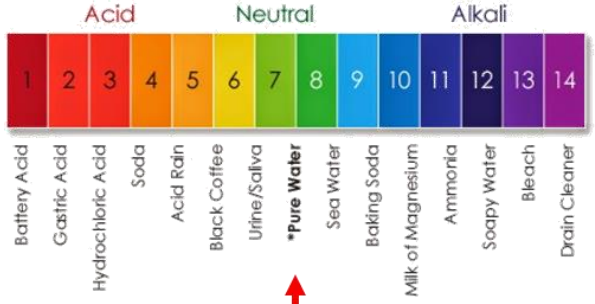
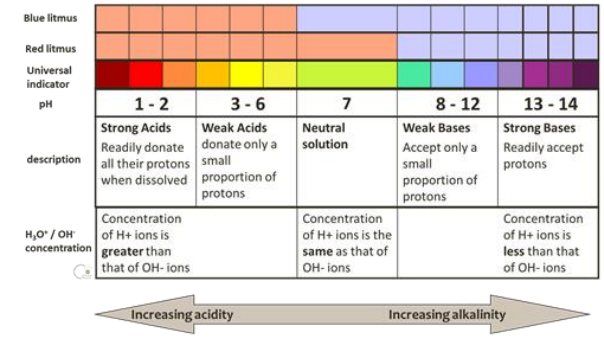
Acids and Bases

Last minute study sheet

pH is a measure of H^+ ions or OH^- ions





Universal indicator can also show pH

Added to...	Blue Litmus	Red litmus
Acid solution	Turns red	Stays red
Base solution	Stays blue	Turns blue
Neutral solution	Stays blue	Stays red

Litmus is used to show an acid, base or neutral substance

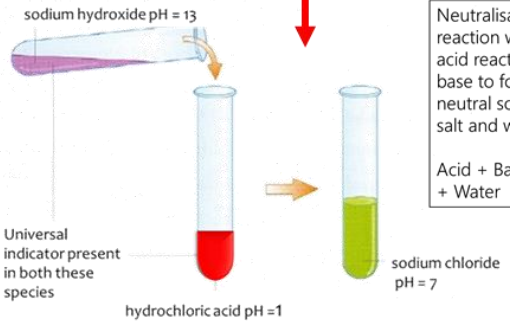
Name	Chemical formula
sodium hydroxide (OH)	NaOH
calcium carbonate (CO_3)	$CaCO_3$
magnesium oxide (O)	MgO
potassium hydrogen carbonate (HCO_3)	$KHCO_3$

Bases gain H ions (H+)

Name	Chemical formula
hydrochloric acid	HCl
sulfuric acid	H_2SO_4
nitric acid	HNO_3

Acids lose H ions (H+)

Acids and Bases combine in a neutralisation reaction



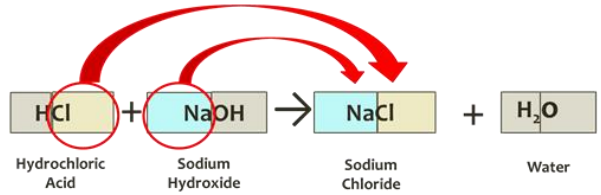
Neutralisation is a reaction where an acid reacts with an base to form a neutral solution of a salt and water.

Acid + Base → Salt + Water

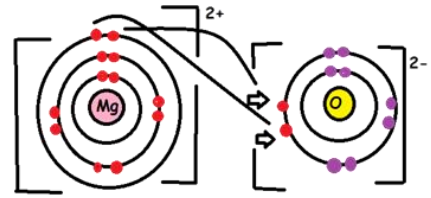
Neutralisation reaction produce salts

When salts are formed the name depends upon the acid reacted and the metal that forms part of the base compound.

Name of acid	Name of salt formed
Hydrochloric acid	chloride
Sulfuric acid	sulfate
Nitric acid	nitrate



Equations can show a neutralisation equation



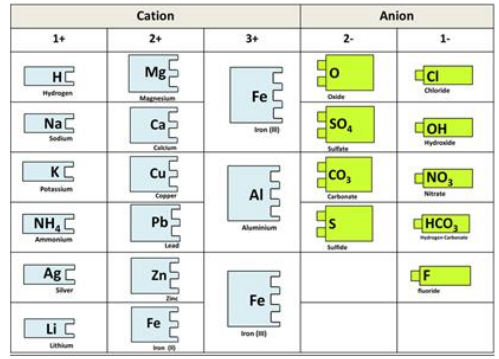
The formula for magnesium oxide is MgO made of Magnesium ion has a charge of +2 and oxide ion has a charge of –2. A compound overall has to have no charge. Therefore the +2 charge of magnesium ion cancels out the –2 charge of oxide ion and so therefore the ratio of ions is one to one. The charge on the ions arises as magnesium has to lose two electrons in order to have a full outer energy level and gets a charge of +2, and oxygen has to gain two electrons in order to have a full outer energy level and gets a charge of –2.

2. Acid and Metal Carbonate
General equation acid + metal carbonate → salt + water + carbon dioxide
Word equation hydrochloric acid + magnesium carbonate → magnesium chloride + water + carbon dioxide
Formula equation $2HCl + MgCO_3 \rightarrow MgCl_2 + H_2O + CO_2$

Acid and metal carbonate (or hydrogen carbonate) produce a salt, water and carbon dioxide gas

1. Acid and Base
General equation acid + base → salt + water
Word equation nitric acid + copper oxide → copper nitrate + water
Formula equation $2HNO_3 + CuO \rightarrow Cu(NO_3)_2 + H_2O$

An acid and base (hydroxides and oxides) produce salt and water



Ion charts are used to write formula

GZ Science Resources

Acids and Bases last minute study sheet

GZ Science Resources

Ideas for last minute study sheet

1. **10 questions.** Working in pairs. Each student uses the sheet to write 10 questions that could be answered with information on the sheet. The other student could have a different topic sheet. Focus on the students creating specific questions – rather than "what is an acid", ask "what colour would acid turn blue Litmus paper". Swap over the question sheets for the other partner to answer (without the sheet). Once finished, use the sheet to check answers. For any answers that are incorrect, use the sheet to correct them.

2. **Concept maps.** Students use the information on the sheet to create a large concept map.

3. **Scaffolded Practice Tests.** Create a short test, either paper or online (i.e. Kahoot, FORMS, Education Perfect), where the students are able to use the sheet to help. Repeat the test (or an alternative) the next day, without the information sheet.

4. **Sticky Notes.** Write summary statements, using information on the sheet, on small post it notes (digital or paper) and find the area of their notes to place it on.