

NUMBER PATTERNS

Excel spreadsheet.

Load the EXCEL program by double-clicking its icon and follow the instructions below.

a) Entering basic formulas. A spreadsheet is basically a table of *columns* and *rows* into which you can enter numbers and formulas.

E.g. the following spreadsheet has columns A to G and rows 1 to 5.

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							

Notice the *cell* A1 which is outlined.
Type the number 1 and press ENTER.

Now press the arrow keys; ←, ↑, →, ↓, until the cell C3 is outlined.

{or use the MOUSE!}

	A	B	C	D	E	F	G
1	1						
2							
3							
4							
5							

We can tell the computer to double the number in cell A1 and put the answer in cell C3;
type the following:

=2*A1 ENTER

and notice the number 2 appear in cell C3.

Now return to cell A1 and type in the number 5 {followed by ENTER}. **Notice what happens to the number in cell C3.**

EXPERIMENT FURTHER!

	A	B	C	D	E	F	G
1	5						
2							
3			10				
4							
5							

b) Using the 'fill' command. Use the DELETE key to erase your work so far.
The *fill* command saves us from typing in the same formula time and time again.

Enter the following into the spreadsheet.

Outline the cell C1.

	A	B	C	D	E	F	G
1	1						
2	2						
3	3						
4	4						
5	5						

Now type the following to double the number in cell A1:

= 2*A1 ENTER

	A	B	C	D	E	F	G
1	1		2				
2	2						
3	3						
4	4						
5	5						

The *fill* command will now allow us to double the numbers in A2, A3, A4 and A5 without having to enter any more formulas.

Highlight cells C1 to C5 by clicking and dragging your MOUSE.

	A	B	C	D	E	F	G
1	1		2				
2	2						
3	3						
4	4						
5	5						

Release the MOUSE and select Edit at the top of the screen.

Select Fill.

Select Down.

The numbers in column C are now double the numbers in column A.

	A	B	C	D	E	F	G
1	1		2				
2	2		4				
3	3		6				
4	4		8				
5	5		10				

Exercise. Use the above method with the *fill* command to produce numbers in column C which are:

- obtained by tripling each corresponding number in column A,
- obtained by adding 10 to each corresponding number in column A,
- obtained by *squaring* each corresponding number in column A,
- obtained by halving each corresponding number in column A,
- obtained by adding each corresponding number in column A with the next number in column A.

It is now important that you EXPERIMENT FURTHER in order to familiarise yourself completely with the basics of using the spreadsheet program.

c) Exploring number patterns. Use the DELETE key to erase your work so far.

Example.

Enter the following into the spreadsheet.

	A	B	C	D	E	F	G
1	1						
2	2						
3	3						
4	4						
5	5						
6	6						
7	7						
8	8						
9	9						
10	10						

The idea is that you will be given a list of 10 numbers which you are to place into a separate column in the spreadsheet. For example, the numbers 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 can be placed as follows:

	A	B	C	D	E	F	G
1	1		1				
2	2		3				
3	3		5				
4	4		7				
5	5		9				
6	6		11				
7	7		13				
8	8		15				
9	9		17				
10	10		19				

However, you are NOT allowed to simply type in the numbers 1, 3, 5, 7, 9, 11, 13, 15, 17, 19.

Instead, you MUST enter a formula into the first cell (i.e. cell C1 above), involving the number in cell A1, and use *fill down* etc.

{For the set of numbers 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, type in the formula

$$= 2*A1 - 1$$

into cell C1 and then use *fill down* etc. to copy this formula into the cells in column C.}

The problem is in identifying the correct formula! Don't be afraid to use guess work!

FINDING FORMULAS WITH EXCEL

For each of the following sets of 10 numbers:

- i) Start with a blank spreadsheet.
- ii) Enter the following into the spreadsheet.

	A	B	C	D	E	F	G
1	1						
2	2						
3	3						
4	4						
5	5						
6	6						
7	7						
8	8						
9	9						
10	10						

iii) Find a formula which when entered into the first cell (e.g. cell C1) and *filled down* etc. produces the 10 given numbers. **{See the example above}**

iv) Write down the formula you typed into the first cell (e.g. cell C1).

EXERCISE.

- | | |
|--|---|
| 1) 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. | 2) 3, 5, 7, 9, 11, 13, 15, 17, 19, 21. |
| 3) 3, 6, 9, 12, 15, 18, 21, 24, 27, 30. | 4) 4, 7, 10, 13, 16, 19, 22, 25, 28, 31. |
| 5) 5, 10, 15, 20, 25, 30, 35, 40, 45, 50. | 6) 4, 9, 14, 19, 24, 29, 34, 39, 44, 49. |
| 6) 2, 5, 8, 11, 14, 17, 20, 23, 26, 29. | 7) 3, 7, 11, 15, 19, 23, 27, 31, 35, 39. |
| 8) 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. | 9) 0, 2, 4, 6, 8, 10, 12, 14, 16, 18. |
| 10) -1, 0, 1, 2, 3, 4, 5, 6, 7, 8. | 11) 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5. |
| *12) 1, 4, 9, 16, 25, 36, 49, 64, 81, 100. | *13) 2, 6, 12, 20, 30, 42, 56, 72, 90, 110. |
| *14) 0, 2, 6, 12, 20, 30, 42, 56, 72, 90. | *15) 3, 8, 15, 24, 35, 48, 63, 80, 99, 120. |
| *16) 4, 9, 16, 25, 36, 49, 64, 81, 100, 121. | *17) 0, 1, 4, 9, 16, 25, 36, 49, 64, 81. |