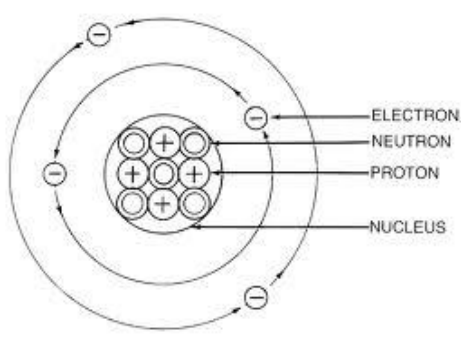
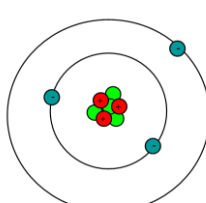
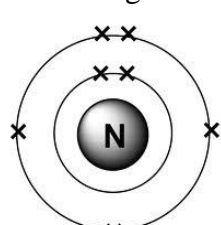
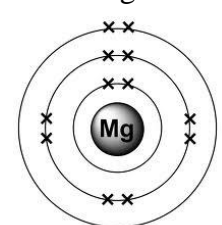
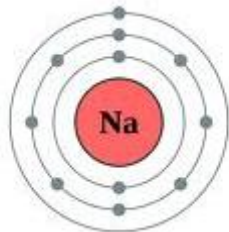










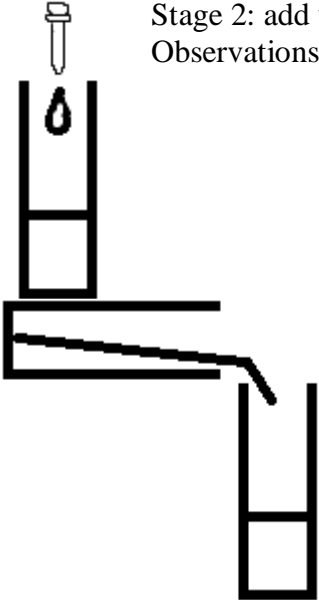
SOLUTIONS

Q	Outcome																																					
1.	1	Give a definition of the term “matter” Matter is the substances around us that take up volume and have mass.																																				
2.	2	Complete this table of the parts of an atom: <table><tr><th>Particle</th><th>Charge</th><th>Location in atom</th></tr><tr><td>Proton</td><td>Positive</td><td>In the nucleus</td></tr><tr><td>Neutron</td><td>Neutral</td><td>In the nucleus</td></tr><tr><td>Electron</td><td>Negative</td><td>Around the outside</td></tr></table>	Particle	Charge	Location in atom	Proton	Positive	In the nucleus	Neutron	Neutral	In the nucleus	Electron	Negative	Around the outside																								
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3.	2	Draw an atom and label all particles. <div></div>																																				
4.	2	Draw an electron configuration diagram for the following atoms: <div>Lithium<div></div>Nitrogen<div></div>Magnesium<div></div><p>Make sure you have the correct number of electrons in each shell.</p></div>																																				
5.	3	Fill in the table <table><tr><th>Atom</th><th>Atomic No.</th><th>Mass No.</th><th>Protons</th><th>Neutrons</th><th>Electro ns</th></tr><tr><td>⁶₁₂C</td><td>6</td><td>12</td><td>6</td><td>6</td><td>6</td></tr><tr><td>³₅Li</td><td>3</td><td>5</td><td>3</td><td>2</td><td>3</td></tr><tr><td>¹⁷₃₅Cl</td><td>17</td><td>35</td><td>17</td><td>18</td><td>17</td></tr><tr><td>¹⁹₃₉K⁺</td><td>19</td><td>39</td><td>19</td><td>20</td><td>18</td></tr><tr><td>⁸₁₆O²⁻</td><td>8</td><td>16</td><td>8</td><td>8</td><td>10</td></tr></table>	Atom	Atomic No.	Mass No.	Protons	Neutrons	Electro ns	⁶ ₁₂ C	6	12	6	6	6	³ ₅ Li	3	5	3	2	3	¹⁷ ₃₅ Cl	17	35	17	18	17	¹⁹ ₃₉ K ⁺	19	39	19	20	18	⁸ ₁₆ O ²⁻	8	16	8	8	10
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6.	4	Columns in the periodic table are called ____groups____. Rows in the periodic table are called ____periods____																								
7.	4	How many valence electrons does sodium have? 1 Describe two ways this can be determined: Draw an electron configuration diagram  Or look at group number. Group 1 elements have 1 valence electron.																								
8.	4	Using the group number, determine how many valence electrons each of the following elements have: Magnesium: <u>2</u> Boron: <u>3</u> Oxygen: <u>6</u> Silicon: <u>4</u>																								
9.	6	Why do group 1 elements form +1 ions? Atoms want to have full outer electron shells. Group 1 elements lose 1 electron to have a full outer electron shell. Why do group 8 elements not form ions? They have full outer electron shells and so remain neutral.																								
10.	5	Give the common ionic form for the following elements (FROM MEMORY): <table><tr><td>Ion name</td><td>Ion formula</td></tr><tr><td>Copper</td><td>Cu^{2+}</td></tr><tr><td>Potassium</td><td>K^{+}</td></tr><tr><td>Silver</td><td>Ag^{+}</td></tr><tr><td>Oxide</td><td>O^{2-}</td></tr><tr><td>Nitrate</td><td>NO_3^{-}</td></tr><tr><td>Sulfide</td><td>S^{2-}</td></tr><tr><td>Sulfate</td><td>SO_4^{2-}</td></tr><tr><td>Hydroxide</td><td>OH^{-}</td></tr><tr><td>Lead</td><td>Pb^{2+}</td></tr></table>	Ion name	Ion formula	Copper	Cu^{2+}	Potassium	K^{+}	Silver	Ag^{+}	Oxide	O^{2-}	Nitrate	NO_3^{-}	Sulfide	S^{2-}	Sulfate	SO_4^{2-}	Hydroxide	OH^{-}	Lead	Pb^{2+}				
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11.	7	Fill in the table <table><tr><td>Chemical Name</td><td>Number and type of atom</td><td>Chemical Formula</td></tr><tr><td>Sodium Chloride</td><td>1 Sodium: 1 Chlorine</td><td>NaCl</td></tr><tr><td>Lithium Fluoride</td><td>1 Lithium: 1 Fluorine</td><td>LiF</td></tr><tr><td>Copper Oxide</td><td>1 Copper: 1 Oxygen</td><td>CuO</td></tr><tr><td>Copper Chloride</td><td>1 Copper: 2 Chlorine</td><td>CuCl_2</td></tr><tr><td>Magnesium Hydroxide</td><td>1 Magnesium: 2 Oxygen: 2 Hydrogen</td><td>Mg(OH)_2</td></tr><tr><td>Copper Nitrate</td><td>1 Copper: 2 Nitrogen: 6 Oxygen</td><td>$\text{Cu(NO}_3)_2$</td></tr><tr><td>Aluminium Carbonate</td><td>2 Aluminium: 3 Carbon: 9 Oxygen</td><td>$\text{Al}_2(\text{CO}_3)_3$</td></tr></table>	Chemical Name	Number and type of atom	Chemical Formula	Sodium Chloride	1 Sodium: 1 Chlorine	NaCl	Lithium Fluoride	1 Lithium: 1 Fluorine	LiF	Copper Oxide	1 Copper: 1 Oxygen	CuO	Copper Chloride	1 Copper: 2 Chlorine	CuCl_2	Magnesium Hydroxide	1 Magnesium: 2 Oxygen: 2 Hydrogen	Mg(OH)_2	Copper Nitrate	1 Copper: 2 Nitrogen: 6 Oxygen	$\text{Cu(NO}_3)_2$	Aluminium Carbonate	2 Aluminium: 3 Carbon: 9 Oxygen	$\text{Al}_2(\text{CO}_3)_3$
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12.	8	Write balanced ionic formula for the following compounds. This must be done without looking at a valency table.																								

