

Acids & Bases Learning Statements

No.	Learning Outcome	Understanding?
1	pH is a number which indicates how acidic or alkaline a solution is.	😊 😐 😞
2	An acid is a solution with a pH less than 7.	😊 😐 😞
3	A base is a substance which reacts with an acid and neutralises it giving water as a product. An alkali is the solution formed when a base can dissolve in water. Alkalis have a pH greater than 7.	😊 😐 😞
4	3 types of compounds which are bases are metal hydroxides, metal oxides, metal carbonates are all bases (Memory aid - ABC: A lkalis, B ases, metal C arbonates).	😊 😐 😞
5	Soluble metal oxides dissolve in water to produce alkaline solutions. Soluble non-metal oxides dissolve in water to produce acidic solutions. If any oxide is insoluble it will not affect the pH of water.	😊 😐 😞
6	Acids, alkalis and neutral solutions all contain $H^+(aq)$ and $OH^-(aq)$ ions. Water and any neutral solution (made up in water) contains an equal concentration of both contain $H^+(aq)$ and $OH^-(aq)$ ions. Acids contain a higher concentration of $H^+(aq)$ ions compared with $OH^-(aq)$ and alkalis contain a higher concentration of $OH^-(aq)$ ions compared with $H^+(aq)$.	😊 😐 😞
7	When acids are neutralised the concentration of $H^+(aq)$ ions decreases, the acidity decreases and the pH of the solution increases to pH 7. When alkalis are neutralised the concentration of $OH^-(aq)$ ions decreases, the alkalinity decreases and the pH of the solution decreases to pH 7.	😊 😐 😞
8	A neutralisation reaction is one in which an acid reacts with a base to form water. A salt is also formed in this reaction.	😊 😐 😞

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9	Three examples of everyday neutralisation reactions are: treating acid indigestion with indigestion tablets, treating acidic soil or lakes with gardener's lime (a base) brushing teeth with toothpaste to neutralise mouth acid.	  
10	The course of most neutralisation reactions can be followed using a pH indicator which changes colour when neutralisation occurs.	  
11	A common lab pH indicator is universal indicator and one natural substance which can be used as a pH indicator is red cabbage.	  
12	When a base is insoluble an indicator is not required to follow a neutralisation reaction. In this case, when no more solid base reacts (i.e. is left unreacted at the bottom of the beaker) then that means all the acid had been neutralised.	  
13	When an insoluble base is used in a neutralisation reaction the excess (unreacted) solid is removed by filtration.	  
14	The general word equations for the 3 types of neutralisation reaction (neutralising acid with alkali, base or metal carbonate are: acid + alkali → salt + water acid + base → salt + water acid + metal carbonate → salt + water + carbon dioxide	  
15	Metals can also react with acid to reduce the acidity. The general word equation for metal reacting with acid is : metal + acid → salt and hydrogen	  

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16	In salt formation, the aqueous hydrogen ions in the acid, H^+ (aq), are replaced by the positive metal ions (or ammonium ions) from the base. This gives the first part of the name of the salt. The second part of the name comes from the name of the negative ion in the acid. e.g. the salt formed from sodium hydroxide (the base) and hydrochloric acid (the acid) is called sodium chloride.	  
17	Increased production of non-metal oxides such as CO_2 and SO_2 is mainly as a result of humans burning large quantities of fossil fuels to meet our energy demands.	  
18	Acid rain, global warming and ocean acidification.	  
19	<u>Eroding</u> stone buildings, speeding up the <u>corrosion</u> of metal structures and <u>killing</u> plant and animal life.	  
20	Although all non-metal oxides which dissolve in rain water can contribute to acid rain sulfur dioxide is the main gas which causes acid rain. Sulfur dioxide is produced by burning fossil fuels which contain sulfur impurities.	  
21	Three positive uses of acids are: acidity regulators in foodstuffs (ethanoic acid and citric acid), preservatives (Benzoic acid), and vitamin C (ascorbic acid).	  
22	The acid in various foods/drinks contributes to tooth erosion. Overproduction of HCl in the stomach during digestion leads to indigestion.	  

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23	A volumetric titration is an experiment in which volumes of reacting liquids are accurately measured. The results of these titrations can be used to calculate the unknown concentration of one reactant if the concentration of the other is accurately known. The methods of following neutralisation reactions used previously (using measuring cylinders/syringes) were not as accurate.	<input type="radio"/> <input type="radio"/> <input type="radio"/>
24	During a precipitation reaction two solutions react to form an insoluble product called a precipitate.	<input type="radio"/> <input type="radio"/> <input type="radio"/>
25	An experiment which could be used to measure the concentration of ions in an acid/alkali is by measuring conductivity. The more ions that a solution has in it then the larger the reading on the conductivity meter.	<input type="radio"/> <input type="radio"/> <input type="radio"/>