Task 1: What is Group 7?

a) Why are elements in Group 7 known as the halogens?

b) **Colour** the correct column to show the location of the halogens in the periodic table.

1	2											3	4	5	6	7	0
				atomic	atomic s (proton) nı		H hydrogen +		atomic m	ass							He helum 2
L ⁷ Lithium 3	Be											B boron 5	Corbon	N nitrogen 7	0 0 oxygen 8	F fluorine 9	Ne neon 10
Na sodiam	Mg mognesium 12											Al atuntinium 13	Si sificon 14	P phosphorous 15	32 S sulfur 16	CI cticrine 17	Ao Ar argon 18
K potessium 19	Ca colcium 20	SC scondium 21	Tinanium 22	vanadium 23	Cr chromium 24	Mn marganese 25	Fe 100 26	59 CO 000011 27	Ni nickel 28	63.5 Cu 29	Zn ^{ainc} 30	Ga gattum 31	Ge germanium 32	AS arsenic 33	Se sekenkum 34	Br Br bromine 35	Kr krypton 36
Rb rubicium 37	Sr strontium 38	89 Y yttrium 39	Zr zirconium 40	Nb niotium 41	MO molybdenum 42	[98] TC technetium 43	Ru rutherium 44	Rh rhodium 45	Pd polladium 46	108 Ag 108 47	Cd codmium 48	In indium 49	50	Sb sitimony 51	Te teilurium 52	127 I iodine 53	Xe 34
CS caresium 55	Ba barium 56	La kanthanum* 57	Hf hafnium 72	Ta tentakam 73	184 W tungsten 74	186 Re menium 75	190 OS osmium 76	In In iridium 77	Pt platinum 78	401 Au gold 79	Hg B0	thalium	207 Pb Head 82	Bi bismuth 83	PO potonium 84	(210) At ostotine 85	Rn redon 86
francium 87	Ra radium 88	(227] AC octinium* 89	Rf rutherfordium 104	[262] Db dubnium 105	Sg seatoorgium 106	[264] Bh bohrium 107	(277] HS hassium 108	(268) Mt meitnerium 109	DS dormstedhum 110	Rg roenrgemium 111	copernicium 112	[286] Nh nihonium 113	[289] FI flerovium 114	MC moscovium 115	LV livermorium 116	[294] TS tennessine 117	Og ogenessen 118
*Lonthonid	es and Actini	des have be	en omítted.														

Task 2: What is Group 7?

a) Cross out one of the words in the brackets to make this sentence correct.

The halogens have (high/low) boiling points.

b) **Describe** the trend in melting points as you move down the Group 7 elements.

c) There is a trend for colour and state in the halogens at room temperature. **Predict** the colour and state astatine would be at room temperature.

Task 3: Chemical properties and trends

- a) **Describe** the trend in reactivity of the halogens as you go down the group.
- b) Why are the halogens poisonous?

c) **Complete** the word equations.

hydrogen	+	fluorine	→	
sodium	+	bromine	→	
aluminium	+		→	aluminium iodide
	+	chlorine	→	iron chloride
	+	iodine	→	hydrogen iodide
copper	+		→	copper fluoride

Task 4: Displacement reactions

a) For each pair of reactants, **tick** to show whether a displacement reaction would occur or not.

Reactants	Displacement reaction	No reaction
potassium iodide + chlorine		
magnesium bromide + fluorine		
lead chloride + iodine		
sodium fluoride + bromine		
zinc astatide + chlorine		
rubidium bromide + iodine		

b) For each of the displacement reactions in your table, **write** the full equation for the reaction with expected products.

c) **Describe** an experiment you could perform and the reaction you would observe to show that chlorine is more reactive than bromine.

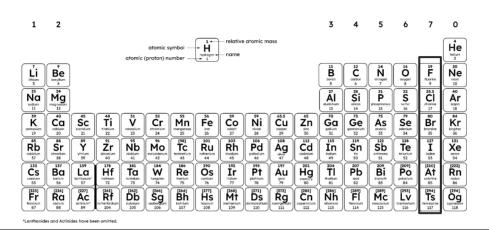
Group 7

Task 1: What is Group 7?

a) Why are elements in Group 7 known as the halogens?

The elements in Group 7 are called the halogens, which means salt formers. This is because they react with other elements to form salts.

b) **Colour** the correct column to show the location of the halogens in the periodic table.



Task 2: What is Group 7?

a) Cross out one of the words in the brackets to make this sentence correct.

The halogens have (high/low) boiling points.

b) **Describe** the trend in melting points as you move down the Group 7 elements.

As you go down the Group 7 elements, the melting points increase.

c) There is a trend for colour and state in the halogens at room temperature. **Predict** the colour and state astatine would be at room temperature.

Based on the trend and the properties of iodine before it, astatine would likely be a black solid.

Task 3: Chemical properties and trends

a) **Describe** the trend in reactivity of the halogens as you go down the group.

The reactivity of the halogens decreases as you go down the group.

b) Why are the halogens poisonous?

The halogens are poisonous to living things because they are so reactive.

Answers

c) **Complete** the word equations.



hydrogen	+	fluorine	→	hydrogen fluoride
sodium	+	bromine	→	sodium bromide
aluminium	+	iodine	→	aluminium iodide
iron	+	chlorine	→	iron chloride
hydrogen	+	iodine	→	hydrogen iodide
copper	+	fluorine	→	copper fluoride

Task 4: Displacement reactions

a) For each pair of reactants, **tick** to show whether a displacement reaction would occur or not.

Reactants	Displacement reaction	No reaction
potassium iodide + chlorine	~	
magnesium bromide + fluorine	~	
lead chloride + iodine		v
sodium fluoride + bromine		v
zinc astatide + chlorine	<i>v</i>	
rubidium bromide + iodine		v

b) For each of the displacement reactions in your table, **write** the full equation for the reaction with expected products.

potassium iodide + chlorine → potassium chloride + iodine

magnesium bromide + fluorine -> magnesium fluoride + bromine

zinc astatide + chlorine → zinc chloride + astatine

c) **Describe** an experiment you could perform and the reaction you would observe to show that chlorine is more reactive than bromine.

Take a solution of any metal bromide (e.g. sodium bromide) and add chlorine. A chemical reaction will take place as chlorine displaces the bromine from solution. A colour change shows a reaction occurred.