
Cirrus
Cumulus
Stratus
Formations
Cloud facts
Clouds
David & Debbie Hibbert

Clouds

- David & Debbie Hibbert -

In this educational eBook we take a brief look at cloud types using a simple photo format. We also introduce you to some of the truly amazing formations visible in the sky.

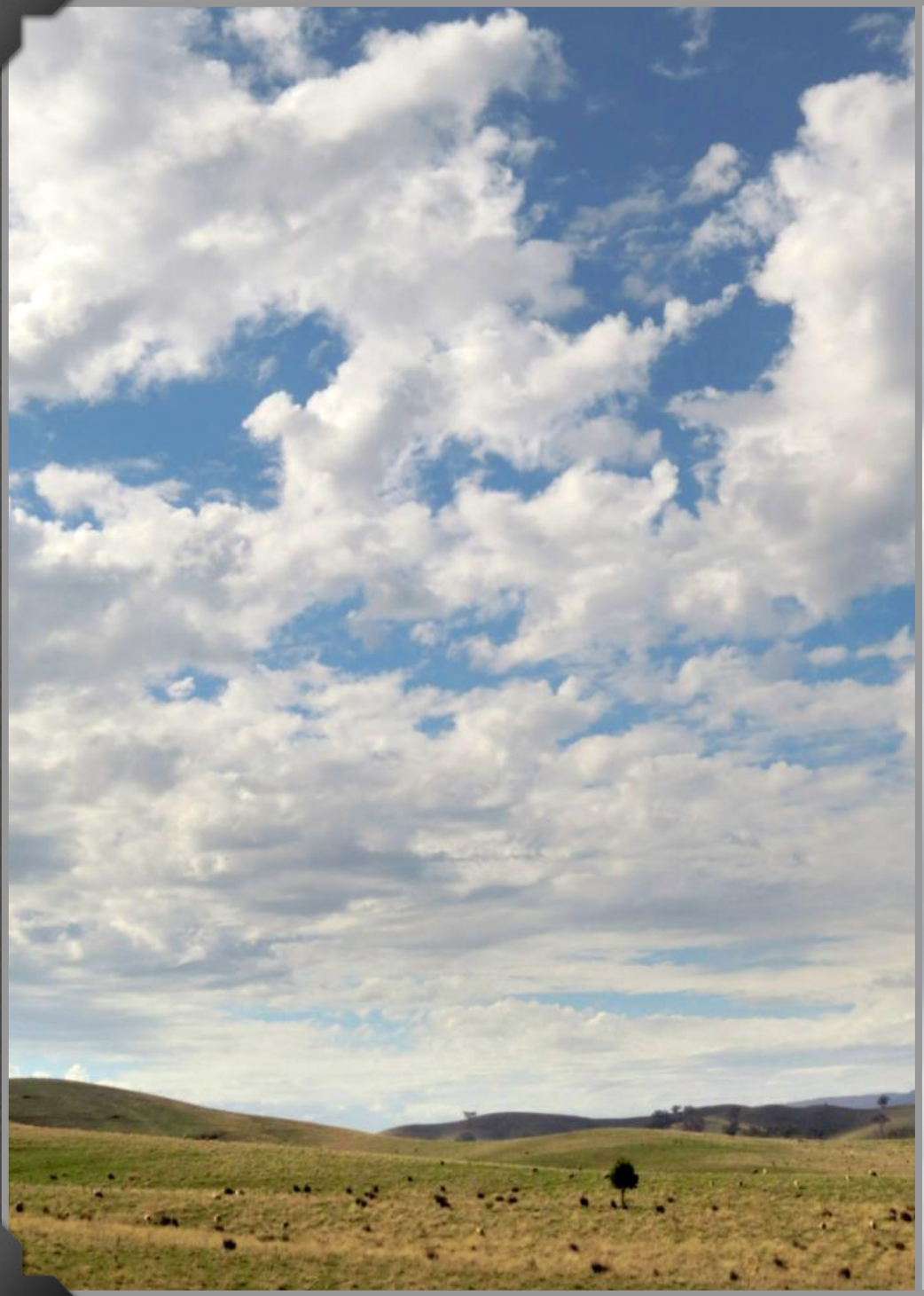
This simple children's resource is primarily designed for early years education.

Special thanks to Kathie Maynes and photographers Linda Laws and Neil Baulch.

WIKI ENCYCLOPEDIA

Cloudy Skies

How many can you describe?



Patchy

Sun and
cloud make
up the sky.

Overcast

Cloud blocks
out the blue sky.

Foggy

Cloud reaches the ground.

Smoky

Smoke from
fire rises
into the sky.

Misty

It is misty when there is moisture in the sky that can be seen.

Stormy

A storm front moves in with dark clouds, rain and lightning.

Colourful

Ice crystals high in the atmosphere can produce colourful clouds.

Cloud Types

Do you know any cloud types?

