how to identify cloud type using a cloud chart

First estimate how much of the sky is covered by clouds. The official unit of **cloud cover** is oktas, or eighths of the sky.

When the sky is completely covered by cloud (overcast), the cloud cover is eight oktas. When the sky is clear the reading is zero oktas.

As a guide, tear a piece of white A4 paper into eight equal-size pieces. To judge what a cloud cover of four oktas might look like, scatter four of the pieces on a full sheet of blue A4 paper.

Cloud types

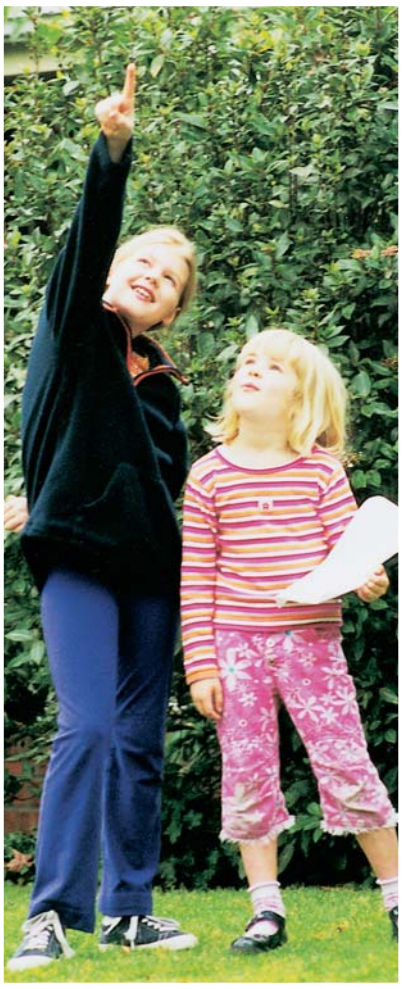
To identify the type of cloud, go outside and refer to the enclosed *Sky Chart* . There can be more than one cloud type present at one time.

- Check if there are any large cumulonimbus or storm clouds (M, N, O, P on *Sky Chart)* – the large, fluffy clouds that are easy to recognise. These clouds can appear quickly and, with dark bases, indicate stormy conditions.

Next look at the clouds according to how high they are above the ground. Use nearby landmarks such as tall buildings, hills and mountain ranges as a guide to height.

- Start with low-level clouds – those up to about 2.5 kilometres high. You can often see the most detail in these clouds and can watch them change shape or move across the sky.

  The three main types of low-level clouds are **stratus** (clouds in a layer), **cumulus** (clouds in lumps or clumps (I, J, K)) and **strato-cumulus** (layer of cumulus or clumpy clouds (L)).



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- Mid-level clouds are from 2.5 to six kilometres above the surface.

  The three main types are **alto-stratus** (clouds in a layer (A)), **alto-cumulus** (clouds in lumps or heaps (B,C, D)) and **nimbo-stratus** (stratus clouds producing rain). These clouds can appear to move slowly if they are above low-level clouds.

- High-level clouds are amore than six kilometres above the ground and tend to be pale and white. They are usually thin and made of ice crystals.

  The three main types of high-level clouds are **cirrus** (cloud wisps (E,F,G)), **cirro-cumulus** (ice clouds in ripples (H)) and **cirrostratus** (flat layers of ice clouds) that look similar to A but are lighter and let more sun through. They can also produce solar and lunar halos.

For more information on describing clouds, including the numbering system, refer to *Observing the Weather* in Section 5 (other resource material).

clouds

What the heck is the use of naming cloud types and estimating cloud cover?

Well, for pilots it is essential for safety reasons and for the comfort of passengers to know the height, type and size of clouds they might encounter. Clouds can reduce visibility and can also indicate what is going on in the atmosphere, particularly with regard to winds.

Clouds can indicate the speed and direction of winds, turbulence and vertical mixing of the air. For example, some **middle-level clouds** produce rain that evaporates before it hits the ground. This rain, or virga, tells pilots that a lot of cold air is moving down through the atmosphere, producing turbulent conditions near the ground that may make landing and take-off dangerous.

Notification of **low cloud** and **fog** is especially important for airlines and passengers because pilots can't see where they are going during take-off and landing. In Australia, aircraft are not allowed to take off or land when visibility is poor, and this can cause delays in departures and the diversion of flights.

Other low-level clouds such as **cumulonimbus** or storm clouds are often associated with turbulent winds, and airlines prefer to avoid them by a long way. There is also the chance of damage from hail and lightning, as well as the danger of icing of aircraft wings.

Ice on the aircraft can reduce lift and thrust due to the change in aerodynamics, can change the balance of the aircraft, can interrupt communi-cations if ice forms on the radio antennae, and can reduce visibility if ice forms on the windscreen.

Icing can occur if the aircraft travels through extensive cloud in which the temperature is 0 to minus 20 degrees Celsius. The rain in the clouds collects on the aircraft and freezes.