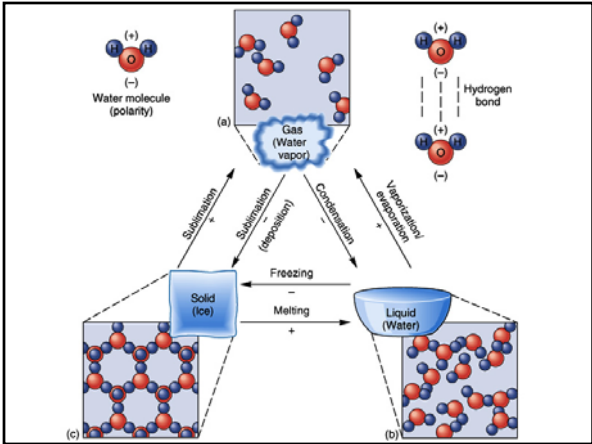


**Essay Review #2**  
  
 GEOG 101  
 The Natural Environment

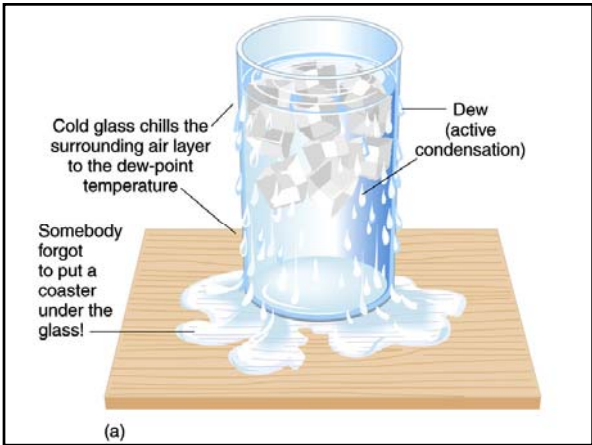
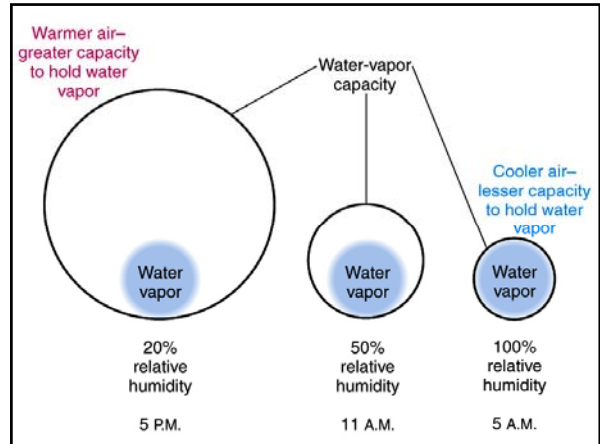
**1. Phase change:** Support the idea: "It is cool near a water fountain." You need to discuss the (1) state, (2) temperature, and (3) heat energy involved in the phase change of water. Hint: How are sensible heat and latent heat involved in the phase change?



**1. Phase change:** Support the idea: "It is cool near a water fountain." You need to discuss the (1) state, (2) temperature, and (3) heat energy involved in the phase change of water. Hint: How are sensible heat and latent heat involved in the phase change?

- (1) Evaporation is a cooling process
- (2) Describe phase change of water:  
State: Solid-Liquid-Gas
- (3) What is sensible heat?  
Temperature
- (4) What is latent heat?  
No temperature change;  
600 cal/gram for evaporation
- (5) Explanation to support the idea

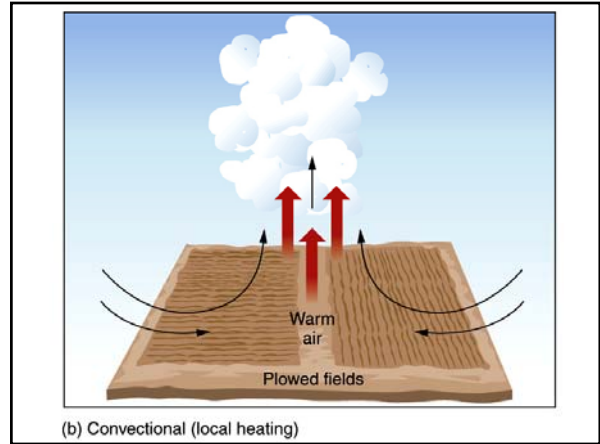
2. **Humidity:** Describe the relationship among (1) absolute humidity (AH), (2) saturation capacity (SC), (3) relative humidity (RH) and (4) dew point temperature (DP). Then calculate AH when SC = 50 g/m<sup>3</sup> and RH = 70%. Do not forget the unit for AH. Show your work.

