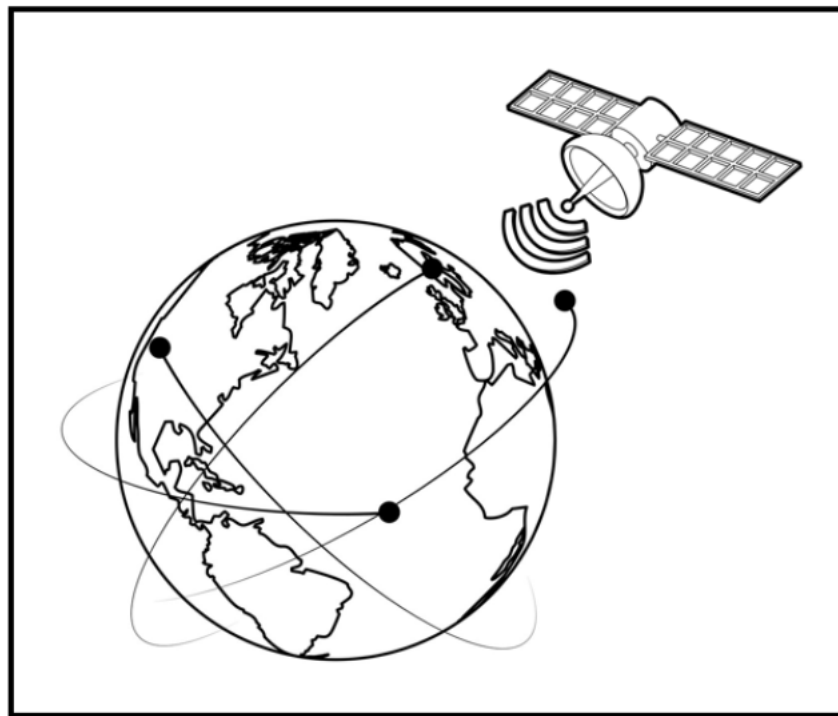




# TELEMATICS 2021



## GEOGRAPHY

## GRADE 12

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:

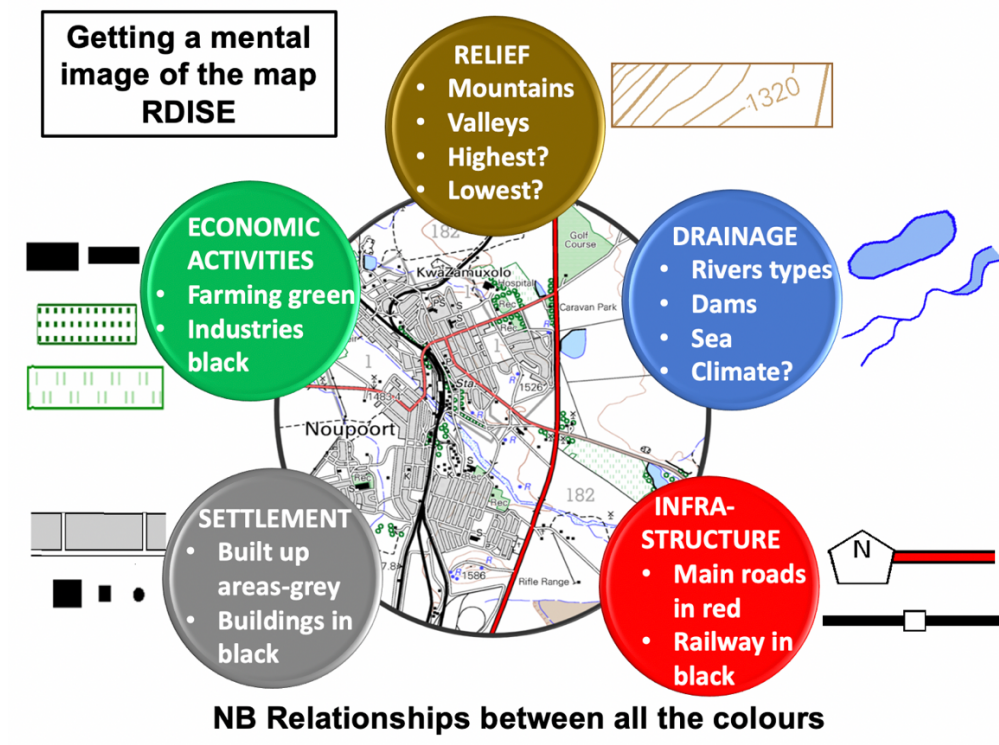
- **Mapwork:** Techniques, as well as questions and answers.
- **GIS:** Notes and applications of important GIS concepts and a guide as to how to use GIS in a given situation or scenario.

