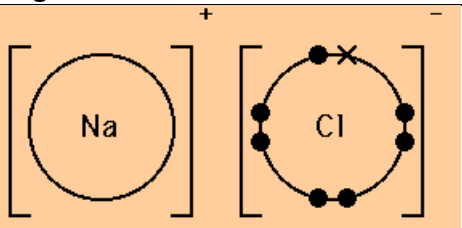


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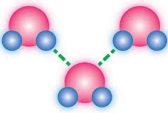
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Ionic bonding, formulae and properties of ionic compounds		
1.	What is an ion?	An atom or group of atoms with a positive or negative charge.
2.	How many outer shell electrons does a group 1 element gain or lose to have a full outer shell?	Loses 1 electron
3.	How many outer shell electrons does a group 6 element gain or lose to have a full outer shell?	Gains 2 electrons
4.	How many outer shell electrons does a group 3 element gain or lose to have a full outer shell?	Loses 3 electrons
5.	How many outer shell electrons does a group 7 element gain or lose to have a full outer shell?	Gain 1 electron
6.	How many outer shell electrons does a group 2 element gain or lose to have a full outer shell?	Loses 2 electrons
7.	What is a cation?	A positively charged ion
8.	Do atoms have to lose or gain electrons to form a positive ion?	Lose electrons (as electrons are negatively charged)
9.	Do atoms have to lose or gain electrons to form a negative charge?	Gain electrons (as electrons are negatively charged)
10.	What is an anion?	A negatively charged ion
11.	What is an ionic bond?	A strong electrostatic force of attraction between oppositely charged ions
12.	What charge is formed by an ion of a group 3 element?	+3
13.	What charge is formed by an ion of a group 2 element?	+2
14.	What charge is formed by an ion of a group 7 element?	-1
15.	What charge is formed by an ion of a group 1 element?	+1
16.	What charge is formed by an ion of a group 6 element?	-2
17.	What charge is formed by an ion of a group 5 element?	-3
18.	What is a lattice?	A giant 3D repeating pattern
19.	What is an ionic compound?	A compound made of alternating positive and negative ions in a lattice
20.	Draw sodium chloride's dot-and-cross diagram.	

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21.	Draw magnesium oxide's dot-and-cross diagram.	
22.	Draw magnesium chloride's dot-and-cross diagram.	
23.	What is the formula of magnesium chloride?	Mg ⁺² Cl ⁻¹ so it's MgCl ₂
24.	What is the formula of sodium oxide?	Na ⁺¹ O ⁻² so it's Na ₂ O
25.	What is the formula of a hydroxide ion?	OH ⁻¹
26.	What is a formula of a sulfate ion?	SO ₄ ⁻²
27.	What is a formula of a carbonate ion?	CO ₃ ⁻²
28.	What is a formula of a nitrate ion?	NO ₃ ⁻¹
29.	What is a formula of an ammonium ion?	NH ₄ ⁺¹
Group 7, group 0 and covalent bonding		
1	What are group 7 elements called?	Halogens
2	What is the colour and state of fluorine at room temperature?	yellow gas
3	What is the colour and state of chlorine at room temperature?	Pale green gas
4	What is the colour and state of bromine at room temperature?	Red-brown liquid
5	What is the colour and state of iodine at room temperature?	Grey solid
6	What happens to the colour and state of the halogens as you go down the group?	The colour gets darker as you go down the group and it becomes more solid at room temperature.
7	How do halogens exist in nature?	They exist as diatomic molecules (2 atoms bonded together) e.g: F ₂ , Cl ₂ , Br ₂ , I ₂
8	What is the test for chlorine gas?	Damp blue litmus paper turnss red then bleaches white
9	What bonds are present between fluorine atoms to form a molecule?	Covalent bonds
10	What is the trend in reactivity for group 7 elements?	They are less reactive as you go down the group (F = most reactive, At = least reactive)
11	How many electrons do halogens have in their outer shell?	7
12	Why is fluorine the most reactive halogen?	The outer shell electrons are closer to the nucleus. This means there is a stronger force of attraction between outer electrons and nucleus, so can gain an extra electron easier to form a full shell.

