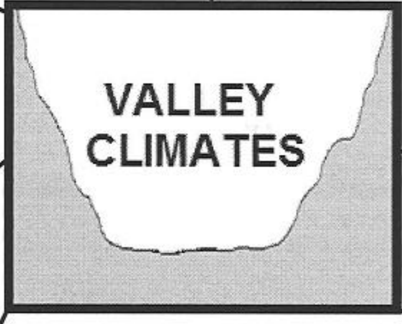
1 Formative stage(above 1000hpa) 2 Immature stage(below 1000hPa) 3 Mature stage(far below 1000hPa) 4 Degenerating stage(rises 1000hPa)

High pressure cells that affect the weather of SA

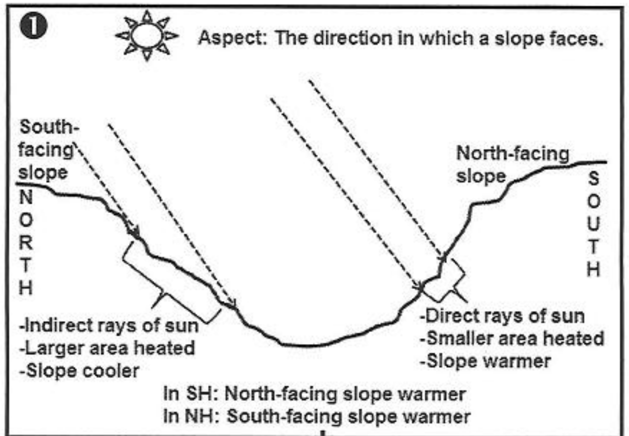


Line Thunderstorms

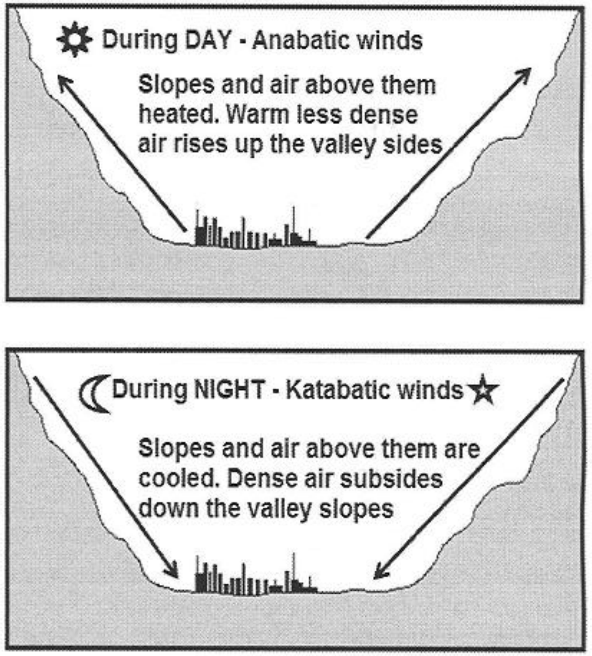




❶

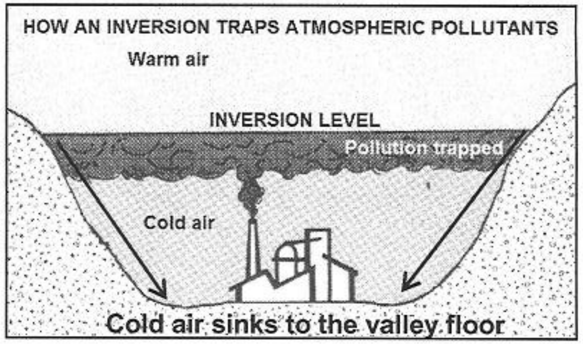


❷ Anabatic and Katabatic winds



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.



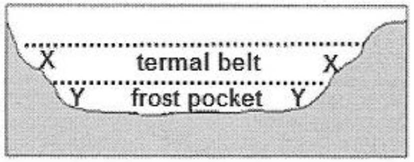
❹ Frost Pockets

- 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

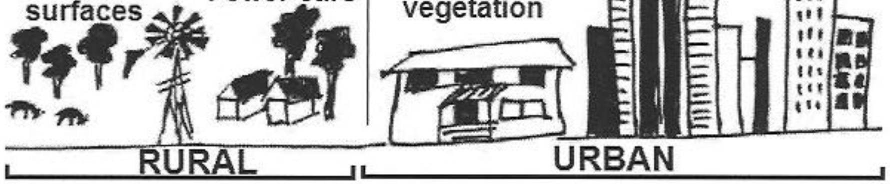
FARMING

- 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)

1 Why are cities warmer than rural areas?

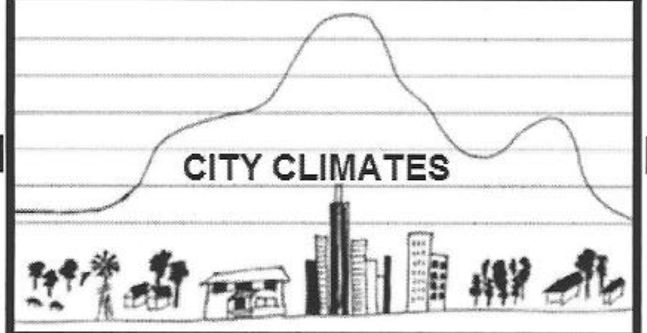
Rural
- Natural surfaces
- Less pollution
- Few/no industries
- Dense vegetation
- Small heat absorbing surfaces
- Less people
- Fewer cars

Urban
- Artificial surfaces
- Air conditioners
- Industries
- High-rise buildings
- Many motor cars
- Large dark surfaces
- Lots of people
- Pollution
- Lack of vegetation

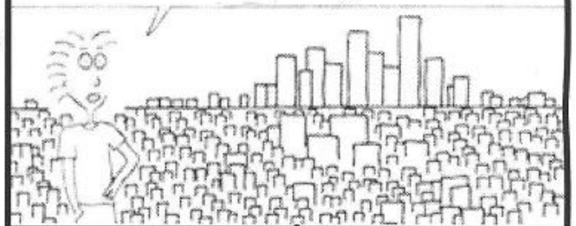


CAUSES
- Building materials: Concrete, tar, brick absorb heat.
- Tall buildings trap heat.
- Air pollution helps to trap heat.
- Burning of fuels.
- Transport
- Industries release heat.
- Central heating from shops.
- Large concentration of people.

CITY CLIMATES



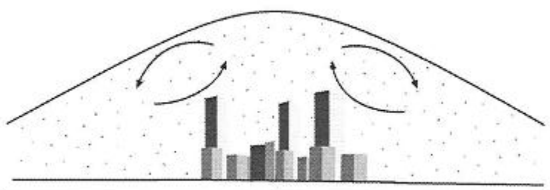
2 An urban HEAT ISLAND is when the city has warmer temperatures than the surrounding rural areas



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

3 POLLUTION DOME

Trapped mass of polluted air over the city



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

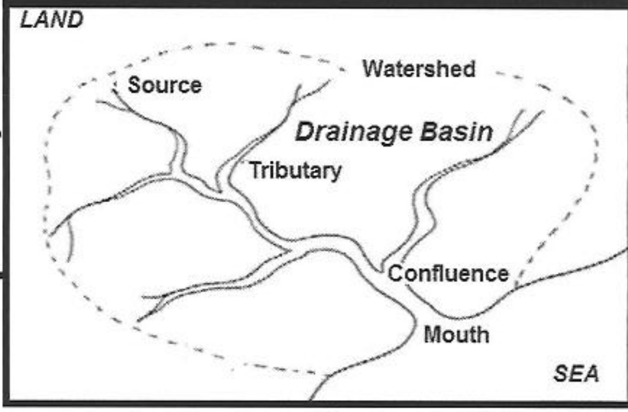
EFFECTS
- Insolation blocked during day.
- Precipitation increases as pollutants act as condensation nuclei.
- Triggers allergic reactions, breathing difficulties and asthma attacks.
- Lead poisoning from petrol fumes.
- Cause smog which reduces visibility.
- Global climate change

