



Reading Clouds

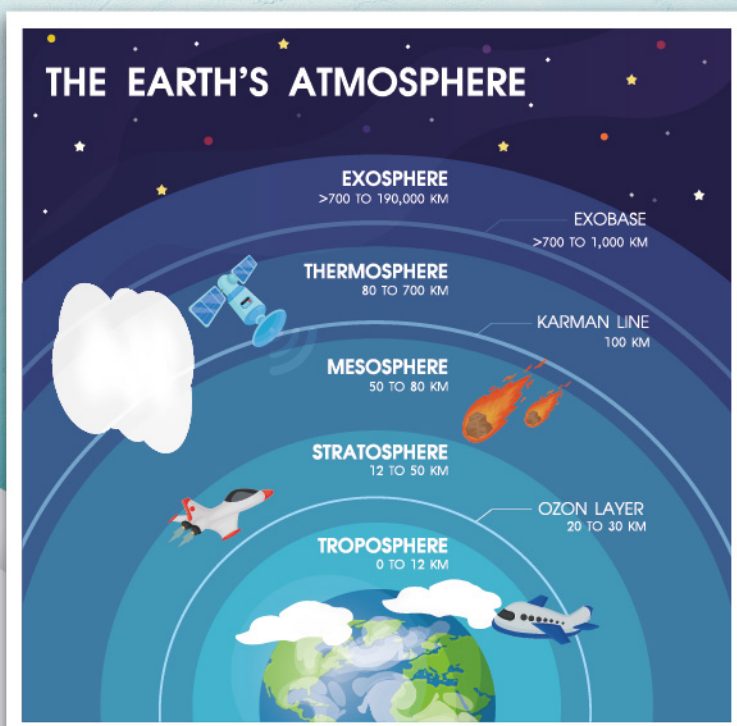


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Whenever you look at the sky, it is very likely that you will be able to see some clouds. The shape of these clouds allows your imagination to run wild and are a great example of how beautiful nature is. Apart from being inspired by their beauty, many people in the world study clouds extensively to understand them better and make use of the knowledge acquired.

The study of clouds falls under the branch of meteorology (the study of the atmosphere), where Aristotle is considered as the founder due to his works written around 340 B.C. However, records of cloud observation started much earlier than that. One of the earliest examples can be traced back to ancient India, where writings of the 3000 B.C. era discussed the processes of cloud formation.

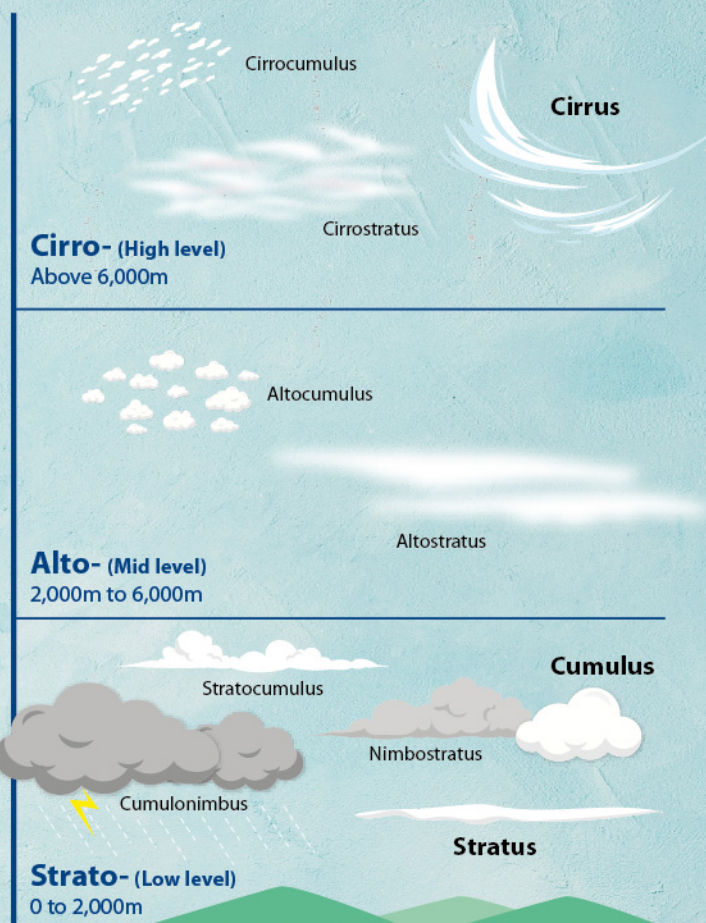
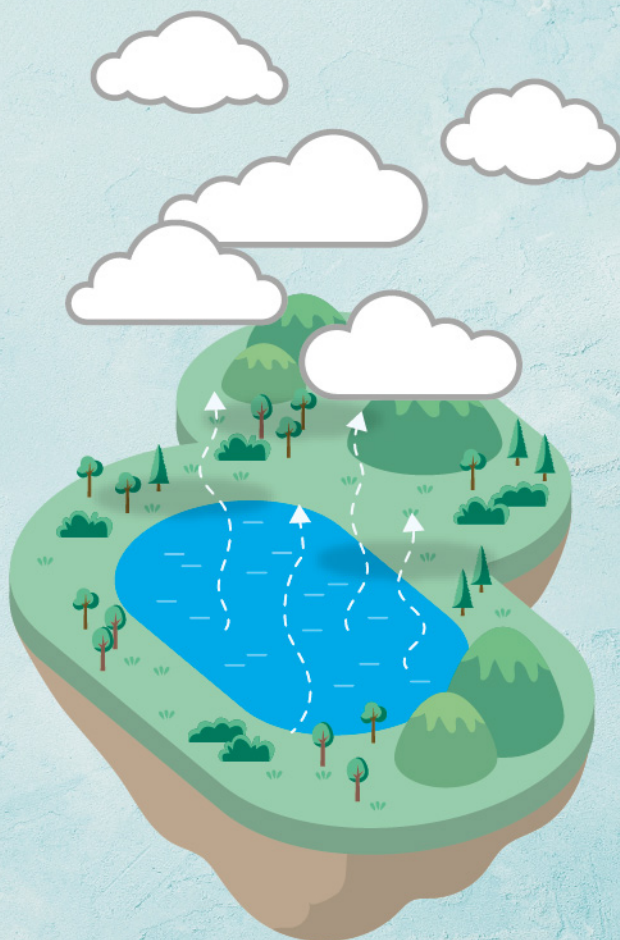
The modern study of clouds with the knowledge of physics was developed in the 19th century, and it continues today. On Earth, clouds are made of condensed water vapour or ice. These water droplets and crystals are suspended in the lowest portion of the atmosphere surrounding Earth, also known as the troposphere.





