

DEFINITION OF pH

Alkalinity and acidity of water and soil are frequently expressed in terms of their pH, which is a symbol for hydrogen ion concentration. A pH test determines the strength of the acid or alkali, while chemical tests for acidity and alkalinity determine the amounts of the acid or alkali present. An ion is an atom or group of atoms that carries an electric charge. Solutions ionize, i.e. split up into the electrically charged ions. Acidity is caused by positively charged hydrogen or H⁺ ions, and alkalinity by negatively charged hydroxyl or OH⁻ ions. A soil containing alkaline material will have many OH⁻ ions, while a soil containing acid will have many H⁺ ions. In neutral solutions the H⁺ ions and the OH⁻ ions unite to form H₂O, or water. Pure water itself, however, dissociates to a slight extent, measurement of the electrical potential exerted by the positively charged ions indicates that there is 0.000,000, 1 gram of H⁺ ions per liter. This is an awkward number to use, however, and the logarithm of its reciprocal, which is 7, is used to express neutrality. In any solution, as the negative ions increase, the positive ions must necessarily decrease, and accordingly measurement of the H⁺ ions remaining will indicate alkalinity until the solution contains one gram of OH⁻ ions per liter when the logarithm of the reciprocal of the H⁺ concentration is 14. On the acid side of neutrality the logarithm of the reciprocal of the H⁺ concentration decreases until it reaches 1.

The following table will help to make the above clearer.

pH values	Grams of hydrogen ions (H ⁺) per liter of solution	Gram equivalents of hydroxyl ions (OH ⁻) per liter of solution
4.0	0.000,1	0.000,000,000,1
5.0	0.000,01	0.000,000,001
6.0	0.000,001	0.000,000,01
7.0	0.000,000,1	0.000,000,1
8.0	0.000,000,01	0.000,001
9.0	0.000,000,001	0.000,01
10.0	0.000,000,000,1	0.000,1

ANSWERS TO "QUIZ YOURSELF"

1. A. Nitrogen - Phosphoric Acid - Potassium.
2. 10% Nitrogen - 6% Phosphoric Acid - 4% Potash.
3. 100 pounds, 200 pounds.
4. 27,000 gallons to cover an acre one inch deep.
5. One cubic foot holds 7½ gallons.
6. Potential of Hydrogen ion concentration.
7. 8 million seeds.
8. 1926.
9. White stakes.
10. No.
11. Two club lengths.

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USGA LISTS COURSE "SINS MOST FREQUENTLY COMMITTED"

A six page pamphlet recently released by the USGA to its member clubs listed the "sins most frequently committed" on a golf course. These include:

1. Littering with soft drink bottles, glasses and paper cups;
2. Climbing out of bunkers from the high side;
3. Failure to replace divots;
4. Failure to repair ball marks;
5. Turf scuffing caused by dragging feet and twisting on the green;
6. Leaning on a putter while standing on the green;
7. Using a putter to scoop the ball out of a hole;
8. Jabbing the putting surface with a flagstick or carelessly replacing the pin;
9. Deliberately hacking up the green;
10. Careless use of golf cars.