# 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 mapwork. Use this guide to study and prepare yourself mapwork.

Before you attempt to answer questions regarding map interpreting and reading you must:

- Know your **CONTENT** (theory): Map interpreting and reading is the application of content on topographic- and orthophoto maps. Therefore, you cannot answer this section of mapwork if you do not have a good understanding of the content, especially the basic Geography terms and concepts.
- Know the **KEY** of the topographic map: Do not only depend on the key that appears at the bottom of the map. You must know what every symbol means. Remember that most questions need two or more symbols to get to the answer. You cannot waste time by constantly referring to the key for the meaning of the basic topographic map symbols.
- Get a **MENTAL IMAGE** of the map: You must have a knowledge of the mapped area before you attempt to answer the questions. Read the map by using **RDISE** (**R**elief, **D**rainage, **I**nfrastructure, **S**ettlement and **E**conomic activities). Ask the following questions: What is it? Where is it? Why is it there? What are the relationships between each of the colours. Follow this link for lesson <https://www.youtube.com/watch?v=0CFergDlf5s&feature=youtu.be>



## 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 as well as the underlying structures that caused the pattern.
- 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 basins 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/ post office/ education!(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 routes? 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: canals 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**

Linear: 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**

Flat land/ roads/ river/ mountains/ sea/ etc

**2 Identify the land-use zone at ..... 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 track/ 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

**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.**

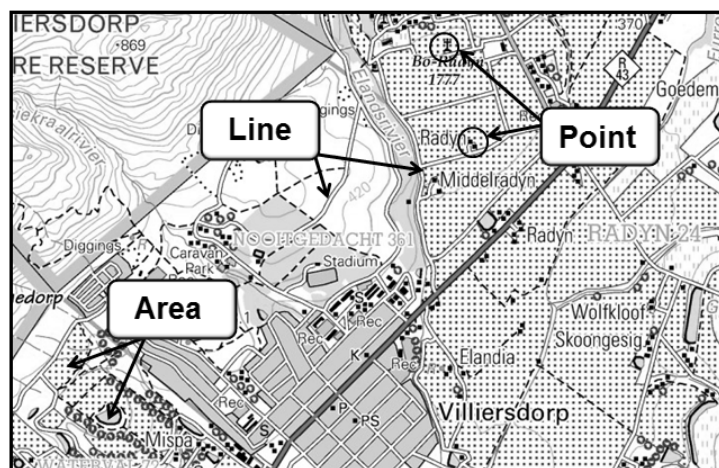
**2 COMPONENTS OF GIS**

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

**3 REMOTE SENSING**


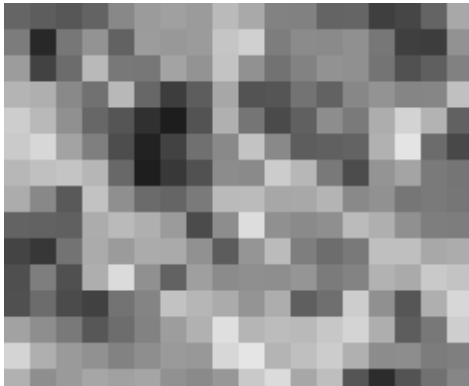
The collecting of information of the earth's surface **without actually being in contact with it.** (weather balloons, aeroplanes and satellites)

**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



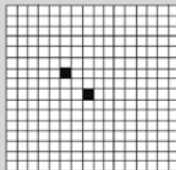


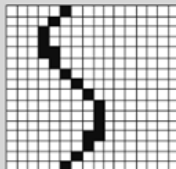
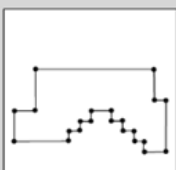

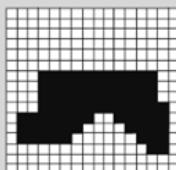
**6 SPATIAL DATA**

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.

VECTOR		RASTER	
	 <b>Point - Houses</b>		P I X E L S
	 <b>Line - Road</b>		
	 <b>Area - Plantation</b>		

**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

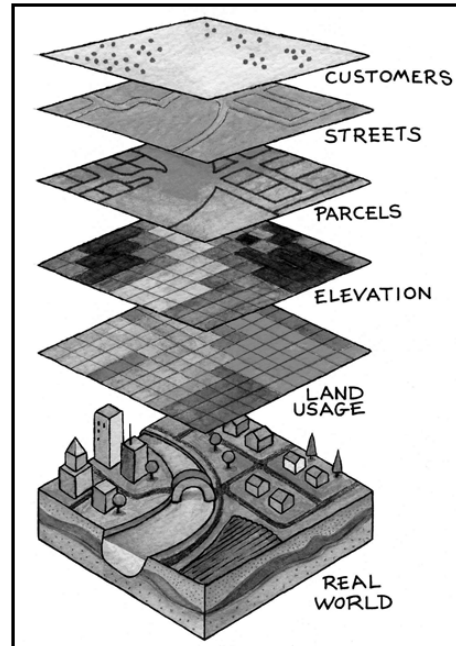


## 9 GIS LAYERS

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***

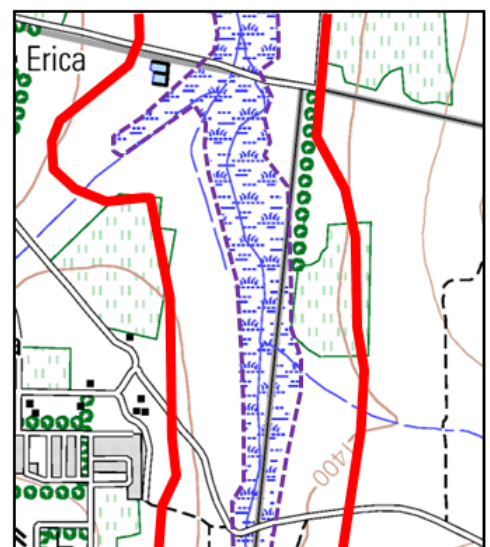
Examples

- 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

- 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. Intervisibility
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