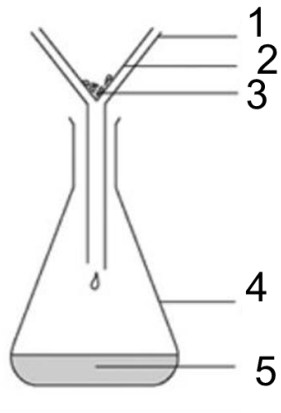
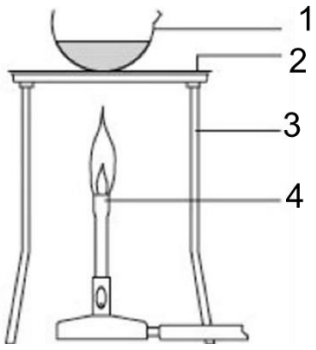
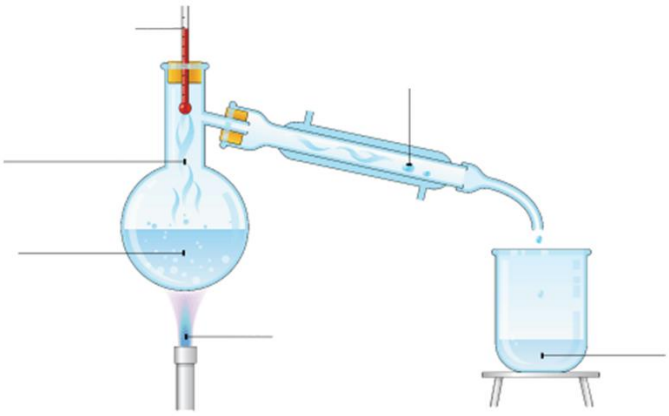
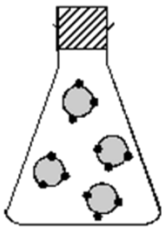
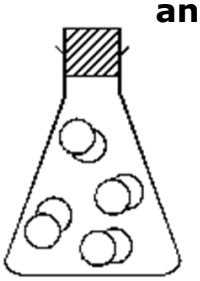
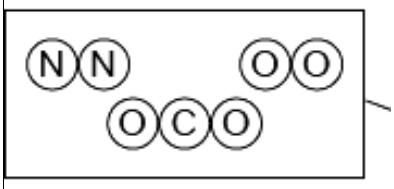
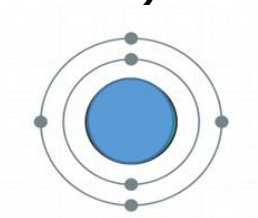
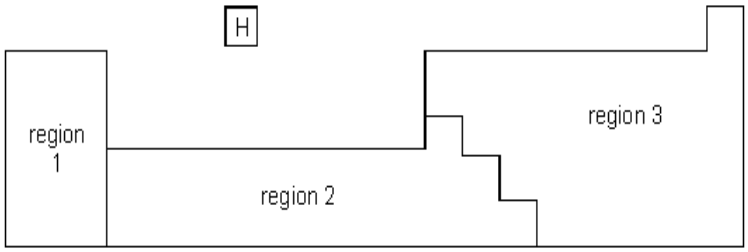
C1 Atomic Structure Fact Sheet

Filtering	
1. What does it mean if a solid is insoluble?	**It will not dissolve**
2. Name the method of separating we use to separate a solid that hasn't dissolved from a liquid	**Filtering**
3. Label the diagram below  	**1. Funnel** **2. Filter paper** **3. Residue/ solid** **4. Conical flask** **5. Filtrate/ liquid/ water**
4. Explain how filtering separates the mixture	• The liquid particles are small enough to fit through the filter paper • The solid particles are too big to fit through the filter paper
Evaporation	
5. What does it mean if a solid is soluble in water?	**It will dissolve**
6. Name the method of separating we use to separate a solid that has dissolved from a liquid	**Evaporation**
7. Label the diagram below  	**1. Evaporating dish** **2. Gauze** **3. Tripod** **4. Bunsen burner**
8. Explain how evaporation separates the mixture	• The liquid particles turn into a gas and leave the mixture • The solid particles do not evaporate so are left in the evaporating dish

