

### Use an atlas

1. Use the contents and index
2. Identify the location of the continents, oceans and seas around Australia

### Use various types of maps

1. Physical maps show landforms using colours and shading
2. Political maps show borders of nation-states
3. Topographic maps show altitude using contour lines
4. Thematic maps focus on one factor (eg water consumption, income) – usually using a choropleth map (different colours show different levels of the factor)

### Identify and use elements of maps

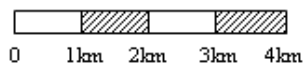
- B Border
- O Orientation (direction of north)
- L Legend
- T Title
- S Scale

### Distinguish between different types of map projections

1. Cylindrical projections which project spherical surfaces onto a cylinder (such as Mercator projection) are accurate at the Equator but distort the poles. Areas and shapes are also distorted.
2. Conic projections which project a spherical surface onto a cone are more accurate near the poles but still only correct along key parallels of latitude and meridians of longitude.
3. Azimuthal projections which project a spherical surface onto a plane (usually a circle) are only correct at the centre point

### Measure distances on a map using a scale

Linear Scale



Written Scale

1cm = 1km

Ratio Scale

1 : 100 000

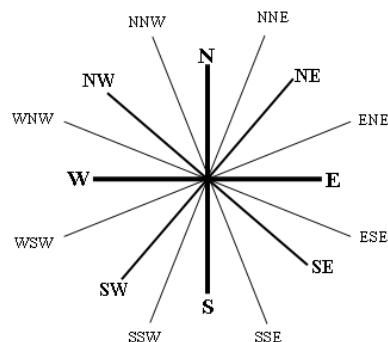
1m = 100 cm (two zeros)  
 1km = 1000m (three zeros)  
 100,000 has five zeros and therefore is 1km

### Locate features on a map using latitude and longitude

1. Major parallels of latitude are the Equator (0°), Tropic of Cancer (23°N), Tropic of Capricorn (23°S) Arctic Circle (66°N), Antarctic Circle (66°S). Latitude is strongly linked to climate.
2. Major meridians of longitude are the Prime Meridian (0°) and International Date Line (180°E). All other meridians are east or west of Greenwich, England. Asia (including Australia) is east of Greenwich, the Americas are west of Greenwich. Longitude is linked to time zones.
3. Latitude is always quoted before longitude. Here are some memorisation tips:
  - a. Lat is flat, Long is long (from pole to pole)
  - b. Latitude is before longitude in the alphabet
  - c. In a compass direction N/S is always quoted before W/E (eg North West) – this is the same in latitude/longitude (eg 23°N 18°E)
  - d. It is quoted in the opposite order to grid/area references

### Use the points of a compass to determine direction

1. Direction must be determined to within 22.5 degrees, using the 16 different directions available.
2. Remember to correctly name all points. Eg NNE (north north east) is North of the North East line and is therefore NNE. Eg ENE is East of the North East line and is therefore ENE.

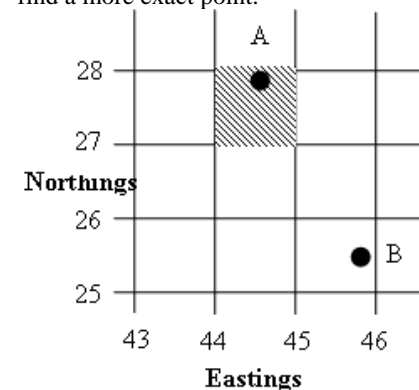


### Identify physical and cultural features on a map

1. Differentiate between physical features (natural features of the earth such as landforms or vegetation zones) and cultural features (features made by humans). Physical features can be categorised as being from the lithosphere, hydrosphere, biosphere and atmosphere.
2. Use the legend to identify a symbol from the map.

### Locate features on a map using area and grid references

1. Northings are where lines where numbers go in a northerly direction (horizontal lines)
2. Eastings are where numbers go in an easterly direction (vertical lines)
3. Eastings are always quoted before northings – this can be remembered as it is alphabetical and in the opposite order to latitude/longitude
4. Area reference finds the entire square – use the smaller of the two eastings and then the smaller northing
5. To find a grid references you need to divide the distance between each easting and each northing up into 10 to find a more exact point.



Area Reference of point A is AR4427

Grid Reference of point B is GR459255

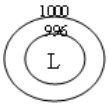
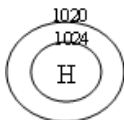


### Identify and interpret relief



1. Relief (altitude) can be shown using:
  - shading on a relief or physical map – the shading represents shadows of a mountain
  - spot heights on a physical or topographic map – shows the exact height at a particular point
  - colour on a physical map – different colours represent different altitudes. Usually the darker the brown, the higher the mountain.
  - contour lines on a topographic map – the line joins together areas of equal altitude

### Construct a sketch map

1. Sketch maps show the rough location of different features in a particular area. They are usually hand drawn. Like all maps, they should comply with BOLTS.