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13	Why is astatine the least reactive halogen?	The outer shell in electron is further away from the nucleus. This means there is a weaker force of attraction between outer electrons and nucleus, so will gain an electron more slowly to form a full shell.
14	What kind of elements have covalent bonds between them?	Non-metal elements only
15	What is the definition of a covalent bond?	A shared pair of electrons
16	Why do simple covalent molecules have a low melting and boiling point?	They have weak intermolecular forces between molecules, so little energy is needed to break these weak forces.
17	What are the forces between molecules called? 	Weak intermolecular forces
18	Why are simple molecules poor conductors of electricity?	All atoms have a full outer shell so electrons cannot move freely to carry the current.
19	What does redox stand for?	Reduction and oxidation
20	What does oxidation mean?	O xidation Is L oss of electrons
21	What does reduction mean?	R eduction Is G ain of electrons
22	What happens in the displacement reaction?	When a more reactive halogen takes the place of a less reactive halide.
23	What is a halide?	It is a group 7 element with a negative charge (F^{-1} , Cl^{-1} , Br^{-1} , I^{-1})
24	What happens if chlorine water is placed with potassium bromide solution?	Chlorine displaces bromide to form potassium chloride and bromine. This happens as chlorine is more reactive than bromine.
25	What are group 0 elements called?	Noble gases
26	Why are group 0 elements inert (unreactive)?	They all have a full outer shell so they do not lose or gain electrons.

Calculations involving masses		
1	How do you calculate relative formula mass?	By adding all the relative atomic masses together of all the atoms of different elements in a molecule
2	Calculate the relative formula mass of CO_2 ? (Ar: C = 12, O = 16)	CO_2 $12 + 16 + 16 = 44$
3	What does empirical formula mean?	Empirical formula is the simplest whole number ratio of atoms in a compound
4	What is the empirical formula of C_2H_6 ?	C_2H_6 can be simplified to CH_3
5	What is the equation for calculating concentration?	Concentration = $\frac{\text{mass}}{\text{volume}}$
6	What is the unit for volume?	dm^3
7	How do you convert cm^3 to dm^3 ?	Divide by 1000
8	What is the unit for concentration?	gdm^{-3}

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9	State the law of conservation of mass	No atoms are lost or made during a chemical reaction Mass of reactants = mass of products
10	How do we show that mass is conserved in chemical reactions?	Balancing symbol equations
11	State one example of when a reaction may APPEAR to lose mass.	When a gas is produced and escapes eg. Thermal decomposition of metal carbonate, producing carbon dioxide
12	State one example of when a reaction may APPEAR to gain mass.	When a gas reacts with a solid adding onto it eg. Oxygen reacting with magnesium to form magnesium oxide
13	State the equation for calculating percentage composition.	% composition = (mass of element/total mass of compound) x 100
14	What is the percentage by mass of hydrogen, in H ₂ O? Answer to two significant figures. H = 1 H ₂ O = 18	% composition = ((2 x 1) / 18) x 100 = 11%
15	State the equation for calculating percentage composition.	% composition = (mass of element/total mass of compound) x 100
Amount of substances (HT)		
17	What are chemical amounts measured in? What is the unit?	Moles Unit = mol
18	One mole of any substance contains how many particles?	6.02×10^{23}
19	What is the name for this number? 6.02×10^{23}	Avogadro's constant
20	Which has more particles – one mole of carbon atoms or one mole of magnesium ions?	They both have the same number (6.02×10^{23})
21	State the equation to calculate number of particles in a given substance	Number of particles = mol x Avogadro
22	One mole of any substance is equal to...	its relative formula mass (M_r) in grams
23	State the equation to calculate moles from mass and M_r	moles = mass / M_r
24	$\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ How many moles of magnesium react with 20 moles of hydrochloric acid?	10 moles
25	$4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$ How many moles of aluminium would form 4 moles of aluminium oxide?	8 moles
26	What is the term for a reactant that gets completely used up in a reaction?	Limiting reactant
27	Why is one reactant often added in excess?	To make sure all the other reactant is used up