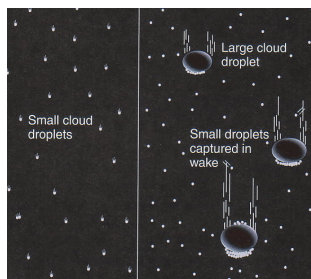


Rain formation in warm (not frozen) clouds

- In a supersaturated environment, **activated cloud drops grow by water vapor condensation**
 - It takes many hours for the cloud drop to approach rain drop size
- **Collisions** between cloud drops can produce large rain drops much faster through **coalescence**
 - Collisions occur in part due to different settling rates of large and small drops
 - Not all collisions result in coalescence
- Rain formation favored by
 - Wide range of drop sizes
 - Thick cloud
 - Fast updrafts

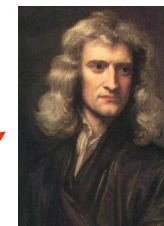


Forces Acting on the Air

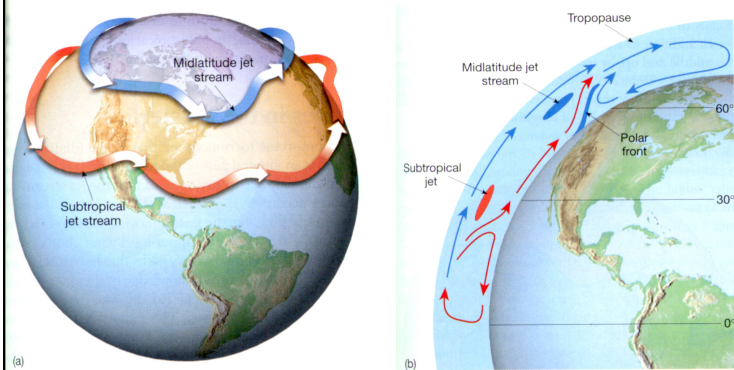
- Pressure gradient force (pushing)
- Gravity (falling)
- Friction (rubbing against the surface)

- "Apparent" forces
 - The Coriolis Force
 - Centrifugal Force

$$\sum \vec{F} = m\vec{a}$$

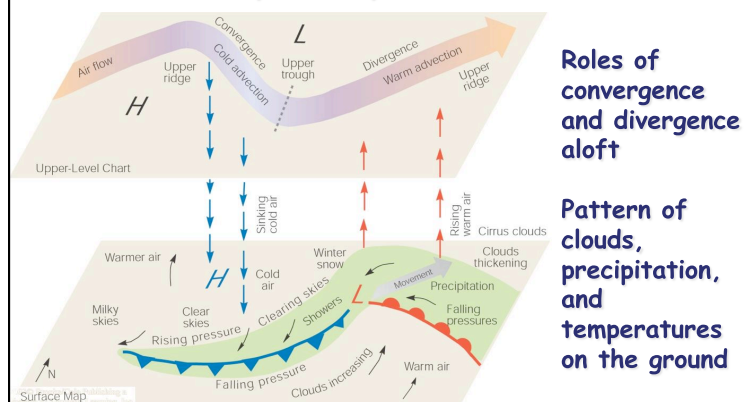


Jet Streams



- Subtropical Jet is zonal mean response to poleward flow in upper branch of Hadley Cell
- Polar front jet is response to meridional temperature gradients

Summary of Cyclone Weather



Roles of convergence and divergence aloft

Pattern of clouds, precipitation, and temperatures on the ground

