**Wind Notes**

1. Heating Earth & Seasons
   1. Uneven heating
   2. Earth is tilted 23.5° on its axis
   3. Affects amount of solar rays & length of day
   4. Solstice (summer = more direct rays, winter = indirect rays)
   5. Equinox (spring, fall = equal amount of rays because sun is directly over the equator)
2. Milankovitch Cycles = wobble of the Earth like a spinning top
3. Wind =Air Moving from High Pressure to Low Pressure
   1. Pressure = how close air molecules are
   2. High = molecules far apart; Low = molecules close together
   3. High pressure = warm air; Low pressure = cold air
   4. Air moves from high pressure to low pressure = WIND
4. Global Winds = Convection Cycles
   1. Trade winds (E to W; 0° to 30°N or S move towards the equator)
   2. Westerlies (W to E; 30° to 60° move towards the poles)
   3. Polar easterlies (E to W; 60° to 90° at the poles)
5. The Jetstream
   1. Narrow band of fast moving air (400 km/hr)
   2. At wind zone boundaries = where surface air and upper atmosphere air = greatest temperature and pressure differences
   3. Polar jetstream; Subtropical jetstream
   4. Moves warm air to the poles & cold air to the tropics
6. Local Winds: Sea breezes vs. Land breezes
   1. Land heats & cools FASTER than water
   2. Water has a high heat capacity
   3. Cold air sinks = high pressure – moves to low pressure
   4. Daytime = sea breeze (air moves from ocean to land)
   5. Nighttime = Land breeze (air moves from land to ocean)
7. Mountain breezes & Valley breezes
   1. Daytime = Valley breeze
   2. Nighttime = Mountain breeze (mountain heats/cools faster)

**What Causes Global Wind? KEY (35 pts)**

1. (**2 pts**) Rotation = Earth spinning on its axis; Revolving = Earth orbitting the sun
2. (**2 pts**) Seasons caused by (1) intensity of the sun’s rays & (2) the length of daylight hours (amount of time exposed to the sun’s rays)
3. (**1 pt**) Earth receives more direct solar rays at the equator.
4. (**2 pts**) Earth’s tilt (23 ½ degrees) determines the length and amount of time of exposure to the sun’s rays
5. (**3 pts**) Winter in the Northern Hemisphere = tilted away from the sun, receiving indirect rays, & having shorter days WHILE the Southern Hemisphere is tilted towards the sun, receiving direct rays, and having longer days (which means it’s summer)
6. (**1 pt**) Coriolis effect: Fluids & objects appear to move in a curved path instead of a straight line because the Earth is rotating
7. (**2 pts**) Convection = the transfer of heat energy by the movement of the heated particles; Heated particles have higher energy that causes the particles to move.
8. (**15 pts**)

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| **Convection Cell** | **Latitude** | **Wind Name** | **Air Temp** | **Wind**  **Direction** |
| Tropical | 0° – 30° | Trade winds | cool | East to West |
| Temperate | 30° - 60° | Prevailing westerlies | warm | West to East |
| Polar | 60° - 90° | Polar easterlies | cold | Northeast to West |

1. (**3 pts)** Trade winds sink; Prevailing westerlies rise; Polar easterlies rise & sink.
2. (**2 pts**) Sea breezes = Land heats faster than water SO sinking, cooler air over water moves from high pressure area to low pressure area over land where hot air has risen
3. (**2 pts**) Land breezes = Land cools faster than water SO sinking, cooler air over land moves from high pressure area to low pressure area over water where hot air is rising