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Geography

Mapwork Skills

This support pack for the **Mapwork Skills** topic in the **Geography Grade 12 CAPS curriculum** provides valuable practical activities. All activities have the answers provided. Learners can work through these individually at home or these could form the basis of a catch-up class or online lesson. You have permission to print or photocopy this document or distribute it electronically via email or WhatsApp.

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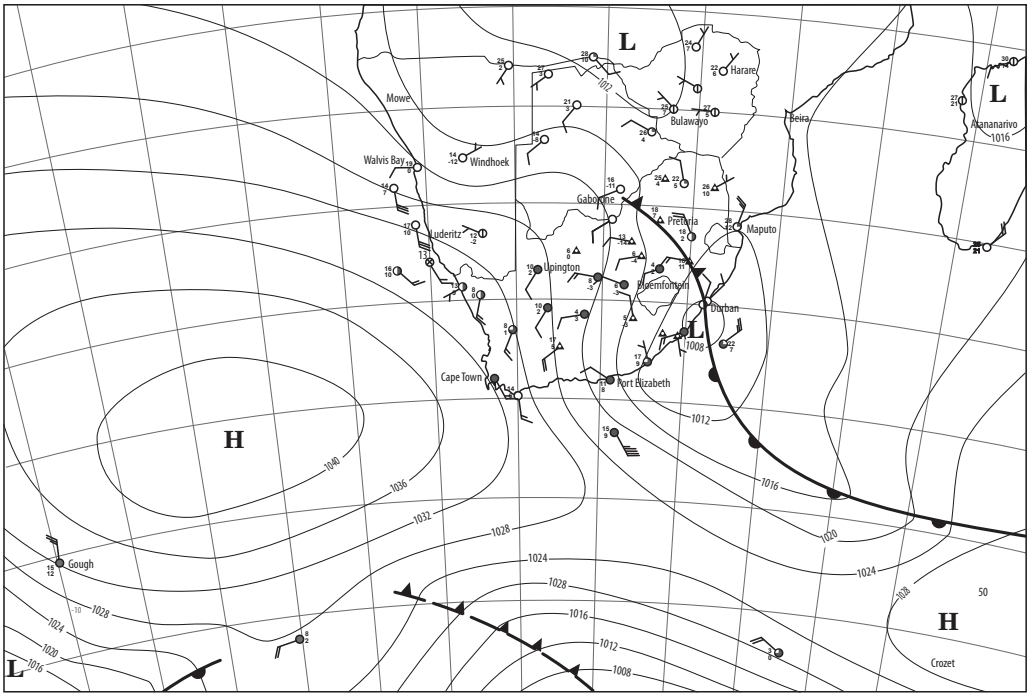
Mapwork techniques

1. A map is a reduced representation of reality.
2. Maps are either drawn on paper or produced digitally.
3. Maps show reality in two dimensions. If we want to represent the third dimension (height or altitude) we have to use contour lines or spot heights.
4. On many maps (including **synoptic maps**) it is not necessary to show altitude. However, symbols are needed to represent other information on the map.

Interpreting weather- and climate-related data

1. A synoptic weather map provides a summary of weather conditions over a particular area at a particular time.
2. Synoptic charts, satellite images and other data give us valuable information about the weather and climate.
3. To make a weather forecast, forecasters examine a series of synoptic charts and compare them to satellite images and data from weather stations and weather balloons.
4. Synoptic charts show weather-related data only and include isobars, station models (the symbols that show a variety of conditions) and weather features.
5. Satellite images are remotely sensed. This means that there is no contact between the sensor in the satellite and the item being sensed (e.g. the Earth's surface).
6. Satellite images are digital images captured by sensors in satellites that orbit the Earth.
7. Meteosat satellites are weather satellites and their sensors capture images of large areas.
8. Satellite sensors don't just capture images; data is also collected from outside the visible light spectrum, for instance, infrared.

