

1) Complete the table for the first four elements in Group 7 - the halogens. Start with the smallest element.

Name	symbol	atomic number	relative atomic mass	melting point °C	boiling point °C	colour	state at room temperature

2) Complete the following sentences;

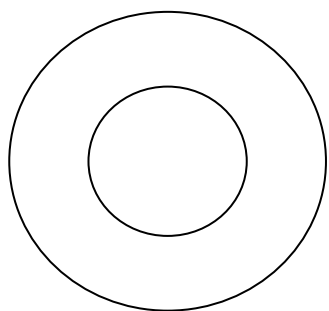
As you go down the group the elements become ...

- because
-
- because
-

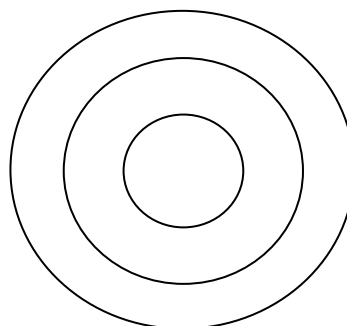
3) Find out some uses for the halogens.

- Fluorine
- Chlorine
- Bromine
- Iodine

4) Add electrons to complete the atomic structure for fluorine and chlorine.



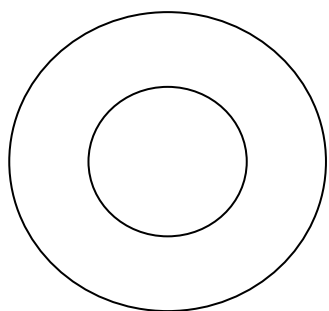
fluorine



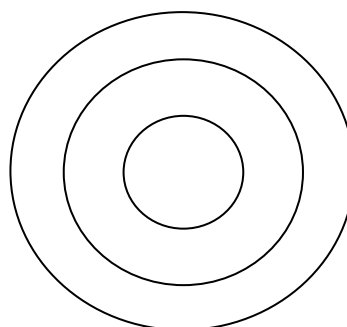
chlorine

5) Halogens form both **ionic** (F^- , Cl^- , I^- , Br^-) and **covalent** bonds (e.g. with themselves F_2 , Cl_2 , I_2 , Br_2 (diatomic molecules)).

Add electrons to complete the ionic structure for fluorine and chlorine.



F^-



Cl^-

6) Draw a diagram to show how two fluorine atoms bond to form a fluorine molecule, F_2 .

7) As you go down the group the halogens become less reactive. Can you explain why?

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Teaching notes

Students will need access to a periodic table and a source of information about the uses of the elements. The periodic table on the Royal Society of Chemistry website is an excellent source of information, <http://www.rsc.org/periodic-table> (link available at time of publishing).

Suggested answers

1)

Name	symbol	atomic number	relative atomic mass	melting point °C	boiling point °C	colour	state at room temperature
fluorine	F	9	19	-219	-188	pale yellow	gas
chlorine	Cl	17	34.5	172	239	yellowish green	gas
bromine	Br	35	79.9	266	332	red brown	volatile liquid
iodine	I	53	126.9	387	457	dark grey	solid with purple vapour

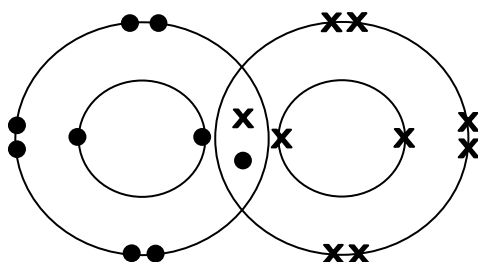
2) The boiling point increases because the relative atomic mass increases.
The atomic mass increases because the number of protons and neutrons increases.

3) fluorine - added to toothpaste to prevent tooth decay
chlorine - bleach, added to drinking water
bromine - dyes, medicines etc
iodine – printing inks, starch indicator etc

4) fluorine – 2, 7 electrons
chlorine – 2,8,7 electrons

5) fluoride ion – [2,8]⁻ electrons
chloride ion – [2,8,8]⁻ electrons

6)



7) They become less reactive as the number of outer shells increase as it's more difficult to gain an extra electron.