

Learning Objectives:

- I can compare and contrast atmospheric stability based on graphs.

Bellringer Review:

- What kind of weather is expected to happen soon when seeing cumulonimbus clouds?
- Which clouds form the highest? the lowest?

Check for Understanding Questions:

- What is the difference between adiabatic and diabatic processes?
- How does air act different if it is unstable vs. stable?
- What must happen for condensation of water to occur in the atmosphere?

Types of Clouds

Cirrus - (*cirrus* = a curl of hair) clouds are high, white, and thin. They can occur as patches or as delicate veil-like sheets or extended wispy fibers that often have a feathery appearance.

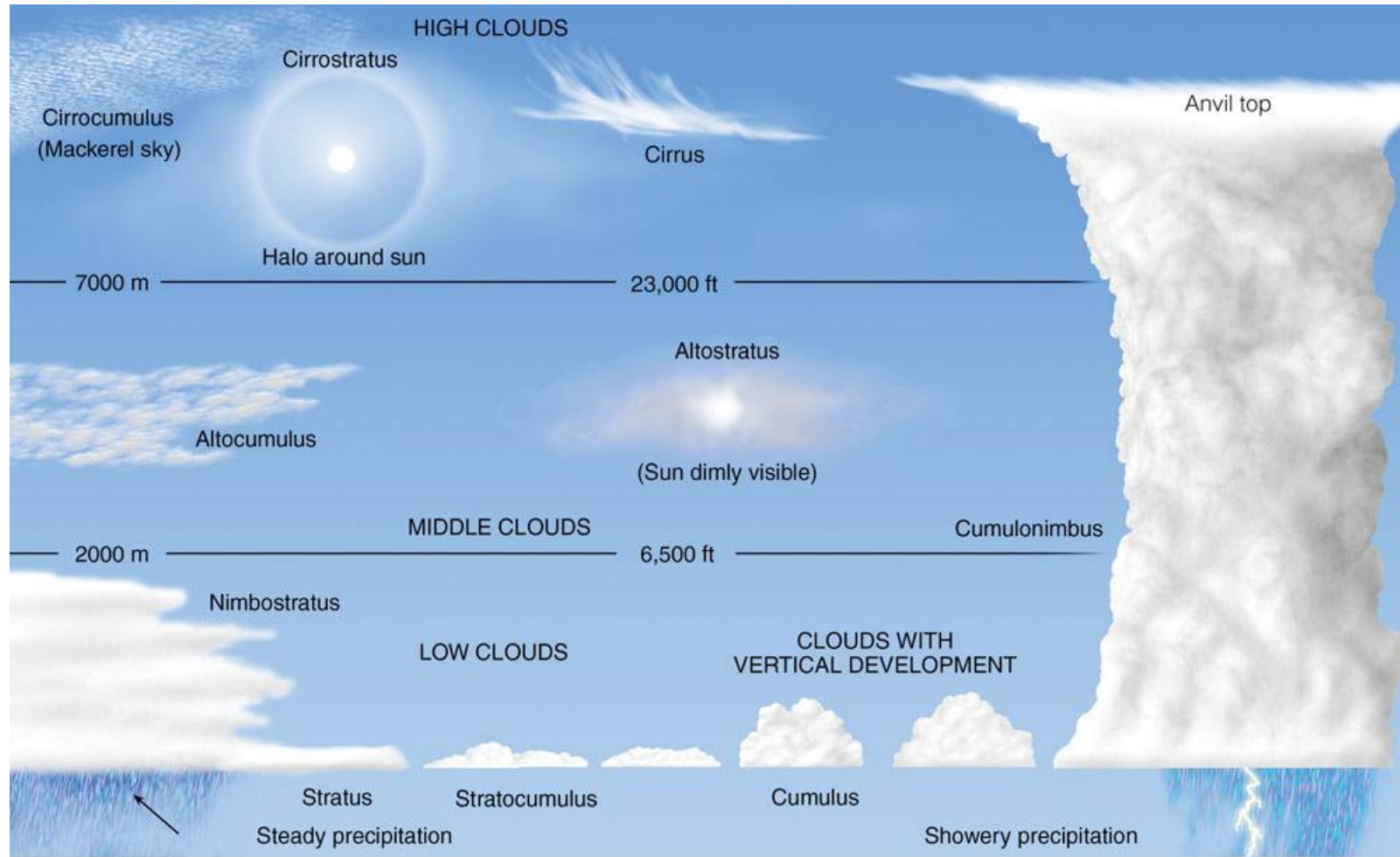


Cumulus - (*Cumulus* = a pile) clouds consist of rounded individual cloud masses. Normally, they have a flat base and the appearance of rising domes or towers. These clouds are frequently described as having a cauliflower structure.



