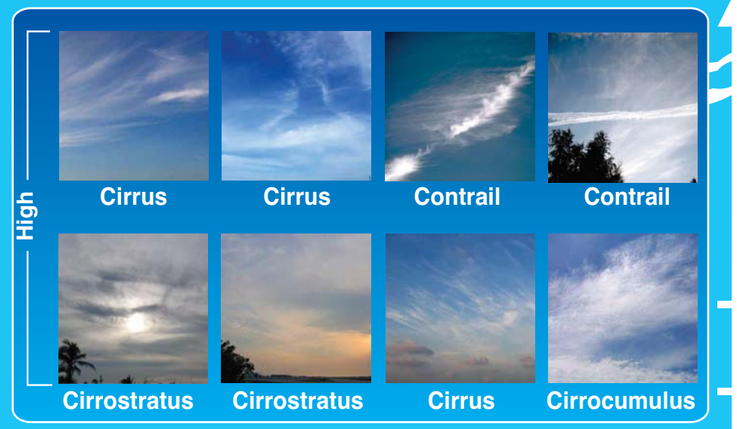
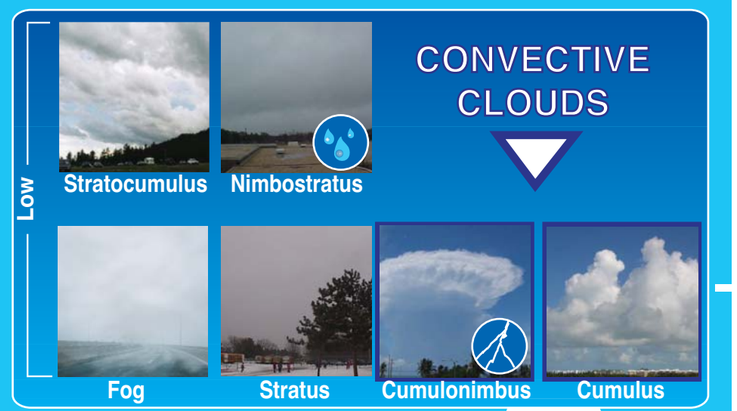
Introduction to Clouds

http://science-edu.larc.nasa.gov/cloud_chart





Convective Clouds form because of large updrafts of warm, moist air moving up into cold air!

Altitude of Cloud Base

6 km
5 km
4 km
3 km
2 km
1 km
0 km

Cloud Cover

- Clear (0% - 5%)
- Partly Cloudy (5% - 50%)
- Mostly Cloudy (50% - 95%)
- Overcast (95% - 100%)

Visual Opacity

- Opaque
- Translucent
- Transparent

The water on Earth is always on the move, changing state from liquid to vapor back to liquid and snow and ice near the poles and mountains. The process used to describe the continuous movement of water between the Earth and atmosphere is known as the water cycle, and is often referred to as the hydrologic cycle. There is no beginning or end to the water cycle; it behaves much like a Ferris wheel at an amusement park, moving around and around.

Cloud Cover

Determination of the amount of cloud cover is done by estimating the percentage of the sky covered with clouds. This is one of several possible scales or categories for cloud cover.

