Get going with
Excel 2000

	A	B	C	D
1	Ware:	Netto:	MwSt:	Br
2	Pinsel	5,00		
3	Grundieringsfarbe	25,00	3 7	
4	Farbe	35,00		
5	Spachtelmasse	15,00		
6	Glasgewebe	50,00		
7	Sandpapier	5,15		
8	Malerrolle	9,25		
9	Flächenspachtel	15,50		
10	Stanleymesser	10,35		
11	Klingen	4,95		
12	Kleine Leiter	53,00		
13	Gummihandshuhe	4,85		
14	Staubmaske	4,85		
15	Lack	32,75		
16	Gesamt:	270,65		
17				

Tabelle1 / Tabelle2 / Tabel

Markieren Sie den Zielbereich, und drüc

© droigk

Get going with Excel 2000

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Translation: Linda L. Gaus
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Acrobat Reader: How to ...

F6 opens/closes bookmarks/thumbnails: Click a bookmark to jump to it.

In menu VIEW **you can set, how the file is displayed**
CTRL+0 = Fit in Window, CTRL+1 = Actual size, CTRL+2 = Fit width
You can set SINGLE PAGE, CONTINUOUS VIEW or CONTINUOUS FACING
.. try them out and you will see the differences.

Navigation
ARROW LEFT/RIGHT: forward/backwards one page
ALT+ARROW LEFT/RIGHT: same as in a browser: forward/back

Zoom
CTRL++ zooms in AND CTRL +- zooms out

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Is This Booklet for You?

This booklet is for Excel beginners. Basic topics will be discussed thoroughly with a focus on fundamental concepts of spreadsheets in general and Excel in particular.

If you can relate to one of the following statements, you can benefit from reading this booklet:

- You have no idea what a spreadsheet is, and what it is used for.
- You have heard of spreadsheets, but never had the chance to work with one.
- You have worked with other spreadsheet programs, but need to learn about the differences in Excel.
- Arithmetic and calculation have never been your strong points.
- Maybe you are fascinated by numbers and mathematics.

My goal is that this booklet will help you understand the program in such a way that you will continue to learn after you have completed the exercises. At the same time, you will have drawn up a household budget, something that most of us will find useful in our daily life.

No matter what you come to use Excel for, you will find that the program is easy to come to grips with, yet advanced enough to be able to solve most problems involving numbers.

If you feel that Excel is a little bit too difficult at first, then remember the wise words: **'Every beginning is fun....'**

Technical Language – Only for Nerds?

The computer industry uses a lot of technical abbreviations and terms, which are difficult for a beginner:

Pentium 150MHz, 32 Mb RAM, 8 x CD-ROM, 2.1 GB hard disk etc. etc.

'Pentium – is that part of the keyboard? How does the computer RAM something?

CD-ROM, is that something to do with music…?'

As a new user it is easy to get confused by all this gobbledegook. To understand the most basic terms, then I suggest you read the KnowWare booklet 'Make Friends with your PC', while terms that are Excel specific will be explained the first time they appear in the booklet.

For words that are directly relevant for Windows 98/95, see the booklet **Get going with Windows 98/95.**

About the Author

I've been teaching since 1980. In the computer arena I'm an autodidact, something that I regard as an advantage. Hopefully my experience can be of use to you.

Your background

I do not expect you to have any knowledge of spreadsheets. You should have a basic understanding of Windows 98/95 and have followed **Exercises for Windows 98/95.**

Your opinion

This booklet is written for you, so I would really appreciate hearing your comments, either by letter to the publisher, or directly to me via e-mail.

The structure

This booklet is designed around a series of practical examples. By following it from start to finish, you will learn to use the Excel methodology and increase your knowledge in a natural way.

Throughout the booklet some typographical conventions have been used. These make it easier to read and allow you to practice the most important points quickly and effectively.

Symbols

If you see CTRL+C, you should hold the CTRL key down while pressing the letter C.

You may also have to hold down two keys while pressing a third: CTRL+SHIFT+%.

Function keys are indicated in square brackets, for example, [F4]. Menu commands will appear with vertical lines in between them, for example FORMAT|LINE|HEIGHT.

In some places we have used the following symbols in the left margin to highlight a particular section:

This symbol indicates an important and useful tip. It will often be especially useful if you follow the exercises a second time.

Text marked this way is important for using the program – in order to use it according to the programmers' intentions and to avoid mistakes and impractical "detours."

Enjoy yourself, both with the booklet and with Excel itself!

Excel – the first impression

If you have some experience with the program, you can skip this section, or just browse through it to pick up any useful tips you may not already know.

Throughout the booklet I will describe the parts of the screen as we meet them, so they are introduced to you when they become relevant. I will use Microsoft's own names and terminology so you can search for more help in the Excel's Online Help.

General concepts

The first time you run Excel, an introduction program shows you the most important functions and principles in the program on your screen. Exit from this window; you can always return to it later.

Before we begin on a household budget we will first try a little sample budget for redecorating my living room. I suggest that you follow it on your own computer.

What is a spreadsheet?

In principle, a spreadsheet is nothing more than a large sheet of paper with lots of little squares on it. So that an individual 'square' can be used in a calculation together with other 'squares', each has to have a way of differentiating it, a unique address.

For the program to be able to manage individual 'squares' in large spreadsheets, it works in three dimensions, with each individual spreadsheet built up as a table in two dimensions. These two dimensions are called respectively rows (horizontal) and columns (vertical). Columns are always given a letter as a name, and rows are always given a number. An individual sheet can also be called a worksheet.

The fact that there can be more than one spreadsheet in a file gives Excel the third dimension, as entries on one spreadsheet can link to entries in another spreadsheet.

There can be up to 256 spreadsheets in a file, which in Excel is called a workbook. At the bottom of each workbook you will find a sheet tab for every spreadsheet, or page, in the workbook. Each time you open a new workbook **Sheet1** will be selected.

You can move to another worksheet by clicking on its sheet tab. Try clicking on different tabs, then return to **Sheet1** before continuing.

Cells are the individual 'squares' in a worksheet.

A cell is where a column and a row cross. The name of a cell comes from the name of the column (letter) together with the name of a row (number). So, the cell where column C and row 5 cross each other has the address C5.

Inserting text and numbers

When a new worksheet is selected, the cursor will always be in cell **A1** (it is *selected*).

1. Type **Material:** and press Enter. Cell **A2** will automatically be selected.
2. Type **Brush** and press Enter. Cell **A3** will automatically be selected.
3. Type **Primer** and press Enter.
4. In **A4** type **Paint** and press Enter.

> If the cursor jumps automatically to the next cell as soon as you press enter, you should use the command TOOLS|OPTIONS and have a look at the **Edit** tab. Here's where you can deactivate **Move selection after Enter**.

If you mistype anything you can correct it immediately by using the Backspace or Delete keys. You must do this before you press Enter, and you cannot use the arrow keys. If you notice a mistake after pressing Enter, simply retype the correct text over the incorrect text. The contents of the cell are overwritten when you press Enter. Editing the contents of a cell will be discussed in more detail later on in this booklet; for now, let's take a closer look at the data we've just entered. Select cell **A4** by pressing the Up arrow key:
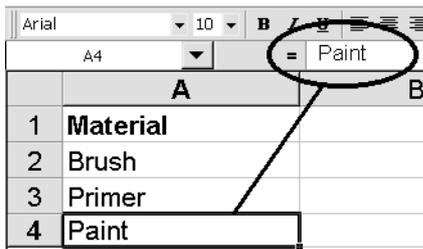
Notice that the word **Paint** is visible both in the cell and on the *formula bar* (just under the toolbars). This field shows what you typed, and the cell shows the result of your typing.

1. Use the arrow keys, or click with the mouse to select cell **B1**.
2. Type **Net price:** and press Enter.
3. In **B2** type **5** and press Enter.
4. In **B3** type **25** and press Enter.
5. In **B4** type **30** and press Enter.

It is important to understand how different entries are interpreted by Excel.

Data types

Excel differentiates between two data types; text and formulas. Numbers are regarded as formulas. When you have typed data into a cell you can immediately see in the cell itself how your data has been classified:

If data is aligned to the left, then it is text (text being written from left to right).

If the cell data is right-aligned, then Excel has interpreted your data as a number or a formula (numbers are usually written right-aligned, so that decimal points line up vertically under each other). This may sound banal, but it's very important to understand that you're having a kind of dialogue with the program whenever you enter data.

If you think you have typed a number, but Excel has displayed it left-aligned, then you have probably made a mistake. Maybe you have typed a comma instead of a period when you typed the decimal.

Do not delete the data you have just typed in **Sheet1** – we will come back to it later.

Click on **Sheet2** to start with a clean worksheet. We can test the principles for inserting data in Excel mentioned above.

Creating formulas

If you mix text and numbers, your data will be understood as text. If you type in an equation, for example, **125-12**, the '-' will be interpreted as a hyphen, not a minus sign, and Excel will behave as if the cell contains only text. Whenever you type a formula, you must *always* start with an equals sign: **=125-12**. Try the following example:

1. Type two numbers separated by a minus sign in **Sheet2**, cell **A1**, for example **120856-2895,** and then press Enter. Even though it is longer than the cell, it is obvious that the data flows from left to right over the next cell. It has been interpreted as text, which is correct.
2. Now type in the same data in **A2,** but this time with an equals sign in front of it: **=120856-2895** and press Enter.

> You can also begin a formula with a plus or minus sign ('+', '-'). In every case Excel will add an equals sign in front of the formula. But I would strongly suggest starting formulas with '='. It is a good habit and will help you understand all of Excel's built-in functions.

Operators

When you type formulas, you can use any of the following operators:

+ add
- subtract
* multiply
/ divide
^ raise to the power of (as in 3^3 = 3*3*3 = 27).

If you want to type a number as text, you must begin with an apostrophe (for example '125).

Order of Operations

When you type a formula containing several numbers and operators, you should remember that all calculations are carried out according to the following order of operations:

first calculation : ( ) and ^
second   : * and /
and finally   : + and -

Type the following formula in cell **A3**:

= 20 + 20 / 4 and press Enter. The result is 25, as 20 / 4 is calculated first.

Now type the same formula in **A4**, but this time in brackets:

= (20 + 20) / 4 and press Enter. The result is now 10, as the numbers in brackets are calculated first.

Even though brackets are not necessary for calculations using operators on the same level such as plus and minus, they can often make a formula easier to read. I often use brackets for precisely this reason.

Formula bar

On the far left side, this bar refers to the *active* cell (the selected cell). Next to this is a field for displaying and typing a formula.

Active cell   Data of the cell
(Name box)   (Formula bar)
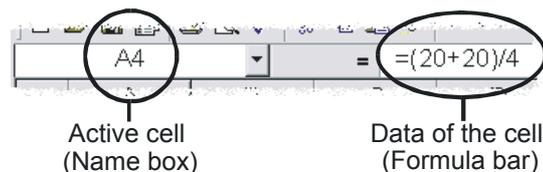
All entries in cells take place here.

A cell consists of two 'levels,' the background, which contains the data entered (shown on the formula bar), and the foreground, which contains the result of the entry. It is the foreground that is actually displayed in the cell, and is printed out, while the background creates the result. A cell has to be selected

to see the background in the formula line.

Of course if you type in text or a number, there is no difference between what you type and the result – there is only a difference with data that is calculated (formulas).

Select **A2** and check the formula on the formula bar. Press the Down arrow and check the formulas in **A3** and **A4**.
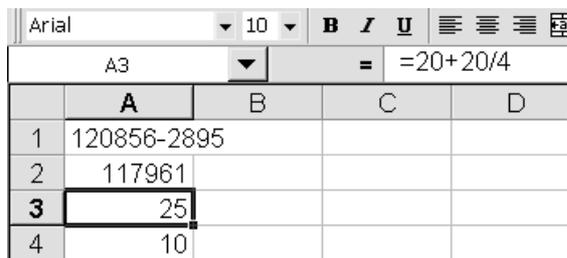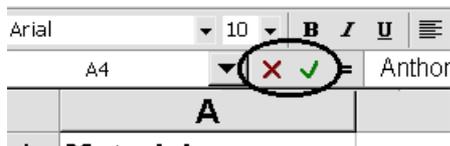
> All changes to the contents of a cell happen in the background layer – as shown in the formula line.

You probably noticed that while you were typing data in the cell, two small buttons appeared on the formula line:

Let us look at these buttons a little more closely:

1. Try typing your name in cell **A5**. Now the formula has *apparently* disappeared, but only apparently.
2. Now try pressing Esc and you will see that your name disappears immediately (just as if you'd clicked on the red cross).
3. Type your name again and press Enter (the same as clicking on the green checkmark). The formula is replaced by your name.

The buttons show that you are editing the cell. So far so good. But I would never click on them; instead, I strongly advise that you use the Esc and Enter keys.

A word processor inserts text and numbers while you are typing them. In Excel they are not inserted until you actively choose to insert them.

Now click on **Sheet1** and we'll continue our work on our example.

We have been able to buy everything that is necessary from a wholesaler. So there is no sales tax included in the price. We must work out both this and the total price for ourselves.

To do this, we must alter the heading in column **B**.

1. Select cell **B1**, type in **Net price** and press the right arrow key. The text is inserted and the cursor moves in the direction of the arrow to cell **C1**.
2. Type in **Sales tax** and press Enter.
3. …and in **D1**, type **Price** and press Enter.

We now need to enter the formula for calculating the sales tax on brushes. We could just type in =5*15%, which would calculate the sales tax on the net price. Quite honestly, if we did that, we could just as easily forget about the computer and take out our pocket calculator!

It is in exactly this kind of situation that Excel shows its strength…when you type in a new net price, the new sales tax and total price should be calculated automatically.

It is totally wrong to insert variables in a formula on a spreadsheet. If the value changes at a later time (for example, an exchange rate), you would have to change every cell manually. Instead, it is better to point out the cell containing the appropriate value. This way, all you have to do is edit that cell every time

the value changes, and formulas will be updated automatically.

Here's how it's done:

1. Select **C2** and type the following formula: **=b2*15%**
   Press Enter and the Up arrow to see both the result and the formula.

> I was quite clear about what I was doing above when I typed a small 'b' in reference to cell **B2**. I want to start a dialogue with Excel. When you pressed Enter, the 'b' was changed to a large 'B', which is the program's way of saying 'cell address understood'. If I discover later that there is a mistake in the formula, I know for certain that it has nothing to do with the reference to cell address **B2**.

2. After typing a formula it should be tested. Type a new net price in cell **B2** and check that the sales tax in **C2** changes. Now type the original net price again.
3. For the sake of the exercise you should type the formula for the sales tax for two more materials in the same way. Type the formula **=b3*15%** in cell **C3** and **=b4*15%** in **C4**.

By default, only as many decimal places as necessary are shown in each cell. So, even if you type in 24.00, only 24 is shown. Later we will format numbers to two decimal places.

Now we will calculate the total price. In other words, what we want to calculate is:

=Net price + Sales tax

1. In **D2,** type the formula **= B2 + C2.**
2. Continue by yourself with the formula for calculating the price of the next two materials.

Your spreadsheet should now look like this:

	A	B	C	D
				=B4+C4
1	Material:	Net:	Sales Tax:	Price:
2	Brush	19.00	2.85	21.85
3	Primer	105.00	15.75	120.75
4	Paint	148.00	22.20	170.20

It is only for the sake of the exercise that we have typed all the formulas here manually. Normally all you need to do is type a formula once, check that it works (here you'd type in a new net price), and then copy it to all the other cells!

When you have checked that the first formula works as it should, why run the risk of typing an error in the following formulas?

Menus – and How You Use Them

Whenever you open a menu, Excel only shows you a few of its commands. The ones that you've used the most are the ones that are visible – which can lead to a situation where some of the menu options change themselves around. The point of this is to avoid confusion caused by the presence of too many possibilities.

🔍 Find...		Ctrl+F
Links...		
	⌄	

1. If you click on the EDIT menu, you'll see a
   double arrow at the bottom.
2. Click the double arrow or wait a moment until all the commands on this menu appear. The additional possibilities appear below.
3. Close the menu by pressing ESC.

Editing

Changing the contents of a cell

You have already tried changing the contents of a cell. However, there are many ways of doing it:

- Type new data over the old and press Enter. If you mistakenly start typing data in the wrong cell, you can undo your mistake by pressing Esc.
- Click directly on the formula bar…
- or press the F2 key (edit).