MAIN CLOUD TYPES

Ice crystals

CIRRUS
Above 5000 metres

CUMULUS
From 500 metres
to 2000 metres

Water
droplets

Water droplets

STRATUS
Below 2000 metres

There are three main cloud types

Cirrus	Cumulus	Stratus

Cirrus

Thin wispy strands found at high altitudes.

Cirrus means 'Curl of hair'.

Floccus means tufts of wool. This cloud is also made entirely out of ice.

CIRRUS

CIRRUS
Above 5000 metres

Cirrus Uncinus Clouds

Uncinus means curly hooks

Cirrus Clouds

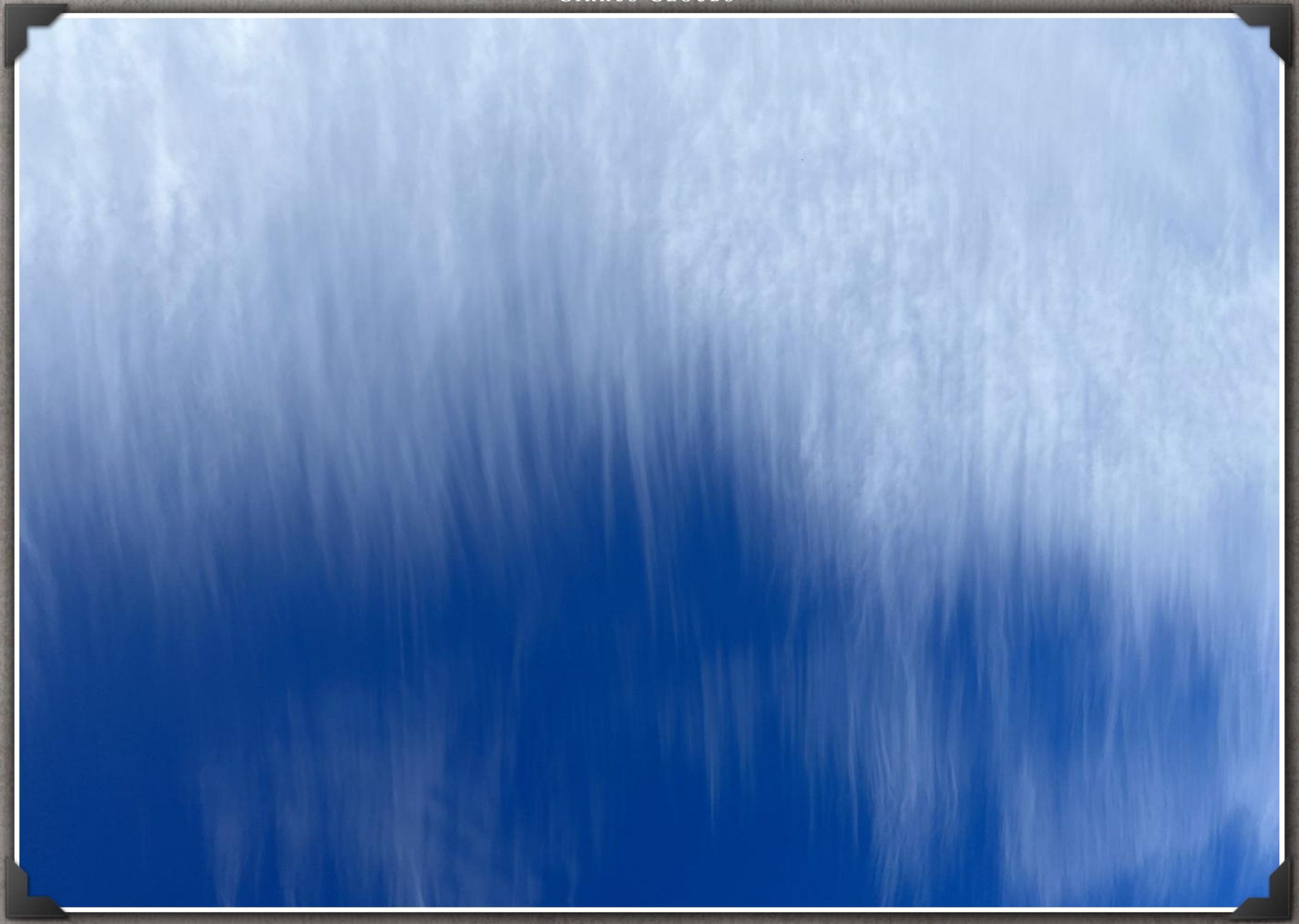
Cirrus Clouds in Windy Conditions

Cirrus Fibratus Clouds

Fibratus means fibres

Cirrus Clouds

Cirrus Clouds



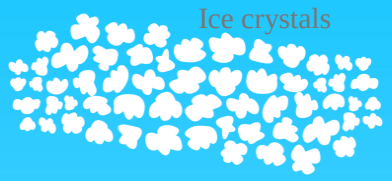
Cirrus Clouds

Cumulus

Fluffy clouds with defined edges that grow vertically and are found at low to medium altitudes.

