Global Weather 1

**Outcome: (212-1)**

**Content: Page 212-213**

## **Water and the Weather – The Water Cycle**

* The earth has a **limited amount of water**. That water keeps going around and around and around and around and (well, you get the idea) in what we call the "**Water Cycle**".
* If you fill a glass with water, it may have fallen from the sky as rain just last week, but the **water itself has been around pretty much as long as the earth has**!
* The earth's water is contained in lakes and streams, the salt water of the oceans, the ice of the giant polar glaciers and a small amount in the atmosphere.
* All the Earth's water is know as the **hydrosphere**.
* Since 70% of the earth's surface is covered by water it is no wonder that the **hydrosphere plays such an important role in the weather**.

### **The Water Cycle:**

* The main driving force for the water cycle is the **sun**.
* The sun's energy is responsible for the energy needed for the **evaporation of liquid water and sublimation of ice**.
* **There are two main parts of the water cycle:**

#### **1. Getting water into the air...**

##### a. Evaporation:

* When the sun heats up liquid water in rivers or lakes or the ocean and turns it into **vapour or steam**, which goes into the air.

##### b. Sublimation:

* **Sublimation** is when the **sun heats up snow and ice**.  This energy **changes the ice directly into vapour**.  It skips the liquid phase!
* So if a pair of wet jeans are hung out, they freeze up, and then the solid ice sublimes.. the jeans are freeze dried!

##### c. Transpiration:

* **Transpiration** is the process by which **plants lose water out of their leaves**.
* Plants version of sweating

#### **2. Removing the water from the air...**

##### a. Condensation:

* The water vapour rises with the warmed air.  As the **air begins to cool the water vapour in the air gets cold and changes back into liquid, forming clouds**. This is called **condensation**.
* When this condensation **occurs on a cold surface close to the ground we call it dew**.  If the surface is below zero the water vapour **re-sublimes** to form **solid frost**.

##### **Precipitation:**

* Precipitation occurs when so much **water has condensed that the air cannot hold it up anymore**.
* The clouds get heavy and water falls back to the earth in the form of **rain, hail, sleet or snow**.
* The type of precipitation we get depends on the air temperature and in some cases the ground temperature.

**Types of Precipitation: (BLM 4.6b)**

1. **Rain**

* **As the water vapour condenses small droplets form**.  These small droplets collide with other droplets forming bigger droplets, which fall from the atmosphere.
* **Drizzle** is rain that is made up of drops smaller than 1/2 mm.
* **Rain** is made up of drops between 1/2 mm and 5.0 mm.

1. **Hail**

* **Hail is formed as water droplets ride the updrafts inside thunderclouds**.
* Each time the hailstone rises, **a** [**new layer of ice**](D:CDLI%20SC2200%20resourcessci2200-04unit02section02lesson01u2s2L1_hail_ec.htm) **forms on its surface**.
* After about 20 trips up the hailstone is too heavy to rise again and then crashes down to earth!

1. **Sleet**

* Sleet is formed by **snow that passes through a layer of warm air**, melts slightly, and then passes through a cold layer air **re-freezing as a little ball of ice**.

1. **Snow**

* Snow forms when **water vapour crystallizes** (turns into a solid) **on the surface of tiny dust particles**.
* We get wet snow if the snowflakes pass through some warm air, melting the snowflake slightly.

1. **Freezing rain**

* Freezing rain forms when a **super cooled raindrop** (the drop is still liquid below 0oC) **hits an object on the ground**.
* The raindrop **freezes on contact**.

**Homework: Page 212: #2**

**BLM 4.6a & 4.6b**