

# Weather Systems Level 4-5

## Concept

This lesson is a combination of classroom activities and experiments where the students will be introduced to reading weather charts and forecasting.

## Activity - Reading Weather Charts

### Background

In this lesson students are introduced to simple concepts that are depicted in the weather charts that they see on the evening news. These include:

- High pressure systems – systems where the air at the top warms and sinks to the ground. They have relatively high pressures and are very stable, slow moving and long lasting compared to low pressure systems. Air moves in an anti- clockwise direction in a high pressure system in the southern hemisphere.
- Low pressure systems – low pressure systems are where warm air rises from the ground, cools down and forms clouds. Air moves in a clockwise direction in a low pressure system in the southern hemisphere.
- Cold fronts – zones where a moving cold air mass replaces a warm air mass. The air behind a cold front is colder and drier than the air in front of it and as it passes through an area, air temperatures usually drop.
- Warm fronts – zones where a moving warm air mass replaces a cold air mass. In opposition to cold fronts, the air behind a warm front is warmer and moister than the air ahead of it, thus increasing the temperature and humidity as it passes through.
- Isobars - lines that connect locations of equal barometric pressure on a weather map. Together these lines show areas of high and low pressure.

### Materials/Equipment

To begin with, students download a mean sea level (MSL) weather chart of Australia from the Bureau of Meteorology web site. Weather charts for today's date can be found at <http://www.bom.gov.au/weather/national/charts/> whilst past charts can be found at <http://www.bom.gov.au/nmoc/MSL/index.shtml> and <http://www.bom.gov.au/nmoc/archives/>.

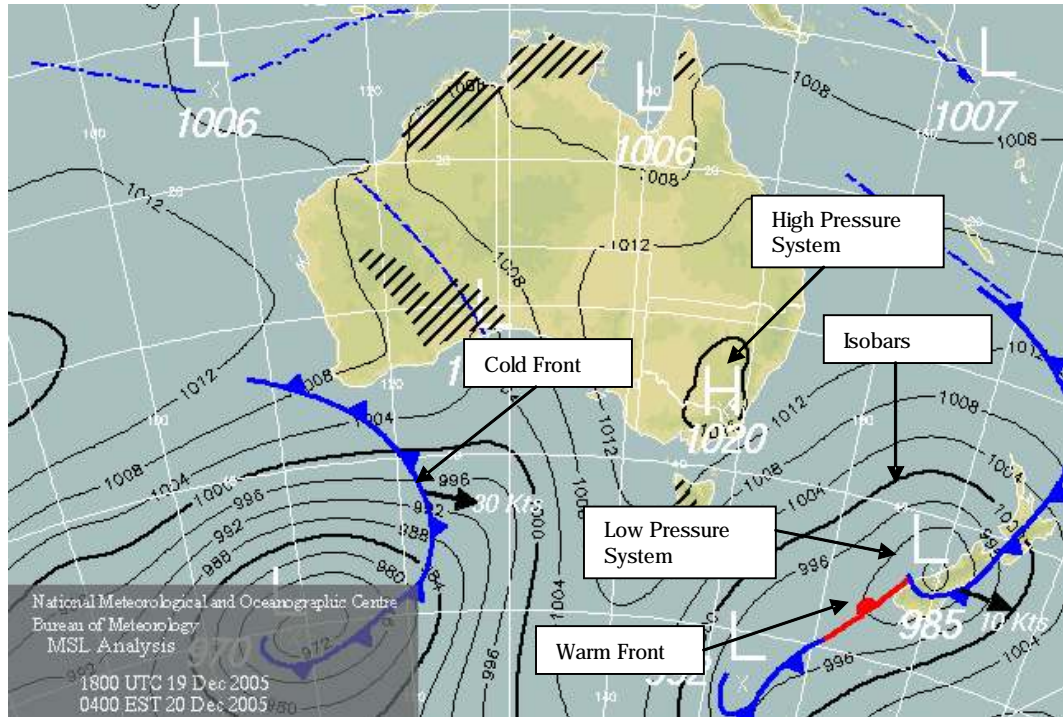
### Procedure

Using Microsoft Word instruct the students to import the MSL chart into a blank document.