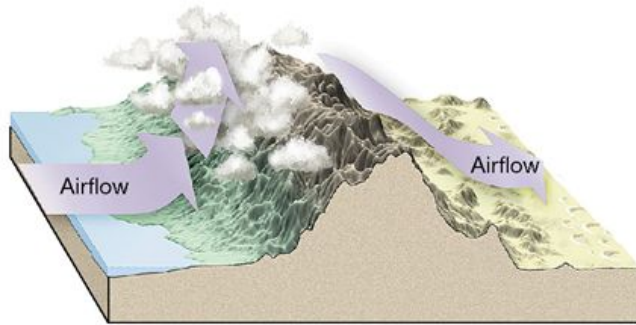
Stratus - (*stratum* = a layer) clouds are best described as sheets or layers that cover much or all of the sky. While there may be minor breaks, there are no distinct individual cloud units.



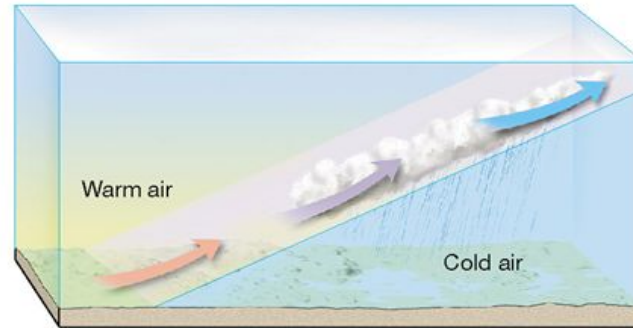


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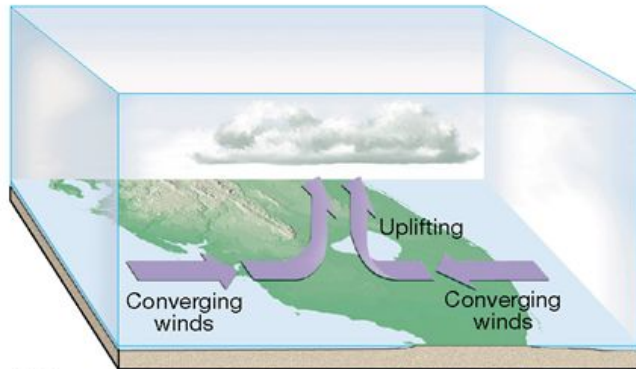
Processes that lift air



