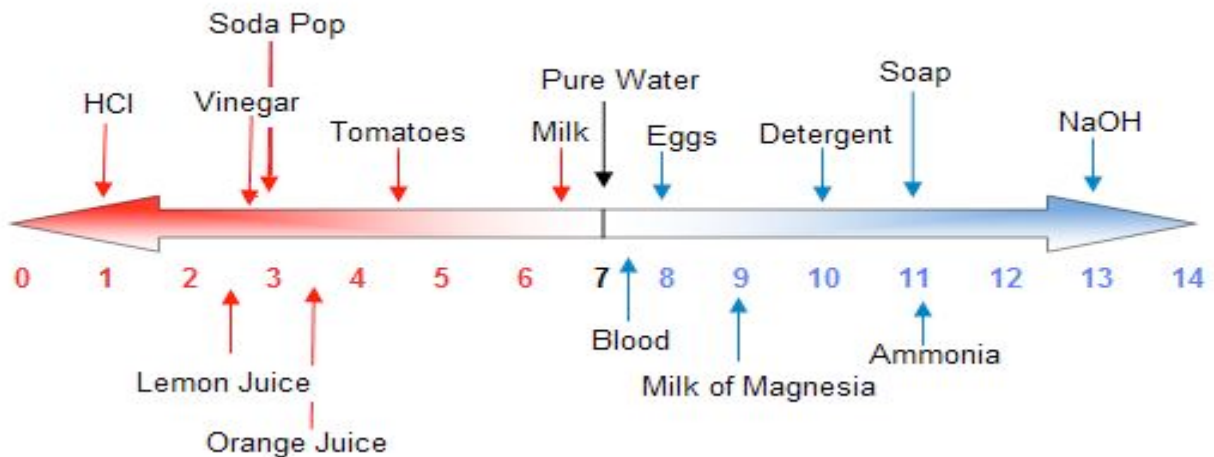


## pH and Soil pH:

pH is a measure of how **acidic** or **basic** substances are. pH is recorded in a scale that ranges from 0 to 14. If a substance has a pH between 0 and 7, it is considered to be an acid. A substance with a pH somewhere between 7 and 14 is considered basic, or alkaline. Substances that are neutral, neither acid nor base, have a pH of 7. For example, lemon juice and battery acid are acidic and fall in the 0-7 range. Seawater and baking soda are basic and have a pH range of 7-14. Distilled water is neutral with a pH of 7.

Some substances are stronger acids than others. Stronger acids have a lower pH than do weaker acids. For example battery acid, a very strong acid has a pH of 1, while apple juice, a weak acid has a pH of 3. Similarly, as the pH increases from 7 to 14, the strength of a substance's basic character increases.

Compare the pH of several common substances in the pH scale below:



## THE IMPORTANCE OF SOIL pH

The pH of soil is very important because it can affect the soil's ability to make nutrients available to plants. **Nutrients** are elements that are found in inorganic and organic soil components. Think of them as vitamins, similar to the kind of multivitamin you take everyday. These nutrients are vital to plants to help them grow, reproduce and fight off diseases. Nitrogen (shown as an N), Potassium (shown as a K) and Phosphorus (shown as a P) are all important soil nutrients.

As the pH of the soil changes, nutrients become more or less soluble and therefore become more or less available for plants to take them up through their root systems. If the pH of the soil is increased above 5.5, Nitrogen (in the form of nitrate) is made available to plants to uptake and incorporate into their biomass. Phosphorus, on the other hand, is available to plants when soil pH is between 6.0 and 7.0.

If the soil is too acidic plants cannot utilize Nitrogen, Phosphorus, Potassium and the other nutrients they need. This may become a limiting factor for plants as they struggle to grow in soils that do not have adequate nutrients available. Some plants have been able to use this limiting factor to their advantage. Some coniferous trees, including pine, spruce and fir species slowly acidify the soils around their bases as they drop needles onto the soil. As these needles decay, they release weak acidic compounds into the soil and slowly decrease the pH of the upper layers of the soil profile.

Herbicides, pesticides, fungicides and other chemicals are used on and around plants to fight off plant diseases and get rid of bugs that feed on plants and kill plants. Knowing whether the soil pH is acidic or basic is important because if the soil is too acidic the applied pesticides, herbicides, and fungicides will not be absorbed (held in the soil ) and they will end up in garden water and rain water runoff, where they eventually become pollutants in our streams, rivers, lakes, and ground water.