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

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

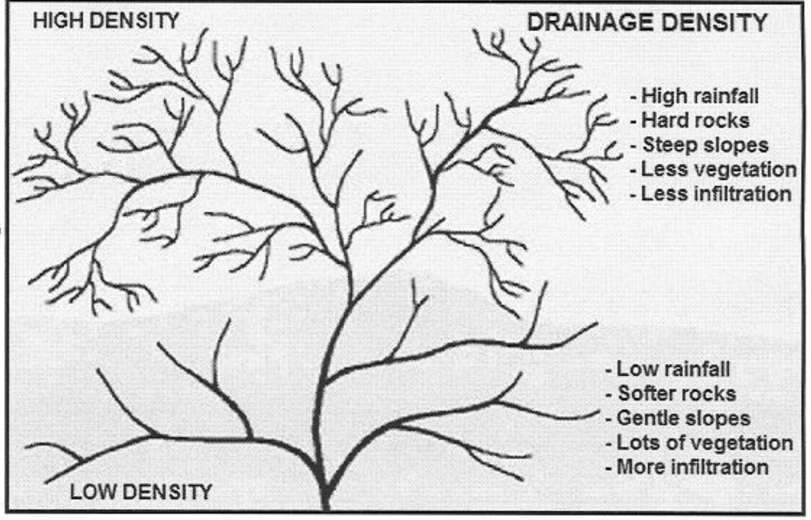
DRAINAGE BASINS



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

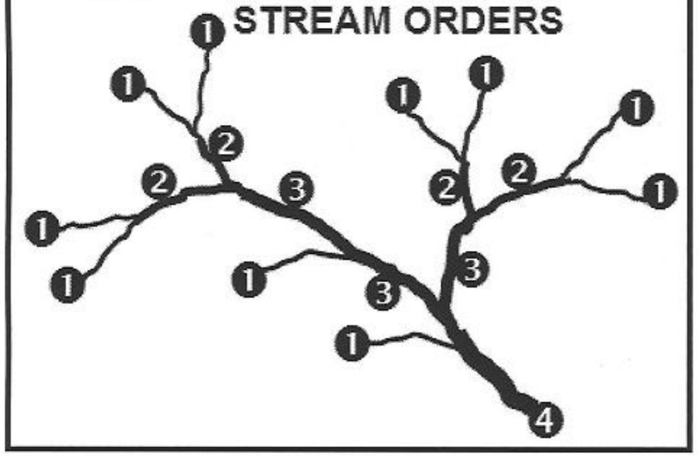
3 DRAINAGE DENSITY



HIGH DENSITY
- High rainfall
- Hard rocks
- Steep slopes
- Less vegetation
- Less infiltration

LOW DENSITY
- Low rainfall
- Softer rocks
- Gentle slopes
- Lots of vegetation
- More infiltration

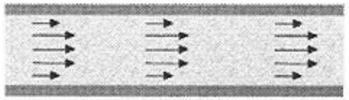
4 STREAM ORDERS



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

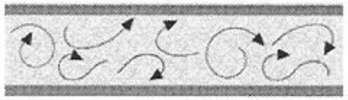
5 RIVER DISCHARGE

Laminar flow



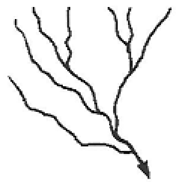
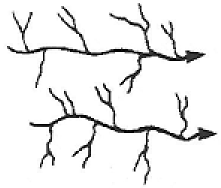
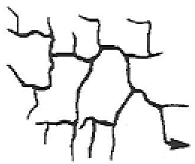
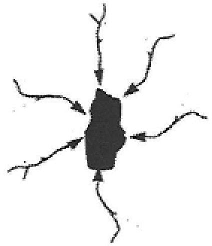
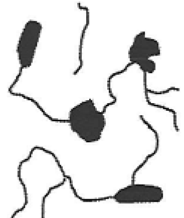
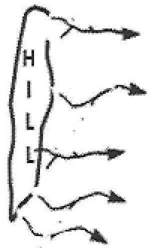
- Water flows as parallel sheets
- River bed is even
- Less erosion

Turbulent flow



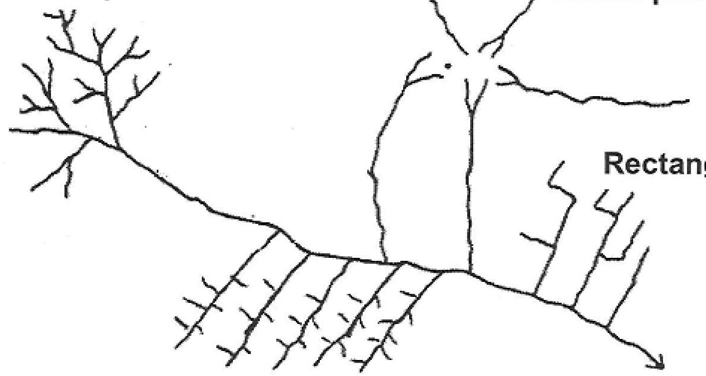
- Water flows bubbling/turbulent
- River bed is uneven
- More erosion

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:

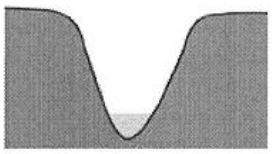
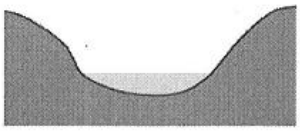
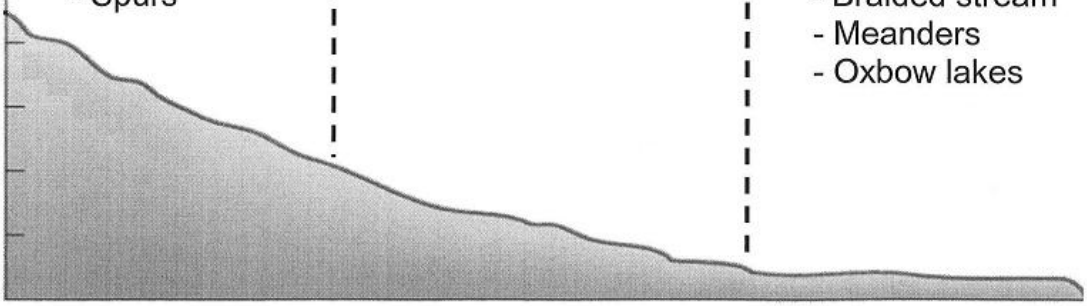
- Identify each of the patterns on diagrams.
- Identify stream patterns on topographic maps.
- Give a description of the patterns.
- Describe the underlying structures that caused the stream pattern.



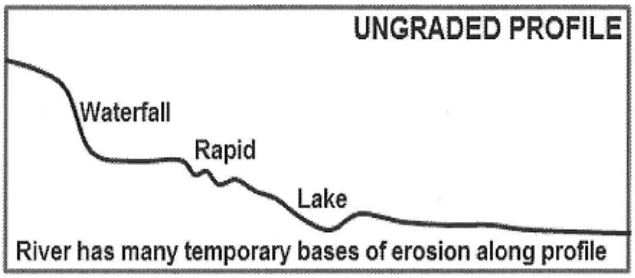
LONGITUDINAL- AND CROSS PROFILES

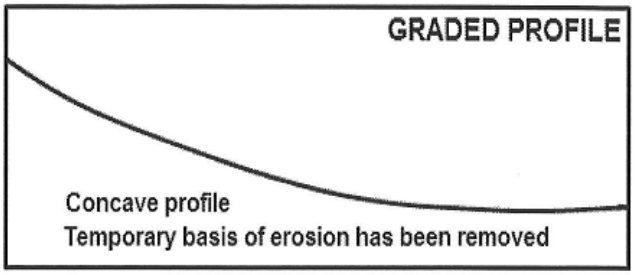
Longitudinal profile: The 'side view' of a river from its source to its mouth

