QUESTION	ANSWER

Quiz Cards: Chemical Changes

How to use the quiz cards to learn the key facts

1) Take 6 quiz cards at a time and read through them

2) Cover up the answer side of the page.

Question	Answer

3) Take the first quiz card and ask yourself the question. Either write the answer down or say it out loud.

4) Check your answer using the answer side of the card.

5) Do this question again until you get it right.

6) Repeat the process for the second question.

7) Before going onto the third question repeat question one and two.

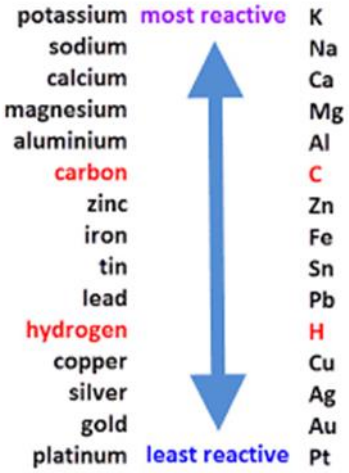
8) When you have gone through all of the questions try and do them in a random order to really test your knowledge.

ONCE YOU HAVE LEARNT THEM ALL ….

9) Complete some exam questions to apply your knowledge.

10) Check your answer with the mark scheme and correct any errors in green pen.

11) Repeat steps 9-10 until you get the answers correct all of the time.

QUESTION	ANSWER
List the order of the reactivity series and **what** element is the most and least reactive?	 • Potassium is the most reactive. • Platinum is the least reactive.
Why can the metals below carbon in the reactivity series be extracted from their oxides using carbon?	• Carbon is more reactive than all of the metals below it in the reactivity series. • Carbon will displace these less reactive metals from their oxides by the process of reduction. • Metal Oxide + Carbon → Metal + Carbon Dioxide • The metal oxide and carbon must be heated.
Why cannot the metals above carbon in the reactivity series be extracted from their oxides using carbon?	• Carbon is less reactive than all of the metals above it in the reactivity series. • Carbon will not displace these more reactive metals even when heated. • The metals above carbon can be extracted from their ores by electrolysis.

QUESTION	ANSWER
What is a reduction reaction?	• The removal of oxygen from a compound.
What is a oxidisation reaction?	• The gaining of oxygen in a compound.
What is a redox reaction?	• A chemical reaction where both reduction and oxidisation occur.
What is a native metal?	An unreactive metal that is naturally found in the earth as its own element. (it is not an ore).
What is an acid?	• Produce H^+ ions when added to water. • Has a pH between 0-6.
What colour do acids universal indicator?	Red-orange-yellow

QUESTION	ANSWER
What is an alkali?	• A soluble base (dissolves in water) • Produce OH- ions when added to water • Has a pH of between 8-14.
What colour do acids universal indicator?	Blue - purple
What is a base?	• A substance that neutralises an acid. • E.g metal oxide or metal hydroxide
What does the symbol (aq) mean?	Aqueous (dissolved in water).
What does the symbol (s) mean?	Solid
What does the symbol (l) mean?	Liquid

QUESTION	ANSWER
What does the symbol (g) mean?	Gas
What is an indicator?	Something that has a different colour in acids and alkalis.
What does the term “strong” mean?	The acid or alkali is fully ionised in water.
What does the term “weak” mean?	The acid or alkali is partially ionised in water.
What substance would have a pH of 2?	Strong acid (red)
What substance would have a pH of 7?	Neutral (green)

QUESTION	ANSWER
What substance would have a pH of 12?	Strong alkali (purple)
What is neutralisation?	A reaction between an acid and an alkali or base that results in a solution that is neutral (pH7).
What happens to the pH of an acid when an alkaline is added?	It increases towards a pH of7.
What happens to the pH of an alkali when an acid is added?	It decreases towards a pH of7.
What is the neutralisation word equation?	Acid + Base ⟶ Salt + Water
How do you form crystals from a neutralisation reaction?	Heat with a Bunsen and evaporate off the water.

