



Air Activities Badge



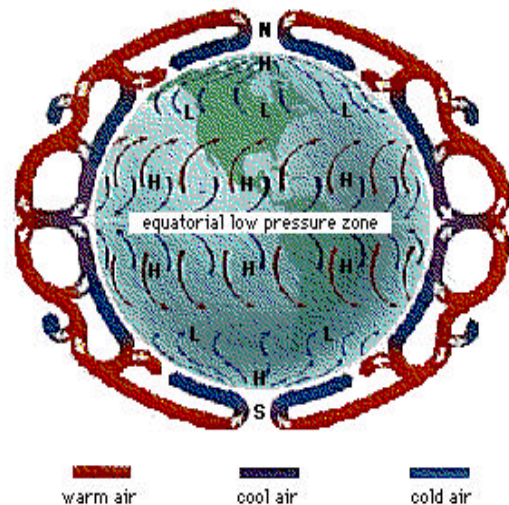
Requirement 3g

Weather takes many forms, and it varies from day to day. Changes may also occur rapidly and it is important for all pilots as well as other aviation-related personnel to be constantly aware of even small changes, which may affect flying conditions.

Winds

Wind conditions are of great importance, as they predict changes in weather. Wind is caused by a combination of the earth's rotation with hot air rising at the equator and cold air descending at the North and South poles. This forms areas of *High* and *Low* air pressures – and the air tries to balance itself out by constantly moving about and this causes warm or cold **wind** movements. This movement of wind are called **fronts**.

Strong winds can cause bumpy flights, give take off and landing hazards for pilots and be extremely dangerous for Balloonist, Gliders and Parachutists – blowing them off course or damaging them.



Precipitation - Rain, Fog, Hail, Snow

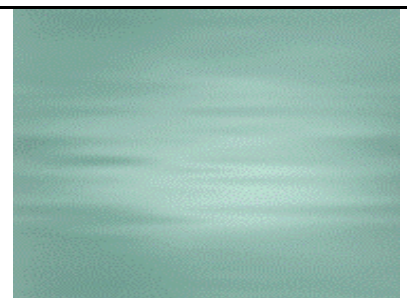
A band of warmer or colder air reaching us usually causes sharp changes in our weather. The abrupt change (and, in fact, the contact between the two masses of air) produces strong winds and **precipitation** (the catch-all term for rain, fog, snow, hail, etc.).

This moisture comes from the clouds. Observing the sky and classifying the types of clouds along with their movements are most valuable in predicting changes in weather.

Snow and Hail are dangerous to all air activities and must be avoided. Rain on wings can freeze in the right conditions, thus destroying the wings lift and pilots have to constantly be aware of this.

Fog happens when **warm moist** air is rapidly **cooled** (usually by passing over colder water or land) and tries to dump its excess moisture. Since there's no rapid motion - vertically or horizontally - to mix up the droplets, they are too small to form raindrops, and just hang there.

Fog is extremely dangerous to air activities as hazards can't be seen and landings and take offs are nearly impossible !

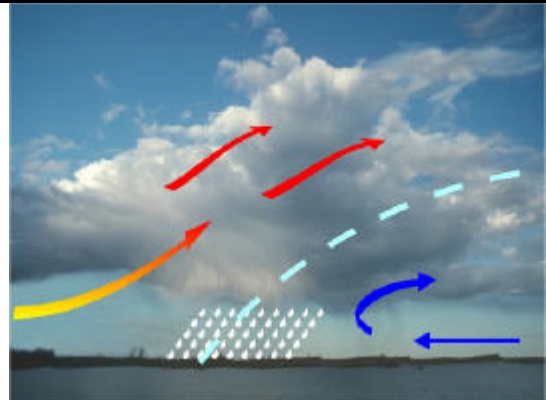




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Warm fronts are caused by warm air being blown across country, meeting colder air, rising up over it, cooling by contact, and forming clouds and rain. The approach of a warm front is marked by wind and high clouds (*cirrus & cirro-stratus*) followed by lower *alto-stratus* and rain-bearing *nimbo-stratus*.



Cold fronts are the reverse; a layer of cold air burrows in under some warmer air. Again, the warm air is cooled by contact; but this time the process is more sharp, and violent rain (and characteristic huge anvil-shaped *cumulo-nimbus* clouds) result.

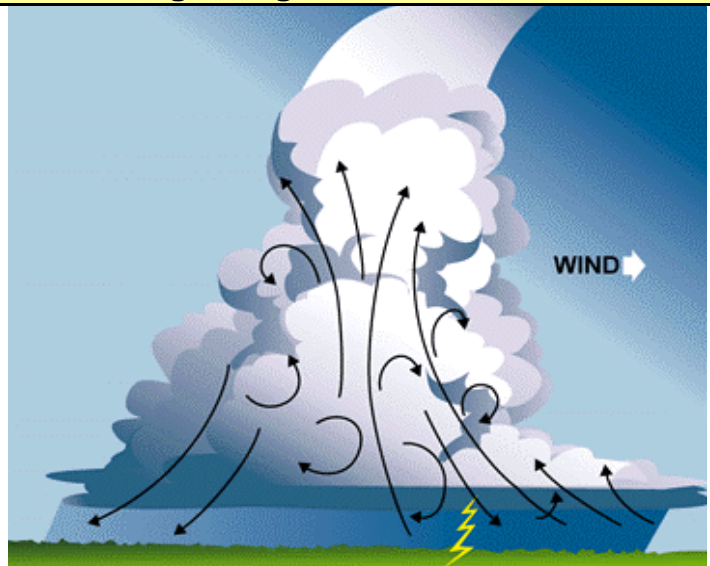
Thunderstorms happen at cold fronts.



Thunderstorms & Lightning

Moist air near the Earth's surface is warmed by the sun, and as the air becomes warmer it starts to rise. As it rises it cools, and, if cooled sufficiently, cumulus clouds form at the condensation level. These small, white puffy clouds grow larger and larger as more warm air rises from the ground.

Most thunderstorms are associated with towering clouds known as cumulonimbus. These clouds normally form on warm, sunny days, although they are sometimes found on a cold front if conditions are right for their formation.



When the cloud gets large enough, the top is so high where the air is cooler. Strong winds at these altitudes blow the top of the cloud downwind, and this gives the top of the cloud an anvil shape.

Not all cumulonimbus clouds bring thunderstorms and lightning; some just bring heavy showers or hail. However these clouds can cause great damage aircraft because of the strong wind forces within the cloud, and lightning could damage an aircraft's radio as well as the hazards of Hail and freezing Rain.