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

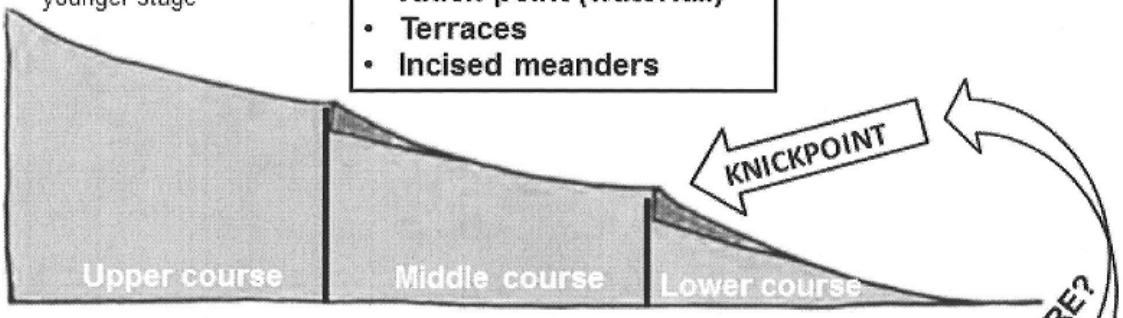




RIVER REJUVENATION

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

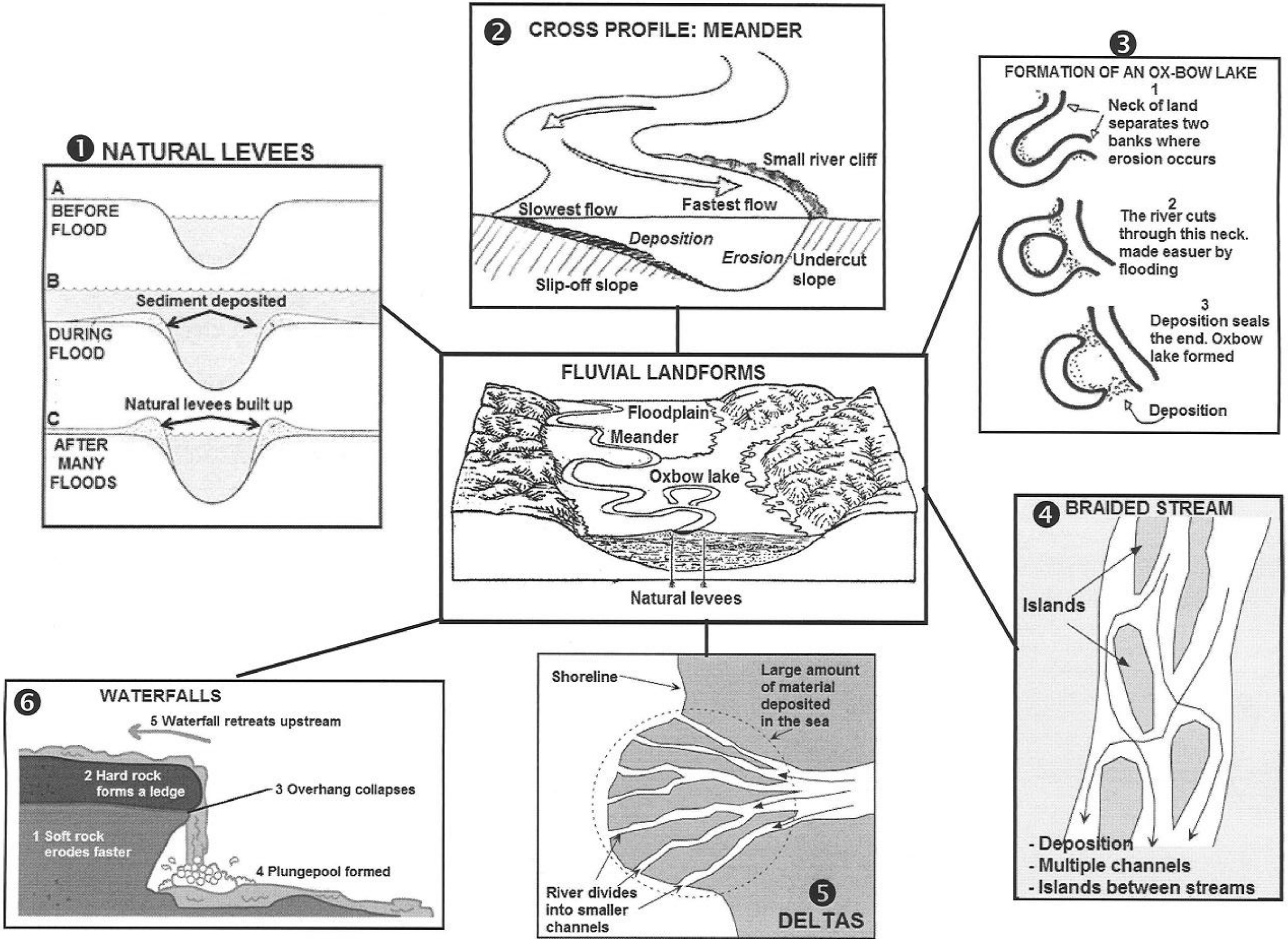
Old river flows very slow

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**

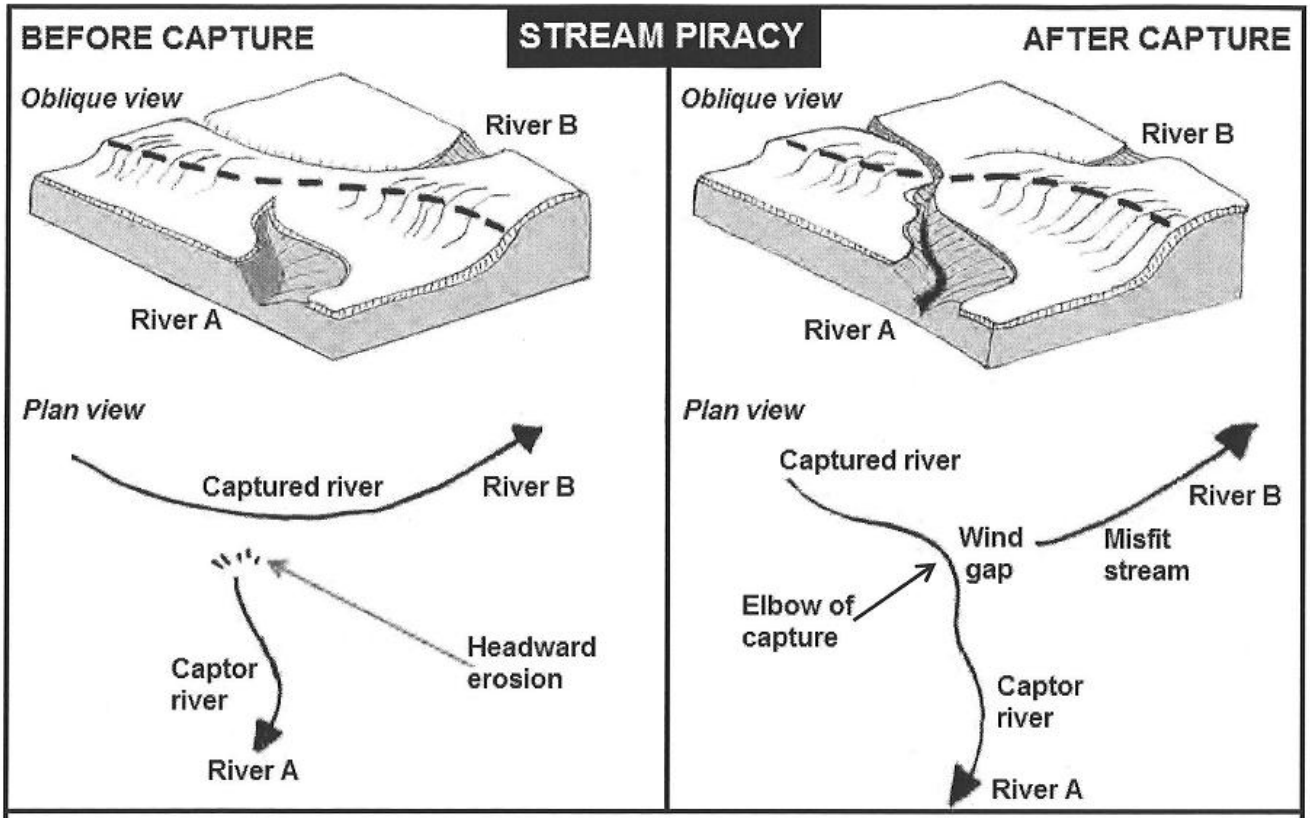
You must be in a position to do/answer the following:
- Identify the process of rejuvenation on a diagram.
- Define the concept, rejuvenation.
- Explain how rejuvenation occurs.
- Identify/describe the features/landforms of rejuvenation.



