WORKSHEET

ACIDS, BASES AND INDICATORS

Syllabus reference 9.3.1

1 For each item in column A, write the letter of the best matching item in column B.

	Column A	Column B
_____ **1**	A substance which in solution produces hydrogen (H^+) ions	**a** litmus
_____ **2**	A soluble base	**b** blue
_____ **3**	Property of an acid	**c** vitamin C
_____ **4**	Property of a base	**d** alkali
_____ **5**	Common indicator	**e** hydrangea
_____ **6**	Neither acid nor base	**f** neutral
_____ **7**	A substance that changes colour in solution depending on the acidity or basicity of the solution	**g** sour taste
_____ **8**	Colour of litmus in alkaline solution	**h** indicator
_____ **9**	Flower that is a good indicator of soil acidity or alkalinity	**i** acid
_____ **10**	Another name for ascorbic acid	**j** soapy feel

2 Complete the following table.

PROPERTY	ACIDS	BASES
Ions produced in solution		
Taste		bitter
Feel		
Electrical conductivity		
Colour of litmus		
Common example		
Common use		

3 An indicator is a substance that takes on different colours as the acidity and basicity of a solution changes. Different indicators change colour over different acidity–basicity ranges as shown in the table below.

Common indicators and their acidity/alkalinity ranges

	COLOUR CHANGE				
INDICATOR	HIGHLY ACIDIC	SLIGHTLY ACIDIC	NEUTRAL	SLIGHTLY ALKALINE	HIGHLY ALKALINE
methyl orange	red →	yellow	yellow	yellow	yellow
bromothymol blue	yellow	yellow →		blue	blue
litmus	red	red →		blue	blue
phenolphthalein	colourless	colourless	colourless	colourless →	red

Answer the following questions using the table as a guide.

a Solution A is red in methyl orange while solution B is red in phenolphthalein. Which is the more acidic?

_____

b Four different solutions were tested with different indicators. Which of the solutions *could* be neutral?

i Colourless in phenolphthalein
ii Red in litmus
iii Yellow in methyl orange
iv Blue in bromothymol blue

_____

c What is the acidity/alkalinity of the following solutions?

i White vinegar turns methyl orange red and bromothymol blue yellow.

_____

ii A baking soda solution results in phenolphthalein staying colourless and turns litmus blue.

_____

4 Pickup pink turns blue if P is present and Bendon orange turns green if Q is present. Pickup pink and Bendon orange were added to separate samples of four colourless solutions A, B, C and D and observations were recorded in the table below.

SOLUTION USED	COLOUR AFTER ADDING PICKUP PINK	COLOUR AFTER ADDING BENDON ORANGE
A	Pink	Orange
B	Blue	Orange
C	Blue	Green
D	Pink	Green

Which solution(s) contain both P and Q?

_____

5 What colour would you expect to see in a piece of litmus paper to which the following have been added?

a 1 drop of $Ca(OH)_2$

_____

b 1 drop of HF

_____

c 1 drop of $NaNO_3$

_____