QUESTION	ANSWER
What does the term "soluble salt" mean?	A salt that is dissolved in water (is aq).
What does the term "insoluble salt" mean?	A salt that is NOT dissolved in water (is solid).
What happens to the ions during a neutralisation reaction?	. $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$
How do you make soluble salts?	a) metals: Acid + Metal ⟶ Salt + Hydrogen b) metal oxide: Acid + Metal oxide ⟶ Salt + water c) hydroxides: Acid + Hydroxide ⟶ Salt + water d) metal carbonates: Acid + Metal Carbonate ⟶ Salt + Water + Carbon Dioxide
When acid reacts with metal **what** do you get?	Salt + Hydrogen
How do you form insoluble salts?	Mix two solutions to form a precipitate.

QUESTION	ANSWER
What is a use for precipitation reactions?	Removing metal ions from waste water.
How do you make salts from an insoluble base?	Add the base to the acid until no more will react. Filter to remove excess. Crystallise the salt solution
How do you make salts from an acid and alkali?	mix acid and alkali solutions; use indicator to show when have completely reacted to produce a salt solution; crystallise solution to produce solid salt.
What salt does hydrochloric acid form?	….. Chloride
What salt does Nitric acid form?	….. Nitrates
What salt does Sulphuric acid form?	….. Sulphates

QUESTION	ANSWER
What do you get if you react an acid with a metal?	Acid + Metal ⟶ Salt + Hydrogen
What is oxidation?	Oxidation is the loss of electrons and happens to the non metal ion: $\mathbf{2Cl^- \rightarrow Cl2 + 2e^-}$
What is reduction	Reduction is the gain of electrons and happens to the metal ion $\mathbf{Mg^{2+} + 2e^- \rightarrow Mg}$
What is electrolysis?	Electrolysis breaks down a substance using electricity. The substance being electrolysed is called the <u>electrolyte</u>.
Why can ionic compounds can only be electrolysed when molten or in solution?	Their ions are **free** to move to the electrodes.
Where do positive ions move to?	The negative electrode (the cathode)

QUESTION	ANSWER
Where do negative ions move to?	The positive electrode (the anode).
What happens to the ions at the electrodes?	Ions are discharged at the electrodes producing elements. At the electrodes, negative ions lose electrons (they are **oxidised**) and positive ions gain electrons (they are **reduced**)
Represent the reactions at the electrodes with half equations.	$2Cl^- \rightarrow Cl_2 + 2e^-$ $Na^+ + e^- \rightarrow Na$ OR: $2H^+ + 2e^- \rightarrow H_2$ $4OH^- \rightarrow O_2 + 2H_2O + 4e$ $4OH - 4e^- \rightarrow O_2 + 2H_2O$
What ion is made at the at the cathode?	Metal ion But … Hydrogen if the metal is more reactive than hydrogen.
What ion is made at the at the anode?	Non-metal ion But … Oxygen unless the solution contains halide ions when the halogen is produced.
What are the uses of electrolysis?	Extract metals if they are too reactive to be extracted by reduction with carbon or if the metal reacts with carbon.

QUESTION	ANSWER
What is the main disadvantage of using electrolysis?	Large amounts of energy are used in the extraction process to melt the compounds and to produce the electrical current.
How is Aluminum extracted from it's ore?	Molten aluminium oxide is electrolysed in to make aluminium metal. First the aluminium oxide is mixed with cryolite to lower its melting point. A carbon anode is used. The positive carbon electrode is replaced regularly as it reacts with the oxygen to form carbon dioxide. Aluminium forms at negative electrode. $\mathbf{Al^{3+} + 3e^{-} \rightarrow Al}$ Oxygen forms at positive electrode. $\mathbf{2O^{2-} \rightarrow O2 + 4e^{-}}$
What do we produce when we electrolyse brine (salty water)?	We produce three products- **chlorine gas, hydrogen gas and sodium hydroxide solution** (an alkali)