FLUVIAL LANDFORMS
Floodplain
Meander
Oxbow lake
Natural levees
1 NATURAL LEVEES
A
BEFORE FLOOD
B
Sediment deposited
DURING FLOOD
Natural levees built up
C
AFTER MANY FLOODS
2 CROSS PROFILE: MEANDER
Small river cliff
Slowest flow
Fastest flow
Deposition
Erosion
Undercut slope
Slip-off slope
3
FORMATION OF AN OX-BOW LAKE
1
Neck of land separates two banks where erosion occurs
2
The river cuts through this neck. made easuer by flooding
3
Deposition seals the end. Oxbow lake formed
Deposition
4 BRAIDED STREAM
Islands
- Deposition
- Multiple channels
- Islands between streams
6 WATERFALLS
5 Waterfall retreats upstream
2 Hard rock forms a ledge
3 Overhang collapses
1 Soft rock erodes faster
4 Plungepool formed
Shoreline
Large amount of material deposited in the sea
River divides into smaller channels
5 DELTAS

STREAM PIRACY

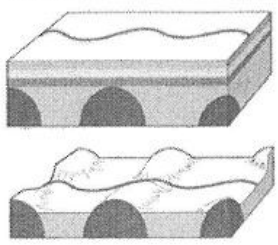
Stream piracy (river capture) takes place when the energetic stream (captor stream) cuts back and intercepts (takes) the water from the other river (captured/beheaded river).



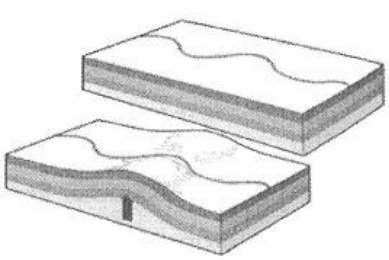
Headward erosion at river A resulted in the capturing of the water of river B.

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

SUPERIMPOSED AND ANTECEDENT DRAINAGE



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



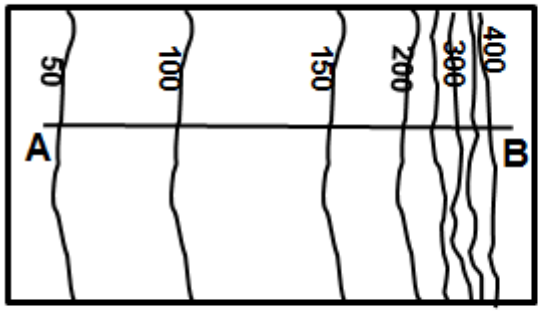
The river is older than the structures it flows over

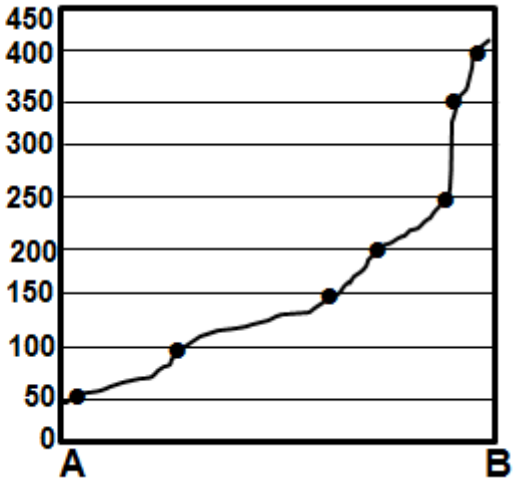
GEOGRAPHICAL MAPWORK SKILLS AND TECHNIQUES

1 CONTOURS AND SLOPES

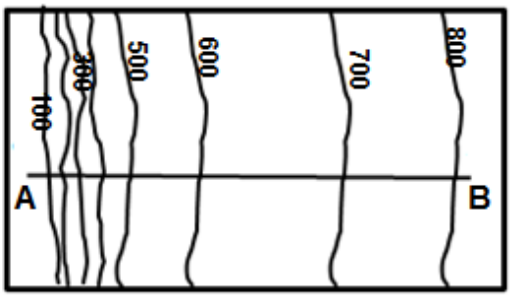
- Contour lines join places with the same height above sea level.
- Contours far apart show a gentle slope.
- Contours close together show a steep slope