If a long piece of text or formula needs editing I prefer F2. If it is a short piece of text or formula, I prefer overwriting the cell.

Try both methods now:

1. Change cell **A3** to **Primer Color** by using F2 and the Backspace key. The cell is too small for the text – but we'll fix that later.
2. Change the net price for Primer to **35** by selecting **B4**, typing the number in, and pressing Enter.

Deleting the contents of a cell

You have deleted the contents of a cell several times by using Delete. This is simple – if you only know how. I have seen students try to use the Backspace key many times, and even seen them try to use the spacebar.

Try pressing the spacebar and then ENTER. Apparently the cell is empty – but look at the error messages in cells C2 and D2:

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush		5	#VALUE!
3	Primer	105	15.75	120.75
4	Paint	30	4.5	34.5

The formulas in **C2** and **D2** are trying to calculate the sum of the net price and a

space! There is no way we can expect an answer.

If a cell should be emptied, use Delete!

Undo

The formula in cell **C2** should be rewritten. If you have just deleted it, then click on the Undo button, or choose Edit|Undo. You can also use the Ctrl+Z keys, which function the same way as in most other Windows programs.

I would strongly suggest that you use Ctrl+Z.

You can undo the last 16 actions. So if you have deleted a cell, then formatted another cell in bold type, then you must press Ctrl+Z twice to undo your deletion.

But even when you have carried out a lot of actions, they are easy to undo.

1. Click the small **Undo** arrow on the toolbar.
2. Drag the mouse down the drop-down list until you have selected all the actions you want to undo. Notice that you cannot undo individual actions alone, you must select a whole list.
3. You can redo actions that you have undone by using the **Re-do** button. This drop-down list only contains the actions you have undo-ne. Try undoing and redoing some actions so you are confident about using this function. You can also press Ctrl+Y to redo actions one at a time.

When you type in new values to check formulas, you can use Ctrl+Z to return to the original number. It often happens that the display updates so fast that it is hard to check whether the values are changed in all the relevant formulas. The solution is as follows:

1. Select cell **B2**.
2. Type a new price, and keep an eye on the sales tax and the Price (**C2** and **D2**) when you press Enter.

3. If these values changed as they should, restore the original price by pressing Ctrl+Z.
4. The formulas were calculated so fast that it can be difficult to check them both simultaneously. Click Ctrl+Y (undoing your undo, if you understand what I mean). Keep switching using Ctrl+Z and Ctrl+Y as often as you want until you are certain that all cells with formulas dependent on cell **B2** have been changed correctly.

Column width

Let's have a look at **A3** again. Here, we typed **Primer Color**, which didn't fit into the cell, so it was shortened by the program. If you want to ensure that the complete text appears in a cell, select that cell and have a look at the cell's contents in the formula bar. And how can we make space for a word that doesn't fit into a cell?

Try this:

1. Leave **A3** in peace, move to **A5**, type **Spatula Size** and press Enter.
2. If **B3** is empty, Excel will simply allow the text to flow over the border into the next cell.
3. Now type **15** in **B5** and press Enter.

Only part of the text can be seen.

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush	5		#VALUE!
3	Primer	105	15.75	120.75
4	Paint	30	4.5	34.5
5	Filler			
6	Edge filler			
7	Glass-fibre			

When you change the width of this cell, it will apply to the entire column – luckily! Can you imagine how confusing it would be to work with a spreadsheet where cell **A5** was double the width of all the other cells? Cell **B5** would be under column **C**, cell **C1** under **D**…chaos!

How to change the column width

Place the mouse pointer on the line between columns **A** and **B**. The mouse pointer will change into a split arrow. Now, you can drag the column divider in the direction you want by holding down the left mouse button.

	A	B
1	Material:	Net:
2	Brush	19
3	Primer	105
4	Paint	148
5	Filler	67
6	Edge filler	156.25

If you adjust the column width, the field now shows the column width measurement before you release the mouse button. The width is shown as the typical number of characters and pixels that will fit in the column, and is *not* an absolute value. The width of a character depends on the font, its size, and which character you type (an 'i' fills much less than an 'm', for instance).

This makes it difficult to calculate the precise column width that will accommodate all text.

If, for example, 100 cells in a column contain text, they're not all visible at the same time, so it's very hard to determine the appropriate column width.

Therefore, we'll try another, much more practical method of automatically altering the width of a column to accommodate the widest contents:

Double click when the arrow changes to a split arrow, and the width of the column on the left automatically changes (AutoFit).

Automatic adjustment can also be used on rows in the same way. In this picture the height of row **4** will be adjusted when you double click.

Basic Principles for Constructing Large Calculations

You may ask, 'couldn't I just insert the text in column **A**, leave column **B** blank and then type the numbers in column **C**?

You could do this, but it would be a big mistake! Blank columns or rows split up the data area and make it difficult to add colors and borders or use the many advanced Excel functions.

It is good practice to enter data in adjoining cells. Avoid using blank columns and rows when data belong together.

Uniform Column Width
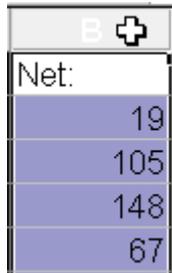
If you'd like several columns to have the same column width, select them all and use the mouse to adjust their width to suit your taste.

Mark a column by clicking its heading.

Try selecting the columns B:D by dragging the mouse from the heading B to the heading D, then changing the width of one column.

Data Entry in Columns

For our living room renovation, we'll still need more materials – luckily therefore we'll have the chance to learn about copying formulas, in this case the ones for the sales tax and total price.

1. Enter the following data in columns **A** and **B** – and make sure that you notice what happens when you begin entering data in **A6**:

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush	19	2.85	21.85
3	Primer	105	15.75	120.75
4	Paint	148	22.2	170.2
5	Filler	67		
6	Edge filler	156.25		
7	Glass-fibre	187		
8	Sandpaper	28.25		
9	Roller	38.95		
10	Filling knife	47.5		
11	Craft knife	27.35		
12	Craft knife blades	19.95		
13	Small stepladder	208		
14	Rubber gloves	19.25		
15	Face mask	19.95		
16	Wood treatment	125.75		

Entering Values in Cells Automatically

Whenever you enter data into a column, Excel compares your current entry with the other cells in the column.

If, for example, you typed "**P**" here, Excel would promptly offer you the same text as in **A3**, since the data in both cells begins with the same letter. The

	A
1	Material:
2	Brush
3	Primer
4	Primer

preliminary entry is selected and marked as a suggestion, which can be replaced by your actual entry.

If you'd like to accept the suggestion, press ENTER. If, on the other hand, the cell should contain only a **P**, then press DELETE.

This principle applies within a continuous area – and it eases the process of en-tering a word several times in a column. In this way, I created a budget for my firm, where I arranged the expenses according to categories such as office supplies and transport costs.

This function is extremely practical on spreadsheets – you type a letter and Excel fills in the rest.

If you would like to deactivate this function, choose TOOLS|OPTIONS and click the **Edit** tab…

☐ Enable AutoComplete for cell values

…then remove the checkmark next to **Enable AutoComplete for cell values**.

Simple number formatting

The numbers need to be formatted so that they all appear with an equal number of decimal places. In the example, this is two decimals.

1. Select cell **B2**, and click twice on the Increase decimal button. Excel starts with the format of the selected number and shows one more decimal each time you click the button.
2. Select cell **B7** and click once on the Decrease decimal button. Now the number **5.15** is decreased to one decimal place. Of course, this does not mean that Excel has forgotten about the last decimal place, something you can check by looking at the formula bar.
3. Click on Decrease decimal again. Now the number is shown without any decimals. Click twice on Increase decimal, to make it appear with two decimals again.

No matter how you decide to format a cell, calculations are performed in the same way. By default, Excel calculates to 15 decimal places.

All the cells in column **B** should be formatted to show two decimals. Instead of trying to format each individual cell, let's learn how to select cells.

Move to **Sheet2** before continuing.

Selecting cells

To format a cell, it has to be selected or highlighted. By selecting several cells simultaneously you can format them in the same way, so that they all have the same appearance. A selected range of cells is indicated by the address of the first and the last cell, separated by a colon. Selecting **B2:D6** will highlight all the cells in a rectangle with **B2** at one corner and **D6** at the opposite corner.
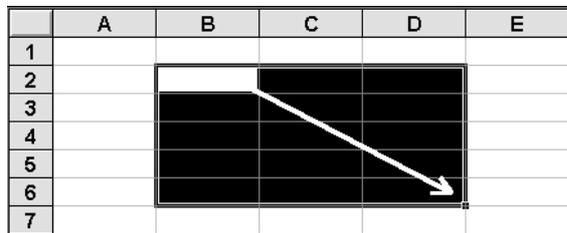
The mouse pointer should be a large cross when you begin highlighting. The first highlighted cell will always be white as it is the 'focus'. The black frame surrounding the selection will clearly show that it *is* a part of the highlighted area.

Try selecting the following area using the mouse.

1. Select **B2:D6** (as shown above) by clicking the left mouse button on cell **B2**, holding the left mouse button down, and dragging to cell **D6**.
2. Before doing anything else, place the mouse pointer over cell **H10**, hold the left mouse button down (the first selection disappears), drag to cell **C2** and release the mouse. The area **H10:C2** is now selected.

The first cell selected will always be white, no matter which method you use.

It is even easier to select cells using the keyboard. Hold Shift down while you expand the selected area using the arrow keys. Try this on different parts of the spreadsheet.

You can select several cells in different parts of a spreadsheet by clicking on one of them, then pressing the CTRL key and selecting the other cells.

Remember, selecting is not an action in itself. You typically select cells *before* carrying out an action on them (for example, displaying two decimal places, or changing text to bold type).

Click on **Sheet1** again. We will now format all numbers in column **B** to display two decimal places.

1. Select cells **B2** to **B15.**
2. The cell with the focus (white), in this case **B2**, will determine how many decimal places appear in each cell. Click Increase decimals and Decrease decimals until all cells show two decimals.
3. Repeat the same process with cells **C2:D4.**

Your model should now look like this:

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush	19	2.85	21.85
3	Primer	105	15.75	120.75
4	Paint	148	22.2	170.2
5	Filler	67		
6	Edge filler	156.25		
7	Glass-fibre	187		
8	Sandpaper	28.25		
9	Roller	38.95		
10	Filling knife	47.5		
11	Craft knife	27.35		
12	Craft knife blades	19.95		
13	Small stepladder	208		
14	Rubber gloves	19.25		
15	Face mask	19.95		
16	Wood treatment	125.75		

Formatting a cell means that all future entries in the cell will be shown with two decimal places, no matter what numbers you enter. The format is only changed by choosing another format for the cell.

If you are still unsure about how you select cells, format decimals or enter simple formula then you should practice a little more now. Use another sheet and then delete any extra data you type for practice before moving to the next section.

Copying cells

When you've entered a formula and checked that it works, you should then copy it to the other relevant cells.

Relative references

The formula we typed into **C2** can be understood as: 'Take the value in the cell to the left and multiply it by 15%'. A cell reference is relative when it refers to a cell that has a distinct position in relation to the first cell, as here.

$$=B2*15\%$$

When you copy data, it is the background you copy (the formula), not the result. When you copy a formula one cell down, the relative cell references in the formula will also 'follow'.

There are many ways to copy data. Which method is best to use depends on what you want to do with the copy. Here I will concentrate on the two methods I find most useful: using the keyboard and using the mouse.

Copying using the keyboard

To the right of the Copy and Paste commands on the Edit menu you can see that the Ctrl+C and Ctrl+V keys can also be used. I recommend this method when you want to paste the copied data into cells that are not directly adjacent to the cells you copied from.

The principle is that the selected area is copied to the Windows Clipboard, from where it can be pasted to a new cell or area in the spreadsheet (or in any other Windows program, for that matter).

The function is carried out by:

a) selecting the cell with the formula that should be copied.

b) choosing Copy

c) selecting the area that should 'inherit' the formula

d) and choosing Paste.

Try the following example:

1. Use the arrow keys to select **C4**.
2. Press Ctrl+C to copy the data. The dotted frame around the selected cell "vibrates" to indicate that the copy function has been initiated.
   Notice the message on the status line

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush	19	2.85	21.85
3	Primer	105	15.75	120.75
4	Paint	148	22.2	170.2
5	Filler	67		
6	Edge filler	156.25		
7	Glass-fibre	187		
8	Sandpaper	28.25		
9	Roller	38.95		
10	Filling knife	47.5		
11	Craft knife	27.35		
12	Craft knife blades	19.95		
13	Small stepladder	208		
14	Rubber gloves	19.25		
15	Face mask	19.95		
16	Wood treatment	125.75		

Sheet1 / Sheet2 / Sheet3 /

Select destination and press ENTER or choose Paste

3. Select cells **C5:C15** using Shift+Down arrow, and press Enter. Copying is now complete.

If you want to copy the formula to several areas, then paste it by using Ctrl+V, which keeps the copy function active. This means that you can continue pasting it by using Ctrl+V. The copying is terminated by pressing Esc.

Press Down arrow to check the sales tax formulas. I have cheated a little in the next picture and shown all formulas directly in the cells for you to compare with your own formulas:

	A	B	C
1	Material:	Net:	Sales Tax:
2	Brush	19	=B2*15%
3	Primer	105	=B3*15%
4	Paint	148	=B4*15%
5	Filler	67	=B5*15%
6	Edge filler	156.25	=B6*15%
7	Glass-fibre	187	=B7*15%
	aper		

Copying with the mouse

Now you are going to copy the formula for the total price by using the mouse. I usually recommend using the keyboard as much as possible, but I have to admit that for this operation the mouse is really good – a stroke of genius!

Click in cell **D4 –** this is the formula that you want to copy.

1. Point the mouse to the small black square at the bottom right hand corner of the cell (the pointer changes to a little black cross) and then drag the mouse down to cell **D15** while holding down the left mouse button.
2. The instant you release the mouse button, the copying is carried out automatically! Voila!

C	D
Sales tax	Price
0.14	2.04
0.79	11.29
1.11	15.91
0.50	
1.17	
1.40	
0.21	
0.30	
0.36	
0.21	
0.15	
1.57	
0.15	
0.52	
0.94	

Notice the difference between *selecting* and *copying*. When you select, all the cells are black (except the first). When you copy, all the cells are white.

Microsoft calls the little black square a 'Fill handle' because it copies or 'fills the area up' with data depending on the kind of data the cell contains.

I will return to the 'Fill handle' function. There are buttons for both Copy and Paste on the toolbar, but force yourself to use the methods above; it will pay off later.

Summing data

It is now time to work out what our decorating project will cost in total. We could, of course, add the individual cells together, but there is a faster and more flexible method. Excel has many built in functions, including one for summation of data. All functions are built up in the following way:

=NAME(arguments)

NAME is the function name (what you want Excel to do for you). Arguments can be cells or other calculations. In our example the function is called SUM, and the arguments are the cells that should be added together, as follows:

=SUM(B2:B15)

You can type the formula manually, but there is no need. Microsoft has assumed that you will need to sum data in the majority of spreadsheets and has developed the following extremely effective and easy to use function:

1. In **A16** type **Total:** and press Enter.
2. Cell **B16** must contain the sum of all the net prices. Click on the **AutoSum** button on the toolbar and wait a second. It is not enough that the formula has been written out for you; Excel has also understood which cells you want to add together (not so bad!).

The dotted frame surrounding your data shows which cells the program suggests – because it is only a suggestion. In the formula the cells are black, meaning that all you need to do is overwrite the references if they are incorrect.

=SUM(B2:B16)

3. Press Enter to accept the formula.
4. Copy the sum formula for the sales tax and the total price from cell **B17** to cells **C17** and **D17**, with the following results:

	D17	▼	=	=SUM(D2:D16)	
	A		B	C	D
17	Total		127.01	9.53	136.54

> Instead of clicking on the **AutoSum** button, use the Alt+= keys (you are actually pressing Alt+Shift+0).

AutoSum calculates both horizontally and vertically on the same principle. Let us prove this by changing the formula for calculating the total price:

1. Select **D2:D15** and press Delete. The cells are empty and the sum formula in **D16** displays '0'.
2. Select cell **D2** and click on **AutoSum**.
3. Press Enter and click on **AutoSum** from cell **D3**.
4. Press Enter and repeat the click on **AutoSum** in cell **D4**; but be careful, this time the suggestion is incorrect!

