H^+/ **Acid, Base and pH Test Review**

1. An *acid* produces H_3O^+ in water. A *base* produces OH^- in water.
2. Your test will also use H^+ (hydrogen) and H_3O^+ (hydronium) interchangeably.
3. Strong acids and bases make strong electrolytes because the compound would dissociate completely. This would make a light bulb shine bright.
4. Weak acids and bases make weak electrolytes because the compound would not dissociate completely. This would make a light bulb shine dim.
5. Complete the table.

Name	Formula	Type? (A or B)	Strong or weak	Intensity of lightbulb	Many or Few Ions
hydrofluoric acid	HF	A	W	Dim	few
lithium hydroxide	LiOH	B	Strong	B	many
Hydrosulfuric acid	H_2S	A	Weak	D	few
perchloric acid	$HClO_4$	A	S	Bright	many
Calcium hydroxide	$Ca(OH)_2$	B	S	Bright	many
Chlorous acid	$HClO_2$	A	Weak	D	few
nitrous acid	HNO_2	A	W	Dim	few
barium hydroxide	$Ba(OH)_2$	B	Strong	B	many
Sulfuric acid	H_2SO_4	A	Strong	B	many
IGNORE	NH_3			Dim	IGNORE

6. Neutralization Reaction Directions: Predict the products and balance the equation for following reactions:

a) $2\ HBr + Ba(OH)_2 \rightarrow 2\ H_2O + BaBr_2$ $Ba^{+2}\ Br^{-1}$

A + B → W + S

already balanced

b) $HNO_3 + LiOH \rightarrow H_2O + LiNO_3$ $Li^{+1}\ (NO_3)^{-1}$

A + B → W + S

c) $Ca(OH)_2 + 2\ HCl \rightarrow 2\ H_2O + CaCl_2$ $Ca^{+2}\ Cl^{-1}$

B + A → W + S

already balanced

d) $HI + KOH \rightarrow H_2O + KI$ $K^{+1}\ I^{-1}$

A + B → W + S

7. Complete the following chart about conductivity data.

Solution	Conducts Electricity	Intensity of Light bulb	Weak or Strong?	Acid or Base?	Many or Few ions
HF	Yes	Dim	W	A	few
NaOH	Yes	Bright	S	B	many
IGNORE NH_3	Yes	Dim	W		IGNORE
H_2SO_4	Yes	Bright	S	A	many

8. An acid-base reaction **produces** water (H_2O) and magnesium chloride ($MgCl_2$), a salt. What were the likely **reactants**? (Think backwards!)

✱ don't worry ~~too~~ about this ✱

but the answer is HCl & $Mg(OH)_2$

9. An acid-base reaction **produces** water (H_2O) and lithium sulfate (Li_2SO_4), a salt. What were the likely **reactants**? (Think backwards!)

✱ don't worry about this ✱

H_2SO_4 & LiOH

10. Solution A has a pH of 6, and Solution B has a pH of 4. Which solution has more hydronium ions (H_3O^+)?

acid

Solution B

more acidic

11. Solution A has a pH of 6, and Solution B has a pH of 4. Which solution has more hydroxide ions (OH^-)?

base

Solution A

closer to above 7 (being a base)

12. Solution A has a pH of 10, and Solution B has a pH of 4. Which solution has more hydronium ions (H_3O^+)?

acid

Solution B lower pH

13. A solution is prepared with a hydronium ion (H_3O^+) concentration of 2.6×10^{-5} M. What is the pH of the solution?

$-\log[2.6E-5] = 4.59$

Acidic

14. Complete the chart:

$[H_3O^+]$ or $[H^+]$	pH	Acidic or Basic?	What is there more of? H_3O^+ or OH^-
2.13×10^{-2} M	1.67	A	$[H_3O^+]$
1.66×10^{-14} M	13.78	B	$[OH^-]$
1.00×10^{-7} M	7	N	equal $[H^+]$ & $[OH^-]$
2.0×10^{-8} M	7.70	B	$[OH^-]$
1.29×10^{-10} M	9.89	B	$[OH^-]$
7.76×10^{-3} M	2.11	A	$[H_3O^+]$
7.2×10^{-4} M	3.14	A	$[H_3O^+]$

15. Complete the following chart about conductivity data.

pH of Solution	Intensity of Light bulb	Weak or Strong?	Acid or Base?	Completely / partially	many or few
1.9	Dim	W	A	partially	few
8.2	Bright	S	B	completely	many
10.8	Dim	W	B	Partially	few
5.5	Bright	S	A	completely	many