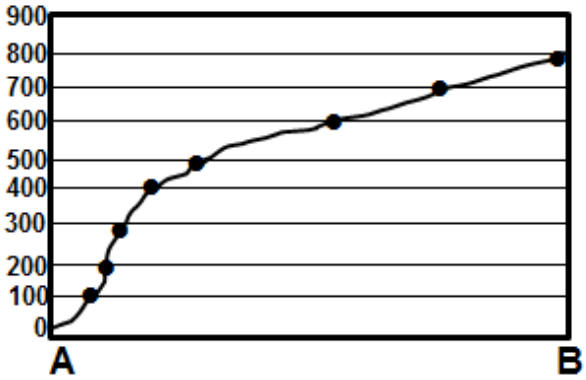
1.1 Concave slope



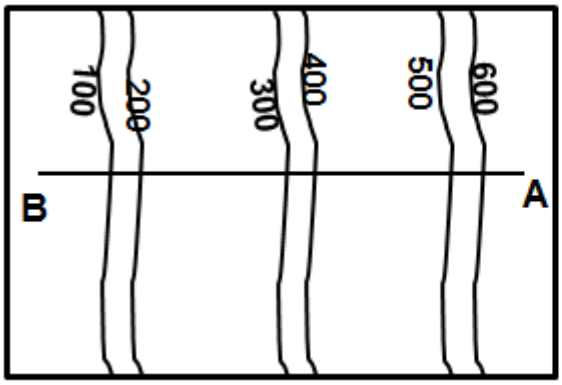


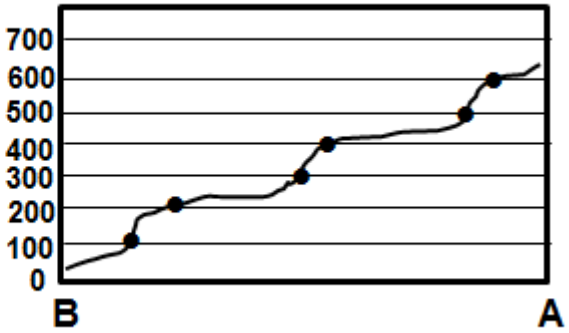
1.2 Convex slope



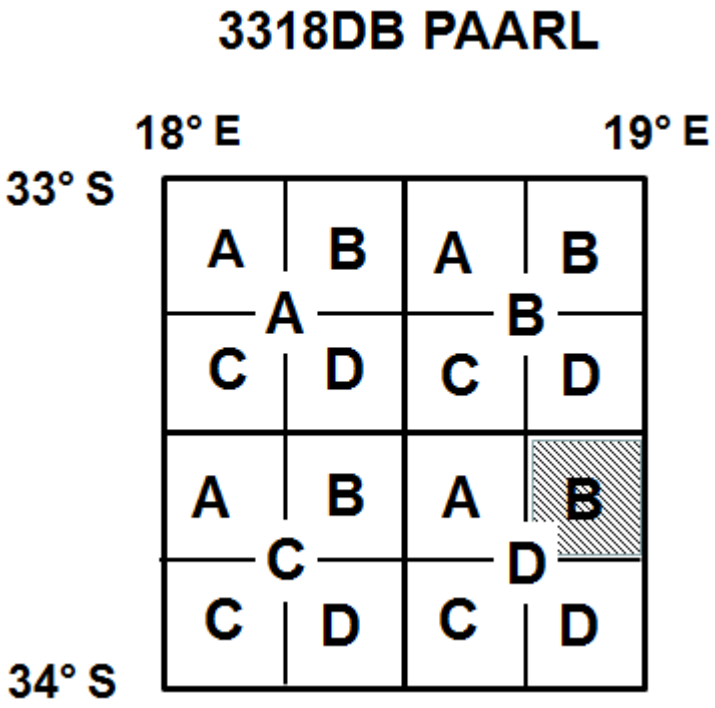


1.3 Terraced slope

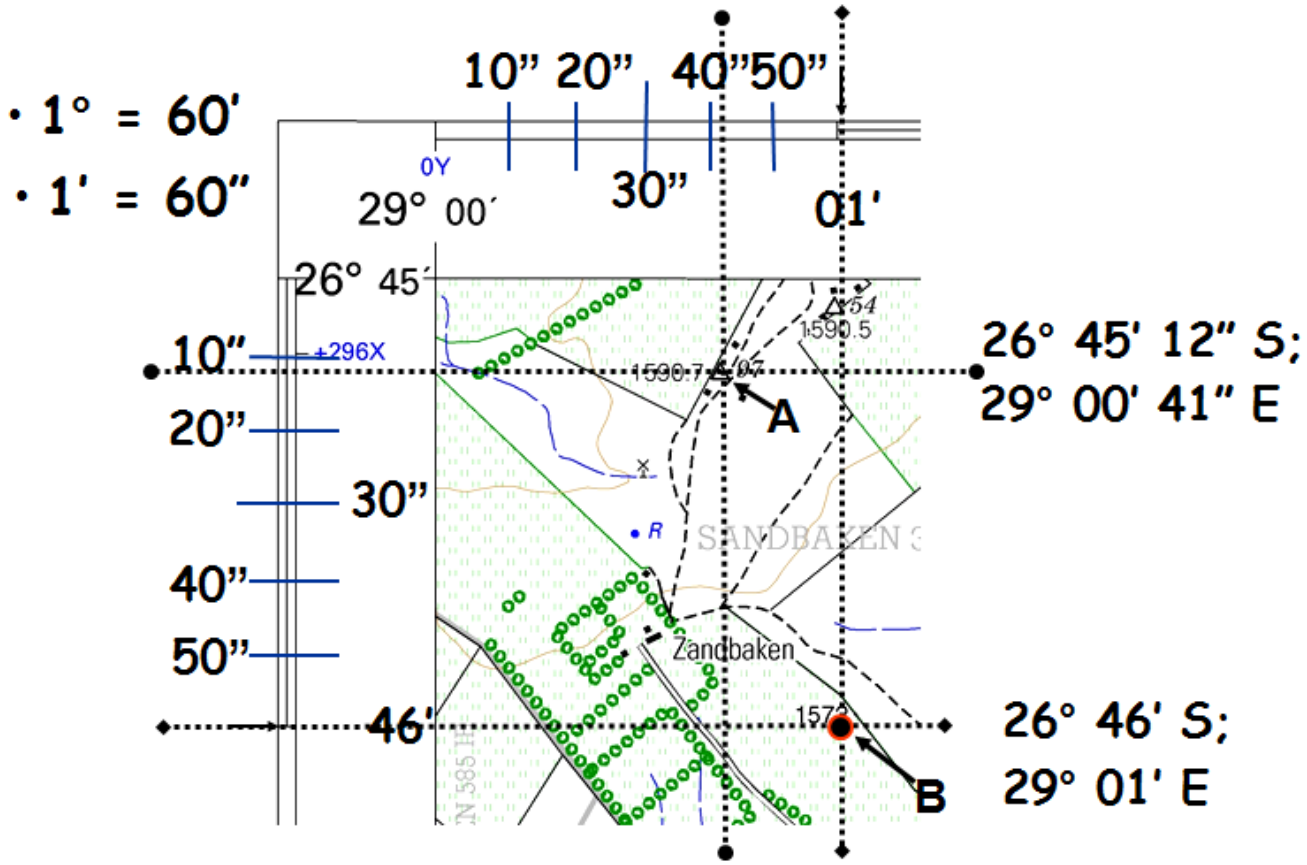




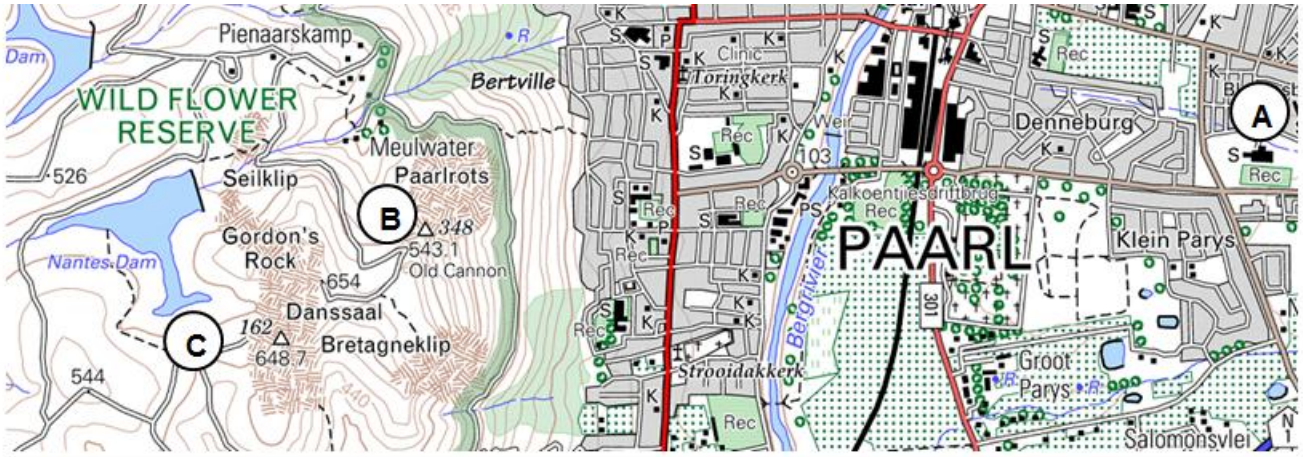
2 MAP REFERENCE

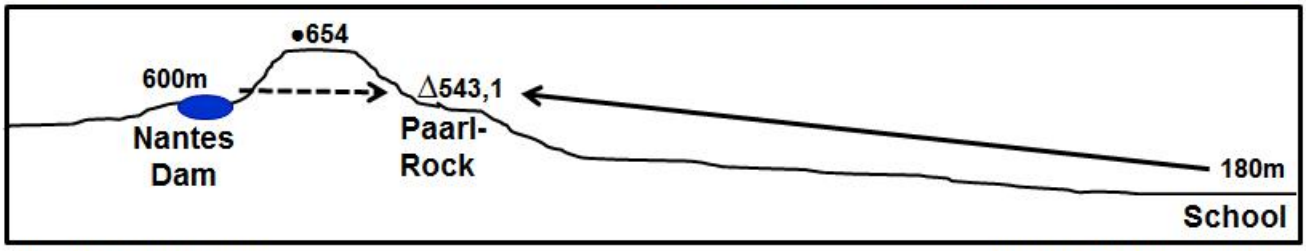


3 LOCATION IN DEGREES, MINUTES AND SECONDS



4 INTERVISIBILITY



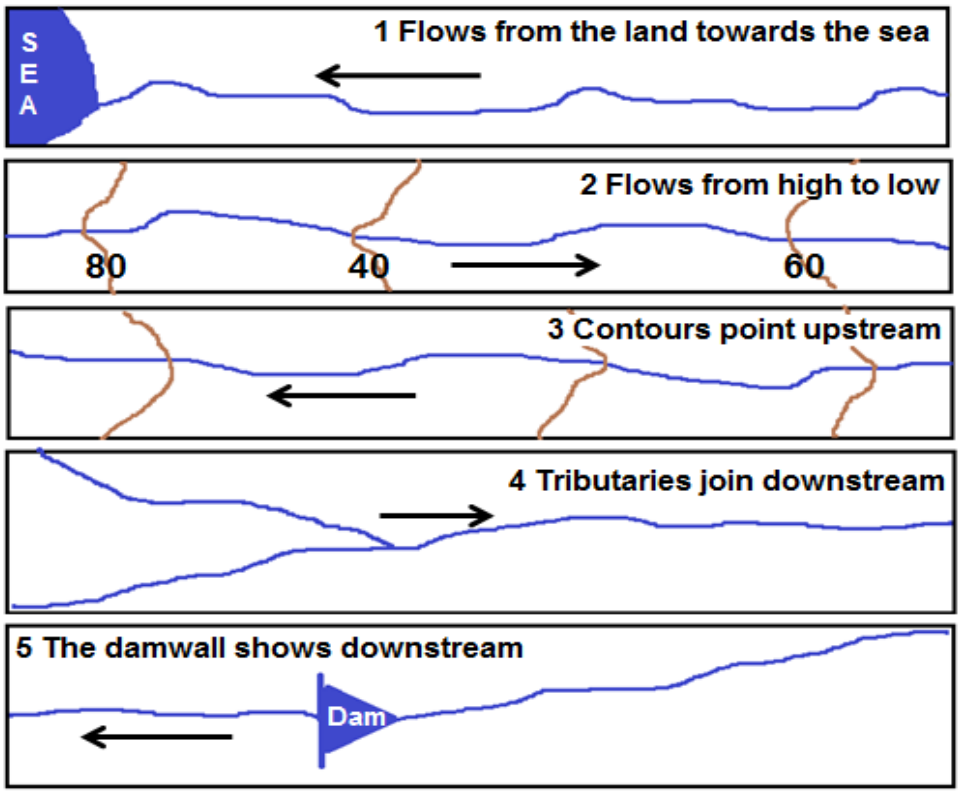


Paarl Rock is not visible from the dam

Paarl Rock is visible from the school

5 DIRECTION OF RIVER FLOW

The following methods can be employed in determining the direction of river flow.