A



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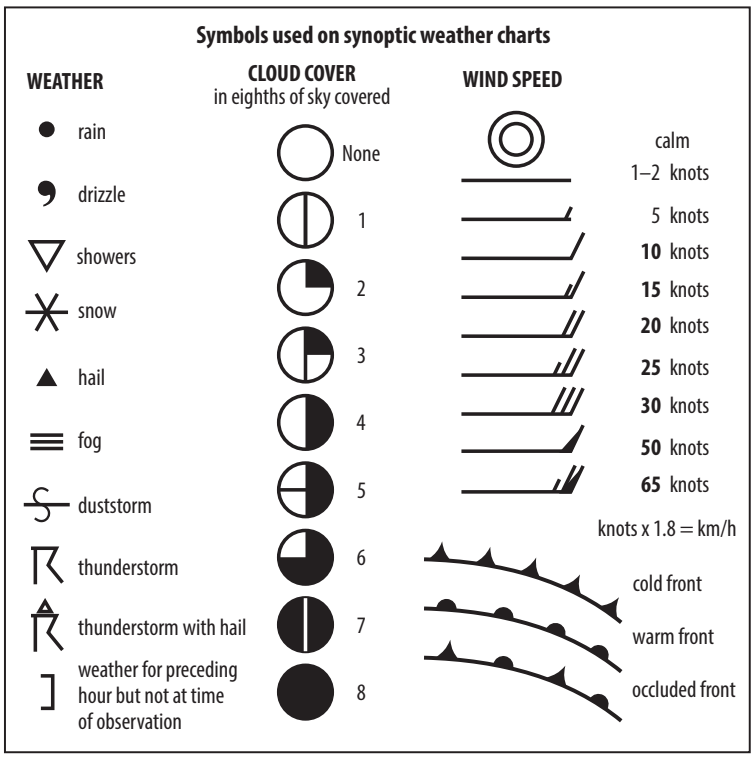

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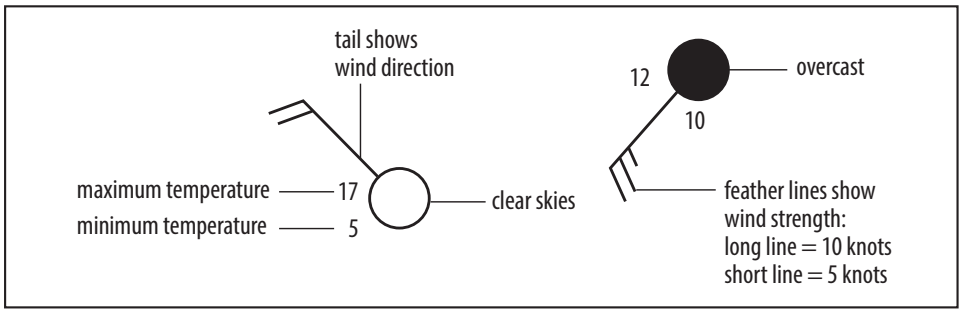

Figure 1 (a) An example of a synoptic weather map (chart) and **(b)** the symbols used on a synoptic map and **(c)** the interpretation of important symbols

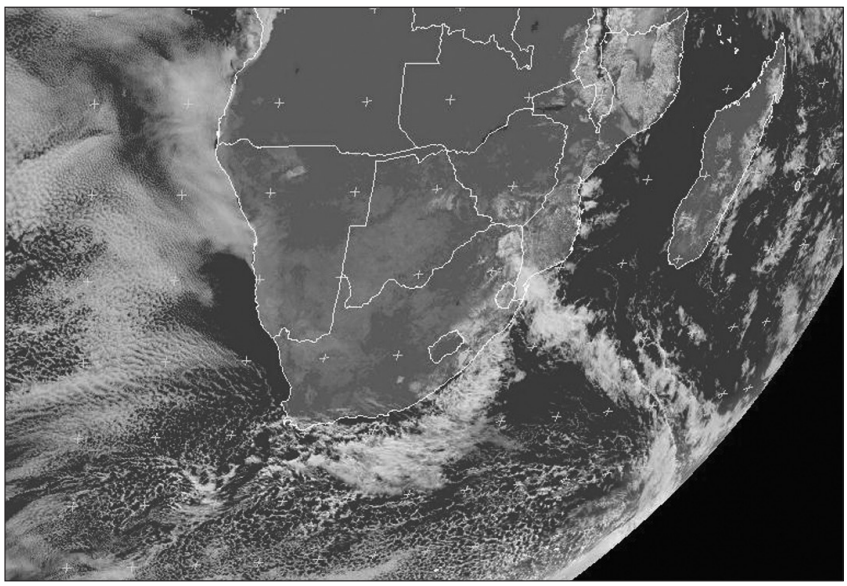

Figure 2 Meteosat image of cloud cover as a cold front passed over South Africa on 12 July 2012. Note the curvature of the Earth and the blackness of space in the bottom right corner

Map and photo interpretation: analysing physical and constructed features

In climatology and geomorphology, we are more interested in physical (natural) features than in constructed (human-made) features.