Cumulus means 'Heap'.

CUMULUS

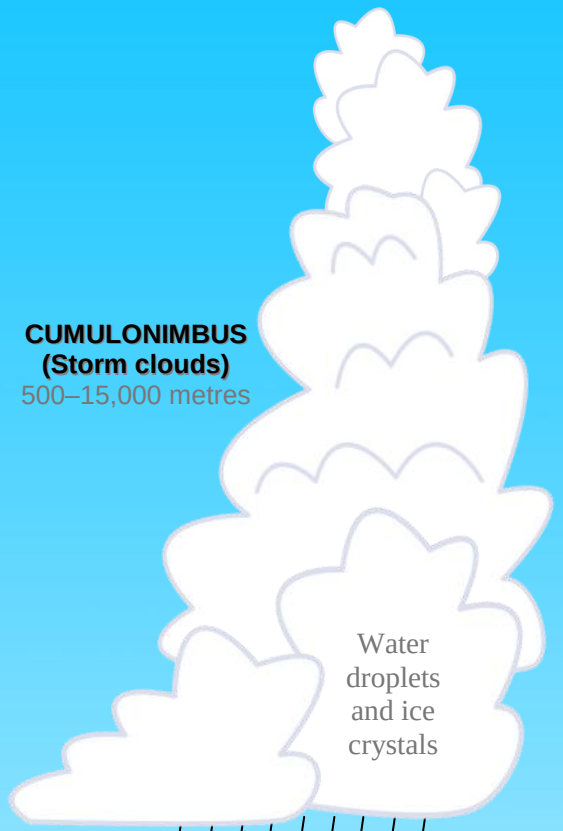


CIRROCUMULUS
(Mackerel Sky)
Above 6000 metres

ALTOCUMULUS
2000–6000 metres

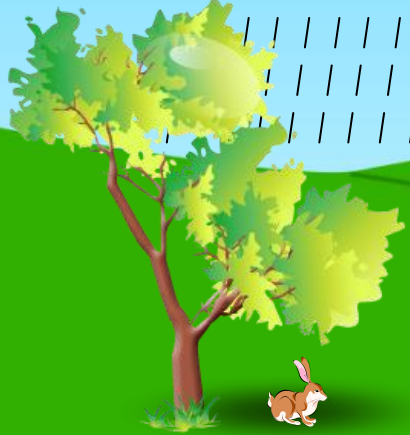
STRATOCUMULUS
Below 2000 metres

CUMULUS
500–2000 metres



CUMULONIMBUS
(Storm clouds)
500–15,000 metres

Precipitation



Cumulus Mediocris Cloud

Cumulus mediocris clouds are small cotton wool clouds that are as tall as they are wide

Cumulus Humilis Clouds

Cumulus Humilis Clouds

Small cotton wool clouds that are wider than they are tall and are common in groups in summer