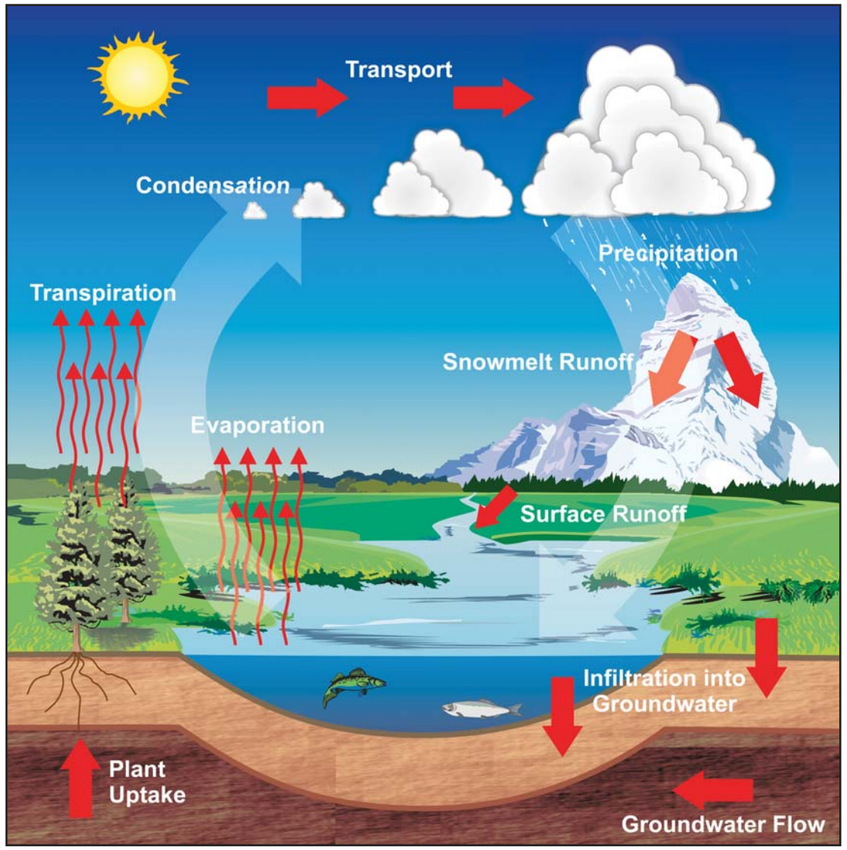
Visual Opacity

The thickness of a cloud determines the amount of light being transmitted through the cloud. Shadows often provide a clue.

Ever wonder how clouds got their names? Well you may be surprised to find out!

Cloud Level

Three levels of clouds have been identified based on the altitude of a cloud's base.



The Earth's Water Cycle

In 1803 Luke Howard used Latin terms to classify four main cloud types.

- Cumulus means pile and describes heaped, lumpy clouds.
- Cirrus, meaning hair, describes high level clouds that look wispy, like locks of hair.
- Featureless clouds that form sheets are called Stratus, meaning layer.
- The term Nimbus, which means "precipitating cloud", refers to low, grey rain clouds.
- Alto is used to describe mid level clouds.
- Finally, convective clouds have a vertical development extending through large portions of the atmosphere.

National Aeronautics and Space Administration
http://www.nasa.gov
http://education.nasa.gov
http://scool.larc.nasa.gov
NP 2007-07-33-LaRC

National Oceanic and Atmospheric Administration
http://www.noaa.gov
http://www.weather.gov
http://www.education.noaa.gov
http://www.srh.noaa.gov/jetstream
YPA-200752-L

SKY WATCHER CHART

http://www.weather.gov/os/brochures/cloudchart.pdf

High Clouds: cloud bases 16,000 - 50,000ft (5-15km)

Typical Types: Cirrus (Ci), Cirrostratus (Cs), Cirrocumulus (Cc)

H1: Cirrus
In the form of filaments, strands, or hooks

H2: Cirrus
Dense, in patches or sheaves, not increasing, or with tufts

H3: Cirrus
Often anvil shaped remains of a cumulonimbus

H4: Cirrus
In hooks or filaments, increasing, becoming denser

H5: Cirrostratus
Cirrus bands, increasing, below 45° elevation

H6: Cirrostratus
Cirrus bands, increasing, veil above 45° elevation

H7: Cirrostratus
Translucent, completely covering the sky

H8: Cirrostratus
Not increasing, not covering the whole sky

H9: Cirrocumulus
Alone or with some cirrus or cirrostratus

Middle Clouds: cloud bases 6,500 - 23,000ft (2-7km)

Typical Types: Altostratus (As), Altocumulus (Ac), Nimbostratus (Ns)

M1: Altostratus
Mostly semi-transparent, sun or moon may be dimly visible

M2: Altostratus or Nimbostratus
Dense enough to hide the sun or moon

M3: Altocumulus
Semi-transparent, one level, cloud elements change slowly

M4: Altocumulus
Lens-shaped, or continually changing shape and size

M5: Altocumulus
One or more bands or layers, expanding, thickening

M6: Altocumulus
From the spreading of cumulus or cumulonimbus

M7: Altocumulus
One or more opaque layers, w/ altostratus or nimbostratus

M8: Altocumulus
With cumulus-like tufts or turrets

M9: Altocumulus
Chaotic sky, cloud bases at several levels

Low Clouds: cloud bases Up to 6,500 ft (0-2km)

Typical Types: Stratus (St), Stratocumulus (Sc), Cumulus (Cu), Cumulonimbus (Cb)

L1: Cumulus
Cumulus of fair weather with flattened appearance

L2:Cumulus
Moderate/strong vertical extent, or towering cumulus

L3: Cumulonimbus
Tops not fibrous, outline not completely sharp, no anvil

L4: Stratocumulus
From the spreading and flattening of cumulus

L5: Stratocumulus
Not from the spreading and flattening of cumulus

L6: Stratus
In a continuous layer and/or ragged shreds

L7: Stratus Fractus
and/or Cumulus Fractus occurs with rain or snow

L8: Cumulus & Stratocumulus
Not spreading, bases at different levels

L9: Cumulonimbus
With fibrous top, often with an anvil

Mammatus
Drooping underside of heavy, rain-saturated clouds

Tornado
Rapidly rotating column under a cumulonimbus cloud that touches the ground

Wall Cloud
Lowering of the rain free base of a thunderstorm, often prior to tornado formation

Shelf Cloud
Represents the leading edge of strong winds in advance of a thunderstorm

Wave Cloud
Formed by strong horizontal winds over uneven terrain

Special photo credit thanks to Jim W. Lee, Eric Kurth, Brian Klimowski, and Eric Helgeson