pH Notes

def:_____
_____

0 - 6.9 7 7.1 - 14

Calculating strength of pH

- For every unit on the pH scale there is a 10x difference between strengths.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

How much weaker is an acid of 4 vs 1?
How much stronger is a base of 13 vs 8?
How much stronger is a base of 9 vs an acid of 5?

Determining strength to neutralize pH

- _____
- _____

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

1- What would you add to neutralize 30 mL of a pH of 6?
2- What would you add to neutralize 60 mL of a pH of 10?
3- You want to neutralize 50 mL of a pH of 3. You only have pH 8 available. What do you do?

Identifying unknowns

Buffer solution: _____
_____

Indicators: _____
_____

Indicator + Buffer solutions =

- Sometimes the colour change gives a lot of info, sometimes very little info.

Table questions

1.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Ind A	Yellow		orange			Red							
Ind B	red	blue								yellow			
Ind C	Blue						green	yellow					
Ind D	red			purple				blue					
Ind E	colorless					blue					dark blue		

a- Which indicator would you use to find a strong acid?
b- Which indicator would you use to find a strong base?
c- Which indicator would you use to find a neutral solution?
d- What color would indicator D give if it had a pH of 5?
e- What is the pH of a substance if it becomes yellow with A and blue with B?
f- What is the pH of a substance if it becomes purple with D and blue with E?
g- What is the pH of a substance if it becomes red with A and blue with C?
h- What is the pH range if indicator A turns orange?
i- What is the pH range if indicator C turns yellow?

2. A solution that conducts electricity and that turns litmus paper blue

pH Scale	**2 3 4 5 6 7 8 9 10 11 12**										
Indicator 1	Yellow					Green		Blue			
Indicator 2	Colourless							Pink	Fuchsia		
Indicator 3	Red		Orange			Yellow					
Indicator 4	Red				Orange			Yellow		Green	

The pH of a given solution is unknown. Indicators 1 and 3 turn yellow in this solution. What colour will indicator 4 become in this solution?

3. The following table gives the colours of two acid-base indicators when they are added to solutions with different pH values.

pH Scale	1	3	5	7	9	11	13
Solution A	Red		Orange	Yellow			
Solution B	Yellow			Green		Blue	

The pH of solution A is 2 and the pH of solution B is 13. What was the colour of solution A and the colour of solution B?

A) Solution A is red and solution B is yellow.
B) Solution A is orange and solution B is green.
C) Solution A is yellow and solution B is blue.
D) Solution A is red and solution B is blue.

Past exam Questions

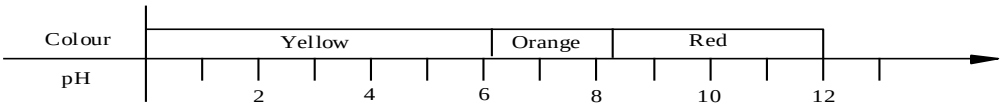
1. Using pH paper, a student determined that rainwater has a pH of 5 and that seawater has a pH of 8. What can the student conclude from these results?

A) Seawater is 3 times more acidic than rainwater.
B) Seawater is 3 times more alkaline than rainwater.
C) Seawater is 1000 times more acidic than rainwater.
D) Seawater is 1000 times more alkaline than rainwater.

2. Following a chemical spill, the contaminated soil reaches a pH value of 10. After a few days, a neutralization process begins and a second test is conducted. Its results show that the pH of the soil has become 100 times more acidic. What is the pH value after the second test?

A) pH= 1 B) pH= 8 C) pH= 9 D) pH= 11

3. The table below indicates the colour of the indicator phenol red in solutions with a pH varying from 1 to 12.



A drop of this indicator is added to some lemon juice.
What colour is the indicator after being added to the lemon juice?

4. In the lab, you are given two acidic solutions. One has a pH value of 5, and the other has a pH value of 6.8. Name the best indicator that would allow you to distinguish between the two solutions?

1) Methyl orange

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	red		Orange									yellow		

2) Bromothymol blue

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Yellow						Green		blue					

3) Phenolphthalein

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Colourless									pink		dark pink		

4) m-Cresol purple

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Yellow								brown		violet			