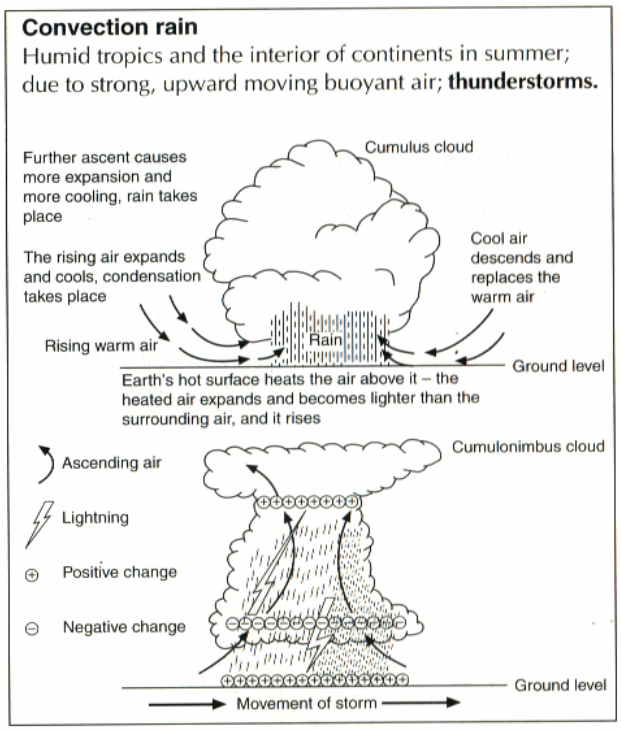
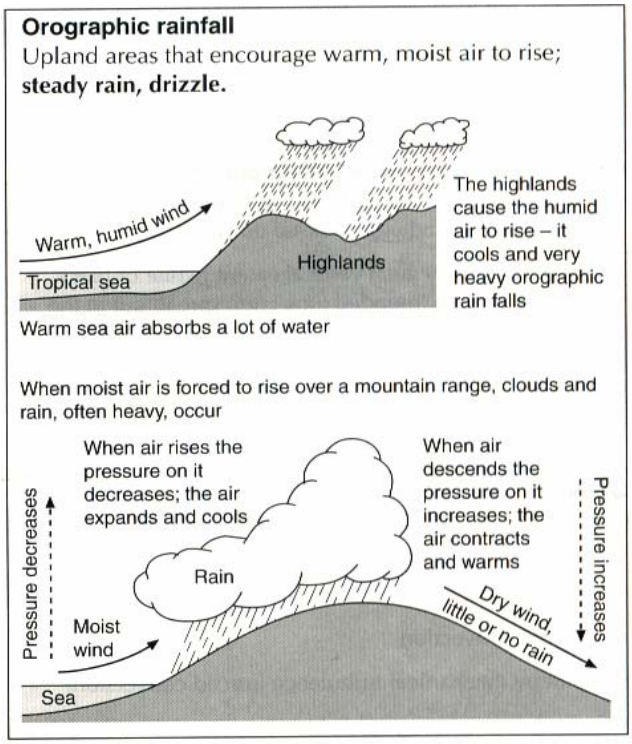
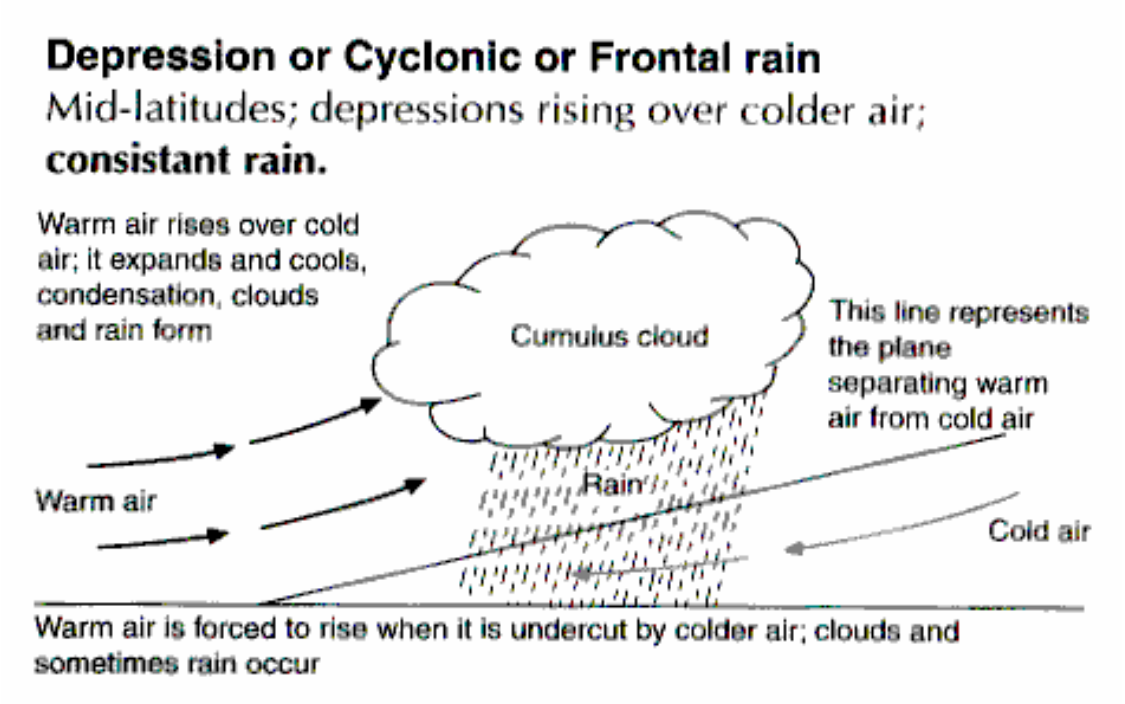
AS Geography 1.2 Fluvial Environments *Student Notes*

The causes of rainfall to include orographic, frontal and convectional processes.

In all three cases of rainfall there is a common theme in that warm, moist air is forced to rise. As the air rises, the air pressure falls allowing the air to expand. This leads to "**adiabatic cooling**". As the air cools it reaches the dew point (temperature) at the condensation level (altitude). Beyond this point, the air can no longer hold all its moisture as vapour; so some starts to condense onto condensation nuclei (particles of hygroscopic dust). This forms clouds of droplets, or at low temperatures, of microscopic ice crystals.







The formation of rainfall is thought to be a result of either **coalescence or collision** or the incremental **growth of ice crystals** within a cloud (**Bergeron-Feindeison theory**), or both. The ice-crystal growth depends on the fact that super cooled water droplets coexist with ice crystals in most large clouds. The ice crystals grow at the expense of the water droplets. Eventually they fall under their increasing weight and melt into rain as the fall through warmer air below.