Sources of information about acids and bases on the internet

This is an example of a record that a class of students might create from all their investigations. It's taken from one student's investigations (http://corescience.edublogs.org/) You can't take it as fact - **it needs to be tested**; your students might get different results!

But notice something interesting – beetroot stayed red in acid and neutral solution, and changed only in alkali solution. Blueberries were red in strong acid but then they gave a blue solutions through weak acid all the way to strong alkali.

So some indicators do more than show that a solution is acidic or basic; they can show where a solution is on the pH scale. The pH scale runs from pH1 (strong acid) to pH14 (strong base)

Which indicator in this list gives the most information about the pH of solutions?

Plant part used	Colour when added to HCl (strong acid)	Colour when added to vinegar (weak acid)	colour when added to water (neutral)	Colour when added to sodium bicarbonate (weak alkali)	Colour when added to NaOH (strong alkali)
Beetroot	Red	Red	Red	Red	Purple
Blackberries	Red	Red	Blue	Blue	Blue
Blueberries	Red	Blue	Blue	Blue	Blue
Cherries	Red	Red	Purple	Blue	Blue
Curry powder	Yellow	Yellow	Yellow	Red	Red
Geranium petals	Red	Red	Red	Blue	Blue
Petunia petals	Pink	Pink	Pink	Violet	Violet
Red cabbage	Red	Red	Purple	Green	Yellow
Rose petals	Red	Red	Pink	Blue	Blue
Purple ranunculus	Pink	Pink	Pink	Purple	Purple.
Buttercup petals	Yellow	Yellow	Yellow	Yellow	yellow
Morning glory petals	?	?	?	?	?
Purple grapes	?	?	?	?	?
Onions	?	?	?	?	?
Pansy petals	?	?	?	?	?

Simple information about acids and bases and pH

http://www.visionlearning.com/en/library/Chemistry/1/Acids-and-Bases/58

http://www.explainthatstuff.com/how-ph-meters-work.html

Detailed information

http://www.chemguide.co.uk/physical/acidebaseindex.html#top This is part of a very good website maintained by a British chemistry teacher, and covers chemistry at GCSE and A-level.

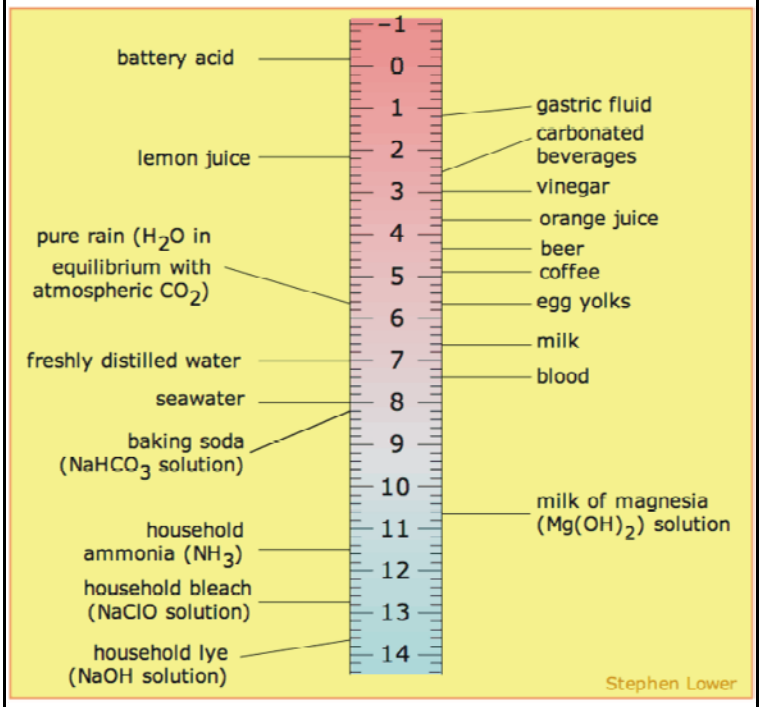
The pH scale

The values for pH make more sense when compared with that of known substances.

Note that the pH scale is logarithmic, i.e it goes up in powers of 10. So vinegar (pH3) is 10 times less acidic than lemon juice (pH2) , not 1½ times less acidic.

pH = 0	5% Sulphuric acid, H_2SO_4, battery acid.
pH = 1	1 M HCl, hydrochloric acid (pH = 1.1)
pH = 2	Lemon juice. Vinegar (pH = 2.4 - 3.4), Cola drinks (pH = 2.2)
pH = 3	wine (pH = 3.5 - 3.7)
pH = 4	Orange juice. Apple juice (pH = 3.8). Beer. Tomatoes.
pH = 5	Cottage cheese. Black coffee. Rain water (pH = 5.6).
pH = 6	Milk. Fish (pH = 6.7 - 7). chicken (pH = 6.4 - 6.6).
pH = 7	Neutral: equal numbers of hydrogen and hydroxyl ions. Distilled water without CO_2, after boiling. Blood (pH =7.3 - 7.4).
pH = 8	Sea water (pH = 8.1). Egg white.
pH = 9	Borax. baking soda.
pH = 10	Milk of magnesia, Magnesium hydroxide $Mg(OH)_2$.
pH = 11	Household ammonia
pH = 12	Photographic developer, household bleach
pH = 13	Oven cleaner
pH = 14	Sodium lye NaOH, 1 mol/litre.

The pH scale again, but shown in another way



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