READ AND INTERPRETATION OF MAPS AND ORTOPHOTOS

The goal of this guide is to empower you with regard to the answer of interpretation questions in mapwork. Remember that there is a large amount of information on the topographical and ortophoto map. To answer these questions successfully, you must know what to look at to get to the answer. Most of these questions come from previous exam question papers. Other questions have also been included. Remember that this is not a memorandum which has been given with the questions, but an attempt **to show what you should look at to get to the answers.** It is important to take note that **ALL** content, modules and skills can be assessed in the mapwork paper. Use this guide to study and prepare yourself for the mapwork question paper (Paper 2).

CLIMATOLOGY

1 Does the area receive seasonal rainfall or rainfall throughout the year?
Seasonal: Non-perennial rivers/ dams/ cultivated lands near rivers/ irrigation/ furrows

2 Which slope is the warmest?
The northward-facing slope – identify the northward-facing slope

3 In which direction will an airplane take off and land?
(Remember that airplanes take off and land against the wind.)

4 In which direction will the smoke blow if a fire is made in the evening on the middle slopes?
NB KATABATIC flow. Smoke will move DOWNWARDS towards the valley.

5 Where would you find temperature inversions?
In the valley

GEOMORPHOLOGY

1 Physical aspects influencing the construction of railways and roads.
Mountains/ steep slopes/ marshes/ rivers/

2 In which direction does the river flow?
-To the sea
-Always from high to low
-Contours bend upstream
-Dam wall on downstream side
-Tributaries join at acute angles

3 Identify the stream pattern in the area
Types: Dendritic, radial, rectangular, trellis – You must know what each one looks like

4 In what stage is the river on the map?
- Upper course: Steep/mountainous/waterfalls/short tributaries/ high watersheds
- Middle course: Gradual slope/ Longer tributaries/ low watershed
- Lower course: Very gradual/ meanders/ sand deposits/ marshes/ oxbow lakes

5 Name temporary basis found in the river
Waterfall/ dams/ lakes

6 What indication is there that rejuvenation occurred in the river?
Waterfall

ENVIRONMENTAL STUDIES AND SUSTAINABILITY

1 Evidence of nature conservation
Nature reserve/ hiking trail/ fire break/ game reserve

2 Evidence of conservational farming.
Anti-erosion walls/ camps/ rows of trees to reduce wind/ contour ploughing

3 Are there sources of air pollution in the area??
-Air pollution: Industries
-Noise pollution: Airport
-Water pollution: Factories / camping sites/ Power station near river

4 Identify environmental injustice caused by mining
Groundwater polluted/ landscape scarred/ food chain destroyed

ECONOMIC GEOGRAPHY

(a) PRIMARY ACTIVITIES (FARMING / MINING)

1 Commercial or subsistence farming?
Commercial: Good infrastructure/ irrigation/ large farms/ farm names/ cellar/ dipping tank/ experimental farm/ estate/ sugar mill/ service rail/ abbatoir/ dairy
Subsistence: Few roads/ footpaths/ no power lines/ small patches of cultivated land

2 Describe factors that advantage/disadvantage farming activities
Advantage: Rivers/ dams/ flat land/ power lines/ railway lines
Disadvantage: Steep slopes/ water scarce/ marshes

3 Identify mining activities
Excavations/ mine dump/ conveyer belt/ terraces/ names of mines/ old mines/ subsiding ground

4 Identifying of fishing activities
Fishing harbours/ fishermen's houses/ factories near coast

5 Identifying of forestry
Trees/ woodlands/ saw mill/ lookout towers/ fire break/ state forest

(b) SECONDARY ACTIVITIES (INDUSTRIES)

1 Describe the factors that influenced the location of the industries
Flat surface/ raw material/ Transport (name the types)/ power (power station, power lines, coal mines)/ water/ labour (residential areas)/ Market/ outskirts/

2 Heavy or light industries?
Heavy: Far from CBD/ railway transport/ Raw material-mining/ large spaces/
Light: close to CBD / road transport/ raw material - farming

(c) TERTIARY ACTIVITIES (SERVICES)

1 ***Tourist attractions, holiday resorts, camping sites***
Close to beaches/ close to road railway/ wine tasting/ historical buildings/ monuments/ museums

2 ***Types of services found***
Electricity supply/ telephone/ medical/ pot office/ educationl(school/ college/ university) transport (roads airport railway)/ police services etc. (buildings on map)

3 ***Recreation facilities?***
Golf course/ athletics/ rifle range/ racing track/ etc

4 ***Factors that determined the location of the airport***
Flat area/ far from built-up area for safety/ noise/ roads/

5 ***Does the railway line and the road follow the same routs? Why not?***
The same? NB influence of topography
Road: through mountain pass. Railway around mountain (between Paarl and Worcester)

6 ***For what is the dam on the map used? Give reasons***
Drinking water: Water purification works
Irrigation: cannels and furrows
Recreation: Yacht club, Hotels at dam, camping site, caravan park, slipway, etc.

SETTLEMENT

(a) RURAL SETTLEMENT

1 ***Why is the settlement located there?***
Flat area/ roads/ river/ mountain/ sea/ etc

2 ***Is it an urban or a rural settlement?***
Rural: Primary activities
Urban: Secondary and Tertiary activities

3 ***Nucleated or dispersed? (pattern)***
Nucleated: Buildings near to each other
Dispersed: Buildings far

4 ***Factors influencing shape of settlements***
Linier: Roads / river
Round: Central point
Crossroad: Roads that cross or join

(b) URBAN SETTLEMENT

1 ***Factors influencing site of the urban settlement on the map***
Flan land/ roads/ river/ mountains/ sea/ etc

2 Identify the land-use zone a ….. on the map

- CBD: Accessibility/ functions
- INDUSTRIES: Light or heavy/ influencing factors (see economic)
- COMMERCIAL: In CBD/ Shops in residential areas/ shopping malls
- RESIDENTIAL AREAS: High income- Large plots/ mountain or hill/ tennis courts/ swimming pools/ parks. Low Income: Near industries/ small plots
- RURAL URBAN FRINGE: Racing rack/ power station/ cemetery/ golf course etc

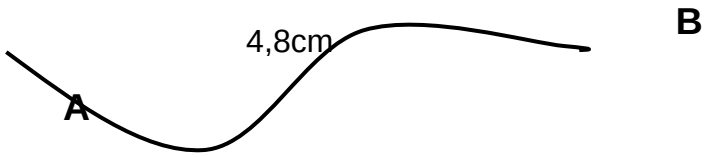
3 Identify street patterns, characteristics
Must be able to identify and describe rectangular, irregular and radial concentric street patterns. Advantages and disadvantages

C A L C U L A T I O N S

DISTANCE

FORMULA: Distance = $\frac{\text{Map distance x Scale}}{100\ 000}$

Calculate the length of the national road from A to B.



STEP 1
Measure distance on map in **cm**

Distance = 4,8cm

STEP 2
Place in Formula

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

$= \frac{4,8 \times 50\ 000}{100\ 000}$

$= \frac{4,8}{2}$

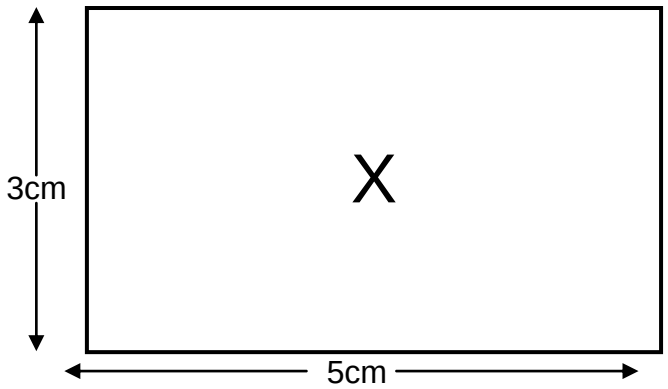
STEP 3
Answer in **km**

=2,4 km

AREA

FORMULA: AREA = Length x Breadth

Calculate the area of Blok X.



