

Problem - How can one perform qualitative analysis of unknown substances using red, blue and yellow litmus papers, and yet obtain quantitative results?

Hypothesis - Changes in the color of Litmus and Hydrion paper will allow the students to predict the acidity/alkalinity of unknown solutions, as well as making an estimation of the solutions' pH.

"If you __, then __."

Independent Variable(s):
Dependent Variable(s):
Constant(s):
Control(s):

Materials: unknowns in labelled glass beakers, litmus papers (red/blue/yellow), forceps, "trash cans", safety goggles, pH probe/probeware* *if operational...

Methods: dip each litmus papers into the liquid (do not allow forceps to touch), record results in chart

- Unknown column will be filled in later
- R, B columns - mark your results as (R)ed, (N)o change, (B)lue
- For Y column - mark your result as (VR) Very Red, (R)ed, (RO) Red-Orange, (O)range, (YO) Yellow-Orange, (Y)ellow, (YG) Yellow-Green, (G)reen, (BG) Blue-Green, (B)lue, (VB) Very Blue
- A/N/B- predict whether the substance will be **A**cid (redder), **N**eutral (no changes), or **B**ase(blue)
- pH column will be filled in later

Experimental Observations & Data

"Unknown"	Let.	R	B	Y	A/N/B	pH
Vinegar	A	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	3
Corn Syrup	B	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	7
Hydrochloric Acid (HCl)	C	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	3
Rubbing Alcohol	D	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	6
Water (H ₂ O)	E	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	8
Sodium Hydroxide (NaOH)	F	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	12
Antifreeze	G	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	10
Baking Soda and Water	H	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	9
Hydrogen Peroxide H ₂ O ₂	I	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	7
Lye (fire ash & water)	J	R N B	R N B	VR R RO O OY Y YG G BG B VB	A N B	13

Conclusions: My hypothesis was... correct? Incorrect?
I learned...