**Chapter 1 – Section 3 LECTURE NOTES**

**Global Winds and Local Winds**

* You can create a wind by letting air out of a bicycle tube because the air pressure INSIDE the tube is greater than the air pressure OUTSIDE of it.

**Why Air Moves**

* Difference in air pressure = wind (the greater the difference = faster wind)  
  + Hurricane Andrew (1992) … 264 km/h winds

**Air Rises at the Equator and Sinks at the Poles**

* Unequal heating of Earth = differences in air pressure
* LOW pressure = equator where air is warmer and less dense due to direct solar energy
* Warm equatorial air rises and flows toward the poles
* Polar air is colder and denser = sinks creating HIGH pressure = flows toward the equator

**Pressure Belts Are Found Every 30o**

* Air travels in MANY large, circular patterns = *convection cells*
  + (It does **NOT** move in ONE big circle from the poles to the equator.)
* Convection cells separated by high and low pressure areas = *pressure belts*
  + pressure belts = *(~ every 30o latitude)*

**The Coriolis Effect**

* Earth spins (rotates) … winds (& ocean currents) curve  
  + Northern Hemisphere = winds traveling north = curve east

= winds traveling south = curve west

**Global Winds**

* Coriolis Effect and convection cells together produce air circulation patterns called *GLOBAL WINDS*

**Polar Easterlies**

* Wind belts from poles to 60o N or S = *“polar easterlies”*
  + Northern hemisphere polar easterlies cause snow / freezing weather to U.S.

**Westerlies**

* Wind belts from 30o to 60o (both hemispheres) = *“westerlies”*
  + Blow FROM west to east and carry moist air causing rain / snow in U.S.

**Trade Winds**

* Wind belts from 30o to ALMOST the equator = *“trade winds”*
  + Northern hemisphere - trade winds blow FROM east to west
  + Southern hemisphere – trade winds blow FROM west to east
* Got the name *“trade winds”* because traders used the dependable winds to transport their goods between Europe and the Americas.

**The Doldrums**

* Area around the equator where trade winds meet = little wind (LOW pressure)

**Horse Latitudes**

* Area near 30o N and 30o S = weak winds (HIGH pressure)
* Got the name “horse latitudes” because horses were thrown overboard to save drinking water when ships got stuck in windless areas
* Most deserts in the world are in the horse latitudes because sinking air is VERY dry.

**Jet Streams: Atmospheric Conveyor Belts**

* Narrow belts of high-speed (up to 400 km/hr) winds = upper troposphere & lower stratosphere called *“jet streams”*
* Useful for: (1) pilots = affects flight time

(2) meteorologists = track storm movement

**Local Winds**

* Move short distances & blow from any direction
* Geographic features produce temperature differences & therefore local wind  
  + Sea Breeze (cool air over water moves into warmer air over land) – day
  + Land Breeze (cool air over land moves out over warmer air over water) - night

**Mountain Breezes and Valley Breezes**

* Similar to sea and land breezes
* Mountain side warmed during day & moves up === cooler valley air moves in (valley breeze)
* Cooler air on slopes at night moves down into valley === (mountain breeze)