One important question emerges: How do clouds form? The answer lies in the air and water vapour in it. The rising air from the Earth's surface contains water vapour. At increasing altitudes, atmospheric pressure decreases and causes this air to expand, lose energy and cool down in the process.

The amount of water vapour that can be retained in the air depends on the temperature of the air. Some of the water vapour is released from the cooled air and forms visible water droplets or crystals – these are the clouds that we see! Due to the complexity of cloud formation, no two clouds are identical in terms of shape and height. However, we can categorise the clouds simply, thanks to British meteorologist, Luke Howard. He devised a system for naming clouds in 1801 based on Latin root words, which indicate the appearance and level of the clouds in the atmosphere. The success of Howard's system was due to the universal usage of Latin and the flexibility to change the names.



There are three groups for appearance: cirrus (curl of hair), stratus (layer) and cumulus (pile). Additionally, there are three prefixes to indicate the level of the cloud: cirro- (high clouds above 6000 metres), alto- (mid-level clouds between 2000 to 6000 metres) and strato- (low-level flat layer) or nimbo- (low-level rain clouds). Combining the prefixes and group names, we are able to classify the clouds into ten categories in Howard's system.

Think:

Can you come up with some combinations of cloud names? Do these actually exist?

Types of clouds



Cirrus: thin and hair-like, sometimes called "mare's tail".

High-altitude clouds

The clouds at high altitude contain ice crystals as water always freezes at that altitude. They usually represent fair weather as they do not bring rain.



Cirrostratus: sheet-like, nearly transparent and covers a large part of the sky. The Sun may appear to have a coloured halo when shining through a large sheet of cirrostratus.



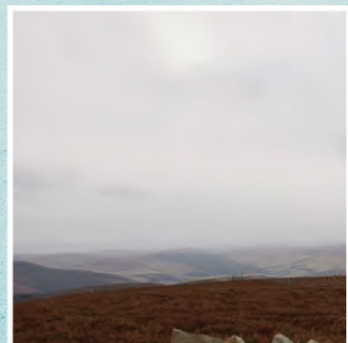
Cirrocumulus: small and patchy, consists of many small clouds in the form of grains or ripples. A sky with cirrocumulus is sometimes called 'mackerel sky' for its scale-like appearance.

Middle-altitude clouds

At this height, clouds are composed of water droplets and occasionally ice crystals.



Altostratus: Thin and uniform, diffused with little appearance of individual clouds. This can bring rain or snow.



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Low-altitude clouds

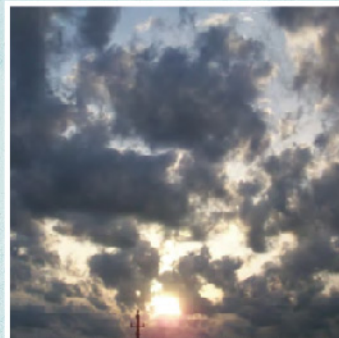
Clouds at a low level are composed of water, and often indicate fair weather or drizzle.



Cumulus: Puffy cloud often associated with fair weather.



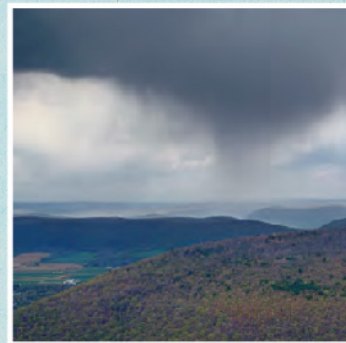
Stratus: Flat and uniform in all directions. This may bring drizzle.



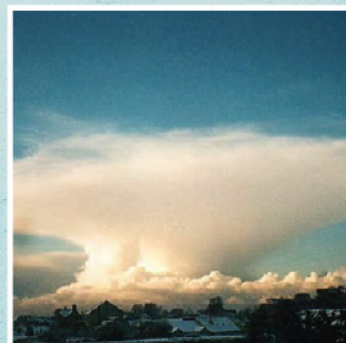
Stratocumulus: Wide and flat at the bottom, puffy at the top. It can produce very light rain (drops that are usually greater than 0.1 cm in diameter) or drizzle (drops with diameters less than 0.1 cm).

Vertical clouds

These kinds of clouds are developed vertically and likely to grow beyond the boundaries between Howard's cloud levels. They often produce rain, snow or thunderstorms.



Nimbostratus: A layered, uniform rain cloud. Its appearance is very dark, and it tends to bring long-lasting rain.



Cumulonimbus: Often called 'thunderhead', this type of cloud generally produces thunderstorms, rain or showers. This is most common in warm and humid weather.

Activity:

Take a look outside your window, what type of clouds do you see outside? Can you name them using Howard's system of naming clouds?