Distillation	
9. How do we separate 2 liquids which have different boiling points?	**Distillation**
10. Where will the liquid with the lowest boiling point be at the end? 	In the beaker
Elements, mixtures and compounds	
11. What do we call a substance made up of only one type of atom?	**Element**
12. What do we call a substance made up of 2 or more elements chemically bonded?	Compound
13. What do we call 2 or more elements/ compounds not chemically bonded together?	Mixture
14. What do we call 2 or more atoms bonded together?	Molecule
15. Is this an element, compound or mixture? 	**Compound**
16. Is this an element, compound or mixture? 	**Element**
17. Is this an element, compound or mixture? 	**Mixture**

Atomic structure	
18. State an approximate radius of an atom	0.1 nm
19. What proportion of the radius of an atom is the nucleus?	1/ 10,000
20. What is the centre of the atom called?	**Nucleus**
21. Name the 2 particles in the nucleus	**Protons and neutrons**
22. Where are electrons found?	**In shells**
23. State the charge of a proton	**+1**
24. State the charge of an electron	**-1**
25. State the charge of a neutron	**0**
26. The number of protons is the same as the number of …… in an atom	**Electrons**
27. What is the overall charge of an atom?	**0**
28. What is the maximum number of electrons in the first shell?	**2**
29. What is the maximum number of electrons in the second and third shells?	**8**
30. The atomic number shows the number of ….	Protons
31. The mass number shows the number of ……	Protons and neutrons
32. The number of electrons in the outer shell is the …….. the group number on the Periodic Table	Same as
33. Name this atom (you will need a periodic table) 	**Carbon**
34. To calculate the number of neutrons we do the mass number take away the ……..	Atomic number
35. State the relative mass of a proton	**1**
36. State the relative mass of a neutron	**1**
37. State the relative mass of an electron	**Very small**
38. Where is nearly all the mass of the atom?	Nucleus
39. What do we call atoms of the same element which have different numbers of neutrons?	Isotopes
40. What is the term for the average that takes into account the abundance of the isotopes of the element?	Relative atomic mass

Atomic structure skills – you need to know how to work these out!! Different elements will be on the test!	
41. The mass number of Magnesium	**24**
42. The number of protons in a Nitrogen atom	**7**
43. The number of electrons in a Fluorine atom	**9**
44. The number of neurons in a Lithium atom	**4**
Development of the model of the atom	
45. What did people think atoms were like before we discovered electrons?	• Tiny spheres/ balls • That couldn't be divided
46. Name the scientist who described atoms as tiny spheres	John Dalton
47. Which model was developed when we discovered the electron?	Plum pudding model
48. Name the scientist who discovered electrons	J. J. Thompson
49. Describe the plum pudding model	• Ball of positive charge • Negative electrons inside the ball
50. What 2 conclusions came from the alpha particle scattering experiment?	• Nearly all the mass of the atom is in the centre of the atom (nucleus) • Nucleus is charged
51. Name the scientist who suggested the nuclear model (where the atom has a nucleus)?	Ernest Rutherford
52. Who suggested electrons orbit the nucleus at specific distances?	Niels Bohr
53. What types of evidence did Bohr have?	• Theoretical calculations • Experimental observations
54. What name was given to the smaller particles of positive charge inside the nucleus?	Protons
55. Who did experiments to show there are neutrons in the nucleus?	James Chadwick
56. How is the nuclear model different to the plum pudding model?	• Location of electrons • Location of the mass • Charge of the nucleus
The Periodic Table	
57. Describe how the periodic table is organised	• By atomic mass • The group number shows the number of electrons in the outer shell • The period number shows the number of electron shells