STEP 1
Calculate length of block in **cm**

Length = $\frac{5\text{ cm} \times 50\,000}{100\,000}$

= 2,5 km

STEP 2
Calculate breadth of block in **cm**

Breadth = $\frac{3\text{ cm} \times 50\,000}{100\,000}$

= 1,5 km

STEP 3
Place in Formula

Area = l x b

= 2,5 x 1,5

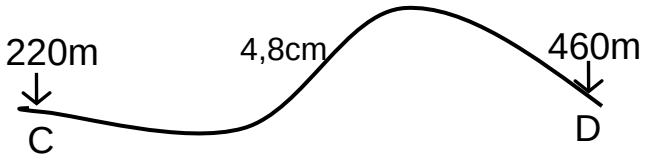
STEP 4
Answer in **km²**

= 3,75 km²

GRADIENT

FORMULA: Gradient = VI (Difference in height)
HE (Horizontal distance)

Calculate the gradient from C to D.



STEP 1
Calculate difference in height

460 – 340 = 120m

STEP 2
Calculate distance

Distance = Map distance x Scale / 100 000

= 4,8 x 50 000 / 100 000

= 2,4 km

STEP 2
Convert to **METERS**

= 2 400m

STEP 4
Place in formula and **SIMPLIFY**

Gradient = Difference in height / Distance

= 120m / 2 400m

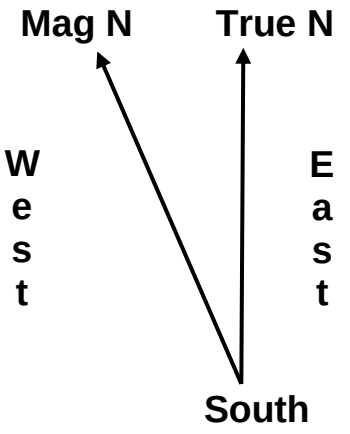
= 1 / 20

STEP 5
Answer as a ratio

= 1:20

MAGNETIC DECLINATION AND MAGNETIC BEARING

Magnetic declination is the difference between true North and magnetic North (on compas).



NB The following when you work with Magnetic Declination
1. What is the mean mag. declination (in degrees & minutes?
2. In which direction is the magnetic declination?
3. In which year is the magnetic declination given?
4. What is the mean annual change?
5. In what direction is the average yearly change?
6. For what year must the mag. declination be calculated?

Mean magnetic declination 23° 53’ West of true north (Julie 2002).
Mean annual change 6’ Westwards.

Calculate magnetic declination for 2009.

STEP 1
Calculate difference in years

2009 – 2002
= 7 years

STEP 2
Calculate total change

6’ x 7 years
= 42’ West

STEP 3
Add or subtract from magnetic declination

23° 53’ +
42’
23° 95’

STEP 3 NB: FOR SOUTH AFRICA
If the chabge is towards the **WEST**, it is **ADDED**.
If the change is towards the **EAST** it, is **SUBTRACTED**

STEP 4
Remember: Minutes cannot be more than **60** !

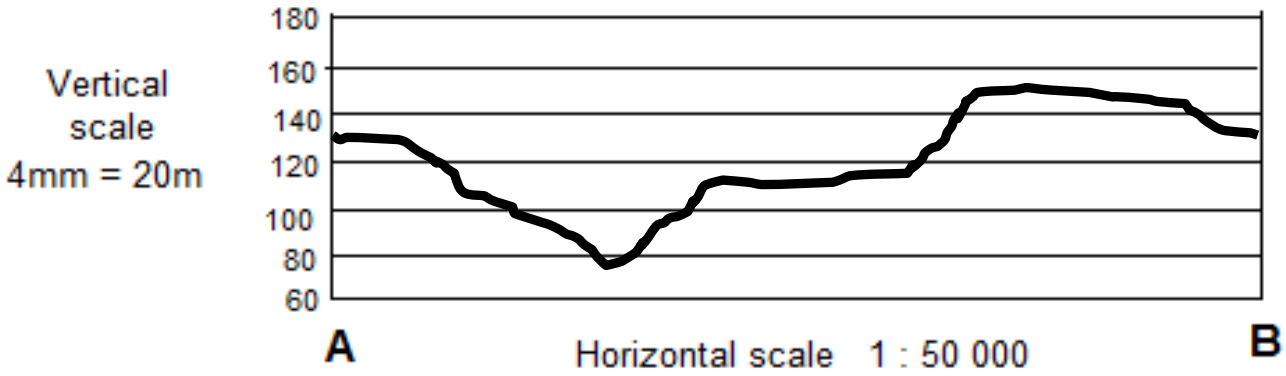
= 24° 35’ West

MAGNETIC BEARING
Magnetic bearing is calculated by simply adding the bearing

5 VERTICAL EXAGGERATION

FORMULA: V E = VERTICALE SCALE / HORIZONTAL SCALE

Calculate the vertical exaggeration of the following



STEP 1
Convert VS to ratio scale

4mm = 20m
4mm = 20 000mm (same units)
4 : 20 000
1 : 5 000

STAP 2
Place in formula

$$V V = \frac{\text{VERTICAL SCALE}}{\text{HORIZONTAL SCALE}}$$

$$= \frac{1}{5\,000} \div \frac{1}{50\,000}$$

$$= \frac{1}{5\,000} \times \frac{50\,000}{1}$$

= 10 Times

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

1 WHAT IS A GIS?

A GIS is a

- a computer system of hardware, software and methods
- to capture, manage, manipulate, analyse, model, display
- spatial data (geographic objects) and
- non-spatial data (attribute data)
- **to solve planning and management problems.**

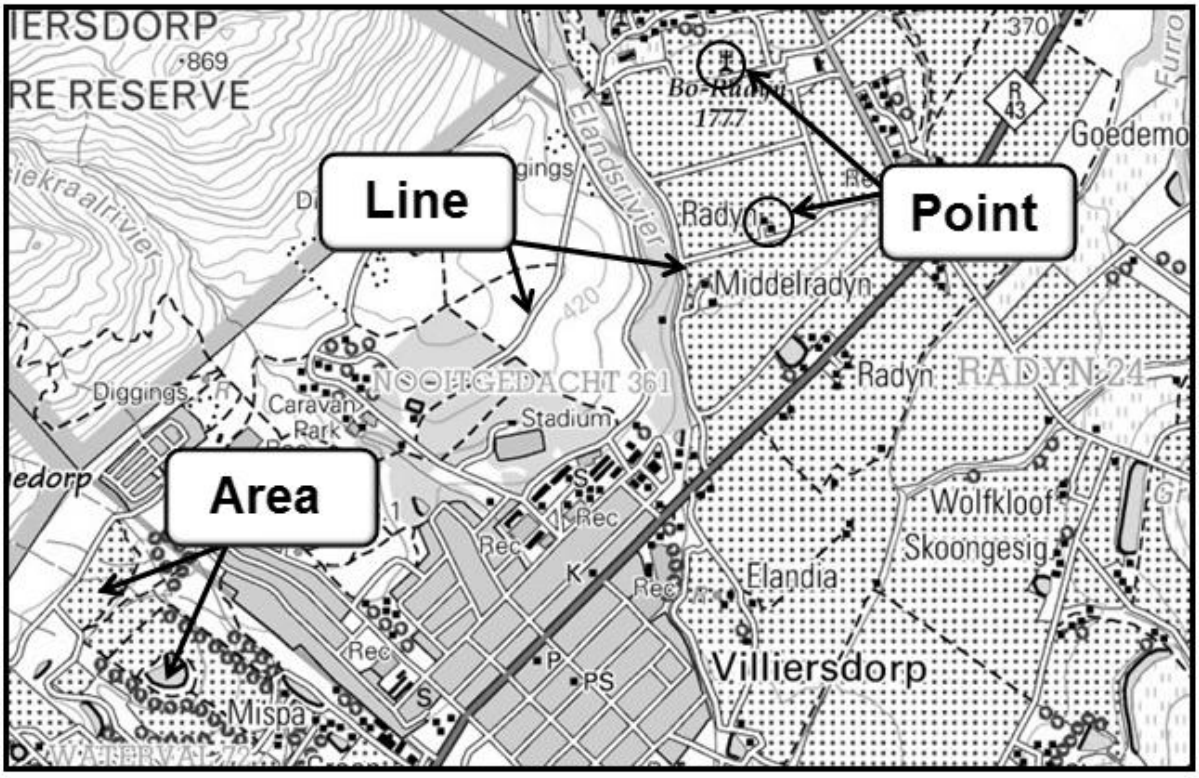
2 COMPONENTS OF GIS

Hardware	CPU, screen, keyboard, mouse, scanner, printer, digitizing tablet.
Software	Application programme such as ArcView.
Data	Maps, aerial photos, satellite images, administrative records, etc.
People	Data capturers, data users, GIS analysts.
Methods	GIS design according to user's needs.

