



Weather Radars

- All radars, including weather radars, beam electromagnetic waves, such as radio waves, towards a distant target and measure the strength of the signal that bounces back from obstacles in the way.
- Meteorological radars measure a quantity called 'radar reflectivity factor', which is related to the strength of the signal returned by a target, such as clouds or rain. This quantity is shown on the colour scale to the left. Weakly returned signals appear blue (the bottom of the scale); the strongest echoes are orange and red.
- Radar reflectivity factor is roughly proportional to the size of the particles reflecting the radar (to the power of six). This means that large particles in the atmosphere such as raindrops and ice crystals send back a much stronger signal than small particles, for example, clouds and dust. Signals from large particles will therefore appear at the orange and red end of the scale.
- A small signal always appears at the very bottom of every image because there is leakage between the transmitter and the receiver (a feature common to all radars).

Clouds



Meteorologists classify clouds by describing how they look, using combinations of these words:

- Cirrus - a tuft or filament
- Cumulus - a heap or pile
- Stratus - a layer
- Nimbus - rain bearing
- Alto - medium level

There are ten basic cloud types in total, with names based on combinations of these words eg cirrocumulus, altostratus, cumulonimbus.

How Clouds Form

Clouds are mainly made up of tiny droplets of water, or ice particles. Clouds form when moist air cools as it rises. There are four main ways in which air rises to form clouds.

1. **Convection.** Heated air at the Earth's surface rises rapidly in thermal currents.
2. **Frontal.** Warm moist air is undercut by denser cold air (the barrier between the warm and cold air is called a 'front').
3. **Turbulent eddies** form as a result of friction against the Earth's surface, making the air in the eddies rise.
4. **Over a barrier of mountains or hills.**