Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period # \_\_

**Ch 11.3**

**Moisture in the Atmosphere**

**Objectives:**

* **Explain** how clouds are formed.

Clouds are formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* **Identify** the basic characteristics of different cloud groups.

Clouds are classified by their shape and by their height. The low clouds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ meters. Middle clouds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ meters. High clouds are formed \_\_\_\_\_\_\_\_\_\_\_\_ meters.

* **Describe** the water cycle.

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**Vocabulary:**

* Condensation Nuclei: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Orographic Lifting: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Stability: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Latent Heat: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* Coalescence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Precipitation\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* Water Cycle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* Evaporation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Moisture in the Atmosphere**



**Cloud Formation**



**Stability**



**Latent Heat**



**Types of Clouds**

* When rising air reaches its lifted condensation level, water vapor condenses, forming clouds
* This can happen at diff. altitudes and they can form in diff. shapes
* Luke Howard developed the classification system, in 1803
* Classified by altitude and shape
* Low clouds form below 2,000 meters
* Middle clouds between 2,000 m to 6,000 m
* High clouds above 6,000 m

**Low Clouds**

* Darker places attracts heat, which cause the surface above to be warmer
* Temp. rises = expansion of air
* When it reaches its LCL, the air becomes saturated and the water vapor condenses, which forms clouds
* If the air stays warm, the cloud continues to grow
* If the air cools, it will be swept all around the sky in a cumulus or a tocumulus cloud
* Stratus clouds form when fog lifts

**Middle Clouds**

* Altocumulus and altostratus are middle clouds
* They can be liquid or a mixture of liquid and ice crystals, which is from cooler temp.
* Middle clouds are layered
* Altocumulus look like white fish scales
* Altostratus clouds are dark and can produce mild participation

**High Clouds**

* Made of ice crystals
* Cirrus clouds are high clouds
* Wispy, indistinct appearance and are layered
* Cirrostratus clouds can vary in thickness from being almost transparent to being very dense

**Clouds of Vertical Development**

* If the air of a cumulus cloud isn’t stable, the cloud will grow
* As it rises, the water vapor condenses and it will gain warmth, and they can expand up to 18,000 m
* The top is composed of ice crystals
* A cumulus cloud can develop into a cumulonimbus

**Precipitation**

* When cloud droplets collide, they form a larger one called a coalescence
* The droplets get too heavy to support so they fall onto Earth, which we know as precipitation
* Rain, snow, hail, and sleet are the 4 main types of precipitation
* Coalescence is the primary process responsible for precipitation from warm clouds
* Precipitation from cold clouds involves ice and water
* When precipitations forms at cold temps. it creates ice and snow
* Sometimes, convective currents carry droplets up and down forming ice and sleet, and if the current is very fast, it creates hail

**The Water Cycle**

* More than 97% of Earth’s water is salt water, in the ocean
* 3% is freshwater and two thirds of this water is frozen in ice caps
* Only a small percent of water is present in the atmosphere
* Water is essential to live
* Constant movement from Earth’s water is known as the water cycle
* The water cycle receives the energy from the sun
* Radiation from the sun causes water to turn from a liquid into a gas, which is called evaporation
* Water evaporates from bodies of water and rises into the atmosphere
* As the water vapor rises it changes back into a liquid after it cools
* When the water vapor condenses, it forms clouds
* Water droplets combine and fall to Earth as precipitation
* The water seeps into the ground and enters back into the water cycle

**Section Assessment**

1. A cumulonimbus cloud is ­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. The process in which a water droplet falls to Earth as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will determine if the precipitation is rain or snow.
2. **Thinking Critically -** The lapse rate of moist air is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.