Reading and interpreting synoptic weather maps

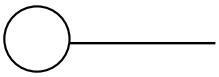
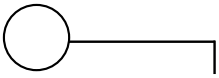
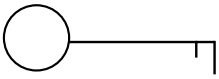
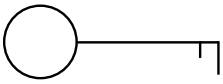
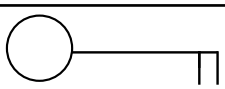
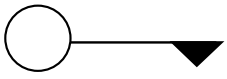
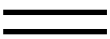
Name:

A synoptic weather map is a summary of hundreds of observations from a network of weather stations, aeroplanes, ships, floating weather buoys (in the ocean), weather stations on islands (Gough Island and Marion Island) and satellite images.

These maps therefore summarise the atmospheric conditions over a wide area at a particular time. Weather information is sent to the South African Weather Services, which records and organises the information on synoptic maps, tables and graphs. These are updated at least every 6 hours.

By collecting the information over a wide area, meteoroligsts are able to observe the behaviour and movement of weather patterns and formations that might affect a region in the future. This allows meteorologists to make more accurate weather forecasts. All weather maps are drawn using the internationally agreed standards and using accepted symbols.

Symbols used on a weather chart

Symbol	Precipitation	Circles	Cloud Cover	Circles	Wind speed
	Drizzle		Clear Sky		Calm
	Shower		One Okta		1 - 2 Knots
	Rain		Two Oktas		5 Knots
	Snow		Three Oktas		10 Knots
	Hail		Four Oktas		15 Knots
	Thunderstorm		Five Oktas		20 Knots
			Six Oktas		50 Knots or more
	Heavy Rain		Seven Oktas		
	Sleet		Eight Oktas		
	Snow Shower		Sky Obscured		
	Mist				
	Fog				

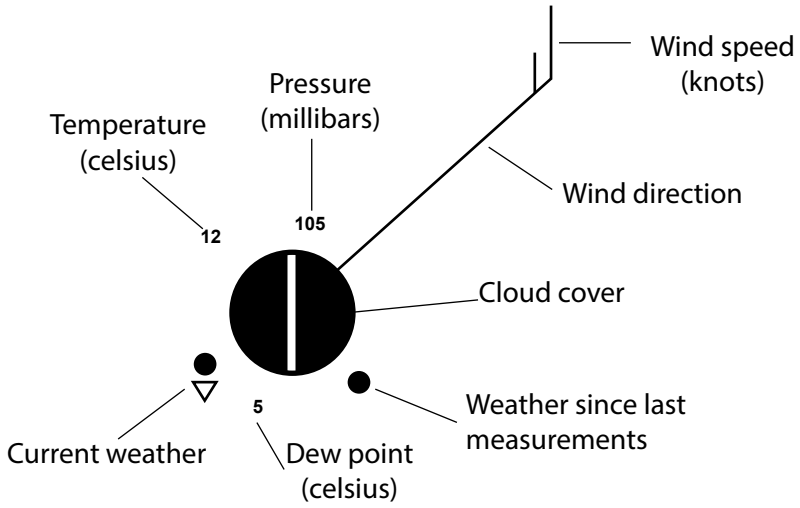


Figure 1: Weather readings from a model weather station.

Each weather station symbol reports on the different weather elements.

- **Temperature:** Air temperature is always shown at the top of the circle and dew point temperature is always at the bottom. Temperature in South Africa is always in °C.
- **Precipitation:** If there has been any precipitation, then it is shown between the two temperature values.
- **Wind direction:** This is represented by the 'arrow' showing the wind blowing into the weather station. The wind direction is described according the direction from where the wind is coming.
- **Wind speed:** this is shown by a 'feather' at the end of the arrow. A long feather represents 10 knots and a short feather represents 5 knots. (10 knots = 18.52 km/h)
- **Atmospheric pressure:** this is shown by the isobars drawn on the map. Usually in 4 hPa intervals. Where they are far apart you may have sub-isobars (2 hPa intervals). The isobars show high or low pressures.

