The important topics for test 3 are:

**Forces**
- What are the forces which act in the atmosphere?
- What is the dependence (strength and direction) of each?
- What does Newton’s 2nd law tell us?

**Joining Forces**
- What are the forces acting in the geostrophic, gradient, and surface winds? What do the balances tell us about the wind (speed and direction)?
- What are the balances of hydrostatic equilibrium and gravity?

**Scales of Motion**
- What are the scales of motion?
- Name examples of each.

**Global circulation**
- What is the three cell model?
- The Hadley cell
- the Inter Tropical Convergence Zone (ITCZ)
- The Trade winds, the Westerlies
- The Polar easterlies
- The Horse latitudes/subtropical highs
- What is the relationship between the subtropical highs, the trade winds, and the ITCZ?

**Flow in the westerlies**
- What is the jet stream?
- How is the jet stream formed?
- Where would I expect to find the strongest wind in the jet stream?
- What is zonal flow?
• What is does flow with a strong meridional component look like?

Air Masses

• What are the 4 types of air masses?
• What are maritime vs continental air masses?
• What are Polar vs Tropical air masses?
• For the US where might mT, cT, mP, cP air masses come from?

Fronts

• What is a front?
• What are the types of fronts?
• What does a cold, warm, occluded front look like?
• What type of precipitation is associated with each front?
• Where do the clouds form with each front?
• What are the two types of occluded fronts?
• What are the wind patterns associated with these fronts?

Life Cycle of Low Pressure Systems

• What does the surface pattern of a developing low pressure system look like?
• How does the low pressure system intensity, what are the conditions which help the low intensity?
• Where are fronts located in this system?

• Where do we find upper level divergence (i.e. upper level support)?
• What are the indications that the low will no longer intensify
• How does the upper level flow help forecast the general weather pattern?
• What is warm air advection and cold air advection? What do we look for on a map to find these advections?
- Where is the warm sector/quadrant in a low pressure system?

**High Pressure Systems**

- Do high pressure systems evolve like low pressure systems?
- Why don’t surface highs need upper level support?
- Why do we associate cold air with high pressure?