

Concentration of Hydrogen ions compared to distilled water

Examples of solutions at this pH

10,000,000	pH = 0	Battery acid, Strong Hydrofluoric Acid
1,000,000	pH = 1	Hydrochloric acid secreted by stomach lining
100,000	pH = 2	Lemon Juice, Gastric Acid Vineger
10,000	pH = 3	Grapefruit, Orange Juice, Soda
1,000	pH = 4	Tomato Juice Acid rain
100	pH = 5	Soft drinking water Black Coffee
10	pH = 6	Urine Saliva
1	pH = 7	"Pure" water
1/10	pH = 8	Sea water
1/100	pH = 9	Baking soda
1/1,000	pH = 10	Great Salt Lake Milk of Magnesia
1/10,000	pH = 11	Ammonia solution
1/100,000	pH = 12	Soapy water
1/1,000,000	pH = 13	Bleaches Oven cleaner
1/10,000,000	pH = 14	Liquid drain cleaner

Image Source: <http://staff.jccc.net/PDECELL/chemistry/pHscale.html>

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PH Scale Activity Sort

Directions:

- Print on Card Stock – one per group of students.
- Prior to giving students this handout, cut out the examples and place them into a small zip-top bag.
- Students will work in groups to determine the correct placement of the solutions according to the clues.
- The clues will be read verbally by the teacher, one at a time, pausing in between to allow students to determine the placement of the solution onto the pH scale.
- Once all the clues have been read, have students finalize their placements.
- One at a time, reveal the correct item for each pH value.
- If the students have the solution in the correct placement, they leave the tab in place.
- If the placement is incorrect, they slide the tab away from the scale.
- See which group has the most placed correctly! Have students then make corrections as needed.

Clues:

- 1) We drink acids when we are thirsty.
- 2) Water is pH neutral.
- 3) This is found in Utah and it has a concentration of $1/1,000^{\text{th}}$ for Hydrogen Ions.
- 4) The strongest acid is found in car batteries.
- 5) The strongest base unclogs your sink.
- 6) You may swim in this very weak base during vacation.
- 7) This second strongest acid is found in your stomach.
- 8) You may spit out this very weak acid.
- 9) Your favorite soft drink has 10,000 times more Hydrogen Ions than pure water.
- 10) Ammonia has a concentration of $1/10,000^{\text{th}}$ for Hydrogen Ions.
- 11) Bleach is the second strongest base.
- 12) Lemon juice is more acidic than soft drinks.
- 13) Coffee is less acidic than tomato juice.
- 14) Baking soda is more basic than sea water.
- 15) In your bathtub, it may have this pH as it goes down the drain.