Speed (Knots)	Symbol	Speed (Knots)	Symbol
Less than 1		33 – 37	
1 – 2		38 – 42	
3 – 7		43 – 47	
8 – 12		48 – 52	
13 – 17		53 – 57	
18 – 22		58 – 62	
23 – 27		92 – 102	
28 – 32		103 – 107	

- **Cloud cover:** This is recorded inside the circle representing the weather station. The circle is shaded in eighths according to the amount of cloud cover seen.
- When a weather station has an upside down triangle around it, it is an automatic weather station and cloud cover is not normally shown.

An isobar is a line on a synoptic map that joins places of equal pressure. As mentioned earlier, these isobars form patterns of high pressures and low pressures. Describe each of these pressure cells in the space provided below.

High Pressure Cells:

Low Pressure Cells:

These pressure systems are three dimensional, i.e. they extend from the surface into the atmosphere. These high and low ridges may develop into troughs and ridges. Describe each of these in the space provided below.

Low Pressure Trough:

High Pressure Ridge (Wedge):

Weather patterns differ in summer and winter. Look at the two synoptic charts below and discuss the changes you see. Take note of the pressure cells and temperatures. Work with your teacher to label the three high pressure cells that play a major role in South Africa's climate. Take notes as your teacher discusses the differences between the summer and winter synoptic maps.