B	C	D	E
Net price	Sales tax	Price	
1.90	0.14	2.04	
10.50	0.79		
14.80	1.11	=SUM(D2:D3)	

> If there are numbers in both the cells above and to the left of the selected cell, Excel will suggest summing the numbers above. Vertical summation takes priority over horizontal summation.

Even though **AutoSum** is smart and easy to use, you should still remember the principle of a spreadsheet: when a formula is inserted *once*, it should be copied to the other relevant cells!

Undo the last formula (Esc or Delete) and instead copy the formula like this:

1. With **D3** selected, drag the Fill handle down to **D15**. If you drag it too far by accident, you can drag the Fill handle back into the selected area. As long as the cells are selected, you can expand or reduce the copying.
2. Use an arrow key or click with the mouse in any other cell to cancel the selection.

> If you need to see the sum of the numbers without having the result displayed in a cell, then just select the cells and read the result on the status line:

Sum=1217,20

> Right-click the field in the status line and choose, if need be, another calculation of the selected numbers.

Our model is now ready. Try changing some of the net prices and see how the calculations reflect the changed numbers. You can also smarten the model up a bit by adding a little color and formatting, but I will tell you how to do this later. Just now it is more important to repeat and emphasize the basic principles

Your spreadsheet should be saved so you do not lose it when you shut down

your computer. After all, you must be able to retrieve it again the next time you decorate your house.

Saving a file

The first time you save a work-book you will be asked to specify a name. Using the File menu, choose the Save or Save As command. You can also just click the **Save** button on the toolbar.

In the Save As dialog box, you can choose an existing folder (directory), or create a new one for the examples in this booklet. I would suggest the latter. If you feel unsure when working with folders and files, you can follow the example here:

1. In the **Save in** field, choose **C:** (the computer's hard disk).
2. Click the **Create New Folder** button and call it **Get going with Excel**. Press Enter, which creates the folder and displays it in the large white field.
3. Double click your newly created folder to open it. The folder name should be in the **Save in** field**:**

Save As

Save in: 📁 Get going with Excel ▼
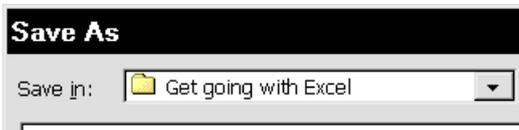
4. Click on the **File name** field, and type DECORATING. Press Enter (or click **OK**). Your spreadsheet is now saved, and the dialog box disappears from the screen.
5. Notice that the file name now appears on the title bar (all Excel spreadsheet files have an XLS extension).

For more detailed information about managing folders and files, I suggest that you read the 'Get going with Windows98/95' booklet from this publisher, or study Excel's own Help function, which lets you search for assistance in

more ways than the Windows Help pro-gram. Let's take a closer look at it.

Help

Without any doubt, the programs of the future will contain larger and better Help programs and come with thinner printed manuals.You have already seen how the Help function works in Excel. The small yellow 'tips' that appear next to the buttons on the toolbar and the longer description on the status line are both part of the complete Help program.

The 'real' Help fuction in Excel is a kind of shortened user manual that can be read on screen while you are working. If you have a standard installation of Excel, the Help function will be available. If it is not, you can run the installation program again and choose to add it. To start the Help program, choose Help|Microsoft Excel Help, or press F1.

You can also click the Office assistant button on the toolbar. A help screen appears as an "Office Assistant", which gives you tips and lets you search for help for a particular subject. If you right-click on the assistant and choose ANIMATION, this little guy will show you what he can do.

You can choose your own particular 'assistant' out of the selection of animated characters available (all of whom are rather fun!). I have chosen this rather competent looking guy to help me:

Now, type your question into the yellow speech balloon.

1. type "Help" and press ENTER…
2. …you'll see several keywords. Choose one of them or try reformulating your question. The cursor will change into a little hand and the blue bullet next to a keyword will "light up" when you point to it with the hand. In our ex-

ample, we chose **How do I get help while I'm working?**
3. Almost immediately, you'll see a large dialog box appear on the screen. If you click the printer button in the upper right-hand corner, you can print out relevant topics.
4. The window with the help text will remain on your screen while you're working. If you need help on another topic, just click on one of the underlined hypertext topics.
5. If you click on the Help button, you'll see a broad help window appear on your screen. This window has three tabs:

Contents tab …

is a list of topics, where you can double-click on a topic you want to learn more about. It should remind you of the Windows Explorer.

Answer Wizard tab…

is just that – a kind of wizard, or assistant. Type in your own words what you'd like to do and press ENTER to search for relevant topics. Then just click the topic you're interested in and read the help text.

Index tab…

is very useful. The program watches what you type in **Type keywords:** field, and moves to the subjects you can find information about. But it does mean that you need to know the name of the function you need help for.

Shift+F1

It can be annoying trying to search for a function without knowing what it is called. So you can find help for the function you have on your screen, or the menu item you are using. Press Shift+F1 and click on a button on the toolbar, or a menu item, and relevant help text is displayed immediately.

Tip Wizard

Finally there is the Tip Wizard tool, which tries to follow your working method. If it

thinks that you could have performed a procedure in a better and more effective way, it will suggest it. Well, that is the theory…unfortunately the practice does not always live up to expectations!

The Tip Wizard is represented by a little light bulb in the Office assistant window that turns yellow when it has a suggestion to make. Click on the button to read the Wizard tip. If you are not displaying the Office assistant window, then the Office assistant button will display the light bulb instead. No matter what, the light is 'switched off' when you have seen the tip, and it is ready to 'switch on again' as you carry on working. Try keeping an eye on the bulb and clicking on it the next time it lights up yellow.

Help for dialog boxes

If you want help with a field or button in a dialog box, then all you need to do is right-click it a field.

Household budget

When I first installed Excel many years ago, I had only a vague idea what I could use it for. I had heard so much about the program that I was curious to try it for myself. Well, I thought, it might also help me find out why my budget never seemed to balance.

It was when I started working with the program that I realised that a spreadsheet did not just function like an adding machine. It could also show me the consequences of my insurance rates increasing by 5% while my salary only increased 2% and my eldest son began take driving lessons …all I needed to do was type in a couple of figures and my increased overdraft was calculated in a moment.

At first I found it frustrating that a task could be carried out in so many different ways. Which was the best? Wasn't it enough for example just to be able to copy in *one* way?

Why not limit all these methods to one for the mouse and one for the keyboard?…But on the other hand, who would go into a clothes shop that only stocked black and white sweaters, or a restaurant that only sold meatballs and mushy peas? People are so different that we need choice. So my task here is to guide you so that you can choose the method that is best for *you*.

I have decided, therefore, to describe most of the options available *while* you are working with a weighty task. So you will not find a section that describes copying, for example, by itself. Different techniques will be described several times, often in a more and more detailed fashion, but always in situations where they are relevant. This will allow you to review and go deeper into the most important functions. It might make it more difficult to look up a single function, but if you work through this booklet several times, I am sure that you will get the most out of this method. Before starting with our exercise there are a couple of preferences I want to change.
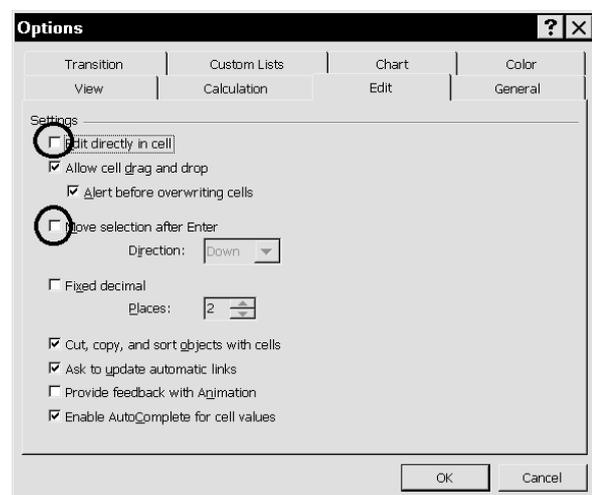
Permanent preferences

Excel comes with a number of default (standard) preferences. The idea is that you can change them as you work to optimize the program to suit your needs.

Try this on your own machine:

1. Click on the menu Tools|Options.
2. The first tab we want to change options on is the **Edit** tab:

I would strongly suggest deactivating the following two options:

1. Click **Edit directly in cell** and **Move selection after Enter** with the right mouse button, so that you can read what they mean. Remove the checkmark in both boxes to deselect them (just click on the checkmarks).
2. Press Enter or click **OK** to close the dialog box.
3. In the DECORATING file, select cell **D17** and press Enter – the cursor remains where it was, which makes it much easier to read and edit formulas when they are entered.
4. Double click on the cell. The cells used in the formula are selected. This is smart, especially when a formula

refers to cells that are not immediately visible.

5. Now, if you press [F2], the cursor will jump to the formula bar. The cells that belong to the formula are colored. If you're finished editing, press Esc.

If you're working with a long formula, I highly recommend deactivating **Edit directly in cell**.

> If this option is active, the cells to the right of the formula are hidden while you're working. If this option is deactivated as in the above example, you can see and select all cells in the calculation. I would suggest that you work for a while with both of these options deselected before you decide whether to select them again.

Let's look at some other things you can do in Tools|Options:

The **Edit** tab contains a field **Enable AutoComplete for Cell Values,** which lets you choose whether or not Excel should suggest text as you begin typing.

On the **View** tab you can change the amount of information displayed on the screen. Gridlines are the small lines surrounding every cell in the spreadsheet. If you deselect them, they will not be seen on the screen or on a printout.

Later you will see that it is possible to print a document without the gridlines, even though they are shown on the screen.

You should know about two fields on the **General** tab:

1. In the **Sheets in New Workbook** field you can specify how many spreadsheets new workbooks contain by default. Set the number of sheets to four. You can always add more later.

2. In the **Default File Location** field you can decide where Excel saves and looks for its files. Type in **C:\Get**

Going With Excel. When you are finished working through this booklet, you can change it to another folder.

Default file location:	c:\get going with excel

Incidentally, it is strange that you cannot click your way to the folder. You have to enter the exact path to it yourself. Therefore, you should note the path, perhaps using the Windows Explorer.

Press Enter to accept the changes and close the dialog box. Close the DECORATING file. If Excel asks you if you want to save the file, choose **Yes.** The program will never close without giving you the opportunity to save any changes you may have made.

The Household budget

We are going to create a household budget that details income and expenditures. You can choose to enter your own figures immediately, or begin by following this example using my fictional figures for a family with two children, and change them to suit your own situation later.

Start by opening a new workbook (Ctrl+N or the **New Workbook** button on the toolbar).

Your new workbook contains only four spreadsheets, as you specified in **Options**.

In **Sheet1,** type the following text in columns **A** and **B** and adjust the width of column **A** until the 'indentation' of the text in column **B** is suitable:

	A	B
1	Income	
2		Salary after tax - husband
3		Salary after tax - wife
4	Total income	
5	Expenses	

You can use Excel's suggestion that the text in **B3** should be the same as the text in **B2.** Press Enter to accept the suggestion and change 'husband' to 'wife'.

A1 and **A5** should be highlighted using **bold** type, which we will do simultaneously for both cells:

1. Select **A1**
2. Hold Ctrl down while you click **A5**.
3. Press Ctrl+B (or click the **Bold** button).
4. Cell **B4** should be *italic*. Press Ctrl+I (or click on the **Italic** button).

If you want to select several unconnected cells, hold the Ctrl key down while you are selecting the individual cells. When selecting adjoining cells, hold down the Shift key while pressing the arrow keys (you can also click on the first cell and then hold Shift down while you click on the last cell). Practice these important keys before you continue.


Insert rows

Whoops, I forgot to leave room for a heading at the top of the spreadsheet. The budget should contain the income and expenditures for every month of the year.

This is easily corrected by inserting a row where row 1 is at present. We will try it first using the mouse:

1. Click on the grey row number **1** on the left side to select the entire row.
2. While pointing at the selected row, click the right hand mouse button. Choose **Insert** on the object menu.

A click on the right mouse button will open the object menu for the object the mouse is **pointing** at! You should point at one of the selected cells before opening the object menu. Try pointing at a cell at random and clicking the right mouse button. Close the object menu using Esc. Repeat the exercise a couple of times so you are sure that you understand how it works.
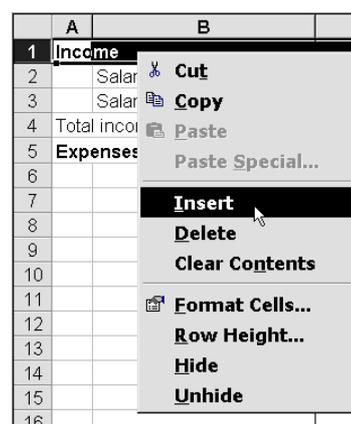
We need to insert one more row. This time let's do it using the keyboard:

1. Select a cell in **Row 1**.
2. Press Ctrl+Plus using the plus sign on the numerical keyboard. If you have a laptop PC without a numerical keyboard, you might need to press Ctrl+Shift+Plus. (Note that this option also works with *some* ordinary PC keyboards, and that the Windows **Regional settings** have an influence on how your keyboard functions. Try yours to see if it works).
The following dialog box is displayed, allowing you to choose what you want to insert:
3. Down arrow to **Entire row** and press Enter.
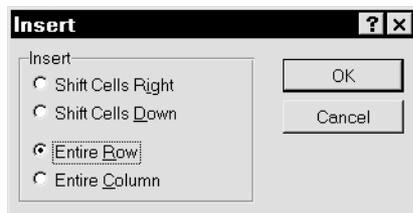
There you are! Any problems you had positioning the mouse exactly are eliminated.

Deleting rows

You can delete rows in the same way by using either the mouse (choose **Delete** on the object menu) or the keyboard by pressing Ctrl+Minus and Down arrow to **Entire row**.

Insert/delete several rows

Drag the mouse over the rows you want to select, *or* use the keys like this:

1. First select a cell in every row by holding down Shift while pressing the Down arrow.
2. Press Ctrl+Plus or CTRL+Minus and Down arrow to **Entire row** and press Enter. Excel inserts or deletes just as many rows as there were selected cells.
3. Delete or insert cells so that your spreadsheet has *two blank rows at the top* (**Income** should be in cell **A3**).

Inserting and deleting columns

Let's look at editing columns:

If you're using the mouse, all you need to do is click the column heading to select it. Other than that, everything is the same as when inserting/deleting rows.

On the keyboard, do the following:

1. Select any cell, for example one in column **B**.
2. Press Ctrl+Plus and Down arrow to **Entire Column**.
3. Press Enter to close the dialog box and insert a column. The existing columns move to the right.

Repeat the exercise with more columns using the same method (select several cells using Shift+Right arrow), and then delete them again. Keep trying until this becomes second nature.

Font and font size

A1 is to contain the heading for the entire spreadsheet. Type **Household budget 1999** here, and press Enter. The text should be larger and in a different font than the rest of the spreadsheet:

1. Click on the **Font** field on the toolbar.
2. Scdrop-down and choose the **Times New Roman** font.
3. Choose **20** in the **Font size** field. The size is given in points, a point being approximately 0.35 millimetres. (You could try typing in a formula that calculates the size of letters in mm).
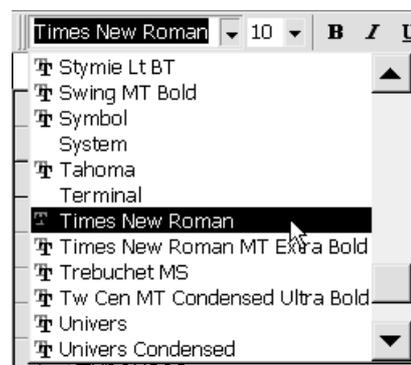
If you're looking for a specific appearance for your heading and do not know what the font is called, it is better to use the **Font** dialog box:

1. With the cursor still in cell **A1,** open the object menu using the right mouse button and choose **Format Cells…**
2. Choose the **Font** tab and click on a name in the **Font** field. An example showing what the font looks like is displayed at the bottom right of the dialog box.

Use the arrow keys to move around in the installed fonts. When you find the one you want, choose its size, style and any other effects, and press Enter to confirm your choice (remember that Esc will let you cancel it). Choose a font and size that you like for your heading.