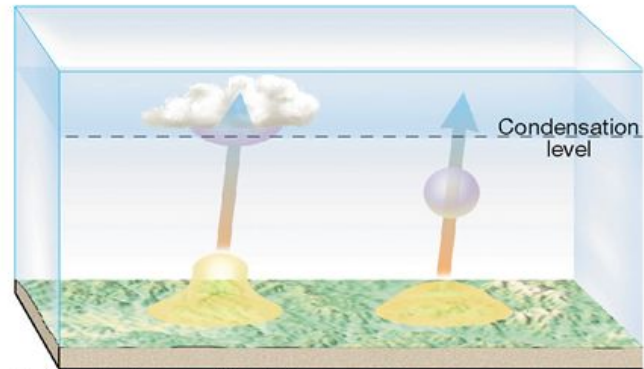
A. Orographic lifting



B. Frontal wedging



C. Convergence

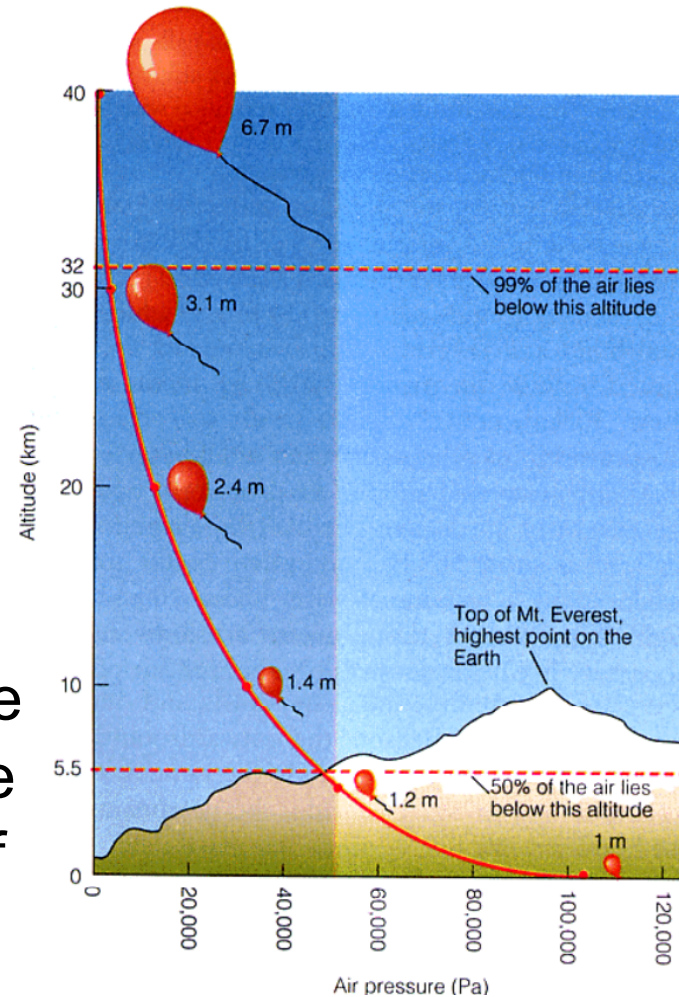


D. Localized convective lifting

Why do balloons pop as they rise into the sky??

Air pressure decreases with elevation.

- If a helium balloon 1m in diameter is released at sea level, it expands as it floats upward because of the pressure decrease. The balloon would be 6.7 m in diameter as a height of 40 km.



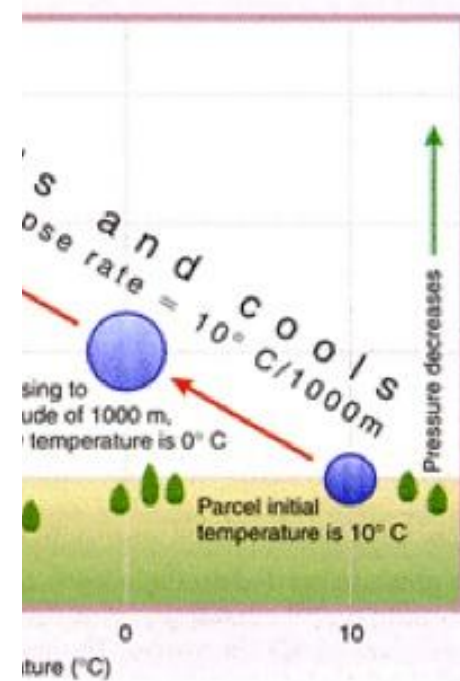
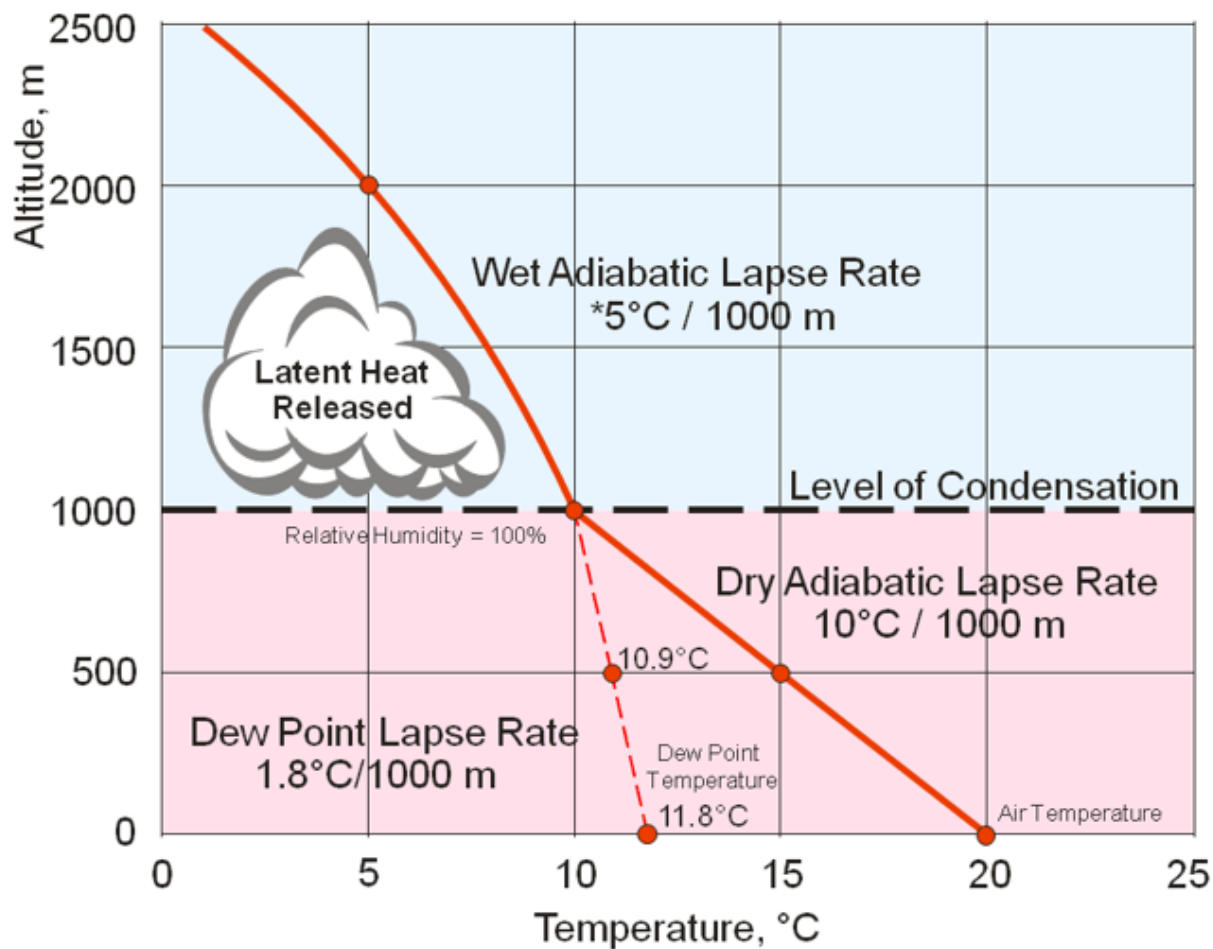
Adiabatic Process