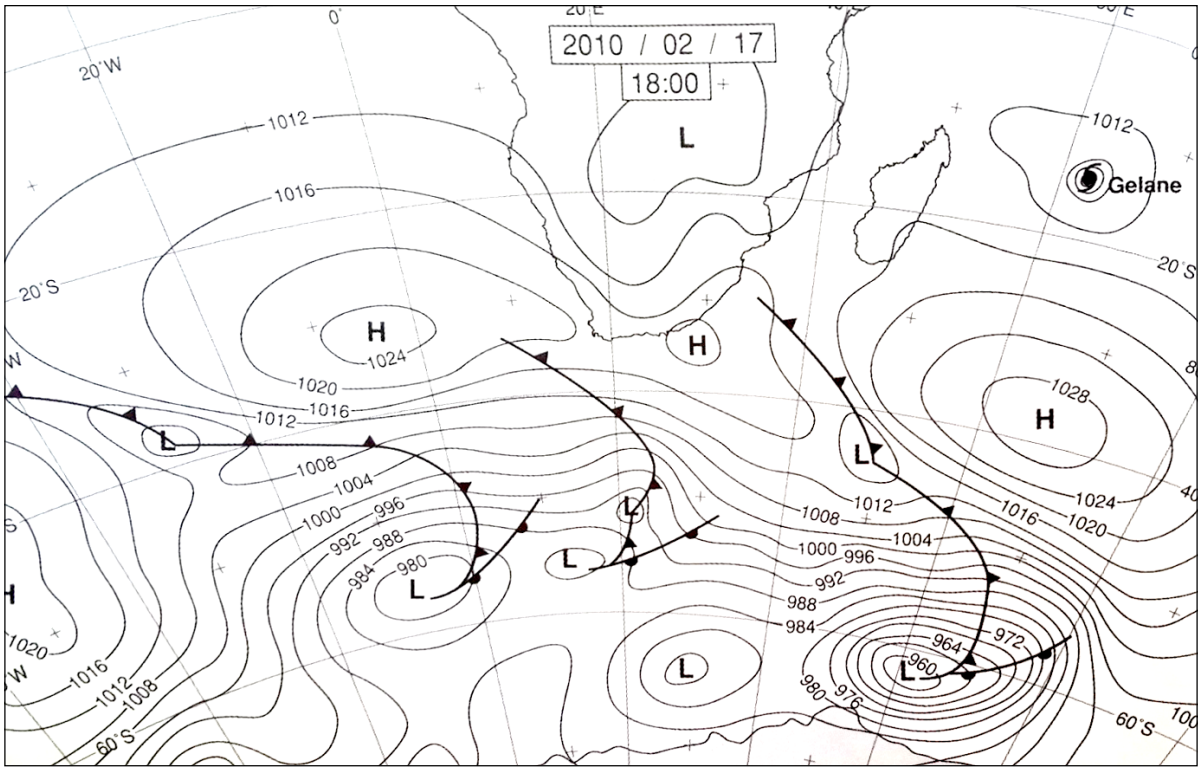


Figure 2: Typical Summer Synoptic Map

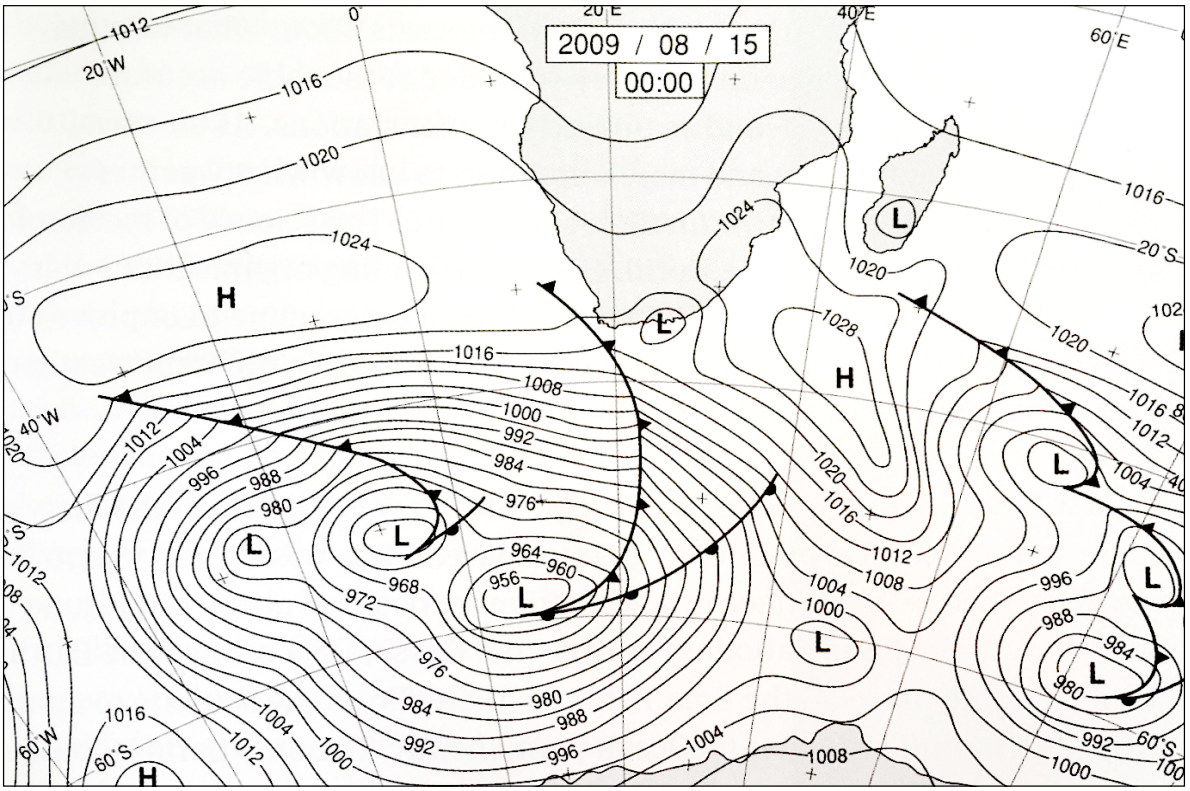


Figure 3: Typical Winter Synoptic Map

Activity

Using the information above, write a comparative piece on the following 2 satellite images.