

Additional Teacher Background

Chapter 2, Lesson 4, p. 120

Relative humidity

One condition that you often hear in the weather report is relative humidity. Relative humidity is reported as a percentage, but a percentage of what? As you know, humidity refers to the amount of water vapor in the air. Relative humidity is the amount of water vapor in the air compared to, or relative to, the maximum amount the air could “hold” at that temperature.

For example, let’s say the relative humidity is 50% at a temperature of 60 °F. This means that the concentration of water vapor in the air is 50% of the maximum it could hold at that temperature. Since water vapor condenses more readily at lower temperatures, it can hold more water at higher temperatures. This means that air with a relative humidity of 50% at 80 °F would have more water vapor in it than air with a relative humidity of 50% at 60 °F.

Dew point

Another condition in the weather report is dew point. Dew point is like the opposite of relative humidity. It is the temperature that it would need to be for the amount of water vapor in the air to condense.

For example, if the air had a certain concentration of water vapor, it might condense at 40 °F. Then the dew point would be 40 degrees. But if the air contained more water vapor, it might condense at 45 degrees so this temperature would be the dew point.

Conditions for frost

When the relative humidity is low, the temperature required to make the water vapor in the air condense (dew point) is low. When a surface is at or below the dew point and the dew point is at or below the freezing point for water, frost can form on that surface.