		<table><tr><th>Name</th><th>Positive ion</th><th>Negative ion</th><th>Balanced Formula</th></tr><tr><td>Potassium Chloride</td><td>K⁺</td><td>Cl⁻</td><td>KCl</td></tr><tr><td>Potassium Oxide</td><td>K⁺</td><td>O²⁻</td><td>K₂O</td></tr><tr><td>Zinc Oxide</td><td>Zn²⁺</td><td>O²⁻</td><td>ZnO</td></tr><tr><td>Hydrogen Sulfide</td><td>H⁺</td><td>S²⁻</td><td>H₂S</td></tr><tr><td>Lead Sulfate</td><td>Pb²⁺</td><td>SO₄²⁻</td><td>PbSO₄</td></tr><tr><td>Lead Nitrate</td><td>Pb²⁺</td><td>NO₃⁻</td><td>Pb(NO₃)₂</td></tr><tr><td>Aluminium Hydroxide</td><td>Al³⁺</td><td>OH⁻</td><td>Al(OH)₃</td></tr><tr><td>Aluminium Sulfate</td><td>Al³⁺</td><td>SO₄²⁻</td><td>Al₂(SO₄)₃</td></tr></table>	Name	Positive ion	Negative ion	Balanced Formula	Potassium Chloride	K ⁺	Cl ⁻	KCl	Potassium Oxide	K ⁺	O ²⁻	K ₂ O	Zinc Oxide	Zn ²⁺	O ²⁻	ZnO	Hydrogen Sulfide	H ⁺	S ²⁻	H ₂ S	Lead Sulfate	Pb ²⁺	SO ₄ ²⁻	PbSO ₄	Lead Nitrate	Pb ²⁺	NO ₃ ⁻	Pb(NO ₃) ₂	Aluminium Hydroxide	Al ³⁺	OH ⁻	Al(OH) ₃	Aluminium Sulfate	Al ³⁺	SO ₄ ²⁻	Al ₂ (SO ₄) ₃
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Aluminium Sulfate	Al ³⁺	SO ₄ ²⁻	Al ₂ (SO ₄) ₃																																			
13.	9	<p>Which of the following substances do you believe to be metals?</p> <p>Substance A: gas at room temperature, does not conduct electricity Substance B: shiny, soft and conducts electricity Substance C: dull, hard, conducts electricity Substance D: shiny, liquid at room temperature, conducts electricity</p> <p>Answer: A is a non metal. C is a non metal (it is carbon-graphite) B is a metal. D is a metal (it is mercury).</p>																																				
14.	9	<p>Indicate which elements are non-metals on the periodic table below:</p> 																																				
15.	12, 13	<p>Separate the following compounds into acids and bases: NaOH, HCl, LiOH, HNO₃, H₂SO₄, CH₃COOH</p> <table><tr><td>Acids</td><td>Bases</td></tr><tr><td>HCl, HNO₃, H₂SO₄, CH₃COOH</td><td>NaOH, LiOH</td></tr></table> <p>CH₃COOH is a tricky one. It is an acid because it splits into CH₃COO⁻ and H⁺</p>	Acids	Bases	HCl, HNO ₃ , H ₂ SO ₄ , CH ₃ COOH	NaOH, LiOH																																
Acids	Bases																																					
HCl, HNO ₃ , H ₂ SO ₄ , CH ₃ COOH	NaOH, LiOH																																					
16.	12, 13, 14	<p>Identify whether each of the substances below is acidic, neutral or basic.</p> <p>Substance A: pH of 3 Substance B: turns universal indicator blue Substance C: has no effect on blue litmus paper and does not turn universal indicator green Substance D: has a pH of 7 Substance E: reacts with a metal to produce hydrogen gas</p>																																				