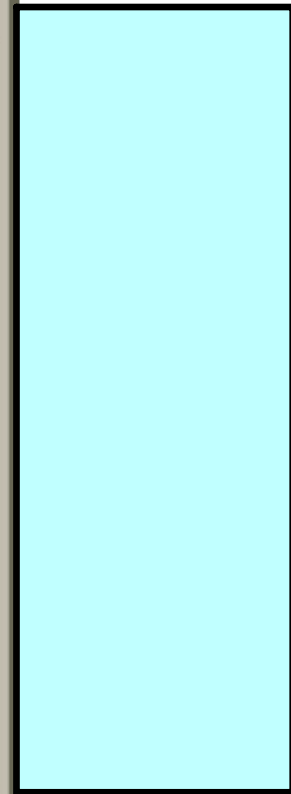
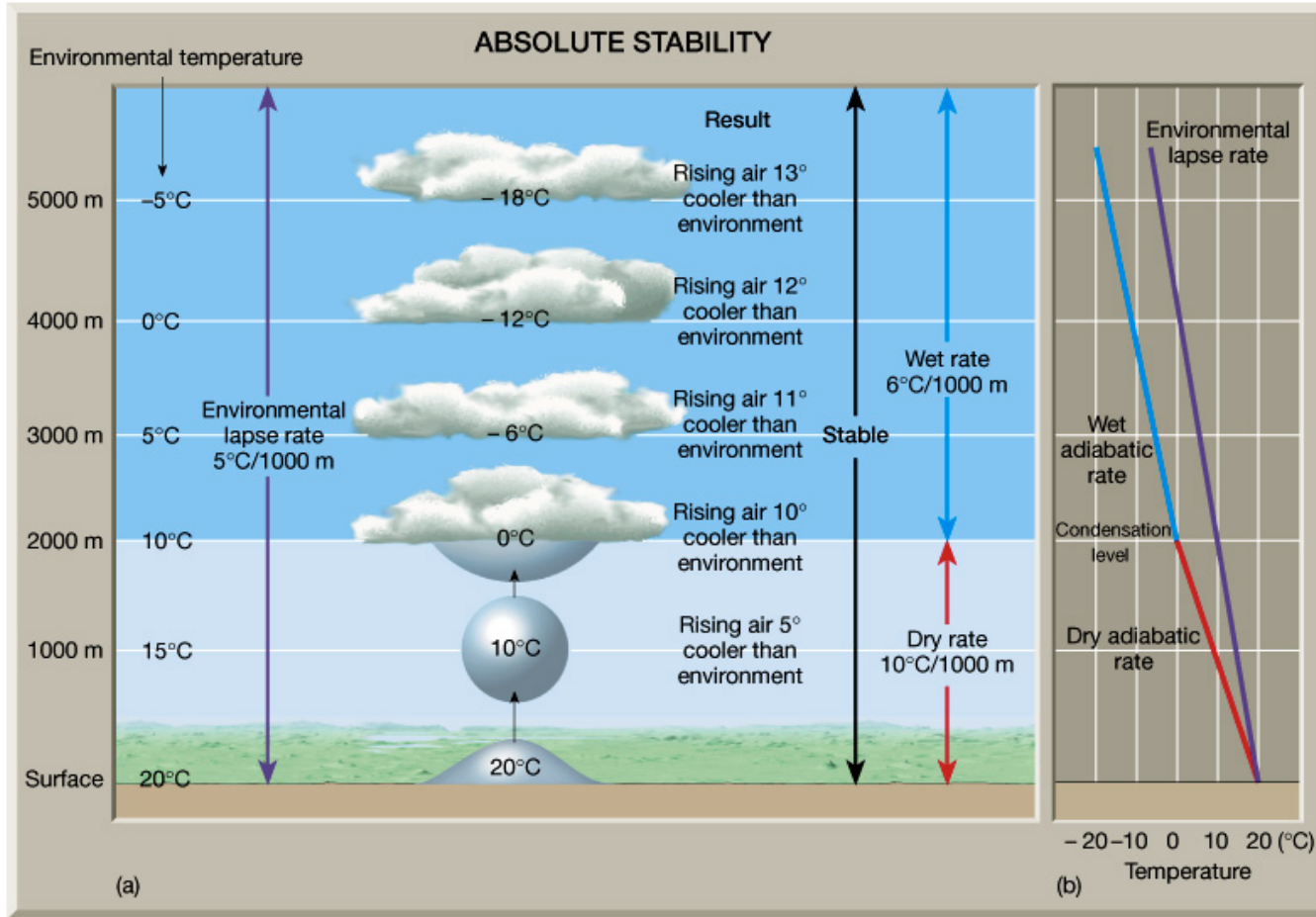
- If a material changes its state (pressure, volume, or temperature) without any heat being added to it or withdrawn from it, the change is said to be adiabatic.
- The adiabatic process often occurs when air rises or descends and is an important process in the atmosphere.

