

# Thunderstorms

October 16, 2015 2:36 PM

- Ingredients:
1. Moisture
  2. Instability - unstable air will continue to rise if given a nudge
    - warm moist air near surface rises, cools and condenses
  3. Sources of lift
    - differential heating
    - fronts
    - terrain



## Life Cycle of a Thunderstorm

- lasts about 30 min

### a) Towering Cumulus stage

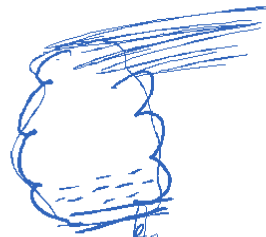
- a cumulus cloud grows vertically
- up to 6 km high
- lots of eddies + updrafts inside

### b) Mature Stage

- up to 12 - 18 km
- strong up + down drafts
- most dangerous stage
  - large hail, high winds, flash flooding

### c) Dissipating stage

- downdrafts cut off the updrafts (eliminating supply of warm, moist air)
- ends with an anvil top



### The Sound of Thunder

Thunder is the shock wave resulting from the rapid expansion of the air as air is heated to  $30,000^{\circ}\text{C}$  by lightning.  
Air expands and compresses similar to a sonic boom.

How far away is the storm?

See lightning

count the seconds

hear thunder

3s = 1 km

5s = 1 mile

Pg 560 # 1, 2, 4

Pg 564 # 6a, 7

webpage