A field needs to be selected before you can use the arrow keys to move around in it. Therefore, you need to click on the **Font** field before using the arrow keys to select a font. You can also press the TAB key until the field has been selected.

Choose a size of 12 points for the words **Income** and **Expenses** in cells **A3** and **A7**.

Continue typing under **Expenses,** inserting the following text:

	A	B
8	**House**	
9		Mortgage
10		Electricity
11		*Total house expenses*
12	**Insurance**	
13		House
14		Accident
15		*Total insurance:*
16	**Transport**	
17		Car loan
18		Tax
19		Insurance
20		Repairs and maintenance
21		*Total transport*

The text in **A8, A12** and **A16** is formatted to be **bold**, while the text in **B11**, **B15** and **B21** is *italic*.

Depending on the size of your screen, you might not be able to see the top rows. Use the scroll bar on the far right, or the Ctrl+Home keys. I recommend the latter, as it selects cell **A1** immediately.

Whoops, I forgot a couple of categories, so you will need to insert a couple of rows:

1. Insert a blank row between *Mortgage* (**B9**) and *Electricity* (**B10**)and type in **Heating** (row 10).
2. Between *Insurance* (**B19**) and *Repairs and Maintenance* (**B20**) there should be a row with the text **Gasoline & oil** (row 20).

The months should be typed in the empty second row:

1. Type **January** in **C2** and press Right arrow.
2. In **D2**, type **Febr**…*hang on a moment!* Press Esc to cancel your typing and read this:

If you already think Excel is smart, then just see what the programmers at Microsoft have come up with here. Think how often you have to type every month of the year in a new spreadsheet.

Fill (series)

You have already tried copying a few times using the Fill handle at the bottom right of a cell. While you were dragging the handle, the status line cryptically informed you: *'Drag outside selection to extend series or fill, drag inside to clear'*. Honestly, who understood that …!

Once again, Microsoft has introduced another nerd term to the computer industry: 'Fill'. Even though the message above may appear confusing, it is actually telling you about a simply amazing function.. Try this example:

1. Select cell **C2** and type **January**
2. Use the mouse to grab onto the Fill handle and drag it to the right. When you get about halfway through cell **D2**, a dotted frame appears.

3. While still pressing the mouse button, keep dragging to the right until you reach **December** (cell **N2**).
4. If you drag too far (when you hit the edge of the window the screen picture can roll very fast), then just drag back to **N2**.

One of the basic principles of Excel is that all trivial and repetitious insertions should be performed by the program.

And before you come to the conclusion that this is all the function can do, follow this example:

1. Click on the sheet tab for **Sheet3**. We can use this to play with.
2. Type **Monday** in any cell, press Enter and drag downwards with the Fill handle…
3. In another cell, type **Jan**, press Enter and drag the Fill handle horizontally

or vertically (but *not* diagonally). Notice that the program continues to use capital letters.

4. Now try typing a list beginning with **June** and then drag the Fill handle. Excel does not pay any attention to the month with which you start.
5. Type **1st quarter** in yet another cell and repeat the procedure. Try dragging further than **4th quarter** (if you use the English version of Excel, it starts again at 1st quarter. If you use it in another language, type it as you usually do, for example '1. quarter').

So how does a function find out when it should copy and when it should make a series like the ones we have just seen?

Let's try some numbers. Type 1999 in a cell and drag. What do you end up with?

Now type **Year 1999** in another cell and drag.

The function differentiates between numbers and text. When you mix text and numbers in a cell, the whole entry is taken to be text and the function allows the number part to grow.

On the other hand, a 'pure' number is simply copied, which is wise…in a moment we will type the mortgage payments into the budget. The number is the same every month, so in this case you need to copy. It would be a little embarrassing if the function made your mortgage increase by a dollar every month.

Let us imagine that you want to type a series of numbers starting with 12 and growing by 6 every time (cell). It's done like this:

1. Type **12** in one cell and **18** in the cell under it.
2. Select both cells. Now the program knows that it should start the number series with 12 and increase it in steps of 6.

3. Drag the Fill handle as far as you want.

Now try this with other number series, like percentages and dates (dates should be typed using hyphens or slashes, for example 10/08/97, and times should be typed with colons, for example 08:30:00).

> If you often need to insert date series, it will pay you to try the following. Type a date in a cell, and drag using the Fill handle and the **right** mouse button. When you release the mouse button you can use the object menu to choose how the series should be continued. If you choose **Fill Weekdays,** Excel leaves out the weekends (and it also recognises leap years…and has no problem with the year 2000). Someone has obviously used their grey matter at Microsoft.

Creating your own lists

Do you often need to type the same data, like the names of your co-workers, stock numbers, etc?

Then you can create your own lists, which function in exactly the same way as Excel's own built in ones.

1. Type some names, or a sequence of some sort (I used signs of the zodiac).
2. Select all the names or text and choose Tools, Options and the **Custom Lists** tab.
3. Click on the **Import** button.
4. You can correct your own lists in the **List entries** field. Click to the right of a name and press Enter. As long as the cursor is in this field, you can use the Enter, Delete and Backspace keys to edit and enter new lines in the list.
5. Click on **Jan, Feb…** in the **Custom lists** field.

6. This time, the list elements are greyed out in the **List elements** field. Try clicking in the field. You cannot edit Excel's own lists.

Whenever you want to use a user defined list, type one of the terms in a cell and drag the fill handle. The list begins with the term you typed and continues in the correct order.

You do not need to start with the first name in the list.

You can delete a list permanantly by choosing Tools, Options, marking the list you want to delete, and pressing the **Delete** button.

You can use your new list in all files you create from now on.

> If you list consists of long names, be smart and set it up with a short name as number one. This will only be used to 'start' the list.
>
> When you want to use the list, all you need to do is type the 'short name' in a cell, drag using the fill handle, then delete the first cell containing the small name again. Try this example:

Pres
Franklin Delano Roosevelt
Harry S. Truman
Dwight David Eisenhower
John Fitzgerald Kennedy
Lyndon Baines Johnson
Richard Milhouse Nixon
…and so on
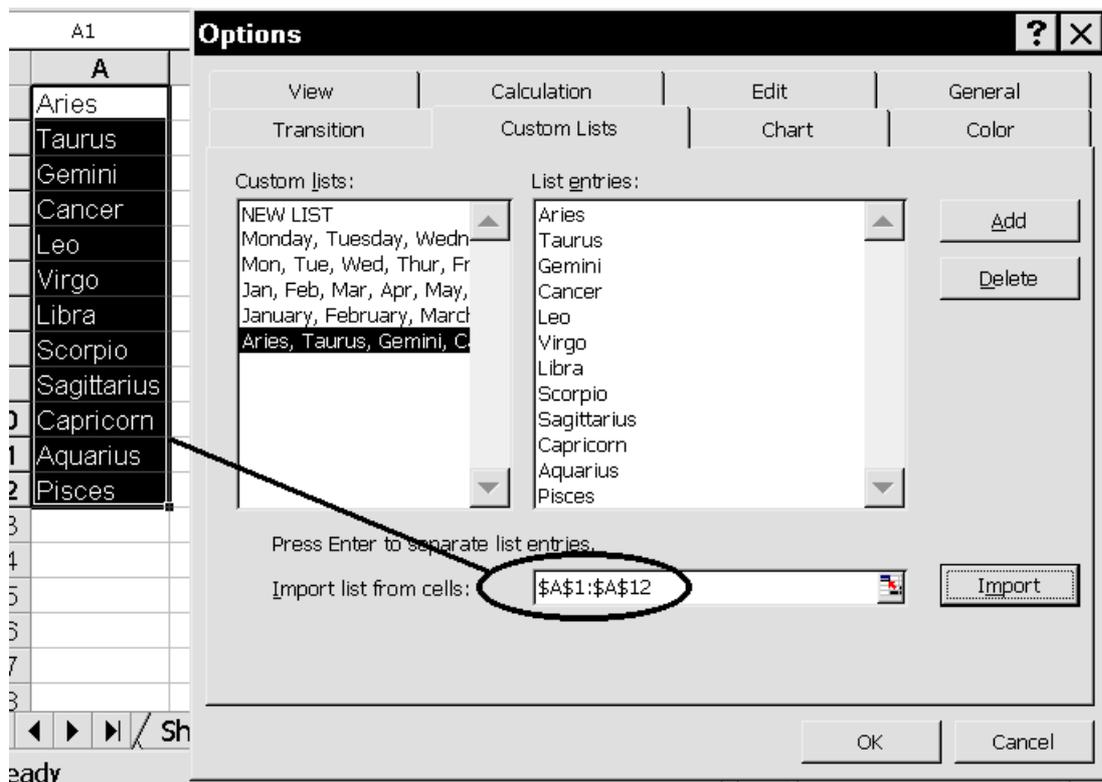
Numbers and formulas in our budget

Click back to **Sheet1,** where we will now type numbers and formulas. Type the numbers without thinking about formatting at the moment.

We will start with income:

1. The husband has a monthly net income of **$958**. Type this amount in cell **C4**.
2. His wife earns net **$1025**. Type this amount into **C5**.
3. Copy both incomes to the other months using Ctrl+C, selecting and Enter.

The formula for **Total income** should be typed into **C6** and copied.

This formula could be given as **=C4+C5**, but this would not be particularly flexible. If you add further rows with other incomes at a later time, these will not appear in the summation. Instead, we will use the function **=SUM(C4:C5)**, which will allow us to insert rows be-

tween rows four and five, and include them in the formulas. We will demonstrate that later.

You can use the **Autosum** button, but try using the following shortcut instead:

1. Select **C6**.
2. Press Alt+= and the formula is ready:

3. Press Enter and copy the formula to the other months.

The mortgage for our fictional family's apartment is constant, but the heating

and electricity costs are shared among all the different apartments, based on their relative sizes. The mortgage is **$387.50**. per month, which you should type in **January** and copy.

The heating bill for the entire building last year was **$1,125**. per month, and the family's apartment has floor space corresponding to **0.12** of the total. So the formula for calculating the total is =1125*0.12.

The final monthly payment for heating is actually not finalized yet, and our family would like to be able to see the effect of any changes. And the way the heating bill is divided could also be changed. If we choose to type 1125 and 0.12 in every formula, we would have to change every single one if either of the figures changes. At the risk of repetition, I will just repeat a point from earlier in the booklet:

> It is totally wrong to insert variables in a formula. They should be put in separate cells. All formulas that use this variable will get the value for this cell. If a variable is changed, just correct this one cell and the entire spreadsheet will be updated!

With this in mind, we will create an area to use for variables:

1. Insert **five rows** above the spreadsheet so that we can easily see the variables while we work with the formulas.
2. Type **Total apartment block:** in **A1**.
3. Continue typing as follows:

The formula for calculating the amount of heating used should appear as in the next illustration, but wait just a moment before typing it.

First I want to show you two easier methods for entering formulas. One method uses the mouse and the other uses the keyboard.

Selecting formulas

The more complex formulas become, and the more of them you enter, the greater the chance becomes of making mistakes when you type them yourself. Use this method instead:

1. With **C15** selected, type **=** to anchor the cursor to the cell.
2. Click **C3**. A dotted frame surrounds the cell. Notice the text 'Point' appears on the left side of the status line. If you click in the wrong cell, just keep clicking until you hit the correct one.
3. Press ***,** and then you are ready to click on the next cell.
4. Click **C2** and press Enter.

> You can also select the cells using the arrow keys, a method that is preferable when they are close together.

When you have begun to type a formula, the arrow keys can only be used for pointing out cells. This is the reason that entering a formula must always be finished by pressing Enter!

Saving the budget

Before continuing, you should save your budget. In contrast to many other programs, Excel does not automatically save its spreadsheets at fixed intervals. (In fact this can be set, but to do it is so troublesome that it appears that the program's designers did not intend for this function to be used).

Click on the **Save** button, or use the Ctrl+S keys. Type **Household budget** and press Enter (the file will be saved in our default folder). I would suggest that you press Ctrl+S regularly to save the data you enter. (In the industry it was once said that: 'Real men never backup their data' – then later it was said that 'Real men cry often'…I know exactly what they mean!).

Absolute cell references

The formula for calculating the monthly cost of heating is ready for copying…or is it?

Try and copy the formula from **C15** one cell to the right. There is something wrong here, the result in **D15** is zero! Select D15 and see if you can work out yourself what is wrong with the formula before you go on.

The formula you have copied was told to use the content of the cell positioned 12 rows above it in the same column, and multiply it with the cell 13 rows above it.

When you copied the formula to column **D,** Excel remembered these relative references and moved them to column **D**. The program did not make a mistake, it did exactly what it was asked to.

So we have to find a way to explain to the program that the references should be fixed, no matter where we copy the formula to.

This fixing of a reference to a cell is called *an absolute reference*, and is defined using a $ (dollar) character in front of both the column and row reference, like this:

=$C$3*$C$2

Why a $ character?

Well, I cannot really give you a good reason, but I would guess that it is because it was the Americans who invented the spreadsheet. No matter, it is standard in all spreadsheet programs.

But this does not mean that you should type a $ character in yourself. Use the F4 key instead:

1. Select **C15**.
2. Press F2 to edit the cell, and use the Left arrow until the cursor is placed by the reference to **C3** (it does not matter if the cursor is in front, in the middle or at the end of the reference).
3. Press F4. The reference is now locked to cell **C3**. Try pressing F4 again. Now only the row is locked, and pressing F4 yet again will lock the column only.
4. A last press will remove the lock from everything. Finally, press F4 to lock the column and row references.
5. Use the Right arrow to move the cursor to the other side of the multiplication sign. Press F4 again. Now **C2** is locked. Now press Enter (the result should be **135**).

6. You can now copy the formula to the heating costs cell for all the other months (D15:N15).

> When you edit a formula using F2, you can use the arrow keys to move backwards and forwards on the formula line.

Now try changing the result of the monthly heating bill by changing the overall use of the building in cell **C3** to **1600**. The moment you press Enter, you have the new figures for each month. Go back to the original figure by pressing undo (Ctrl+Z). Try using other figures for the apartment's share to see what happens to the total.

The formula for **Electricity** should be typed in and made absolute. This time, we will do it all at one time:

1. Select **C16**, type **=** and click **C4**.
2. Press F4 and type *****.
3. Click **C2** and press F4.
4. Press Enter – the result should be 144.

=$C$4*$C$2

We will now copy the formula using the keyboard:

1. Select **C16** and press Ctrl+C.
   Notice the text in the status line.
2. Use Shift+Right arrow to select the cells **D16:N16** and press Enter.

Calculate the **Total house expenses** in **C17** by using the sum formula. Remember the Alt+= keys.

For **January,** the formula looks like this:
=SUM(C14:C16)
and the result should be: 666.50.

Copy the formula to the other months using the keyboard.

Annual total

We still have to add all the monthly figures to get a total for the year.

In **O7,** type the text **Total:**, and in **O9** use the Alt+= keys to sum the formula. The result for the annual total house expenses should be 7,998.

All the rows *containing data* should be summed. Of course you could just copy the sum formula all the way from **O9** to **O17**, but that would also insert the formula in cells **O12** and **O13**. Instead, use the keys for copying:

1. Select **O9** and press Ctrl+C.
2. Select the area **O10:O11** and press Ctrl+V. You should not press Enter, as that would finish the copying. When using Ctrl+V to paste, the copy function is still active. (check the status line).
3. Move the cursor to **O14** and select the area **O14:O17** by using Shift+Down arrow. Since we are not going to continue copying after this range, you can press Enter. (If you want to stop copying without inserting data, press Esc).

Checking your formulas

Type another apartment share in **C2**. Now all the formulas react to the changed number.

Use undo (Ctrl+Z and Ctrl+Y) to swap between the two last entries while you check to see that all the formulas for **heating, electricity** and **Total house expenses** have changed.

Continue typing the following data. When you copy the data, try using the keyboard; it will pay off in the long run.

Insurance:

Home:
    January...125
    July...125
Accident:
    December..975

Transport:

Car loan:
    Each month 125

Parking:
    March.....................................199

Insurance (car):
    January.................................362
    April......................................362
    July 362
    October.................................362

Petrol and oil:
    Every month..........................125

Repairs & maintenance:
    January.................................600
    July 600

Now you have a number of cells that contain data, and some that do not. There is no problem with that, but the empty cells make it difficult for Excel to work out which cells should be summed when you enter formulas for **Total insurance, Total transport** and a year total.