Diabatic Process

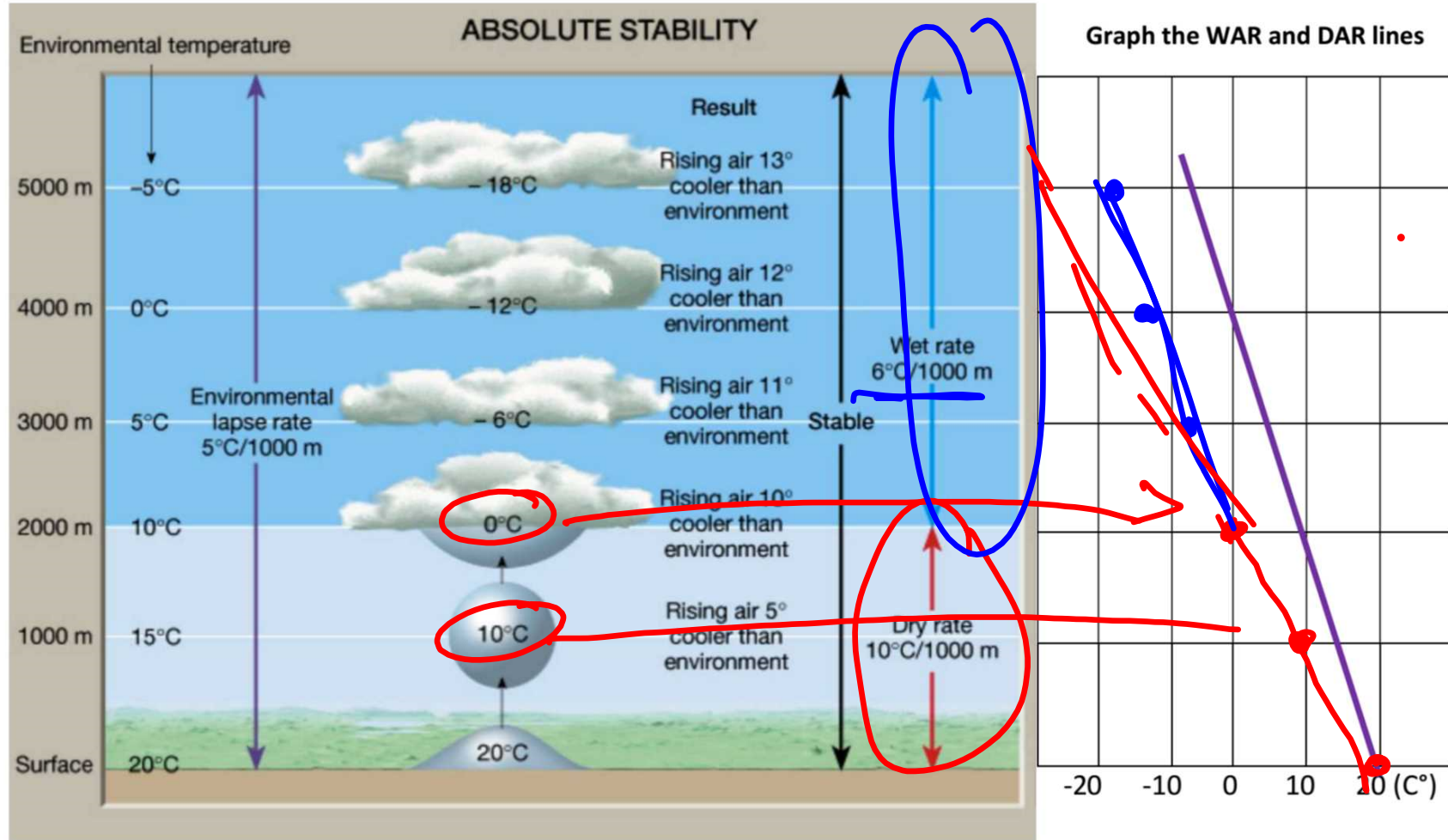
Involve the direct addition or removal of heat energy.

