Global Weather 2

**Outcome: (212-1)**

# Content: Page 214-215

* As you recall from a previous lesson, humidity is a **measure of the amount of water vapour in the air.**
	+ The humidity in the air can be measured using a **hygrometer**.
* Relative humidity is a measure of the **amount of water vapour that is in the air compared to the maximum amount of water vapour that the air can hold.**
	+ Relative humidity can be measured using a **psychrometer**.

**Humidity – Water in the Air**

* The humidity of an air mass depends a great deal on the **temperature of the air**.
* 
* **Figure 1 Page 214** shows us the maximum amount of water that air can hold at **different temperatures**.  From this figure we can see that **warm air can hold much more water vapour than cold air**.
* The reason for this is because warm air molecules are more spread out which **makes more space for water vapour to fit in between**.

##### **What does humidity have to do with our level of comfort?**

* Your body **tries to maintain a constant temperature of 37°C** at all times.  In hot weather makes you sweat.  The sweat then evaporates.  **When water evaporates it has a cooling effect**.
* If humidity levels are high (high moisture content) **sweat does not evaporate as easily.**
	+ This is because **there is already a great deal of water vapour in the air**.
	+ The sweat remains on your body leaving **you feeling hot and sticky**.
	+ Sweat evaporation stops completely when the relative humidity reaches about **90 percent**.
* At low humidity levels the air is **not holding much water**.
	+ The dry air can soak up more water vapour **and your sweat evaporates more quickly**.
	+ This makes you feel **dry and comfortable**.

#### **What happens when the air is cooled?**

* Warm air has more room between its air **molecules and holds more water vapour than cold air**.
* As the air cools, the air molecules begin to contract and there is **no longer enough room for all the water vapour**.
* If the air is cooled enough eventually a temperature is reached when the **water vapour is forced out and the water condenses**.
* The temperature at which condensation occurs is called the **Dew point**.
* If the air has a high humidity **it won't take much cooling to reach the dew point**.
	+ This makes sense since **the air is already pretty much full**.  A tiny amount of cooling will be enough to squeeze out some water.
* **Questions:** Which mass of air will reach its dew point first? air at 20oC with humidity of 70% or air at 20oC with humidity of 50% ?
	+ **70% because they are at the same temperature so the one with the higher humidity makes all the difference**

**Common examples of Dew Point:**

* Dew point can be observed when you see **mirrors steam up when you are in the shower**.
	+ The steam from the hot shower **fills the air in the room with water vapour**.
	+ When this warm moist air hits a cooler mirror the **water vapour condenses on the mirror**.
* On calm clear nights we see the same effect when the land cools **quickly causing the air touching the land to cool quickly too**.
	+ If the air cools below its dew point, dew will form on the ground.
	+ During the winter, the same effect can occur but this time is the ground cools below freezing **and we see the formation of frost**.
* During the summer, basements tend to get damp because of the high humidity.  What could we do to dry up the air in the basement?
	+ Use a de-humidifier which **cools the air to its dew point and takes in the moisture that is released**
	+ Turn the heat up **which we know holds more moisture**

#### **What does humidity have to do with the weather?**

* When the air reaches its maximum amount of water that it can hold (saturation point) **the water vapour will start to condense forming clouds and precipitation**.
* In other words, the higher the humidity, **the greater the chance of rain or snow**.

 **Homework: Page 215: #’s 1, 2, 4**

 **SRL: 4.7, Page 335 - 336**