Select **C28**, **Total transport** and press Alt+= or click on the **AutoSum** icon. Now the cells **C25:C27** are selected – the empty cell **C24** stopped the selection, so that **Car loan** and **Parking** were not included.

	A	B	C
	SUM	▼ ✗ ✓ =	=SUM(C25:C27)
22		Transport	
23		Car loan	125.00
24		Parking	
25		Insurance	362.00
26		Petrol and Oil	125.00
27		Repairs and maintenance	600.00
28		Total transport	=SUM(C25:C27)

Change the formula using this method:

1. You have to select the correct cells yourself. Select cells **C23:C27** and press Enter (Remember that the **Autosum** only *suggests* cells. As long as they are highlighted in black you can change the selection).
   Copy the formula to the remaining months.

2. Type the formula for **Total insurance (C21)** and copy it to the remaining months.

The formula for the calculation of the year's total in column **O** has the same problem – there are a number of empty cells each month.

An empty cell splits up the spreadsheet, so cells that are part of an area should not be empty. Instead, they should contain a value of '0' (zero), as an accountant would expect them to.

1. Insert a '0' (zero) in every empty cell in the area **C19:N20**.
2. Insert a '0' (zero) in every empty cell in the area **C24:N27**.
3. Type a sum formula in **O19** and copy it to **O20:O21** and **O23:O28**. Remember to copy using Ctrl+C and Ctrl+V.

Your spreadsheet should now look like the next illustration.

To understand what I mean it is necessary to illustrate the entire spreadsheet – I hope you can read it!

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Shared building expenses													
2		Apartment share	0.12												
3		Heating	1125.00												
4		Electricity consumption	1200.00												
5															
6		**Household budget 1999**													
7			January	February	March	April	May	June	July	August	September	October	November	December	Total
8		**Income**													
9		Salary after tax - husband	958.50	958.50	958.50	958.50	958.50	958.50	958.50	958.50	958.50	958.50	958.50	958.50	11502.
10		Salary after tax - wife	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	1025.00	12300.
11		**Total income**	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	1983.50	23802.
12		**Expenses**													
13		**House**													
14		Mortgage	387.50	387.50	387.50	387.50	387.50	387.50	387.50	387.50	387.50	387.50	387.50	387.50	4650.
15		Heating	135.00	0.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	1485.
16		Electricity	144.00	144.00	144.00	144.00	144.00	144.00	144.00	144.00	144.00	144.00	144.00	144.00	1728.
17		Total house expenses	666.50	531.50	666.50	666.50	666.50	666.50	666.50	666.50	666.50	666.50	666.50	666.50	7863.
18		**Insurance**													
19		House	1372.00	0.00	0.00	0.00	0.00	0.00	125.00	0.00	0.00	0.00	0.00	0.00	1497.
20		Accident	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	975.00	975.
21		Total Insurance	1372.00	0.00	0.00	0.00	0.00	0.00	125.00	0.00	0.00	0.00	0.00	975.00	2472.
22		**Transport**													
23		Car loan	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	1500.
24		Parking	0.00	0.00	199.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	199.
25		Insurance	362.00	0.00	0.00	362.00	0.00	0.00	362.00	0.00	0.00	362.00	0.00	0.00	1448.
26		Petrol and Oil	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	1500.
27		Repairs and maintenance	600.00	0.00	0.00	0.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	1200.
28		Total transport	1087.00	250.00	449.00	612.00	250.00	250.00	1212.00	250.00	250.00	612.00	250.00	250.00	5722.
29		**Household etc.**													
30		Telephone	134.00	0.00	0.00	104.00	0.00	0.00	98.00	0.00	0.00	122.00	0.00	0.00	458.
31		Cable TV	99.00	0.00	0.00	0.00	0.00	0.00	859.00	0.00	0.00	0.00	0.00	0.00	958.
32		Food and household	275.00	275.00	275.00	275.00	275.00	275.00	275.00	275.00	275.00	275.00	275.00	275.00	3300.
33		Bank loan	145.77	145.77	145.77	145.77	145.77	145.77	145.77	145.77	145.77	145.77	145.77	145.77	1749.
34		Total household etc.	653.77	420.77	420.77	524.77	420.77	420.77	1377.77	420.77	420.77	542.77	420.77	420.77	6465.
35		**Total expenses**	3779.27	1202.27	1536.27	1803.27	1337.27	1337.27	3381.27	1337.27	1337.27	1821.27	1337.27	2312.27	22522.
36		**Income – expenses**	-1795.77	781.23	447.23	180.23	646.23	646.23	-1397.77	646.23	646.23	162.23	646.23	-328.77	1279.

Navigation

When you want to move around in a large spreadsheet (Microsoft calls it navigating), it is not so easy to use the mouse and the scroll bars. Think about it. You type data using the keyboard and have to break off, move your hand to the mouse, move the mouse pointer, click and then go back to the keyboard. It is much easier to keep your hands on the keyboard for the entire operation.

If you use the mouse constantly, sooner or later it will result in problems with your wrist and shoulder, so stick with the keyboard.

Try the following keys until you feel relaxed using them. Write them out on a piece of paper and put it next to your keyboard in the beginning.

Home

Selects the first cell in the row.

Ctrl+Home

Selects cell A1.

Ctrl+End

Selects the last cell on the spreadsheet that contains data or formatting.

Ctrl+Arrow

Selects the last cell containing data in the direction of the arrow. When the cells are empty, the cursor will move to the last row or column in the direction of the arrow.

Try pressing Ctrl+Right arrow – the cursor is now in column **IV**. Press Ctrl+Down arrow – the cursor is now in the last cell in the spreadsheet (**IV16384** = 4.194.304 cells !!!).

F5

Opens a 'Go to' dialog box. Type the address of the cell you want to move to in the Reference field (for example **CD1250**) and press Enter. Press F5 again, type **D48** and press Enter. Press F5 again. All the cells you have jumped to are displayed in the Go to area. Try to double click on one of them. These references disappear when you exit the workbook.

When you keep pressing the F5 key, the program will keep suggesting that you jump back to where you have just jumped from.

Smart detail!

Formatting

Now it is time to do something about the appearance of our spreadsheet.

The heading in **row 7** should be centered and formatted in bold type:

1. Click on the row number to select the entire row and choose bold by using Ctrl+B

2. With the row still selected, center all text by using the **Center** button (there is no key for centering data!).
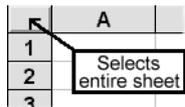
All numbers should be displayed with two decimal places. You can choose between several methods when you have to select a lot of data, as here. You can select entire rows, or entire columns, or even the entire spreadsheet (click on the small grey field at the intersection of the row numbers and column letters). There is just one problem with formatting the entire sheet.

It *can* lead to printing problems, and will most definitely slow down the machine…just think how many cells have to be worked through for no reason at all. So we will format only the cells containing data using the following method:

1. Select the area **C9:O28** (Shift+Arrow keys).

2. Click the **Increase decimal** button until all numbers display two decimals.
   This will help a little, but it would be even easier if the thousands were also selected by commas: 1,000.00 (Note: Many countries use a point for thousands, and a comma for decimals. The way your spreadsheet displays will depend on the **Regional settings** you've selected in the Windows control panel).

1. Now click on the **Comma style** (you really need to have tried this button to understand what it does.).

Now, all numbers have thousand separators and are displayed to two decimal places. When you type in or format a number, Excel will automatically adjust the column width to suit it. But this only applies to cells containing numbers.

If you alter a column width manually so that it is too narrow, then hatch (number) characters will be displayed (######) as soon as the cell cannot display the number in full.

We have seen earlier that if there is not enough space in a cell to display all the text, it is simply cut short. Luckily, Microsoft has chosen a different procedure with numbers…if not, can you imagine the chaos: You type 17,000 – but there is not enough space in the cell, so Excel just removes the last three zeros!

A double click adjusts every selected column to their individually required width. If you want all columns to have the **same** width, then drag the right border of one of the selected columns. When you release the mouse, all the other columns in the selection will be given the same width as the column you adjusted.

Let us just test this out:

1. Select column **C:O**. If cells **C9:O28** are still selected, then it is easiest to simply press Ctrl+Space. If not, then drag the mouse over the top of the columns.

2. Now drag in the column you want to use to define the width for the other columns. Release the mouse, and all column widths are the same.

Notice the extra space to the right of the cell containing numbers. The **Comma style** format is a bit special. The appearance it gives depends on how you

have Windows configured. Let us see how your machine is set up.

1. Select the cells **C9:O28**.
2. Click on the **Currency style** button.

Now all you numbers have a '$' in front of them if you have a standard Windows98/95 US configuration.

	$958.50
	$1,025.00
	$1,983.50

Remember that a cell has two layers. We have just formatted the foreground layer, while the background layer, the formula, remains unaffected. You can check this by changing a number in one of the formatted cells. Try typing **12000** in cell **C9**. As soon as you press Enter, the number will be displayed in the format you have chosen for the cell. Return to the original number by using Ctrl+Z.

Notice that the zeroes in the 'empty' cells are shown as dashes. (This is applied by both currency style and comma style).

Excel and Windows

This booklet is not about Windows…but all programs using Windows are dependant on its configuration, as discussed above when formatting cells using the currency style.

Without closing or minimising Excel, click the **Start** button and choose **Settings, Control panel**. Double-click the **Regional Settings** icon.

I'm assuming that the value in the **Regional Settings** tab is English (US), but it could be any one of a number of languages. This sets a standard for numbers, currency symbols, time and date. The **Number** tab shows the decimal and thousands separator (English speaking countries standard: 1,250.00). If you work on a machine that shows the decimal as a comma, then it is probably set up to reflect continental European standards (French, German, etc. etc.).

The **Currency** tab shows the currency symbol used by Excel (and other programs). If you are on the default English (US) setting, then the $ sign will be there. Maybe you are sitting in an American company in Japan, working with Japanese accounts, and have defined ¥ as your currency symbol.

You can set all the individual values in **Regional settings** to suit your own needs.

Check that the currency is what it should be, and at the same time specify that it should be placed in front of both negative and positive amounts:

Click **Apply** and **OK** to close the **Regional settings** program and the **Control panel** window. Return to the household budget. All the cells formatted with currency style have been adjusted to your new settings.

Your numbers might take up a little more space, so you might see some hatches (######) in some places. Adjust the column widths.

You can also get around the problem by choosing another format, as here:

Toggling formats

Select the area **C9:O28**, as follows:

1. Select cell **C9**.
2. Hold Shift down while you press Ctrl+Down arrow. Excel selects to the next blank cell. Keep holding down Shift and continue to press the Down arrow until the selection has reached the last row of data..
3. Continue holding Shift down and press Ctrl+Right arrow.

Even though selecting using the keyboard demands quite a few strokes, it is by far the most precise method.

Now shift between the **Comma format** and **Currency format**, which simultaneously adjusts the columns' width.

Notice that the numbers do not actually change place. The only difference is the display of your currency unit.

You remove a format by choosing another.

You can choose to delete only some of a cell's many properties. Choose **Clear** on the **Edit** menu. If you choose to clear only the **Formats,** the data in the cell remains untouched.

There are a multitude of formats to choose from. With the cells **C9:O28** still selected, press Ctrl+1 or open the object

menu (right mouse button) and choose **Format Cells.** Click the **Number** tab. (Ctrl+E is used in some language versions of the program).

On the **Number** tab, try clicking the different options in the **Category** field and keep watching the **Example** field.
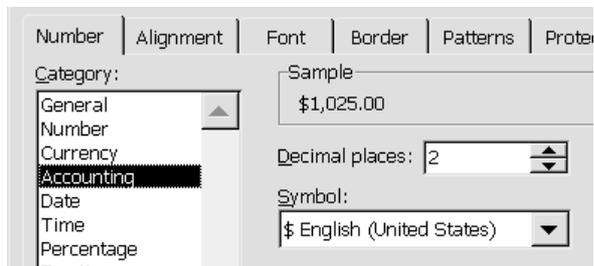
Later on, you will define your our own formats.

Viewing the spreadsheet

Our model has now become so large that it is difficult to keep track of the individual data. Using the arrow keys, move to **O28 – Total transport** (press F5, type **O28** and press Enter). Depending on the size of your screen and its resolution, you probably cannot see any of the headings. It would be an advantage to keep the text in columns **A** and **B** and also the months in row **7** fixed on the screen as you scroll through the data. There are several different ways to do precisely that:

Zoom

We will start by testing the entire budget on your screen.

1. Press Ctrl+Home to select **A1**.
2. Click on the **Zoom** button on the toolbar. Try choosing **50%**. Now you can probably see the entire spreadsheet, but can you read it? Now try **75%**, I'm sure that is better.
3. Notice that you can click on the **Zoom** field, type a number (you do not need to type %) and press Enter. Try this with different values until all the data is visible on screen. Can you read it?
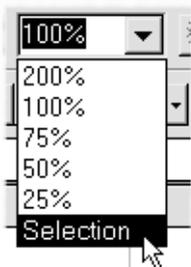
Let's just try a smart detail: Select some cells, try with **A6:E18**. Now choose **Selection** on the **Zoom** drop down box. This lets you quickly zoom in and out on different areas of the spreadsheet. This does not, of course, ensure that some areas are always visible, which is the function we need to look at now. Return to 100% zoom before continuing.

Freeze panes

Freeze panes gives you the option to have certain columns and rows always appear on the screen. Select the first 'free' cell. When you choose to **Freeze panes,** all the columns to the left and rows above will be 'frozen'. We want to freeze row **7** and columns **A** and **B**. With this in mind, select **C8** and choose Window|Freeze panes. A vertical and horizontal line show where the freezing has taken effect. Try using the arrow keys to move around in the spreadsheet. Ctrl+Home usually selects **A1**, but now the cursor stops at the first 'free' cell. You can still move into the locked area using either the arrow keys or the mouse.

Switch the function off again using Window| Unfreeze panes.

We do not need to see the total house expenses while we work with the budget, but we do want as much space as possible for displaying data. Follow the example here:

1. Without freezing the panes, scdropdown the spreadsheet until **row 7** is the first visible row.
2. Select **C8** and freeze the panes. Now only **row 7** is visibly locked:

	A	B	C
7			January
8		Income	
9		Salary after tax - husband	9585

The following data should be entered while the panes are frozen.

The Last Formulas…

for calculating total expenses and the monthly profit/loss should still be entered, as follows:

1. In **A29**, type **Total expenses**. For January, the formula in **C29** should look like this: **=C17+C21+C28**. The result should be {INSERT RESULT!!}

2. Copy the contents of this cell into the cells for the other months and then press HOME and DOWN ARROW – this will select **C30**.

3. Here you should enter the formula for **Income - Expenses**; type in **=C11-C35** and copy it into the cells for the other months. In **C30**, the result should be {INSERT RESULT!}

4. Now you need to create the summation formula in cells **O29:O30**. The annual total should be {INSERT RESULT!}.

As you can see, this isn't so bad after all…in any case you should add other normal household costs such as food, clothing, travel, etc. If you'd like, you can add these categories to your very own budget.

Saving

If you have not already done so, save all the changes you have made to our budget by clicking the **Save** button or pressing Ctrl+S.

You'll see that only when you save the file for the *first* time are you asked to enter a filename. You'll only need to use the menu option FILE|SAVE as if you want to save changes to the file under a new name.

Summary

You have now tried just about all the functions necessary for building up a large spreadsheet. Maybe it is a good idea to stop a moment and review some of the most important functions (and if you don't agree, then just go straight on to page 46.

I want to focus on the principles of absolute references. Leave the household budget on the screen, and open `DECORATING.XLS` using Ctrl+O.

On the **Window** menu, you can see that both files are open. Click on the file you want to work with, or use Ctrl+Tab, to avoid using the menu and mouse.

The supplier we are buying from is a mail order company. Apparently they want to deliver the goods directly from their warehouse in Canada. What we thought were American Dollars have turned out to be Canadian Dollars, which are cheaper, as the Canadian Dollar is worth less than the American Dollar (at this time).

First, calculate the net price of the ordered goods in American Dollars, then the sales tax and finally calculate the total price. We will be paying American sales tax, but it would be interesting to see what the result would be with another sales tax…after all, one never knows...