Here is a summary of the typical physical features that geographers examine and interpret:

Type of feature	Where found or branch of physical geography	Significance
Weather phenomena such as fronts, temperate cyclones, tropical cyclones	Climatology: synoptic maps, vertical aerial photographs, and remotely sensed images	Weather forecasting Hazard prediction Flood risk Long-term weather predictions Climate change studies
Landforms such as mountains, hills, valleys, rivers, lakes and many more	Geomorphology: topographical maps, oblique photographs, vertical aerial photographs, orthophoto maps, satellite images	Planning Construction Hazard prediction Slope management Flood risk management
Vegetation types and distribution	Biogeography: vertical aerial photographs, orthophoto maps, satellite images	Planning Plant inventories Habitat protection
Soil mapping and soil types	Soil geography: topographical maps, oblique photographs, vertical aerial photographs, orthophoto maps, satellite images	Planning Engineering Soil inventories Agriculture and forestry Erosion studies
Ocean currents and sea surface temperatures	Oceanography and climatology: maps, vertical aerial photographs, satellite images	Weather forecasting Hazard prediction Long-term weather predictions Climate change studies Global warming studies Habitat protection Fisheries
Water (surface and underground)	Hydrology, geomorphology: topographical maps, oblique photographs, vertical aerial photographs, orthophoto maps, satellite images	Water resource management Agriculture Salinisation studies Hazard prevention Planning Dams and water storage Underground water potential Aquifers

Table 1 Summary of the typical physical features that geographers examine and interpret

Scale, contours and cross-sections

1. Scale (**linear**, **word** or **ratio**) is one of the most important concepts in map-making.
2. The scale found on a 1: 50 000 topographical map is an example of a **linear scale**.
3. There are two important advantages to linear scales:
   - Distances can be quickly determined by measuring between two points on the map and comparing them directly to the scale line.
   - If the map is enlarged or reduced, the scale remains true because the scale line is also being enlarged or reduced.

Figure 3 Linear scale from a 1: 50 000 topographical map

4. **Word scales** are not often used today.
5. An example would be the statement: One centimetre represents five kilometres.
6. A ratio scale also involves measuring a distance between two points on the map.
7. A **ratio scale** will not remain accurate if the map is enlarged or reduced. An example of a ratio scale is: 1: 50 000.
8. Example: Distance on the map between two points is measured and found to be 8,4 cm.
   $8{,}4 \times 50\,000 = 420\,000 \text{ cm} = 4{,}2 \text{ km}$*

   *To convert centimetres (cm) to kilometres (km), move the decimal five places to the left.

Map and photo interpretation: reading and analysing features

1. In settlement geography, map and photo interpretation is just as important as in physical geography.
2. Settlements are often influenced by physical features (slope steepness, soil, availability of water, avoidance of marshy areas and wetlands), so you must be able to read and analyse physical features in the landscape.
3. Constructed features are those things which humans place (build) on the landscape to serve their needs.
4. Communications and transport (telephone lines, roads, railways), power lines, dams, and the settlements themselves are examples of constructed features.
5. The below extract clearly shows physical features, as well as urban and rural settlements, roads and railways.
6. The key in Figure 5 can be used to identify these features.

Figure 4 1:50 000 topographical map sheet 3030CB Port Shepstone (not to scale)