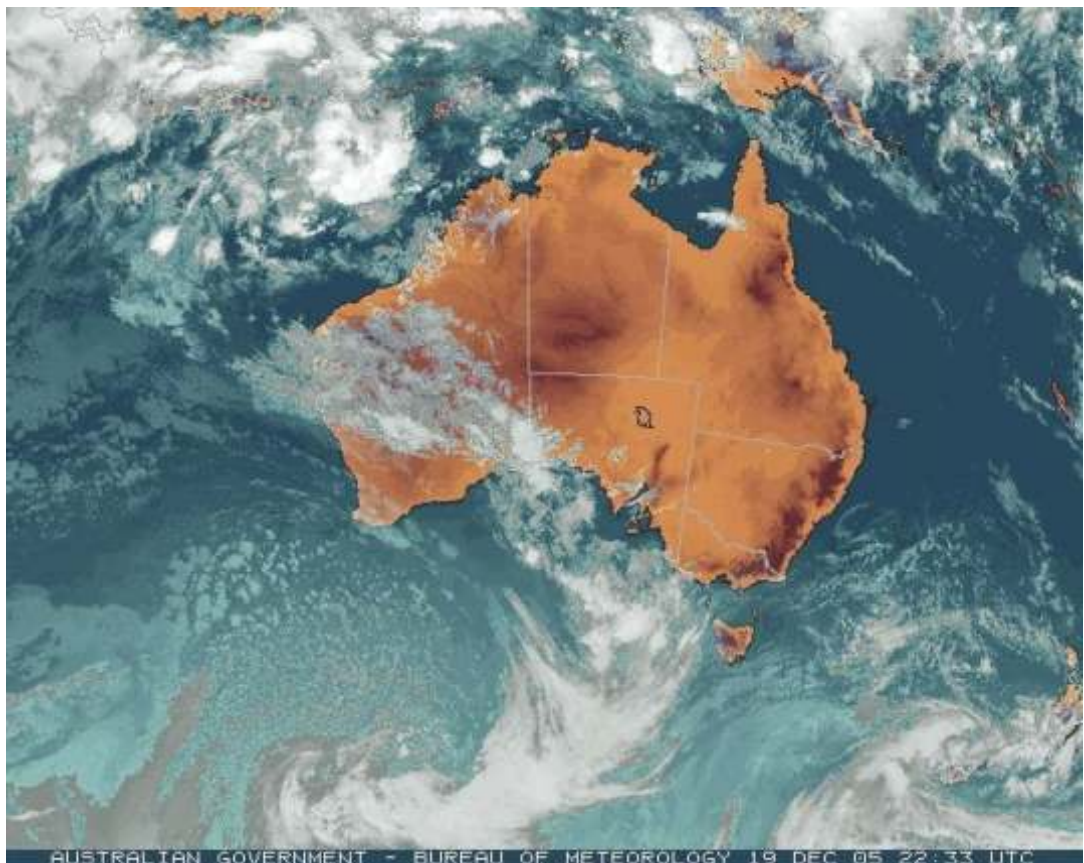
Using text boxes and arrows, students indicate the following major meteorological features:

- low pressure systems
- high pressure systems
- cold fronts
- warm fronts
- isobars

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Students can compare their MSL chart to the corresponding satellite image for that chart <http://www.bom.gov.au/weather/satellite/index.shtml#latest>. This will allow them to compare cloud locations to the different weather systems.



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Get the students to create a Microsoft Power Point presentation of the MSL weather charts and their corresponding satellite images for Australia over approximately 4 consecutive days. Interchange each weather chart with the corresponding satellite image. This works best when very recent weather charts are used so that students can relate their own experiences of the recent weather.

## Explanation

Students are encouraged to observe different weather systems and confirm their observations with how these systems affect the weather:

- At high pressure systems air sinks and therefore there is no cloud and the weather is sunny.
- At low pressure systems there is a large amount of cloud and usually rain.
- Cold fronts arise from low pressure systems and in Australia usually move northward. A cold front is the front of a cold air mass which is moving into a warm air mass. Because cold air is denser and therefore heavier, the hot air rises above it causing cloud formations and often rain.

## Activity - Weather Forecasting

### Background

Using their understanding of their MSL weather chart and corresponding weather patterns, get students to observe the 4 day forecast weather charts from the Bureau of Meteorology and predict the weather conditions for the forecasted period.

### Materials/Equipment

Download 4 day forecast weather charts:

<http://www.bom.gov.au/products/IDG00074.shtml> and  
<http://www.bom.gov.au/products/IDG00073.shtml>.

### Procedure

Using these weather charts, instruct the students to create a 4 day forecast for presentation to the class as they would see on the evening news.

### Explanation

In their forecasts, students should include the direction the wind would travel in depending on the type of system, the relative air temperature (warm or cold), the presence of rain/clouds etc.

Students can test their predictions against their observations of the actual weather patterns over the forecasted period.