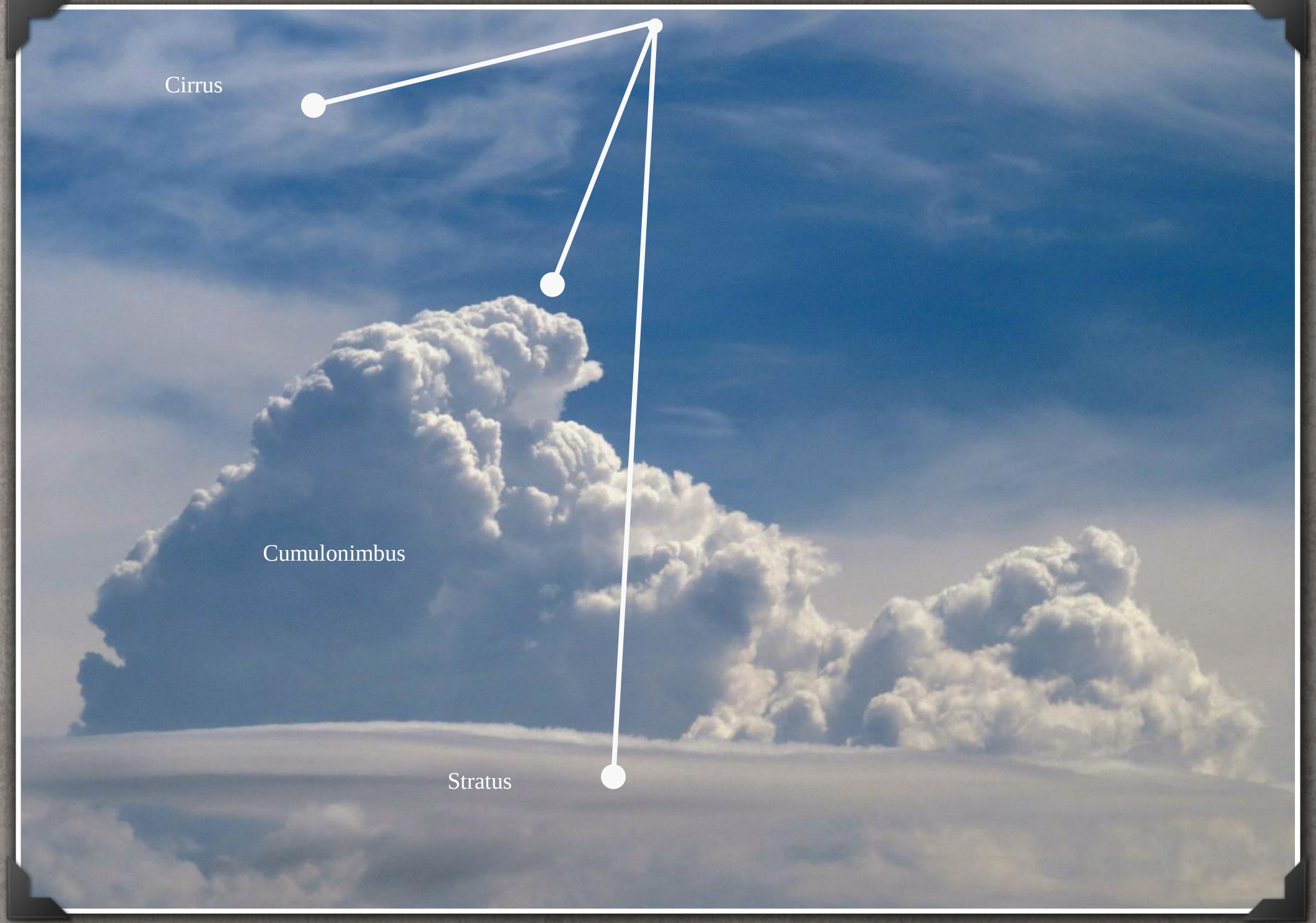
Cumulus Humilis Clouds

Small cotton wool clouds that are wider than they are tall and are common in groups in summer

Small Fluffy Cumulus Clouds near Wilsons Promontory National Park

Cumulus Clouds forming below Altostratus Clouds near Echuca

Cumulonimbus Cloud forming with Stratus below and Cirrus above



Cumulonimbus clouds are storm clouds and can produce heavy rain, hail, sleet and snow

Cumulonimbus Calvus Storm Cloud Building

These are puffy all over, including on top as they have not become cold enough yet to stop growing and span out as ice crystals

Cumulonimbus Storm Cloud

Bottom of a Cumulonimbus Storm Cloud

Cumulonimbus Storm Front

Cumulonimbus Clouds Releasing Rain

Cumulonimbus Clouds Releasing Rain

Cumulonimbus Clouds Releasing Rain Causing a Strong Downdrough

Cumulonimbus Clouds Releasing Rain

Cumulonimbus Clouds Releasing Rain

Cumulonimbus Storm Cell Releasing Rain

Cumulonimbus Storm Cell Releasing Rain

Cumulonimbus Storm Cell Releasing Rain

Cumulonimbus Super Cell Releasing Rain

Cumulonimbus Super Cell

Altocumulus Cloud

Cirrocumulus Clouds producing a Mackerel Sky

Cirrocumulus Clouds producing a Mackerel Sky

Stratus

Mostly featureless clouds found in low to medium altitudes.

Stratus means 'Sheet'.

STRATUS

CIRROSTRATUS
Above 6000 metres

Ice crystals

ALTOSTRATUS
2000–6000 metres

Water droplets and ice crystals

NIMBOSTRATUS
(Rain clouds)
Below 2000 metres

Water droplets

Precipitation

Water droplets

STRATUS
Below 2000 metres

Stratus Nebulosis Cloud (Fog)

Stratus Nebulosis Cloud (Fog)

Stratus Nebulosis Cloud (Fog)

