Key points from Week 1…

Hydrostatic vs. nonhydrostatic phenomena

Development of buoyancy, usage of virtual temperature ($T_V = T(1 + 0.61q)$; $\mathrm{q} = \frac{1+w}{w}$)

Parcel Theory using simplified vertical momentum equation ($\frac{dw}{dt} = B \cong \frac{T_V'}{\bar{T}_V} = \frac{\theta_V'}{\bar{\theta}_V}$ **)**

CAPE and CIN definitions
Maximum updraft speed "thermodynamic speed limit" ($w_{max} = \sqrt{2 * CAPE}$)
Use of skew-T to determine buoyancy and resulting vertical motions

Limitations of parcel theory (dw/dt = B)

1. Entrainment (parcel theory assumes no interaction between parcel and environment)
2. Hydrometeor effects (parcel theory assumes no hydrometeors present)
    1. Loading (drag; reduces accelerations from buoyancy alone)
    2. Warming
    3. Freezing
3. Environmental subsidence (parcel theory assumes constant env)
4. Pressure perturbations (neglected *twice* - impact on buoyancy and in dp'/dz term in vertical momentum equation)