The exchange rate for the Canadian Dollar and the American sales tax rate should be placed in their own cells so that they can be changed quickly if necessary. Try it now:

1. Insert a new row **2** (Ctrl+Plus and Down arrow to **Entire Row**).
2. Insert a new column **C** (Ctrl+Plus and Down arrow to **Entire Column**).
3. Change the text in **B1** to **Net price CAN$:** and in **C1** to **Net price US$:**
4. Adjust the column width.
5. Insert the exchange rate **0.66** in **C2** and the sales tax rate to **15%** in **D2**.

6. Format rows **1** and **2** with **bold**, and center **C2** and **D2**.

B	C	D
Net price CAN$	Net price US$	Sales tax
	0.66	7.5%

You are now ready to build a formula that will calculate the net price in American Dollars:

The formula in **C3** should multiply the Canadian net price in **B3** by the exchange rate in **C2**. In **C4,** the net price in **B4** should be multiplied by the exchange rate in **C2,** etc. The reference to **C2** should be absolute.

When the same cell is to be used in several formulas, the reference to it should be absolute.

Have a go at inserting and copying the formula yourself first. Use the arrow keys to select the different cells and for copying.

How did it go? This is how I would have done it:

1. Select **C3** and type **=**.
2. Press Left arrow to select **B3**.
3. Type '*****' and press Up arrow to select **C2**.
4. Press F4 to lock the reference (make it absolute). The formula should now read **=B3*$C$2**.
5. Press Enter and select down to **C17** using Shift+Down arrow.
6. Press Ctrl+D to copy the formula.
7. Type a new exchange rate in **C2** and check using Ctrl+Z, that all the net prices change.

The formula for calculating the sales tax should not contain a value of 15%, but should get a value from cell **D2.**

1. Select **D3,** press F2 to edit the formula. Delete **15%.**
   Try pressing the Up arrow – nothing happens, because you are in the process of editing.
2. Press F2 again. Now you can press Up arrow to select **D2**. Press F4 to lock (make absolute) the reference (the formula should read **=C3*$D$2**)
3. Press Enter and select the area **D3:D17,** then press Ctrl+D to copy the formula.
4. Type a new sales tax rate and check that the dependant cells adjust correctly.
5. Copy the sum formula in **B18** to **C18**.
6. Check the sum formula in **E3**. It is incorrect at the moment, as it adds together all three cells to the left of it.
7. Change this formula so that it only adds **C3** and **D3** together, and then copy it.

With an exchange rate of 0.66 and sales tax at 15%, the total price (in cell **E18**) should be $220.36.

> The edit key has two functions: Press F2 once to edit the contents of a cell, and F2 again when you want to point to a cell reference.

Save As

Our new model should be saved, but we want to keep the original DECORATING as well. Using F12 or File|Save As change the name to DECORATING – CANADIAN and close the workbook.

Formatting the household budget

Our household budget should be made more attractive and easier to read. The gridlines on the screen seldom look good on a printout. The effect is much stronger if you just have lines where *you* want them to be, to highlight or separate your data.

Rather than defining all frames and colors manually, the program can do it all for you with a built in automatic function:

AutoFormat

One of the smartest things with Excel is that you do not have to select a consecutive area first. All you have to do is select one of the cells in the area. Try it on your own computer:

1. On the **Household budget** sheet, start by choosing the Window menu and the Unfreeze panes command. Press Ctrl+Home to see the entire spreadsheet.
2. Save the changes in the file (Ctrl+S or the **Save** button). You can always return to the original appearance.
3. Select any cell in the household bud-

get, **C10** will do fine.
4. Choose the Format menu and the Auto-Format command. Notice how all connected cells in the entire budget are automatically selected. If you had left an empty row or column somewhere, then Excel would have stopped selecting there.
5. The Down arrow key lets you move among the different options in the **Table format** field, and also displays an example of each of them in the center of the dialog box.
6. Choose a format and press Enter.
7. Look at the different areas of the spreadsheet and see how they are formatted.
8. Choose the Format menu and the Auto-Format command again, and choose another format for your spreadsheet.
9. Repeat step 8 above as often as you want.
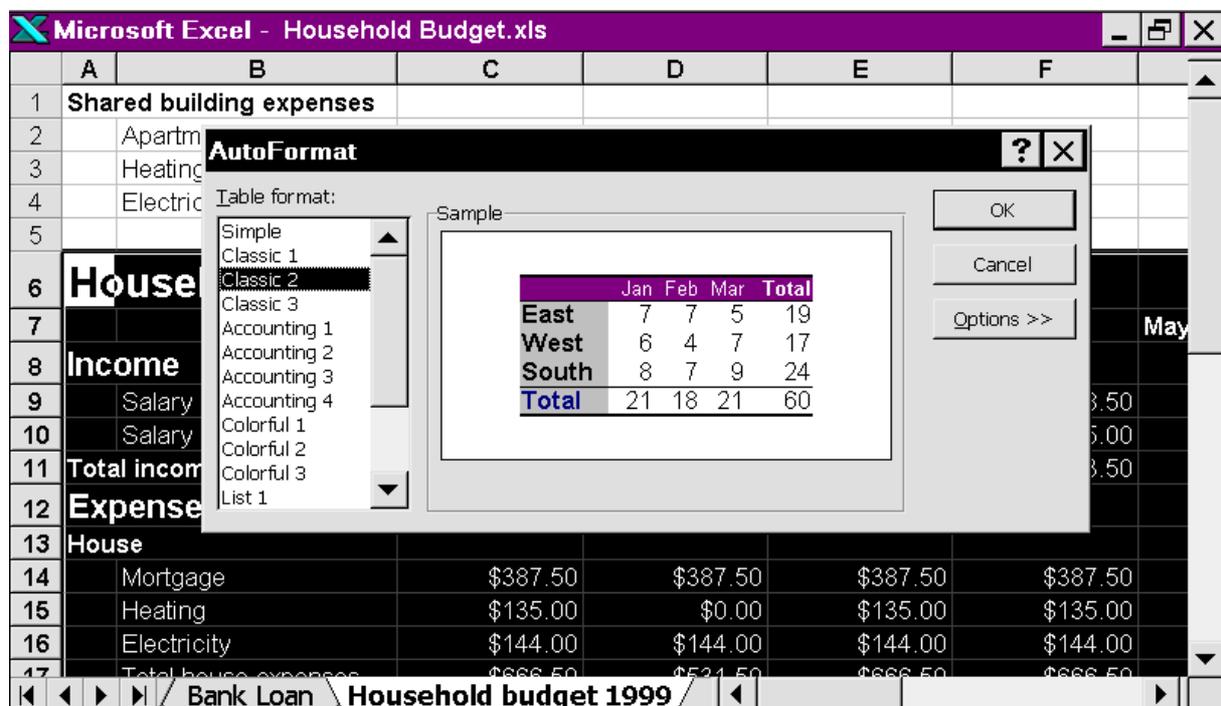
AutoFormat is a quick method to format your spreadsheet, even though you have only a limited influence over what the program actually does. I mainly use the function when I am busy and have to prepare some data for printing in a hurry.

If you want to make your spreadsheet more personalized, then **AutoFormat** function is not the function to use.

> You can decide just how much the **AutoFormat** function will change the appearance of your data. Click on the **Options** button in the **AutoFormat** dialog box and remove the check marks in the fields you do not want changed by the function.

Removing an AutoFormat

An applied **AutoFormat** can be removed in the following way:

1. Choose Format|AutoFormat and None in the **Table format** list (at the bottom). As you can see, all formatting except the number formats is removed.
2. Naturally you can also undo this. But we don't want to do that here – in the next exercise, we'll want to work more on our spreadsheet without **AutoFormat**.
3. Luckily we were sensible enough to save our spreadsheet before we played with the **AutoFormat** function. Close the file and click **No** when you are asked if you want to save changes, then open it again.

Remember that you can always find the last four opened files at the bottom of the File menu. It is easy to open a file using the keyboard:

1. Press Alt+F (the Alt key activates the menu line, while F is the underlined letter in the menu name).

2. Press the number corresponding to the file you want to open (**1** will always be the last saved file).

Manual formatting

I do not think that our budget looks particularly good – the figures are fine, it is just its appearance that I am unhappy with. I must admit that I was not very consistent in my formatting. I will do something about this now, using the data to help me find a suitable format for each part of the spreadsheet.

The **Total income** heading in **B11** should actually have been entered in **A11**, and it should have been in **Bold** instead of in *italic*:

You have probably already guessed that data can be moved in many different ways.

I will demonstrate the two most used methods.

Moving data using the mouse

If you work with the computer in the same way I do, you will already have discovered that the mouse is not the easiest tool to control. It is very sensitive and needs a good deal of precision to be used efficiently.

It is very important to keep an eye on the mouse pointer's appearance as you move the mouse. The mouse pointer appears as one of three basic shapes. You have seen two of them earlier in this booklet:

Select: **Fill & Copy:**   **Move:**

Point at the frame of the selected cell or area, and the mouse pointer changes into an arrow.

1. Select **B11** and move it to **A11** by dragging it with the mouse when the pointer is an arrow.

2. Format row **11** to be **Bold** and not **Italic** using Ctrl+I and Ctrl+B.

Moving data using the keyboard

It is not practical to have the Total apartment block expenses at the top of the spreadsheet. They should not appear in a place where they tend to dominate the entire budget. When data is to be moved outside the viewing area, the keyboard is better than the mouse.

1. Select cells **A1:C4**.
2. Cut the selection using Ctrl+X. Notice the text on the status line.
3. Use the Down arrow to select cell **A34** and press Enter.
4. Press Ctrl+Home to select cell **A1**
5. Select rows **1:5**, (which are now empty), and remove them using Ctrl+Minus.

Now the heading 'Household budget 1999' should now be in **A1,** and the 'Total apartment block' costs are in the area **A29:C32.**

Updating Formulas

What has happened to our formulas for calculating heating and electricity? They originally took their information from cells **C2**, **C3** and **C4**.

Select **C10**, heating for January:

> Formulas "remember" which cells they refer to, and use them no matter where you move them, whether the references were absolute or relative:

Borders

You can divide your spreadsheet into appropriate areas by using borders (lines). Borders should only be used for cells containing data, not for whole rows or columns. Even though it is easier to select an entire row or column, it *may* cause problems when you print.

The principle is as follows:

First select the area you want a border around, then use the **Borders** button on the toolbar. If you just click on the button, the border style shown will be used. If this is not what you want, then you should click on the small arrow on the right part of the button.

The following choices are then given:

If you need to do a lot of work with borders, it is a good idea to drag this menu onto the display. Grab hold of the little grey bar at the top of the menu and drag it to where you want it. The window is closed as usual by clicking on the small cross at the right side of the title bar.
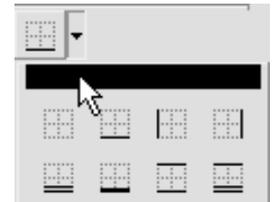
The first choice removes all borders in the selected area, while the last three put a border around the entire selected area.
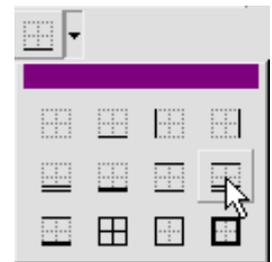
Try playing around with this function, and remember that only the selected cells are given borders. Remove any borders you add before continuing.

1. Select cells **A6:O6**
2. Choose the pattern that puts a single line at the top and a double line at the bottom of the selected area (as in the example above).
3. To make further formatting with the same type of border easier, the button remembers the last border type you used. Select **A24:O24** and click the **Borders** button.
4. Select **B12:O12** and choose the pattern with a thin line above and below (second from right in the center row).
5. Continue adding borders to highlight the part(s) of the spreadsheet you want.

That looks better; although the border options were a little limited. You cannot choose a color for the lines, and there are no thin dotted lines, nor extra thick lines …

Use the toolbar as a shortcut to more subtle options. You have seen earlier how everything to do with formatting cells is contained in the **Format Cells** dialog box:

1. Select **A1:O2**. You will add a colored line under these cells.
2. Open the object menu using the right mouse button and choose **Format Cells** or press Ctrl+1.
3. Choose the **Border** tab.Your choice has to be made in two steps. First you choose the appearance of the line (Style), then which part of the cell should have a line around it like this:
4. Select a thick line in the **Style** field.
5. Choose a suitable color for the line. Note that all the lines in the **Style** field now have the chosen color.
6. You now have to tell Excel where the selected line style should be inserted. Click at the **Bottom** of the **Border** field, or on the small button marked with a line at the bottom.
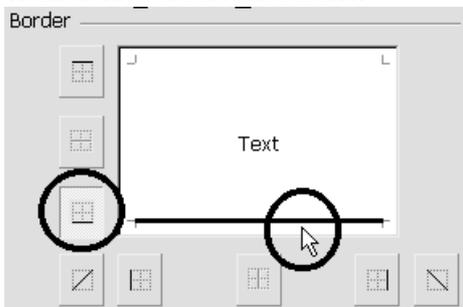
7. Press Enter and press an arrow key to cancel the selection (format options are difficult to see when the cells are selected).

Do you think this way of doing things is strange? I did at first, but now I have to admit that I do not think that there is a better way of doing it. While the dialog box is open, you can give lines an individual format. The example on the pic-

ture is an attempt to demonstrate what is possible (though you cannot see the colors, which may be a good thing!).

The **Outline** field places a border all the way around the selected area.

Changing a border

If you want to change a border, all you need to do is put the new style 'over' the old.

Removing a border

If you want to remove a border, click the **None** option on the **Borders** pop-up box.

If you'd rather remove individual elements of a border, open the FORMAT|CELLS dialog box, click on the **Borders** tab and remove the desired part of the frame with a click.

Removing gridlines

Our household budget has a lot of borders in it, but as long as the gridlines are visible it is hard to see if they are going to help produce a clear and understandable printout.

We will remove the gridlines from the screen:

1. Choose Tools|Options and remove the checkmark in the **Gridlines** checkbox on the **View** tab.
2. Choose **OK** to close the dialog box.

Shading and color

You can color and shade cells. Just as with borders, you can click on the **Color** button to use the color it displays or click on the arrow on the button to choose another color.

We want to pep up some areas in our budget by making them another color.

1. Select the area **A1:O2**.

2. Click on the **Color** button (the standard color is grey).
3. Press an arrow key to cancel the selection.

Let us try another color. Try using **Undo** to select the cell again (it actually removes the color formatting, but as the area was selected before we applied the color, it selects the area for us again). As you are going to choose another color, it is not important that **Undo** removes the grey background.

1. Press Ctrl+Z.
2. Click on the little arrow on the **Color** button. Choose a color.
3. Press an arrow key to cancel the selection.
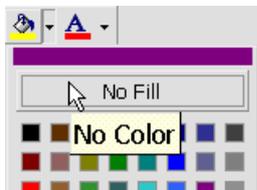
Continue doing this to test different colors. If you want to remove the color completely at some stage, then just choose the large field **None**.

If you prefer a dark basic color, then it is sensible to choose white text:

1. With the area still selected, press the **Font Color** button.
2. Use the same method you used for the background color to change the font color.

Invisible Buttons on the Toolbar
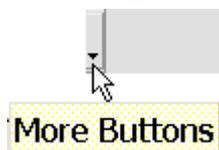
…can be made visible by clicking on the little arrow underneath the double arrow next to the last visible button.

Then, if you've clicked one of the invisible buttons, the program will group the butons on the toolbar so that the last one you used is visible. Not so stupid…

You can combine a background color with a pattern to give exactly the effect you want.

I will just introduce you to the principle, so you can play around with it as much as you want in your own time:

1. Select an area, choose **Format Cells** and the **Pattern** tab.
2. Click the **Pattern** button. Another color palette appears. This is starting to get confusing. The new color palette only applies to the pattern you can add over the background color (the cell color can have two 'layers'):

That is to say, you can look *through* the coloured pattern and *see* the background colour.
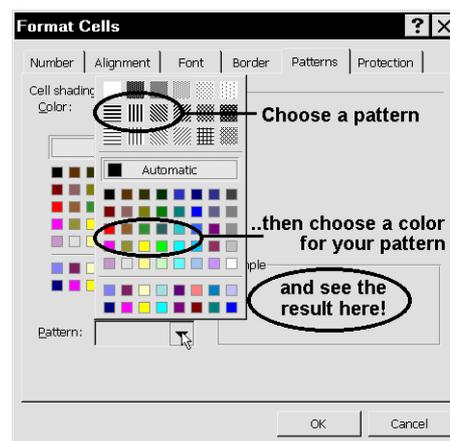
After you have experimented with this function a little, choose a light background color with a pattern of white dots over it for your cells.