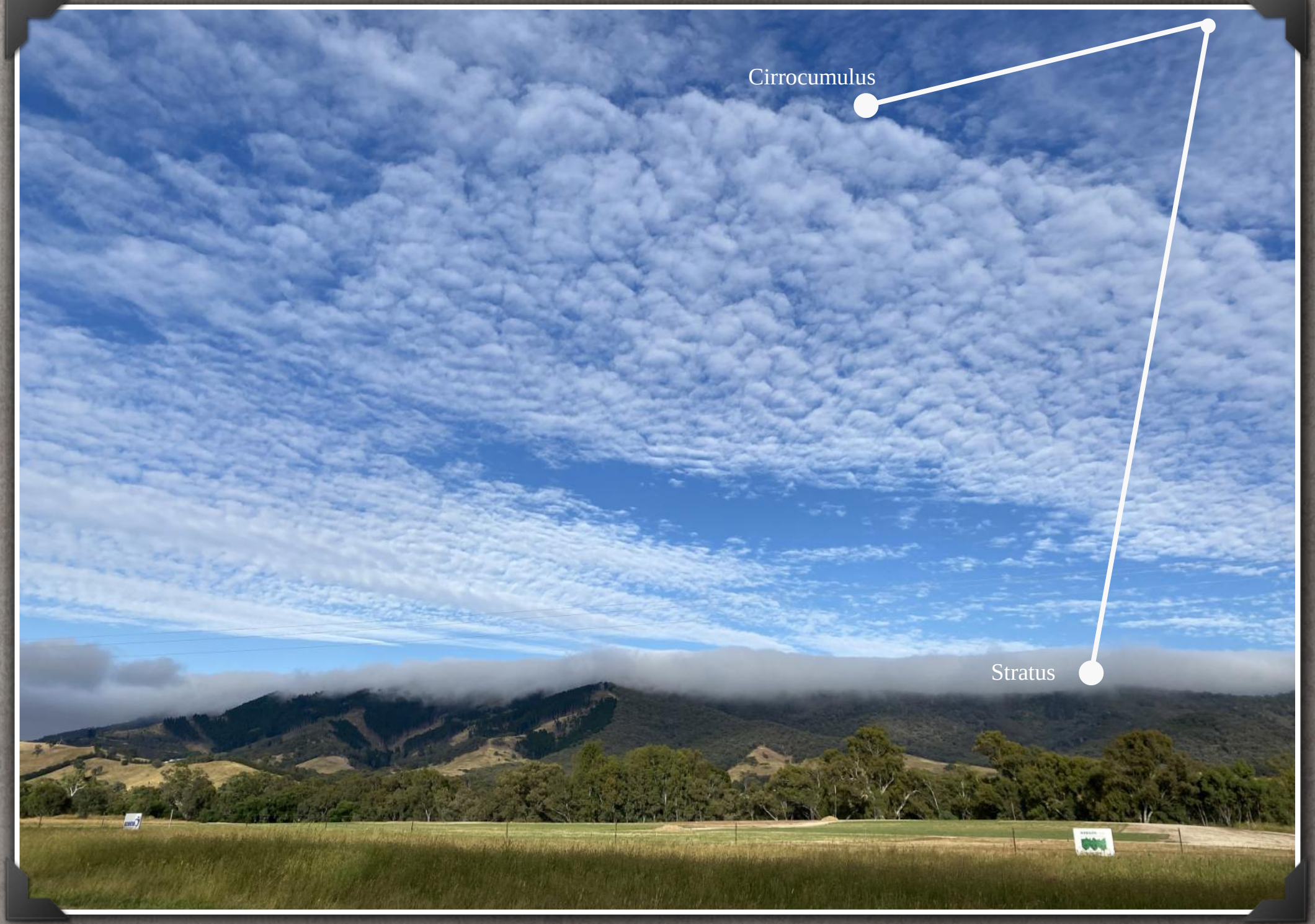
Stratus Nebulosis Cloud (Fog) Filling the Valleys

Stratus Nebulosis Cloud (Fog)

Stratus Shelf Cloud

Stratus Shelf Cloud

Cirro Clouds Sitting on a Range



Nimbostratus Rain Clouds

Cirrustratus Sundog Caused by Ice Particles

Cloud Names

Cloud Names, Abbreviations, Levels, and Meanings (from the Latin)

NAME & ABBREVIATION	LEVEL IN SKY (low, mid, high)	MEANING
Altocumulus (Ac)	Mid	High heap
Altostratus (As)	Mid	High sheet
Cirrus (Cs)	High	Curl of hair
Cirrocumulus (Cc)	High	Wispy heap
Cirrostratus (Cs)	High	Wispy sheet
Cumulonimbus (Cb)	Vertical developing across all levels (rain and storm cloud)	Rain cloud
Cumulus (Cu)	Vertical developing across all levels	Heap
Nimbostratus (Ns)	Low (rain cloud)	Rain sheet
Stratocumulus (Sc)	Low	Heap and sheet
Stratus (St)	Low	Sheet

Cloud names also have cloud abbreviations which are shown here

Layers of the Earth

UNDERSTANDING WEATHER

The atmosphere is the area above the Earth where gases such as air are retained by the gravity of the Earth. Weather occurs because those gases move.

The atmosphere is divided into five layers and the lowest of these is where most of our weather occurs. The weather layer is called the troposphere.