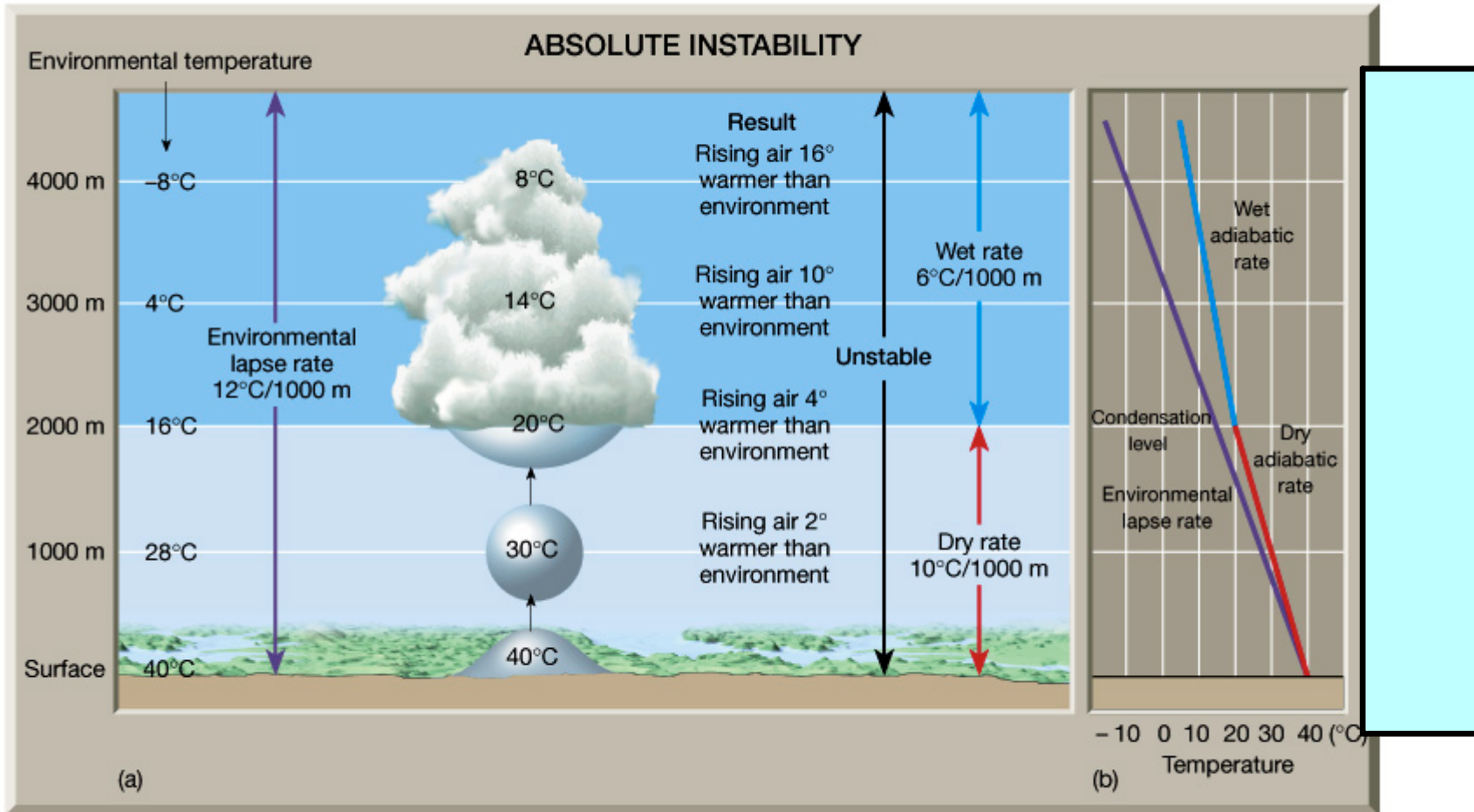
- Example: Air passing over a cool surface loses energy through conduction.