> When a printout of a spreadsheet is to be copied, it is best to choose a dotted pattern as a background color. Copy machines do not copy solid colors well.

Copying formats

The format of cells **B12:O12** should be copied to **Total insurance**, **Total**

transport and **Total household**, etc. This is done as follows:

1. Select the format for copying, **B12:O12**.
2. Click the **Format Painter** button. The mouse pointer turns into a little brush.
3. Click on **B16**. Cells **B16:O16** 'inherit' the formatting (number format, lines and colors). There is no need to select all the cells.

The copying stops automatically. When you want to copy to several areas, as in this example, then do the following:

1. Hold the area **B16:O16** selected and *double* click on the **Format Painter**.
2. Click in **B23**. The function remains active.
3. Click in **B29** and then copy the format of lines **24** and **25** (**Total Expenditures** and **Income-Expenditures**). If you'd like, choose your own format for line 25.

If you want to copy a format repeatedly, double-click on the **Format Painter** button. Now this function will remain active until you click the Esc key or click the button again.

Save the workbook (Ctrl+S) and continue to format the budget as you wish. You may want to change the text colors for income and expenses…it's up to you.

Printing the budget

The easiest way to print the budget is to press the **Print** button. However, the standard printout layout is not especially suited to our spreadsheet. I will now briefly show you how to adjust a printout.

I recommend that you use the **Print Preview** button, as this function will show you exactly how *your* printer prints.

You can see how many pages will be printed at the bottom of the screen. It would be best to print our budget in landscape format (horizontal layout).

Click the **Setup** button and choose **Landscape** on the **Page** tab.

You can use the **Scaling** area to fit your printout on a single page. This is an efficient function as the printout will be compressed to fit on one page, even if it otherwise would take many pages! Select **Fit to 1 page wide by 1 page tall**.
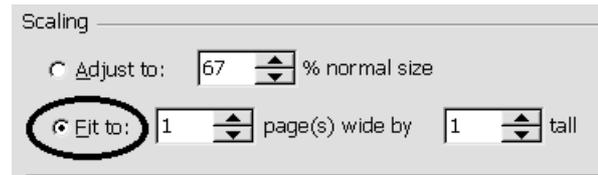
Click **OK** (Enter) and check, at the bottom of the page, that the printout now fits on one page.

Click on the **Setup…** button again and the **Adjust to** field will show you how much the spreadsheet has been compressed (between 10 and 400 percent).

Press Esc to close the **Setup…** dialog box and click on **Close** to return to the working area.

All you need to do now is press the **Print** button to see the budget as 'hardcopy'.

Data layout

Centering headings

The heading 'Household budget 1999' can be centered across the entire spreadsheet:

1. Select the heading and the cells it should be centered across (**A1:O1**).

> Click on the **Merge and Center** button. Excel now treats the cells as one large cell.

Vertical layout

You can create more space in the spreadsheet by increasing the height of rows. This is done by dragging the bottom line of the row number:

Drag down to increase the height.
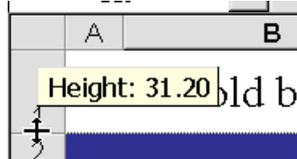
1. Drag the height of **row 1** to be approximately 30.
2. Select the row and choose **Format Cells** (Ctrl+1).
3. On the **Alignment** tab, choose **Center** in the **Vertical** field.

> Entire rows or columns can be selected when you want to format the text to bold, or center it. When you want to add a border to cells in a spreadsheet, you should only select cells containing data as previously described.

Continue as follows:

1. Change the height of row **6** and row **24** to be approximately 20. The height of row **31** should be about 25.
2. Select rows **6**, **24** and **25** and choose **Vertical Centering**.

> You can select several independent areas by holding down Ctrl while clicking on other rows or columns.

It is difficult to really assess the layout properly before looking at a hard copy of the spreadsheet. I suggest that you print one page before deciding whether you are satisfied with the layout or not.

This is what my 'Household budget' looks like now (you may need a magnifying glass to see the lines I have added):

Naming cells

The model on **Sheet1** in the DECORATING – CANADIAN file is very small and easy to maintain.

=B7*$C$2

Formulas like the one depicted here are not particularly easy to understand. As your spreadsheet gets larger with time, it gets even more difficult to be able to see what each cell actually contains.

You should get into the habit of building up spreadsheets so that the formulas are easy to understand. Remember that it might be several months before you work with it again, and by that time you may have forgotten what they refer to.

For this purpose, the ability to name cells is indispensable. Quite simply, it allows you to give cells a more meaningful name than the ordinary cell references.

In principle, all cells in a spreadsheet can be called something other than their cell references. The cell containing the exchange rate, **C2**, would be easier to refer to if it was named **ExchangeRate** like this:

=B7*ExchangeRate

Two cells cannot have the same name, and names cannot contain spaces. If you want to name a cell, for example 'Sales Tax', it could be done without the space (SalesTax) or with an underscore instead of the space (Sales_Tax).

1. Select **C2**, and click on the cell reference in the name box over column **A**. The reference will be selected automatically. This means that you can overwrite the original reference with a new name.
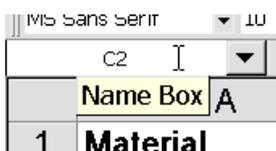
2. Type **ExchangeRate**, followed by Enter.

You can also continue to use **C2** if you want. You can see this by selecting a cell containing a formula for calculating the net price in American Dollars, like **C3**. The formula is unchanged.

Change all formulas in the model so that they refer to the cell name **ExchangeRate** instead of the original cell reference, as here:

1. Select **C3** and press F2.
2. Delete the reference **$C$2** and instead type **ExchangeRate** and press Enter. Excel will show that the reference is valid by showing 'ExchangeRate' with a capital 'E'.
3. Copy the formula down to cells **C4:C17**.
4. Select some cells in the area **C4:C17** to see that the reference is correct. Type a new exchange rate in **C2** and press **Enter**. Did you get new prices?

> If Excel displays a name that's written with lower-case letters in a formula (and not with upper-case letters), it's possible that the name was entered wrong. In other words, the program has a very useful error-checking function.

Important: References to cells with names are automatically absolute. In other words, you do not have to press F4 when you use names.

Other advantages of using names

As well as making formulas easier to read, there are other clear advantages in naming cells.

Entering formulas

Move down the spreadsheet by pressing PageDown (PgDn) a couple of times. The cell containing the exchange rate is no longer visible.

1. In a cell selected at random, type =**ExchangeRate** and press Enter. Excel shows the value of **C2** – you did not need to remember which cell contained the Exchange rate!
2. Press the Down arrow and type =**250*ExchangeRate**. Press Enter. Easy and efficient.

Jumping to named cells

The exchange rate for CAN$ has changed to 0.72:

1. Click the small arrow in the right side of the **name** box:
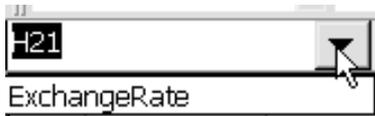
2. All the names in this workbook are listed here. In this case, there is only **ExchangeRate**. Click on the name and the cell is selected. This is a fast and flexible 'go to' function.
3. Type the new rate in: **0.72** and press Enter. The entire spreadsheet is updated.

It is not a good idea to give all cells in a spreadsheet names; but as you can see, all *key* cells should be named.

The cell containing the sales tax rate should also be named.

1. Select **D2** and click the name box.
2. Type **SalesTax** and press Enter.
3. Change the formula in **D3** to =**B3*SalesTax** and press Enter.
4. Copy the formula to cells **D4:D17**.

Column and row headings you want to use throughout the spreadsheet can be defined as Labels. Once defined, they will be applied automatically as you type formulas referring to these cells. Label areas are defined in the Insert|Name|Labels command. Search for help on 'Labels and names in formulas' for more information.

Names in the 'Household budget'

In the household budget there are three cells that should be named. Open or move to the budget and select **C36**, Apartment share.

1. Type **ApartmentShare** in the name box and press Enter.
2. Select **C37,** type **Heating** in the name box and press Enter.
3. Select **C38,** type **Electricity** in the name box and press Enter.

All cells referring to these three key figures should be changed so that they refer to names. Instead of changing each formula and then copying them, we will get the program to do the hard work for us:

1. You should select one cell; it does not matter which one.
2. We will now apply the names we have created. Choose Insert|Name|Apply.

All the names in the workbook will be shown here. Make sure that all three names are selected (click on them).

If you have selected more than one cell when you choose Insert|Name|Apply, the cell references will only be changed in the selected cells. But if you have only selected one cell, Excel will change the formulas in every cell in the spreadsheet.
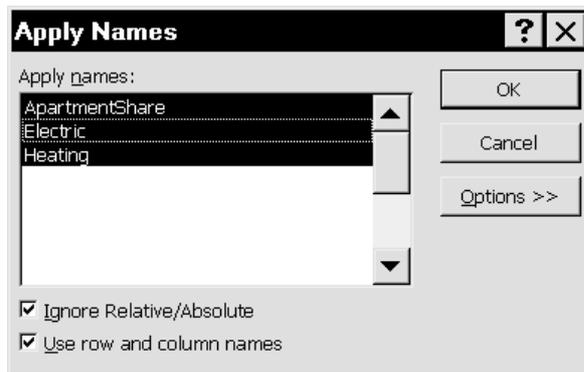
1. Right-click the two checkboxes, **Igno-
   re Relative/Absolute** and **Use Row
   and Column Names** to read what
   they mean.
2. Click on **OK** or press Enter to accept
   the settings.
3. Select some cells in rows 10 and 11
   to check the formulas. **C10,** for ex-
   ample:

   =Heating*ApartmentShare

4. We have now heard that the actual
   heating consumption will be higher
   than expected. By using the name
   box, jump up to the **heating** cell and
   change the number to **1600**.
5. Check that the formulas for calcula-
   ting the monthly heating bill in row
   10. Use Ctrl+Z to check the changes.
6. Save the folder using the same name
   (Ctrl+S).

Printing

Maybe you have already printed the Household budget a couple of times. There are, however, many ways to customize a printout when you need to print large spreadsheets.

Margins

1. With any cell in our household budget selected, click on the **Print Preview** button.
2. When the changes were made in print setup last time (page 51), the spreadsheet was printed on one page in landscape format.
3. Click on the **Margins** button. All margins can be changed by dragging them.
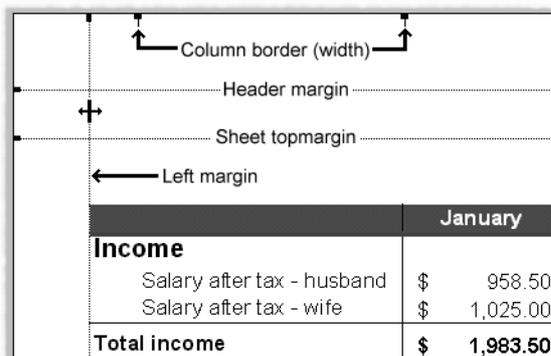
4. Drag the left margin as far to the left as possible. The mouse pointer will stop automatically at the point where text falls out of the print area defined by your specific printer.
5. Drag the right margin as far to the right as possible.
6. Pull the spreadsheet's top margin a little closer to the header margin.
7. Try dragging some of the column borders (you cannot adjust the column widths automatically on the **Print Preview** screen).

As we specified that the spreadsheet must be printed out on one page, Excel will adjust its size each time you drag a margin.

Headers and footers

Now we will adjust the text shown at the top and bottom, the header and footer:

1. Click the **Setup...** button, then the **Header/Footer** tab.
2. Click the little arrow to the right of the **Footer:** field.

Excel is incredibly user friendly – with some exceptions, one of them being here. The options shown on this drop-down list are usually totally useless! Create your own footer instead:

1. Click the arrow again to close the drop-down list, and click on the **Custom Footer...** button instead.
2. The **Footer** dialog box is divided into three sections. You can insert text on either the left, middle or right third of the footer area. There are several codes you can choose from; the one shown here inserts the name of the spreadsheet from the name on the tab.
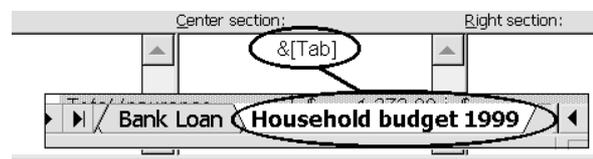
All printer codes begin with an ampersand ('&'), and the action to be carried out is entered between square brackets.
3. If there are codes in all three fields, they can be deleted by dragging the mouse over them and pressing Delete.
4. Click the **Right Section** field and click the **Date** button. This code inserts the current date every time you print the spreadsheet.
5. Drag the mouse over the code **&[Date]** to select it and click on the **Font** button.

6. Choose a font size of 8 points and click **OK** or press Enter to close the **Font** dialog box.
7. Click **OK** or press Enter to accept the footer and return to the **Page Setup** dialog box. The date and page number are shown in the lower part of the dialog box:

The little yellow help labels do not appear when you point to the buttons in the **Page Setup** dialog box. Instead, you can get help by clicking them with the right mouse button.

The footer still needs some changes:

1. Click on the **Custom Footer...** button. We want to see the page number together with the total number of pages.
2. In the **Center Section** field, type **Page** and click the **Page number** button (second from the left, marked with one hatch character). This will insert the page number. (code: **&[Page]**). In this way you can combine text and codes (without having to surround text with quotation marks).
3. With the cursor placed after the code **&[Page]**, click the **Total pages** button.

The result looks very strange, because the codes are not seperated from each other.

Page &[Page]&[Pages]

Page '1' '4'
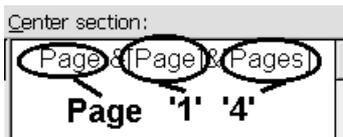
If you are on page one of a four-page

printout, the codes will show these numbers right next to each other, so the code looks like 14! So we need to enter some text and spaces between them:

1. Click between the two codes. Check that the cursor is between ']' and '&'.
2. Type a space, followed by **of** and another space:

Page &[Page] of &[Pages]

3. Click in the **Left section** field, and type in your initials followed by a space.
4. Click the **Time** button.
5. Mark both text and code, and click the **Font** button. The font size should be 6 points. You cannot choose a size less than 8 points, but if you click in the **Size** field, you can type in **6**. Press Enter to confirm, accept, and close the dialog box.
6. We want the file name in the **Right section** field. Click in the field and click the **File name** button. This code ensures that we can always see the name of the file.
7. The file name should be printed in a very small point size. Use the same method as in step 7 above. Look at the picture on the bottom of the page.
8. Click **OK** to close the **Footer** dialog box and **OK** again to close the **Page Setup** dialog box. You should now review the page layout on the **Print Preview** screen.

You can insert other codes, for example the date, in the **Custom Header...** dialog box if you want.

Left section:	Center section:	Right section:
PG &[Time]	Page &[Page] of &[Pages]	&[File]

Scaling the printout

It is not always possible to read the printout of a large spreadsheet when it has been compressed to fit on just one page. So let us return to normal size:

1. While you are in the **Print Preview** screen, click the **Setup...** button and the **Page** tab.
2. Specify that the printout should be adjusted to 100% in the **Adjust to** field (click on the **Adjust to:** field and type 100 and press Enter or use the small arrows).
3. Press Enter and look at the bottom of the screen to see how many pages the printout will be.

Manual page breaks

When a spreadsheet takes up more than one page, it is often necessary to decide where the pages should begin and end:

1. While you are in the **Print Preview** screen, press PageDown (PgDn) and PageUp (PgUp) to leaf through the different pages. You will see that the Total apartment block figures are printed out on their own page, while the spreadsheet is divided at September. Exactly where the sheet is divided depends on your particular computer/printer combination.
2. We want to start a new page after the first half year. Press Esc, or click the **Close** button to return to the working screen. Notice that this now contains both a vertical and horizontal dotted line. These show you where the new pages begin.
3. Click in the cell to the right of and below the position of the new page break (hmm…difficult to explain – but easier to see on the screen). We want the new page to begin between June and July. Select **I33** and choose Insert|Page break.