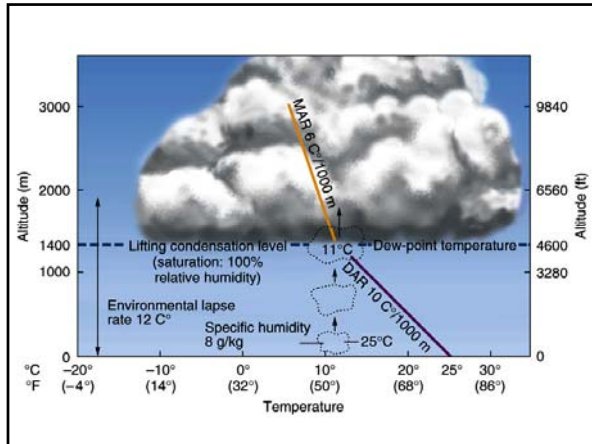


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- (1) What is absolute humidity?  
Actual amount, gr/m<sup>3</sup>
- (2) What is saturation capacity?  
Maximum possible, gr/m<sup>3</sup>
- (3) What is relative humidity?  
Ratio between AH & SC, %
- (4) DPT  
Temperature at saturation, RH=100%
- (5) Calculation work & answer

3. **Convictional lifting & clouds:** Describe the mechanism of convictional lifting. If conditions are unstable, what cloud types are normally formed by this process? Calculate the elevation at which cloud starts forming when the temperature of the rising thermal is 35° C, dew point temperature is 15° C, dry adiabatic lapse rate is 10° C/1,000m, and moist adiabatic lapse rate is 5° C/1,000m. Show your work.

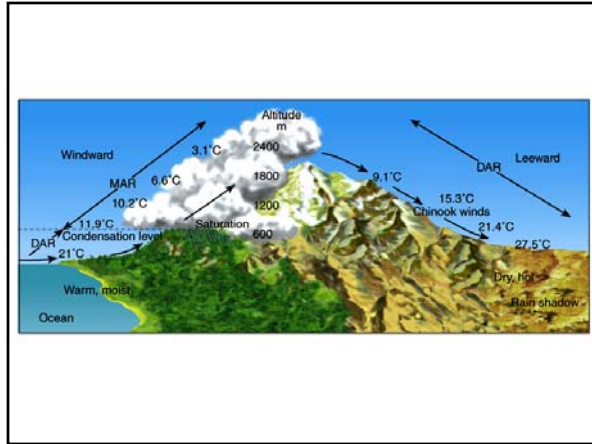
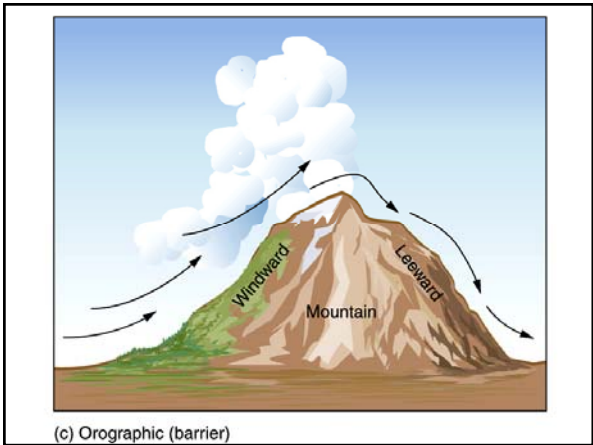




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- Heating from the warmer surface → Lifting of an air mass
- Cumulus, cumulonimbus types
- Lifting condensation level
- Adiabatic process: adiabatic cooling
- DALR & MALR

4. **Orographic rainfall:** Support the idea: “Kapi’olani Community College (Leeward side) is warmer and drier than Windward Community College (windward side).” What is the name of the phenomenon behind this observation? You may discuss how **temperature** and **humidity** change with elevation in an orographic process, and where **cloud** and **precipitation** are expected. Note: You may include a diagram to support your answer.



4. **Orographic rainfall:** Support the idea: “Kapi’olani Community College (Leeward side) is warmer and drier than Windward Community College (windward side).” What is the name of the phenomenon behind this observation? You may discuss how **temperature** and **humidity** change with elevation in an orographic process, and where **cloud** and **precipitation** are expected. Note: You may include a diagram to support your answer.

- (1) Temperature change:
  - Uplift by mountains → **Adiabatic** cooling
  - Air expand → Temperature **decrease**
- (2) Rainfall
  - Windward** side, close to mountain ranges
  - Relative humidity
  - Dew point temp
  - Lifting condensation level (**LCL**)
- (3) **Rain shadow** effect
  - Loss of moisture over the mountain
  - Down draft
  - Adiabatic** warming
  - RH decreases