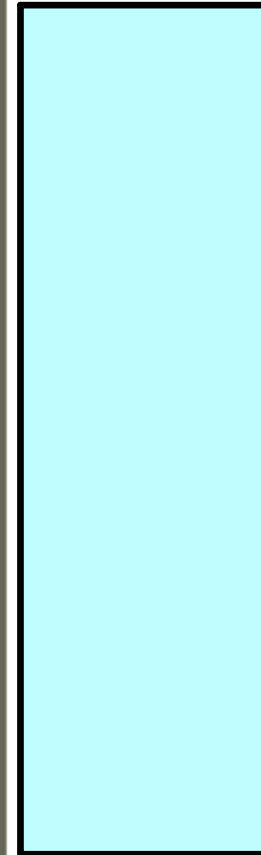
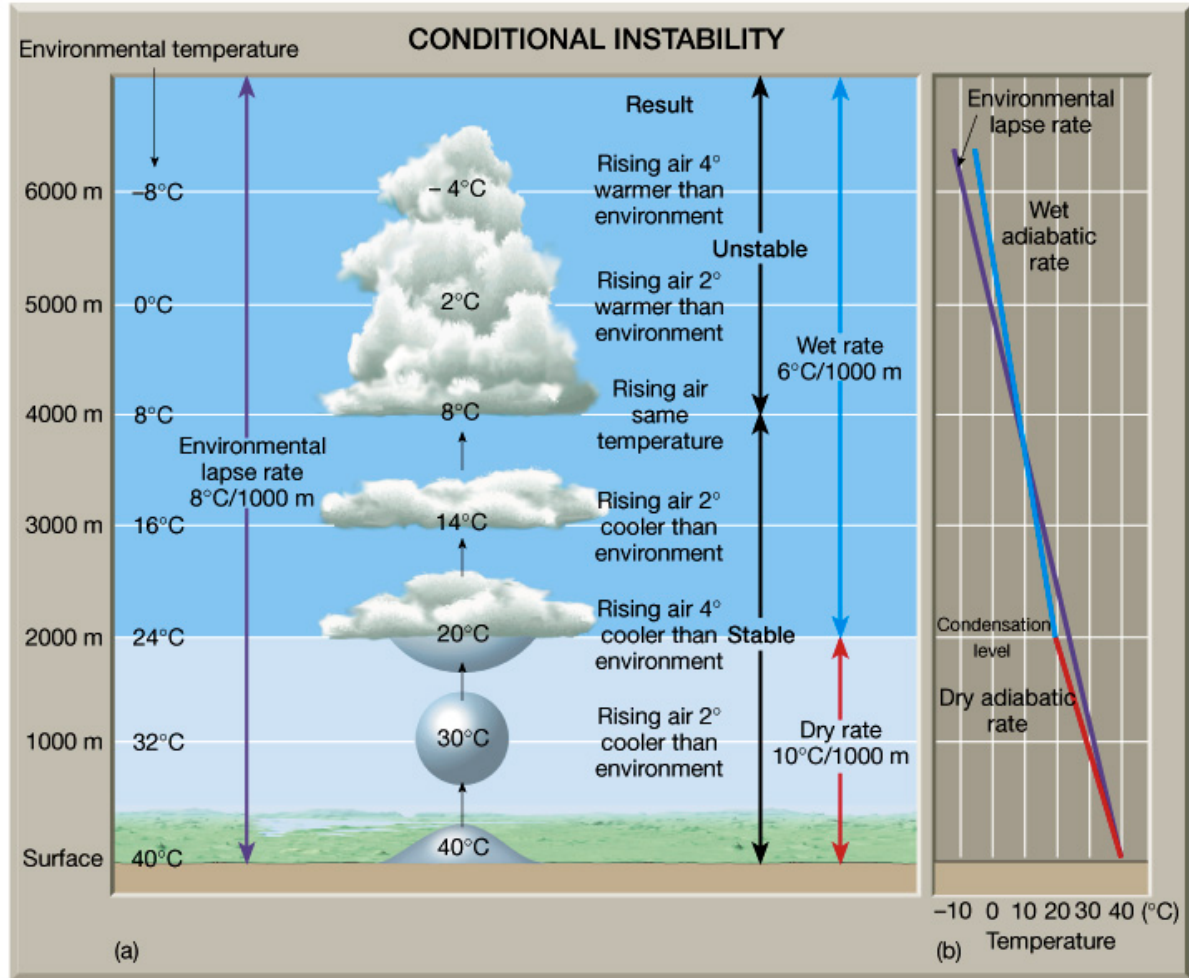