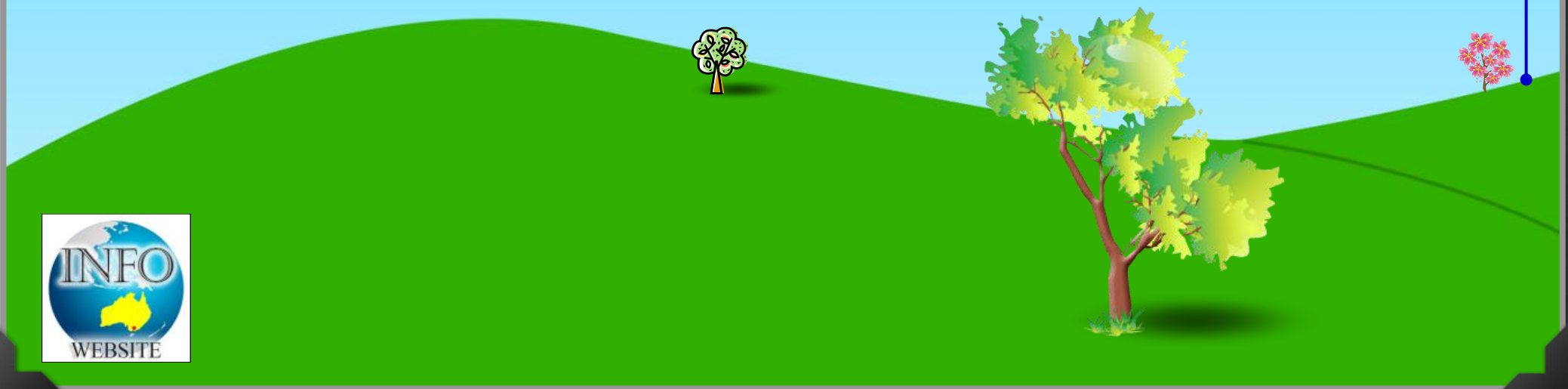
TROPOSPHERE

Although scientists disagree with where exactly the atmosphere ends, it is widely accepted as being around 100 km as this is where most gases exist.

ATMOSPHERE

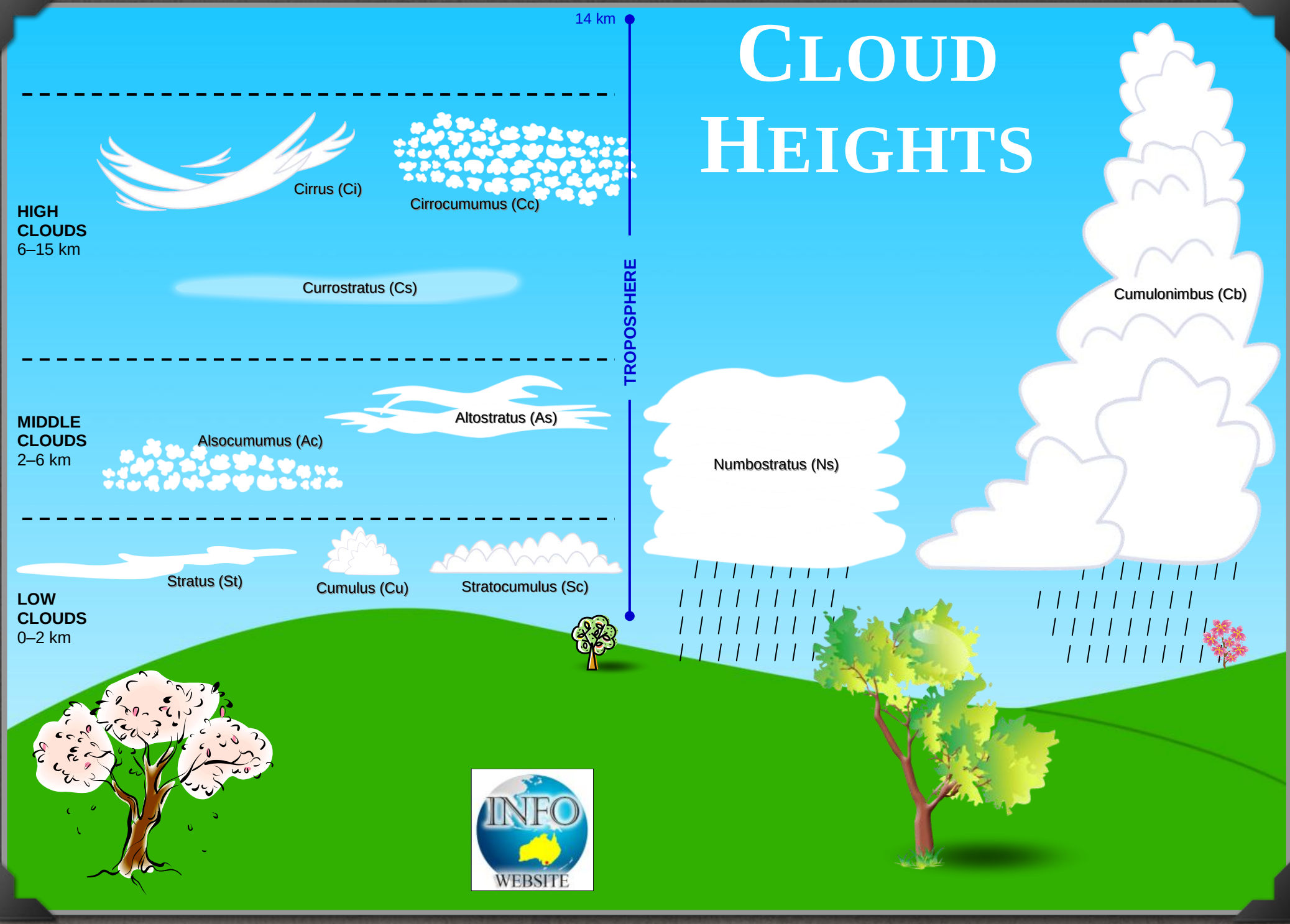
The troposphere is the vertical space between the Earths surface and rises to roughly 14 km above it. However, its height varies. It is thinnest at the poles and thickest at the equator.