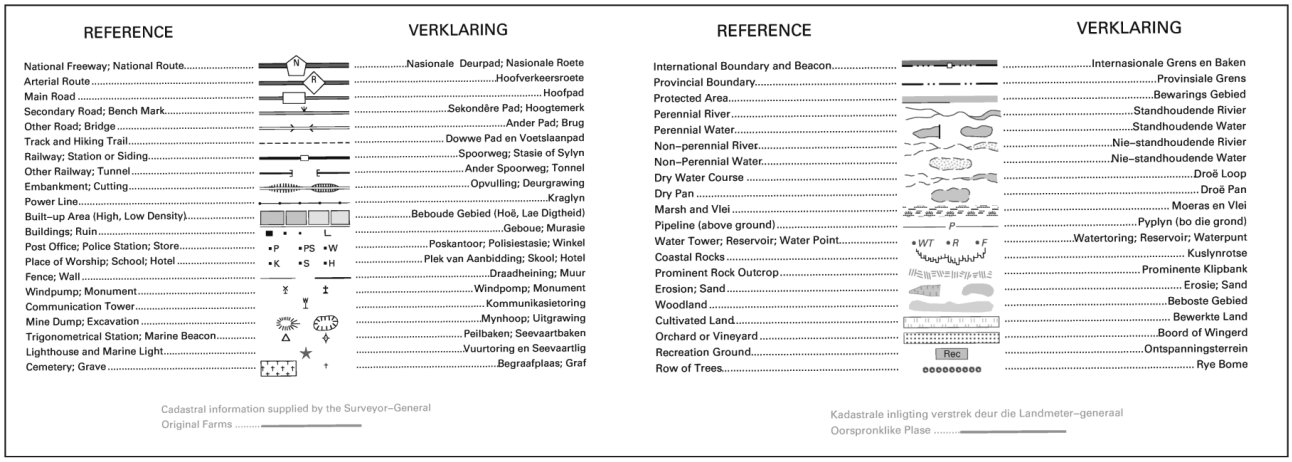

Figure 5 Topographical map symbols

Exam practice

You need to practise converting scales from linear to word (statement) to ratios. Scales and distances are important in settlement geography, not just in physical geography, because of what they can tell us about the location, distribution, and relative closeness/distance of human features on a map or orthophoto map.

Terms with similar meaning

- linear scale = line scale
- word scale = statement of scale
- ratio scale = representative fraction

Consolidation of map skills from Grades 10, 11 and 12

Mapwork is all about skills and techniques. The more you practise, the easier it becomes to work with maps, photographs, aerial photographs, orthophoto maps and satellite images. You are expected to be familiar with these geographical sources from Grade 10 Geography, through Grade 11 Geography, and on until the end of Grade 12 Geography.

Map and photo interpretation: reading and analysing features

Applying map-reading skills

Isolines are sometimes used on demographic (population) and economic maps. Isolines are simply lines joining points of equal value, while a contour line joins points of equal height. Examples of isoline maps in human geography might include lines used to identify equal:

- population density
- income
- production.

A visual spatial representation is often more useful than lots of data or statistics.

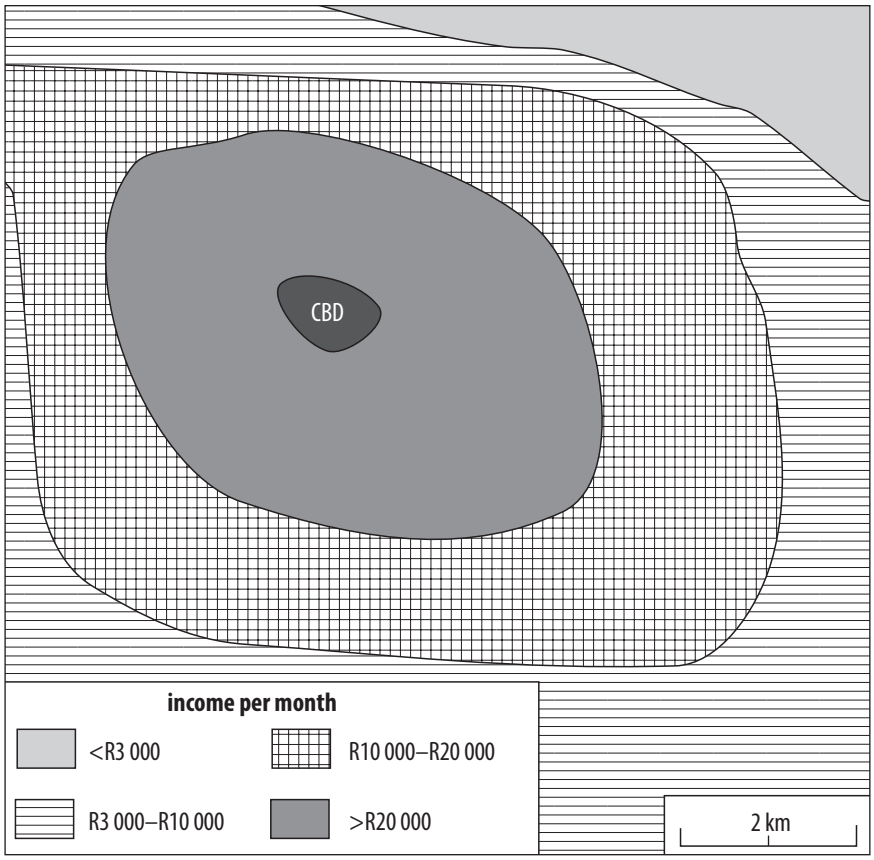

Figure 6 Income distribution around the CBD of a hypothetical city