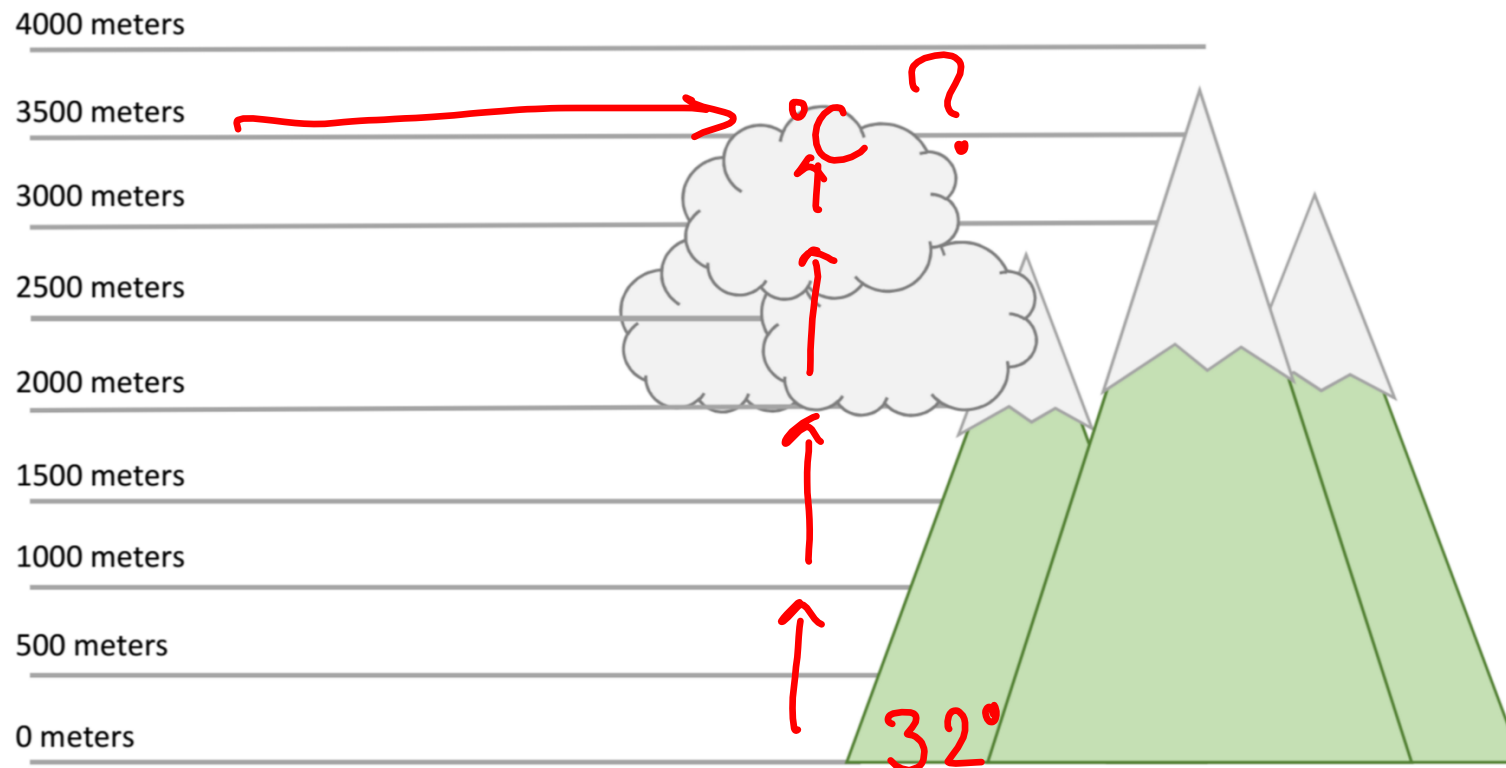
then temperature and how high they are on the line graph to the right, then answer the question after each graph.







Suppose the base of a cumulus cloud has formed at 2000 meters above sea level. The temperature at sea level is currently 32°C. What is the temperature of the top of the cloud at 3500 meters? (Hint: refer to the dry and wet adiabatic rates to help easily calculate the temp.)



Check for Understanding Questions:

- What is the difference between adiabatic and diabatic processes?
- How does air act different if it is unstable vs. stable?
- What must happen for condensation of water to occur in the atmosphere?

Learning Objectives: Did you accomplish them?

- I can compare and contrast atmospheric stability based on graphs.

Self-Evaluation

- How well did you understand the material today?
(1-Lost, 2- understand, 3-can teach it)
- How well did you and your team members participate in class?
(1-didn't do anything, 2-Bare minimum, 3-fully participated)