		<p>Substance F: turns universal indicator green</p> <p>Substance G: has a sour taste to it</p> <p>Substance H: has a soapy feel</p> <table border="1"> <tr> <td>Acids A, E, G</td><td>Neutral D, F</td><td>Bases B, C, H</td></tr> </table>	Acids A, E, G	Neutral D, F	Bases B, C, H
Acids A, E, G	Neutral D, F	Bases B, C, H			
17.	12, 13	<p>Write the chemical formula for the following acids and bases/</p> <p>Hydrochloric acid: HCl</p> <p>Sodium hydroxide: NaOH</p> <p>Nitric acid: HNO_3</p> <p>Sulfuric acid: H_2SO_4</p> <p>Copper hydroxide: $\text{Cu}(\text{OH})_2$</p> <p>Ethanoic acid: CH_3COOH</p>			
18.	14	<p>My fish tank has a pH of 5. The fish store tells me my fish like to have a pH level of 6.5</p> <p>Suggest a method of creating the right pH level in my fish tank.</p> <p>Because my pH is too low, I need to add a base to raise the pH.</p>			
19.	15	<p>Classify the commonly used chemicals below as acids or bases.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  ACID </div> <div style="text-align: center;">  BASE </div> <div style="text-align: center;">  ACID </div> <div style="text-align: center;">  ACID </div> <div style="text-align: center;">  BASE </div> <div style="text-align: center;">  BASE </div> </div>			
20.	16, 17, 18	<p>Fill in the remainder of the chemical word equations</p> <p>Acid + base \rightarrow _____ water _____ + _____ salt _____</p> <p>Acid + metal \rightarrow _____ hydrogen gas _____ + _____ salt _____</p> <p>Acid + carbonate \rightarrow _____ salt _____ + _____ water _____ + _____ carbon dioxide _____</p>			
21.	16, 17, 18	<p>Put a circle around the reactants and a rectangle around the products for the following reactions.</p> <p>$\text{Pb} + \text{O}_2 \rightarrow \text{PbO}_2$</p> <p>$\text{NH}_4\text{OH} + \text{HBr} \rightarrow \text{H}_2\text{O} + \text{NH}_4\text{Br}$</p> <p>$\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$</p>			
22.	16	<p>Write down any observations you would expect to make at each stage of the experiment below.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Stage 1: add universal indicator to 10 ml of 1M acid</p> <p>Observations: solution is red</p> </div> </div>			

		 <p>Stage 2: add universal indicator to 10 ml of 1M base Observations: solution is blue</p> <p>Stage 3: mix the acid with the base Observations: solution is green</p>
23.	17	<p>What observations would you expect to make when mixing a magnesium ribbon with hydrochloric acid in a test tube?</p> <p>Observations: bubbles/gas forming around metal. Metal may disappear into the solution.</p> <p>What are the reasons for these observations? This is an acid and metal reaction. Hydrogen gas forms. Metal turns into a salt/ionic compound and dissolves.</p>
24.	16, 17, 18	<p>Write the chemical formula and write the name of the salt that would be formed in each of the below reactions</p> <p>HCl + NaCO₃..... salt formed: NaCl sodium chloride Nitric acid + magnesium carbonate..... salt formed: Mg(NO₃)₂ magnesium nitrate Hydrochloric acid + copper hydroxide..... salt formed: CuCl₂ copper chloride Sulfuric acid + aluminium.... salt formed: Al₂(SO₄)₃ aluminium sulphate HNO₃ + Li.....salt formed: LiNO₃ lithium nitrate</p>