3 REMOTE SENSING

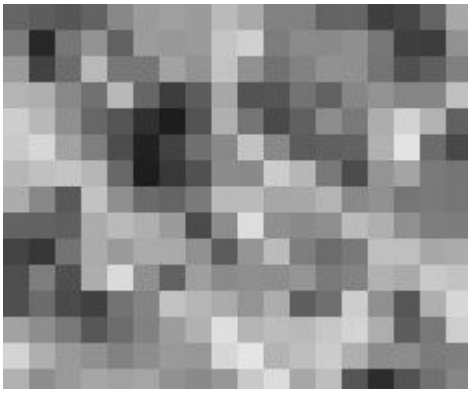
The collecting of information of the earth's surface **without actually being in contact with it.** (weather balloons, aeroplanes and satellites)

4 SPATIAL OBJECTS



5 RESOLUTION

The ability of a remote sensing sensor to create a sharp and clear image.

HIGH RESOLUTION	LOW RESOLUTION
	
Many pixels Small pixels Objects easily recognised	Less pixels Larger pixels Objects not easily recognised

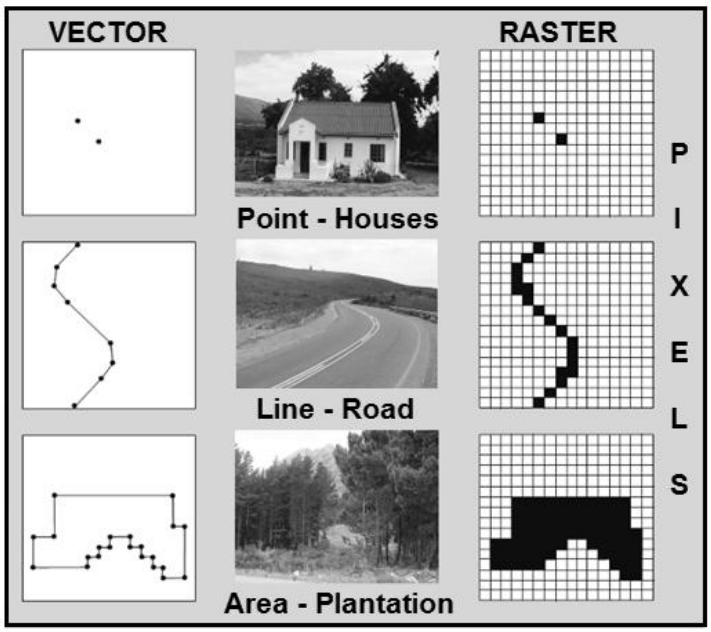
6 SPATIAL DATA

All geographic features/objects both natural and man-made [Map data]

7 RASTER AND VECTOR DATA

In **VECTOR DATA** objects on the surface of the Earth are represented by using a **point**, a **line** or an **area** (polygon).

In **RASTER DATA** objects on the surface of the Earth are represented by rows and columns of evenly sized blocks, called **pixels**. Pixels are the smallest unit of data storage.

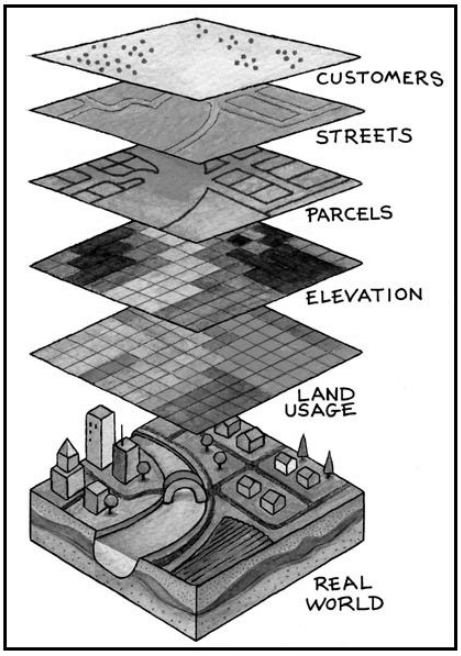


8 ATTRIBUTE DATA

Characteristics/description/information of the geographic objects.

ATTRIBUTES FOR HOSPITAL				
Name	**Address**	**Number of doctors**	**Number of nursing staff**	**Number of beds**
Seaview General Hospital	**Kam Street Stanford**	**6**	**24**	**60**

9 GIS LAYERS



All spatial data whether it is vector data or raster data are shown in layers.

Each layer represents a single entity/theme.

It is this characteristic that enables a GIS to manipulate, integrate, and query data.

10 DATA MANIPULATION

What is data manipulation?

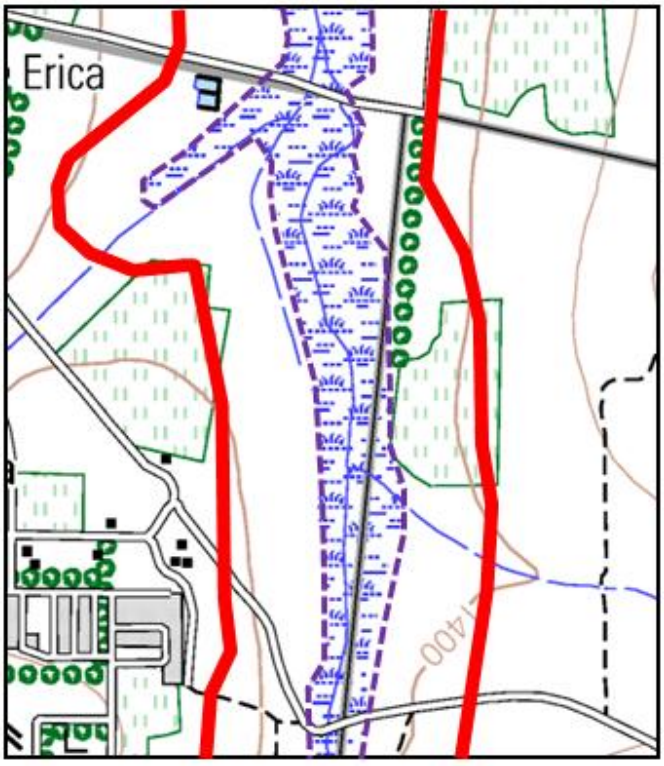
Data manipulation involves getting the different data sources into a format that can be integrated

Explain why data manipulation is important in a GIS.

- When all the data layers are in similar data files the data can be integrated (put together)
- Statistical information must be manipulated into such a file format that it can be used in the GIS software and linked to specific spatial features
- Errors in the database can be eliminated during manipulation

11 DATA INTEGRATION

The integration of data involves the combination of two or more data layers in order to create a new one



12 BUFFERING

It is sometimes necessary to identify zones at different distances from certain geographic features. Buffering –
Definition: ***A line used to demarcate an area around a spatial feature***

Examples

- noise buffers next to roads
- safety buffers for dangerous areas.

Exam question
Create a buffer zone of 250m around marsh/vlei area.

Remember that 250m in reality will be 5mm on a 1:50 000 map.

13 HOW TO USE GIS

Grade 12 Paper 2 GIS Question asks questions relating to analysis.

- Determine/identify/name which data layers to use in solving a problem.
- Without thinking about GIS identify factors/issues that play a role or relates to the problem.
- This will also be the data layers needed in the analysis to get the solution to the problem?

SHOPS

1. Available plots
2. Costs of plots
3. Distance to other shops
4. Client base
5. Client buying habits
6. Central place
7. Influence sphere

CRIME

1. Type
2. Location
3. Time
4. Frequency
5. Risk zones
6. Neighbourhood characteristics

TELECOM

1. Relief (contours)
2. Viewsheds
3. Intervisibilty
4. Distance between towers
5. Signal strength

TERRAIN ANALYSIS

1. Vegetation type
2. Vegetation structure
3. Soil type
4. Soil texture
5. Soil moisture
6. Slopes
7. Aspect
8. Surface roughness

FLOODS

1. Relief (contours)
2. History
3. Rainfall figures
4. 50 year flood line
5. Development above 50yfl
6. Development below 50yfl
7. Bridges
8. Residential areas affected
9. Evacuation routes