Most of the Earth's air and 99 percent of the Earth's water vapour is found in this layer. Clouds form at different heights in the troposphere.



INFO WEBSITE

CLOUD HEIGHTS



Sky

EARTH ORBITS

Geosynchronous orbits (GEO)
Some satellites orbit at distances from the Earth that are greater than 36,000 km and less than half way to the moon. These include television, communications and weather satellites.

Medium-Earth Orbit (MEO)
Some satellites orbit between 2000 km and 36,000 km. These include satellites that make your GPS based navigation systems work.

Low-Earth Orbit (LEO)
Some satellites orbit between 180 km and 2000 km. These include the International Space Station and the NASA Space Shuttle during operations.

36,000 km

2000 km

180 km

Exosphere
(320 km to half way to moon)

Thermosphere
(80–320 km)

Most clouds and lightning appear in the troposphere, though cumulonimbus can reach Stratosphere.

Cirrus

Stratus

Cumulus

Mesosphere
(40–80 km)

Mount Everest is Earth's highest mountain, and reaches a staggering 8848 metres (8.848 km) above sea level. Mount Everest points out into space more than any natural or man made earth based object.

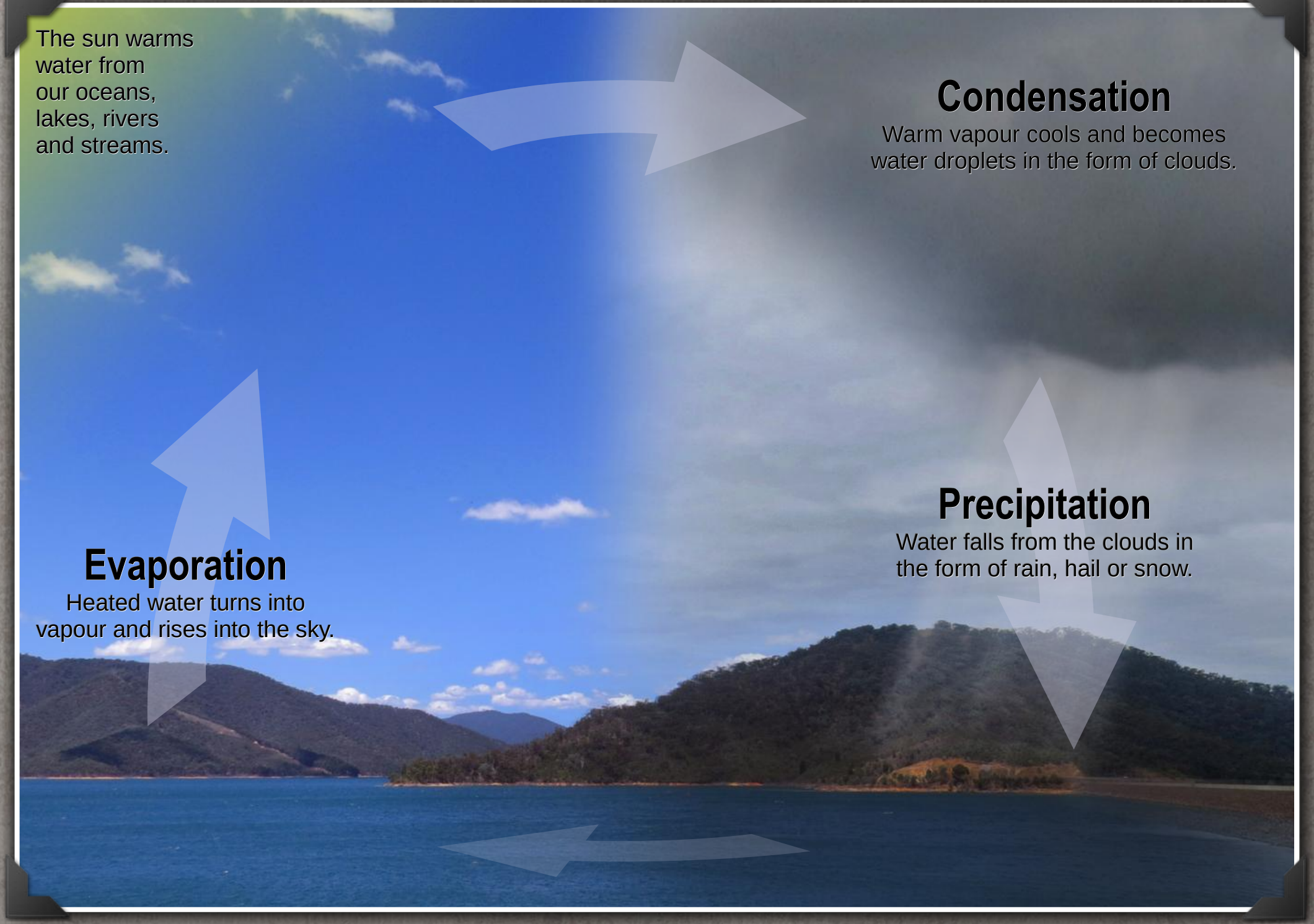
Stratosphere
(14–40 km)