**Read synoptic charts**

- Synoptic (weather) charts show the air pressure at different locations which helps predict the weather features.
- Air pressure is the weight of the air at a particular spot and is measured in hectopascals (hPa) using a barometer.
- Areas of equal air pressure are joined using isobars.
  - Areas of low air pressure usually experience relative cold, rain and wind. The air is moving higher in the atmosphere as it is lighter (where it condenses to produce rain) and is moving clockwise in the southern hemisphere.
 
  - Areas of high air pressure usually experience relative warmth and little wind (calm/stable). The air is moving towards the Earth (as it is denser) and is moving anti-clockwise in the southern hemisphere.
 
- Air pressure tends to equalise over time. Air will move from areas with high air pressure to areas of low air pressure. The boundary is often at 1013hPa.
- Areas where isobars are close together experience higher winds as air moves quickly between pressure systems.
- Pressure systems often move from west to east in Southern Australia, NW to SE in North Western Australia and SE to NW in South Eastern Australia due to the direction of trade winds.
- Wind direction is measured from the point the wind is coming from (as that tells you what weather the wind is bringing with it). A line pointing out from a major population centre with tags on it will point towards where the wind is coming from (in this example SE). The tags can be interpreted using the legend to give wind speed.
 
- A front is a boundary where two masses of air with different densities meet.
- A cold front has  cold air meet and force up warmer air into the atmosphere where it becomes condensed to form rain/wind and storms along the front line. The points of the triangles point towards where the front is travelling.

- A warm front  has warm air allowed higher in the atmosphere by retreating cold air. This also produces rain but travels less quickly and is broader in scale.
- A trough ----- is a region of low air pressure.
- Rainfall is often marked on a synoptic chart using diagonal lines. 

**Use geographical instruments**

- A compass points towards North and must be laid on a flat surface away from metallic items.
- A clinometer determines gradient and is used on the excursion to Gibberagong
- A measuring tape determines distance
- Weather instruments include a thermometer to determine temperature and a barometer to determine air pressure
- The Beaufort wind scale is a way of estimating wind speed using easily observable measures such as leaves shaking.
- Cloud identification charts determine type of clouds, which is influenced by air mass movement
- Vegetation identification charts are used on the excursion to Gibberagong.

**Collect and record data in the field**

- Interviews are used to gather detailed information (usually qualitative) from one or a few people
- Surveys can be used to gather information from a larger sample of people. They should use questions where answers are readily measurable and comparable – usually quantitative.
- A field sketch is a rough drawing showing the location of key features.

**Draw a line drawing**

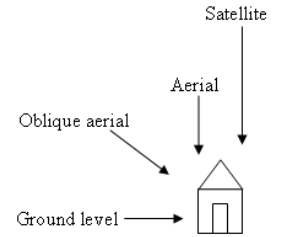
- Draw a border for the drawing
- Draw in the horizon
- Sketch in key features in the foreground and/or background
- LABEL the key features in the drawing that are of geographic interest

**Collect and interpret photographic images**

- Photographs can be interpreted to analyse geographic information. Do not just put photographs in assignments as pretty pictures – caption them to analyse the implications of what you see in them.

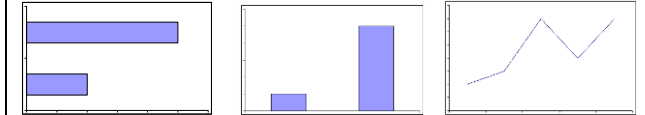
**Distinguish between different types of photographs**

- Oblique photos are taken from an angle – they show height well but distances are inaccurate
- Aerial photos are taken from directly overhead – they show distance (as the crow flies) accurately but don't show height of features
- Ground level photographs show details well but don't always put them in perspective
- Satellite imagery shows large areas and can also show thematic information such as soil type or deforestation

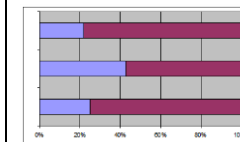
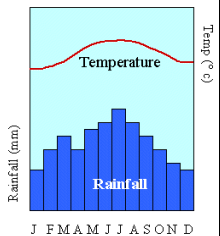


**Construct and interpret basic graphs**

- Bar, column and line charts are useful for showing changes between values



- Climate charts show precipitation (rainfall) and temperature together, allowing meaningful analysis of climate patterns.
- Proportional graphs – either bar or pie – allow comparison of the relative components of different sets of data



**Identify and calculate key statistics**

- Maximum = highest value in the sample
- Minimum = lowest value in the sample
- Total = all the values in the sample added together
- Range = highest value minus lowest value
- Rank = reorder values from highest to lowest (or vice versa)
- Average (mean) = divide the total of the sample by the number of values in the sample