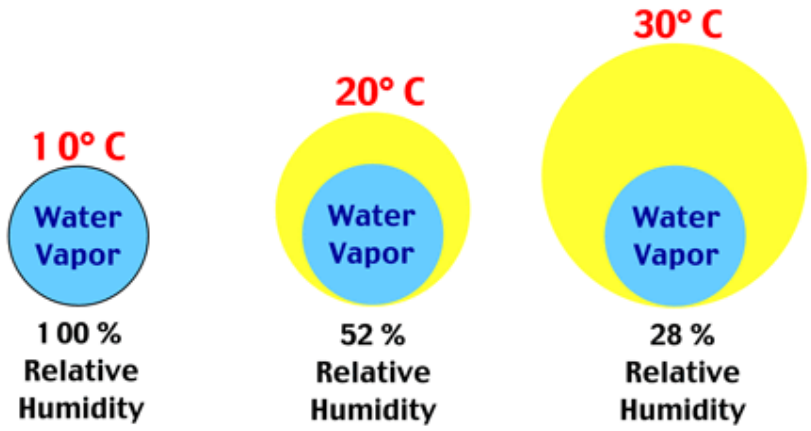
Relative Humidity (RH) is a measure of the moisture content in the air. It is a ratio of the 'actual humidity' relative to the maximum possible humidity at a given temperature. It can be simply defined as the amount of water in the air relative to the saturation amount that the air can hold at a given temperature multiplied by 100. Air with a relative humidity of 50% contains half of the water vapor it could hold at a particular temperature.




The diagram above illustrates how relative humidity changes in a parcel of air with increases in air temperature. At 10°C a parcel of dry air weighing one kilogram can hold a maximum of 7.76 grams of water vapor. In this state, the parcel of air would be at saturation (dew point) and its **relative humidit**y would be **100%.**

Increasing the temperature of this parcel, without adding or removing any water, would increase its ability to hold water vapor. A 10°C rise in temperature would increase the maximum amount of water vapour that this parcel of air can hold up to14.85 grams. Since no water has been added or removed, the actual amount of water in the parcel would remain 7.76 grams. At 20°C the **relative humidity** is therefore **52%**. (7.76/14.85 x 100 = 52%).

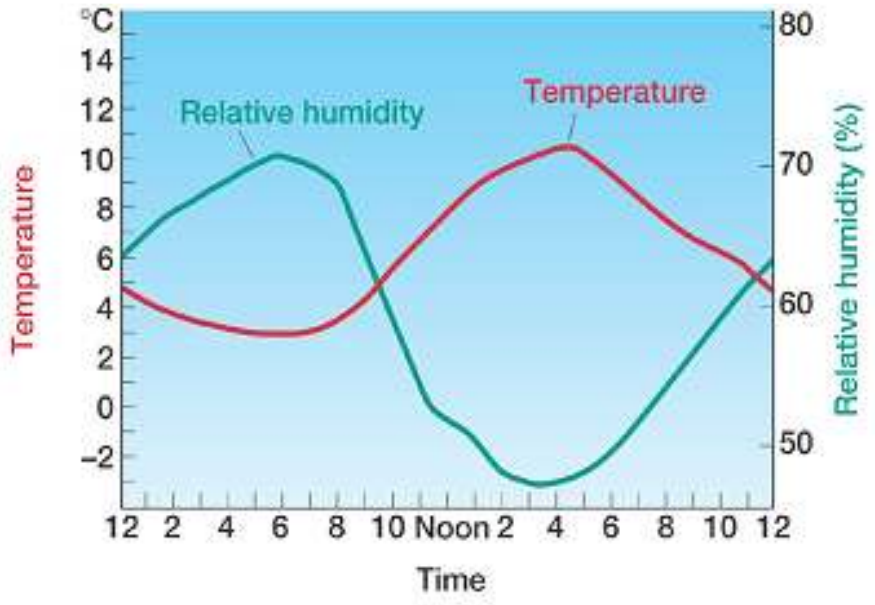
Raising the temperature of this parcel of air containing the 7.76 grams of water vapour by another 10°C would again lower its relative humidity. In this state the maximum amount of water vapour that this parcel of air can hold is 27.69 grams. R**elative humidity** would drop to **28%** at a temperature of 30°C (7.76/27.69 x 100 = 28%).

If we assume air to be like a big sponge that soaks up moisture it will eventually become saturated when it absorbs the maximum amount possible.

Relative humidity of the air is the amount of moisture (water vapour) in the air compared to the maximum amount of moisture that the air can hold at a given temperature. It is expressed as a percentage, so the maximum is 100 %. The formula for relative humidity is

$$\text{Relative Humidity \%} = \frac{\text{Moisture in the air now}}{\text{Maximum possible moisture air can hold at the current temperature}} \times 100$$

The diagram below illustrates how the relative humidity changes with temperature in a 24 hour period. Initially as the temperature decreases RH increases. Later as the temperature increases RH decreases.




This illustrates that the ability of air to hold moisture as temperature changes. An increase in temperature is reflected in the lowering of the relative humidity.