Troposphere *(0–14 km)*

Sea level

Precipitation

Water Cycle


The sun warms water from our oceans, lakes, rivers and streams.
Condensation
Warm vapour cools and becomes water droplets in the form of clouds.
Precipitation
Water falls from the clouds in the form of rain, hail or snow.
Evaporation
Heated water turns into vapour and rises into the sky.

Unusual Cloud Formations

Evaperating 'Virga' Cloud under Comulus Clouds

Evaperating 'Virga' Cloud under Comulus Clouds

Pyrocumulus Cloud Produced by a Bushfire

Altostratus Mammatus Cloud

Altostratus Mammatus Cloud

Kelvin-Helmoltz Instability

Kelvin-Helmoltz Instability

Cloud Iridescence

Cloud Iridescence

Thee appear when the ice crystals in a cloud are a specific size and at an specific angle to the sun to scatter light

Fallstreak Hole Cloud Formation

Altocumulus (Mackerel Sky) with Altostratus below and Iridescence (top left)

Cirrostratus Nebulosus Clouds

An almost invisible thin high altitude sheet of ice that can result in a halo around the sun called sundog

Contrails (clouds formed by jet engines at high altitudes)

Boeing 747-483 flight QF64 from Johannesburg to Sydney at 37,000 ft and 493 km/h - over Alexandra 27 April 2014.

Contrails

Defused Contrails (clouds formed by jet engines at high altitudes)

The cloud on the left is a contrail left by a high flying jet

A Contrail crossing a Cirrus feather-like formation

Unknown Formation

Strong Wind Pulling Apart the Bottom of a Cumulusonimbus Cloud

Crepuscular Rays

Crepuscular Rays are also known as 'God Rays' and are streaks of light that radiate from the sun. They usually stream through gaps in clouds extending outwards from the sun. Although they seem to spread wider and wider, they are in fact near-parallel.

Crepuscular Rays

Crepuscular Rays

Crepuscular Rays

Cloud Facts

Water Vapour

Water vapour (moisture in a gas form) can exist in the warmer air near the ground. When this warm air rises it expands and cools. Once the temperature drops below the dew point the water vapour condenses onto tiny cold particles of dust high in the sky. When billions of these droplets come together, they become a visible cloud. These droplets can be in the form of water droplets, though can also form ice crystals.

NIMBUS

"Nimbo" is from the Latin word "nimbus", which denotes precipitation. Nimbus clouds are clouds that produce precipitation in the form of rain, hail, snow or sleet.

Wind

Clouds move with the wind and can travel
at speeds exceeding 100 km per hour.

Cumulonimbus clouds are very high formations that can be flattened at the top due to high winds and the water turning to ice crystals at that level. This gives them a distinctive shape like an anvil.

Lenticular clouds appear over mountains where high winds often transform them into shapes that make them look like a flying saucer or a lens.

Dark Clouds

Clouds will appear darker when they are thicker or more moisture laden. These clouds block more sunlight from passing through them.

Clouds will often appear very dark before snow, hail or rain is released.

Rain bearing clouds are cumulonimbus or nimbostratus cloud formations.

Acid Rain

Water from clouds is relatively pure. However rain will hit particles of pollution when it is falling back to Earth, causing contamination. In extreme cases where air pollution is dangerously high, rain has actually been acidic and dangerous to humans. This is known as acid rain due to its tendency to have an unusually high proportion of hydrogen ions.

Acid rain can be especially destructive to plants, animals, insects and aquatic creatures.

Fog

Stratus cloud at ground level is called fog.

Fog is made up of droplets of condensed water that are suspended in air that is usually stationary.

Fog may contain ice particles in extremely cold conditions.

As the air supporting a fog cools, the moisture falls to the ground. The temperature at which moisture turns from vapour to water droplets (condenses) is called the dewpoint.

Educational Resources

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Artworkz, serving the community

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