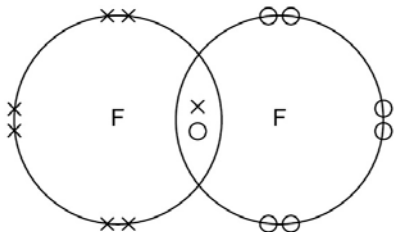
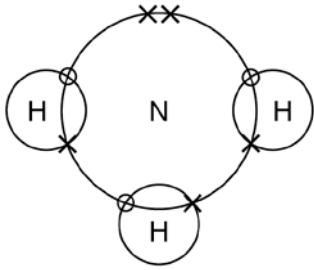


Question	Answers	Extra information	Mark	AO / Spec. Ref.
1.1	(difference) sodium has one and chlorine has seven electrons in <u>outer</u> level / shell or number of electrons	number of electrons must be correct if quoted	1	AO2 5.1.1.7 5.1.2.1
	(similarity) both have three / same number of levels / shells or have electrons in third level / shell or both have incomplete (outer) levels / shells	allow both have 2 electrons in inner shell or both have 8 electrons in second shell or both are one electron away from full outer level / shell	1	
1.2	sodium (atom) loses	allow marks from suitable diagram(s)	1	AO1 5.2.1.2
	one (outer shell electron)	allow moves / transfers for loses do not accept sodium ion loses	1	AO2 5.2.1.2
	chlorine (atom) gains	do not accept chloride	1	AO1 5.2.1.2
	one (electron)	transfer of 1 electron from chlorine to sodium max 2 marks reference to sharing or covalent bonding max 3 marks	1	AO2 5.2.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
2.1		one shared pair anywhere in overlap between two circles or on intersection 6 other electrons on each atom allow dots or crosses or mixture for all marks ignore any inner shell electrons	1 1	AO1 5.1.2.6 5.2.1.4 AO2 5.1.2.6 5.2.1.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3.1	1 bonding pair of electrons in each overlap 2 non-bonding electrons on nitrogen	 scores 2 marks allow dots, crosses, circles or e⁽⁻⁾ for electrons do not accept non-bonding electrons on hydrogen ignore inner shell electrons drawn on nitrogen	1 1	AO1 4.2.1.4
3.2	does not show the shape or only two-dimensional	allow is not three-dimensional	1	AO1 4.2.1.4

Question	Answers	Mark	AO/ Spec. Ref
4.1	Level 2: Scientifically relevant features are identified; the way(s) in which they are similar/different is made clear and (where appropriate) the magnitude of the similarity/difference is noted.	4–6	AO1 AO2
	Level 1: Relevant features are identified and differences noted.	1–3	
	No relevant content	0	

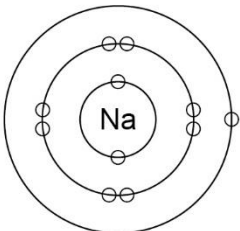
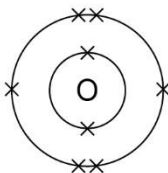
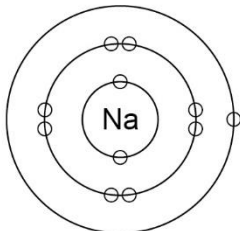
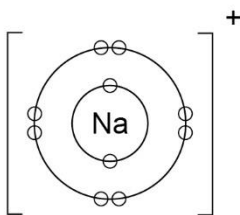
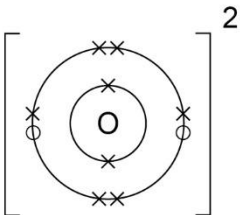
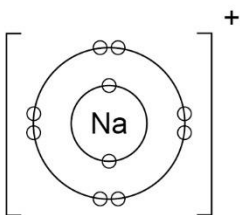
Indicative content

	sodium chloride	hydrogen chloride
differences in bonding	ionic	covalent
	metal & non-metal	two non-metals
	transferring electrons	sharing electrons
	ions (Na^+ and Cl^-)	molecules
	charged particles	neutral or no overall charge
differences in structure	giant structure or lattice	small / simple / discrete molecules
	electrostatic	intermolecular forces
	(electrostatic forces) are strong	(intermolecular forces) are weak
	act in all directions	random or between the molecules
	regular	irregular / random
similarities in bonding	full shells or stability	full shells or stability
	(transferring) electrons	(sharing) electrons
	strong bonds	strong (covalent) bonds
similarities in structure	(electrostatic) forces	(intermolecular) forces

ignore properties eg melting points, conduct electricity

to access level 2 there must be a comparison of the structure **and** bonding **and** magnitude of both sodium chloride **and** hydrogen chloride.

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5.1	caesium atom loses one electron (and) oxygen atom gains two electrons (so) two caesium atoms react with one oxygen atom any one from: • (to form) Cs^+ and O^{2-} • (to form) caesium ion(s) and oxide ion(s) • (to form) ions with full outer shells / levels	max 3 marks if reference to incorrect particles / bonding / structure allow (to produce) Cs_2O	1 1 1 1	AO1 5.1.2.5 5.2.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6.1	(dot and cross diagram to show) sodium atom and oxygen atom	allow use of outer shells only	1	AO2 4.2.1.1 4.2.1.2
	two sodium atoms to one oxygen atom	allow two sodium ions to one oxide ion	1	
	(to produce) sodium ion with a + charge		1	
	(to produce) oxide ion with a 2- charge		1	
				
				
	scores 4 marks			

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7.1	ionic		1	AO1 4.2.1.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
8.1		allow any combination of circles, dots, crosses or $e^{(-)}$		AO1 5.1.2.6 5.2.1.4
	one shared pair in overlap		1	
	6 non-bonding electrons in outer shell of chlorine	do not accept extra electron(s) on outer shell of hydrogen ignore any inner shell electrons	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
9.1		allow any combination of x, o, e ⁽⁻⁾ , • for electrons		AO1 4.2.1.4
		do not accept molecules containing more than 2 atoms		
	bonded pair of electrons in the overlap		1	
	chlorine with 6 non-bonded electrons	do not accept if extra electrons on H	1	
		an answer of		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	sodium atom loses one electron		1	AO1 5.1.1.7 5.1.2.3 5.1.2.5 5.2.1.2
	(and) oxygen atom gains two electrons		1	
	(so) two sodium atoms to one oxygen atom		1	
	any one from: • (to form) Na^+ and O^{2-} • (to form) sodium ion(s) and oxide ion(s) • (to form) ions with full outer shells / levels.		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
11.1		allow any combination of circles, dots, crosses, e ⁽⁻⁾ for electrons		AO1 5.1.2.6 5.2.1.1 5.2.1.4
	one shared pair in overlap		1	
	each chlorine atom with 6 non-bonded electrons (on outer shell)	ignore any inner shell electrons	1	
		the diagram below scores 2 marks		