58. On the periodic table below, which letters show: **a. Metals** **b. Non-metals**  	**a. Regions 1 and 2** **b. Region 3**
Group 1	
59. What are the elements in group 1 called?	**Alkali metals**
60. State 2 properties of alkali metals that make them different to most other metals	• Low density • High reactivity
61. Describe what you see when group 1 metals react with water	• **Fizzing** • **Gas given off (hydrogen)** • **Metal moves around** • **If there is universal indicator in the water, it goes purple**
62. Why do alkali metals all have similar properties and similar reactions?	**Because they all have 1 electron in their outer shell**
63. How does reactivity change down group 1?	**Increases**
64. Why does reactivity increase down group 1?	Electron which is lost is further away from the nucleus
65. How do melting and boiling points change down group 1?	Decrease
66. Why are group 1 metals stored under oil?	Because they react vigorously with water and oxygen from the air
Group 7	
67. What are the elements in Group 7 called?	**Halogens**
68. Do halogens consist of atoms or molecules?	Molecules
69. Why do group 7 elements all have similar properties	**Because they all have 7 electrons in their outer shell**
70. How does reactivity change down group 7?	**Decreases**
71. Why does reactivity decrease down the group?	Electron that is gained will be further away from the nucleus
72. How do melting and boiling points change down group 7?	Increase

73. Which halogens can displace iodine? Why?	• Chlorine and bromine • They are more reactive than iodine
74. Which halogen can displace bromine? Why?	• Chlorine • It is more reactive than bromine
Group 0	
75. What are the elements in Group 0 called?	**Noble gases**
76. Why are the elements in group 0 unreactive?	**Full outer shell of electrons**
77. How does the boiling point of the Nobel Gases change down the group?	**increases**
78. Explain why the boiling point increases down the group	• The atoms get larger • So more energy is needed to turn them into a gas
Development of the Periodic table	
79. How were elements arranged in the first Periodic Table?	By atomic weight
80. How did Mendeleev improve the Periodic Table?	• Left gaps for undiscovered elements • Changed the order to put elements in their correct group
81. Why was the order based on atomic weight not always correct?	Isotopes
Relative formula mass – you will need a periodic table	
82. Calculate the relative formula mass of NaCl	**23 + 35 = 58**
83. Calculate the relative formula mass of $CaCO_3$	**40 + 12 + 16 + 16 + 16 = 100**
84. Calculate the relative formula mass of H_2SO_4	**1 + 1+ 32 + 16 + 16 + 16 + 16 = 98**
Word equation skills	
85. Lithium + oxygen →	**Lithium oxide**
86. Sodium + oxygen →	**Sodium oxide**
87. Sodium + water →	Sodium hydroxide + hydrogen
88. Potassium + water →	Potassium hydroxide + hydrogen
89. Lithium + chlorine →	Lithium chloride
90. Potassium + chlorine →	Potassium chloride
91. Chlorine + potassium iodide →	Iodine + potassium chloride (because chlorine is more reactive)

C1 Atomic structure HIGHER TIER ONLY SECTION	
1. Write the symbol equation for potassium + water	$2K + 2H_2O \rightarrow 2KOH + H_2$
2. Write the balanced symbol equation for lithium + water	$2Li + 2H_2O \rightarrow 2LiOH + H_2$
3. Write the balanced symbol equation for lithium and chlorine	$2Li + Cl_2 \rightarrow 2LiCl$
4. Write the balanced symbol equation for sodium and chlorine	$2Na + Cl_2 \rightarrow 2NaCl$
HIGHER TIER – YOU ALSO HAVE TO BE ABLE TO DO THE MOLE CALCULATIONS – THESE ARE NOT ON THIS FACT SHEET (SO WON'T BE ON THE FACT TEST). THIS IS BECAUSE THEY ARE LONGER AND A SKILL	