

Air Masses & Fronts

- What and where are good source regions for air masses?
- How are air masses classified?
- What are the characteristics of the air masses that commonly affect weather over North America?
- How can air masses be modified?
- What is a front?
- What are the types of fronts? What symbol is used to represent these on a surface weather map?
- What are the characteristics of each kind of front?
- What do the vertical profiles of each different type of front look like?
- What are the typical weather observations during frontal passage for each kind of front?
- What kinds of clouds are produced by each kind of front?

Mid-Latitude Cyclones

- How does the thermal gradient in the mid-latitudes differ in January and July?
- Outline the key stages of a mid-latitude cyclone development according to the polar front theory?
- What is the importance of mid-latitude wave cyclones in terms of atmospheric energy?
- What is the best arrangement of surface and upper level features for the intensification of a mid-latitude cyclone?
- Is surface convergence less than or greater than upper level divergence for a surface LOW to intensify?
- Is surface divergence less than or greater than upper level convergence for the surface HIGH to intensify?
- What are long and short waves? How do they differ?
- How do short waves generate baroclinic instability?
- What are cold and warm-air advection? How do they create vertical motions?
- What is a barotropic atmosphere?
- Where is a jet streak located?
- What are the 3-dimensional relationships between:
 - the surface LOW and HIGH
 - the short wave at middle & upper levels
 - the jet streaks in the jet stream