

ATOMS
A WEAVERSOFT PRODUCT
A program on the arrangement of electrons in atoms,
and the connections with ions and ionic bonding.

WEAVERSOFT *** ATOMS *** 16K ZX SPECTRUM

Load the program into your Spectrum by doing LOAD "atoms2". You will then be faced with a menu of four options, which you select by pressing the appropriate key.

Below are some instructions which should enable you to get the most benefit from this program.

Other Weaversoft products which are useful in this area of Chemistry include "Building Elements" and "Ions & Electrolysis".

OPTION 1

Look up potassium by entering "19". A shorthand way of describing the electron arrangement in this atom is 2 8 8 1. This shows the number of electrons in each "shell" – count them!

Now look at the other elements in Group 1 (see Periodic Table), noting the electron arrangement of each one. Do you see how they are similar?

Now do the same for the elements in Groups 7 and 8.

Can you now predict the electron arrangement of an element from the total number of electrons in an atom? If so, all you need to do so is the atomic number of that element!

OPTION 2

Use this option in conjunction with the copy of the Periodic Table overleaf. When you can correctly identify the elements every time, move on to the next option.

SEE OVERLEAF FOR THE PERIODIC TABLE AND MORE OPTIONS!

OPTION 3

There is a lot to be learnt from this option! Let's take it a bit at a time.....

(a) Look at some elements at random, and pay particular attention to the number of protons and electrons in the atom, then in the ion.

Is there any connection between these numbers and the net charge on the ion?

(b) Now look only at the metals in Groups 1 to 3. What exactly happens when they change into ions? Is there any connection with their valency?

(c) Look at the non-metals in Groups 5 to 7 only. What happens when these elements change into ions? Any connection with valency?

(d) Choose an element in Group 7. When you have seen it ionize, have a look at the next element to it, in Group 8. Now look at the next element in the Periodic Table, in Group 1. Can you now see the pattern in what happens when atoms change into ions?

If you have, you have sorted out one of the most important patterns in the properties of the elements!

(e) Look at the Group 4 elements – they make compounds with other elements in a totally different way. Can you suggest why it is very difficult for them to form ions?

OPTION 4

Again use the Periodic Table to help you identify the atoms or ions.

Is it the number of protons or the number of electrons which remains the same when an atom forms ions?

THE PERIODIC TABLE

H 1

		Group number					8
1	2	3	4	5	6	7	8
Li 3	Be 4	B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12	Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	Transition metals					

The number in each box is the atomic number of the element.