

Humidity Notes

We already know that evaporation allows water to change into a gas and rise into our atmosphere. Eventually, it will condense into clouds when cooler temperatures are near. Well, what happens if the water vapor stays close to the ground where we are?

We use the term humidity to describe the evaporated water or *water vapor* in the air.

Humidity can vary from place to place. The amount of water vapor that air can hold depends on temp. The warmer the air, the more water vapor it can hold. Think about it, warm air is less dense so it has more room for water vapor.

When the air is holding as much water vapor as possible at a certain temperature it has reached saturation. Think about a sponge, at some point it can no longer hold any more water. Well, the air has its limits too and the deciding factor is the temperature. The temperature at which this saturated air starts to condense onto surfaces or into precipitation is called the dew point.

Early in the morning, the air temperature usually cools, which allows water to condense. When this cooling and condensing causes water to form on grass and other surfaces, we call it dew. If there is enough water vapor that condenses you can get clouds close to the ground which are called fog.

Similar to dew forming on grass, water vapor must have something to condense on to form clouds in the upper layers of the troposphere. As water vapor rises into cooler air, it condenses on dust and other particles. The water drops and ice crystals are so light, they stay aft and collect more water forming clouds. The droplets/crystals continue to stay aloft until they become too heavy and fall as precipitation.

One final aspect of humidity that we are probably all familiar with is relative humidity which measure how much water vapor is actually there compared to how much water vapor air can actually hold. Think about your grade on a test. Your grade is a comparison of how many you got right to how much you could have earned. So, an 86% means you got 86 out of 100 possible points. Relative humidity is similar. 86% relative humidity means the air is holding 86% of the water it could hold at that specific temp. The warmer the air, the more water vapor it can hold.

Relative humidity is measured with a sling psychrometer. It compares two thermometers, one with a dry bulb and one with a wet bulb. As water evaporates from the wet bulb, it cools the thermometer. When you compare the two thermometers, the bigger the temperature difference, the less humid the air is because humid air doesn't have a lot of room for water to evaporate. You need to know the wet bulb and the dry bulb reading in order to calculate relative humidity.

Draw pictures that will help you remember humidity, relative humidity and dew point.

Humidity	Relative Humidity	Dew Point