Vertical and horizontal dotted lines indicate page breaks. The spreadsheet is now divided into four pages. Check that the page breaks work properly:

1. Choose **Print preview** and check the pages one by one, using PageDown and PageUp.
   Are the page breaks where they should be?
2. Click the **Setup...** button and the **Sheet** tab. In the **Page order** field at the bottom, you can choose which order the pages should be printed.
3. Press Esc twice to return to the working screen.

You can insert as many page breaks as you want To insert a vertical page break, select a column and choose Insert|Page break. For a horizontal page break, mark a row.

Removing page breaks

Manual page breaks can be removed by placing the cursor to the right of or directly under the page break that is to be removed.

1. Try removing one of the page breaks. Select any cell in column **I**, for example **I35** (but not **I33**). The mouse pointer is now touching the vertical page break.
2. Choose the Insert menu. The command is now called Remove page break. Choose it.
3. The horizontal page break over row **33** is still there. Now select any cell in row **33** and choose Insert|Remove page break.

If you want to remove both page breaks at once, select the cell at the intersection of the horizontal and vertical page breaks (**I33**).

There are still a couple of things to change before the printout is totally satisfactory.

Repeating headings

Earlier you tried to freeze panes so that you could always see the text in the first column and row while you moved through the spreadsheet. Be aware that

the Freeze Pane function only works on the screen and not on printouts.

The first two columns and rows should be repeated on every page of the printout. It's not a good idea to center a heading over several columns if it's supposed to appear on several different pages.

This is how you do it:

1. Select **A1**, which will mark the entire area to be used for headers.
2. Press CTRL+1 and choose the **Alignment** tab.
3. Deactivate the **Merge cells** option by removing the checkmark in the appropriate box and press ENTER.

Now you need to define the headings as follows:

1. Choose File|Page Setup and click the **Sheet** tab. The dialog box is the same as that you saw in **Print Preview, Setup...** but now you should choose the fields in the **Print titles** area (these fields are greyed out in **Print Preview**).
2. The **Rows to Repeat at Top** field is not relevant here, as the printout is wide and not high. Click in the **Columns to Repeat at Left** field and select any two cells in columns **A** and **B** on your spreadsheet using the cursor (this is on the spreadsheet itself, not in the dialog box!).
3. The little button to the right hand side of the fields for **Print area** and **Repeats** will let you display more of your spreadsheet. Click it to reduce the size of this dialog box. When you have chosen your area, click it again. Now your dialog box looks like this:

Print titles
Rows to repeat at top: [   ]
Columns to repeat at left: [$A:$B   ]
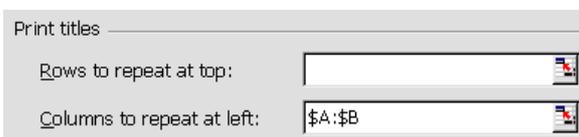
4. Click the **Print Preview** button on the right side of the dialog box and look at the pages. The text next to

every category will be included on pages one and three of the four page printout.

> If you've specified that the heading **Household Budget 1999** should be printed in very big letters, it will probably be split up by the page break.
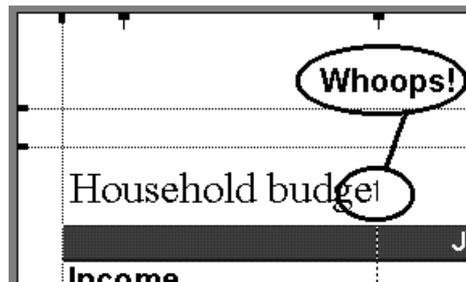
> Excel has done precisely what you asked it to do! You asked for columns **A** and **B** to be repeated on all pages of the printout, and as the heading is longer than two columns, the text has been cut. The easiest workaround is to reduce the font size until the entire heading can fit in column A.

Unfortunately, the total apartment block charges have also been printed on page two, and the text on page four. This should be corrected.

Print area

Print what
⦿ Selection   ○ Entire workbook
○ Active sheet(s)
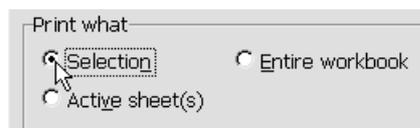
You can limit the area to be printed. The idea with 'key' cells, like our total apartment block charges, is that it should be easy to change the spreadsheet by changing figures in a single cell, making it quick and easy to do 'what if' analyses. These 'key' cells do not necessarily have to be printed together with the spreadsheet.

1. Select the area **A1:O25**.
2. Press Ctrl+P or choose File|Print. The Print dialog box appears.
3. Choose **Selection** from the **Print what** area:

4. Click the **Print Preview** button at the bottom of the dialog box – the printout is now only two pages.

The choice is only valid as long as the area is selected. Next time you print a spreadsheet without selecting anything, the entire sheet will be printed.

Fixed print area

If you want to specify an area as a fixed print area, you do not have to select it and choose **Selection** every time. This can be done as follows:

1. Select the area **A1:O25** and choose File|Print area|Set print area. Press an arrow key to cancel the selection and click on **Print Preview**.
2. Now all you have to do is click the **Print** button without worrying about selecting anything.
3. Press Esc to close **Print Preview**.

When you want to print another area of the spreadsheet, you can do it quite simply, as follows:

1. Select a smaller area, like **A2:E6**, press Ctrl+P and choose Selection. Click the **Print Preview** button. The print area previously specified is now ignored.
2. Press Esc to close **Print Preview** and press any arrow key to cancel the selection.
3. Without selecting anything else, click the **Print Preview** button. The previously defined print area will now be active again.
4. Press Esc to close **Print preview**.

Printing named areas

When you define print titles and print areas, they are automatically named.
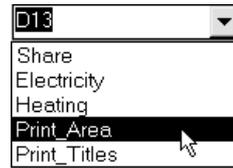
Excel uses named areas to simplify the management of more advanced functions.

If you learn to use names from the very start, many routines will be much easier to manage in the future. When you need to print different areas, it is obviously best to name each area.
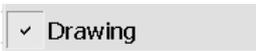
Select areas that you often print, click in the name box and type a suitable name (for example, area **A1:E31** could be named **First_Quarter** – note the underscore as you cannot have spaces in a name). When you want to print this area, choosing its name in the name box will select it. Then press Ctrl+P and choose **Selection**.

Or, even better, you can add a button to the toolbar to define a print area -- as we will see next.

Toolbars

Nearly all commands can be placed on a toolbar as a button. There are a number of predefined toolbars available.

1. Choose View|Toolbars. The two toolbars that are always visible are called **Standard** and **Formatting**.
2. Choose the **Drawing** toolbar and click **OK** to return to the working screen.
3. The **Drawing** toolbar appears as a floating toolbar that can be dragged to wherever you want it (just drag the title bar). You can also place it at the bottom of the screen or together with the other toolbars. In these positions, their title bars are hidden. To drag them somewhere else on the screen, take hold of a toolbar in an area between two buttons and drag it:

Another, faster, way to open a toolbar is to *right click* an empty space on any toolbar button on the screen. You can then select the toolbar you want on the object menu. The object menu also gives you the option of customizing the toolbars.

Customizing toolbars

To be really effective, the buttons on each toolbar should reflect your method of working.

When you have worked a while with the program, you will notice that you have not used some of the buttons on the toolbars. When this is the case, replace them with more relevant buttons. Right now we need a button to help us define printout areas. This is how to do it:

1. Right-click anywhere on the toolbar, and choose **Customize** followed by the **Customize** tab.
2. The buttons in the dialog box are divided into categories corresponding to Excel's menus. Click on the **Describe** button to read a description of selected command:
3. Go back to the **File** category and find the button described as: 'Sets selected cells as area to print'.
4. We want to make space for this button on the **Standard** toolbar. This is done by dragging one or more unneeded buttons from it. You can always find a button again under the category it belongs to in the **Customize** dialog box.
   I suggest that you remove the **Spelling** button. Drag it anywhere off the toolbar and release the mouse. (Note that this can *only* be done with the **Custom** dialog box open!).
5. Grab the new button using the mouse and drag it to the position where you want it on the toolbar. This button will be used when printing, so why not position it between **Print** and **Print Preview**:
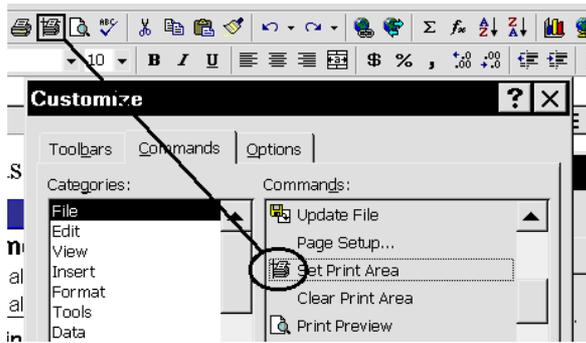
The other buttons on the toolbar move and the program makes space for the new button when you release the mouse button. Change the individual positions of the buttons by dragging them around.

6. Click on **Close,** or press Enter to close the **Custom** dialog box.

You should test out the new button:

1. Select an area, **A1:E6**, for instance, and click the new button, **Set Print Area**. Click on **Print Preview** – Voila…the area is ready for printing!

2. Repeat this with other areas and print out the different areas. Easy and elegant.

Remember: Cells and areas that you use often should be given a name…this bears repeating with emphasis, because it is so important: *Cells and areas that you use often should be given a name!!*

Charts

'A picture says more than a thousand words.' A wise and well known phrase, highly relevant when you've got numbers to display and analyze

It is very difficult to understand things clearly from the spreadsheet data alone, especially in large models.

The amount of data in our household budget is comparatively large, so before we use it, it would be a good idea to 'play' a little with charts for a smaller example.

1. Close Household Budget and choose **Yes** when asked if you want to save changes.
2. Type the following small model in a new, blank workbook. It shows a family's pension plan:

	A	B	C
1		Budgeted	Actual amount
2	Capital pension	$75,000.00	$95,000.00
3	401(k)	$153,000.00	$168,500.00
4	Pension Plan	$85,000.00	$86,250.00
5			
6	Total	$313,000.00	$349,750.00

It is important to decide what the chart should show before you create it because it is possible to distort reality when numbers are presented graphically.

The family wants to see the relationship between the budgeted and actual amounts. The chart should be created to show, for example, the capital pension in two columns, side by side, making them easy to compare.

At the same time, I will create the chart as a separate spreadsheet within the workbook.

The Chart Wizard

A chart on a new page

First, you should select the data to be displayed. Do not include the **Total** (**B6** and **C6**) cells, as these columns would be enormous.

We want to see the *details* in the spread-sheet.

1. Select a cell at random within the area **A1:C4** and press Ctrl+*. The text is also to be included in the chart, and should therefore be included in the selection.

> Mark consecutive cells quickly using Ctrl+*. This is yet one more reason that you should avoid having empty columns and rows on your spreadsheet. Use the asterisk on the numeric keyboard for selecting cells (to use the asterisk beside the Enter key, you must press the Shift key as well).

The chart is built up as follows:

1. Choose Insert|Chart|As New Sheet, or click the **Chart Wizard** button.
2. Your 'personal guide' appears and asks you if you want help with this function. Choose 'No' and he politely dissapears.
3. The **ChartWizard** will now try and help you to make the right choices. The first stage of the guide takes you through the different types of charts. There are sub-types for every type shown, and the guide suggests the first, very simple, format. Choosing format number two shows the three pensions one above the other, showing how much is budgeted and how much is realized (you can see the total pension, and also how large a part each pension type is of the total). Format number three shows the same, but in percentages.

4. Notice the **Press and hold to view example** button, and do as it says to see different types and sub-types of chart.

5. Choose the first bar type and click the **Next** button to go to step two of the Wizard:

> To undo any step and return to the previous stage, click the **Back** button. If you press Enter by mistake instead of the **Next** button, the chart will be created. (Enter is the same as pressing **Finish)**. If this happens, press Delete to delete the chart, and start from the beginning again using the Wizard.

6. The Wizard displays the selected area in the **Range** field. The **Series in:** radio buttons let you choose between columns and rows for your data series. Click on the **rows** button to see the difference. We want to compare the budgeted figures for a pension with the actual figures, so click on **Columns** before continuing.

7. Notice that step two of the Chart Wizard contains two tabs. Click on the **Series** tab. This lets you add or remove series, choose a different name for an existing series, or choose another area of your spreadsheet for labelling the axis. (This last is called 'Category (X) axis labels').

8. Click on the **Next** button to go to step three of the Chart Wizard. Type **1999** in the **Chart title** field and wait a moment. This title is displayed on the little example chart. You can add axis headings in the same way.

9. Try clicking on each tab in step three. I would especially recommend that you try the **Show data table** field on the **Data Table** tab.

10. Click on the **Next** button to go to step four of the Chart Wizard.

11. This is where you can choose where the new chart should be in your workbook, whether it should be a new sheet or an object on an existing

sheet. Choose **As new sheet** and label it as follows:
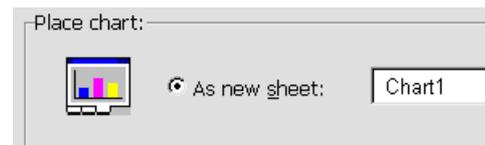
12. The chart is now finished, so choose **Finish** or press Enter.

Excel displays the chart in its standard format.

We will change the colors in a moment, but let us first see if there is a relationship between the data on **Sheet1** and the columns on **Chart1**.

Updating a chart

The smallest column is **Budgeted** for the **Capital pension** where the scale on the Y-axis stops at $100,000. Let us change this number to see if the chart is automatically updated.

1. Click the **Sheet1** tab. Change the value in **B2** to $**100,000**.

Click again on CHART1 and see what has happened to the height of the column.

1. The tallest column is the actual amount from the 401(k) plan. Change that from **$168,000** to **$268,000** Return to the chart and notice that the scale on the Y-axis now goes up to $300,000.

2. Return to **Sheet1** and change the payment in **B3** back to $168,000. (Ctrl+Z).

Adjusting the format in a chart

Every part of a chart can be changed. No matter where you click in the chart area, an element will be selected. Small black 'handles' show the selected area. When you position the mouse pointer on one of these, it changes to a double arrow that allows you to change the size of the object.

To change a format, double click the object you want to change.

1. Double click on one of the blue columns (budgeted).
2. The **Format data series** dialog box opens. Choose another color in the **Area** field. You can also add a pattern to the column by clicking on the **Fill Effects** button. Take a look at the **Texture** tab in the **Fill Effects** dialog box; it contains many attractive textures, but be careful, it is easy to get carried away.
3. Choose **OK** (Enter) and format the other columns as you wish.

If you double click too slowly on a column, the program thinks that you only want to select the one column. When you then choose a different color, only this column will change color – very confusing (undo it immediately).

1. The gray background, the **Plot area**, is not very attractive. Double-click it and choose a subdued color (maybe a pale yellow, or a texture in a pale color).
2. The legend on the right side of the chart area also needs changing. Double-click it and notice the little field **Shadow** in the **Form Legend** dialog box. Check the box and click **OK**.
3. Grab the legend with the mouse and drag it to a new position.
4. You can format and move the title field **1999** in the same way (try using an underlined text).

Of course, you can also use the right mouse button on any element.

1. Right click the **Plot area** and choose **Chart Options**. Click on the **Gridlines** tab and click on the **Minor Gridlines** radio button for the Y-axis. Click **OK** – and now there are enough lines on our chart.
2. The background gridlines should not be so obvious. Right click on one of them and choose **Format Gridlines** on the object menu (or double-click one of the lines).
3. The **Format gridlines** dialog box lets you choose a dotted line and a paler color, like light grey.
4. Click **OK** – now it looks a little better. It is easy to read precise values from your chart.

The axis cross at $0 and the size differ-
ence of each bar will be easier to see if
they cross at a figure like $60,000.

1. Double-click on one of the figures on
the Y-axis. In the **Format axis** choo-
se the **Scale** tab.

2. Type **60000** in the **Minimum** field
and press Enter.

If you want to change the font of the
axis labels, or tilt the text to 45°, then
the principle is the same. Double-click
the text you want to alter. The appropri-
ate dialog box will always appear.

Chart types

Have you noticed the **Chart** toolbar? It
appears automatically when you select a
chart.

1. Click the **Chart type** button and
choose the three dimensional column
chart. All your formatting will be sa-
ved.
2. Try moving between the different ty-
pes of charts. Our model is best suited
to column, line and area charts.
3. Choose the three dimensional column
chart before continuing.

3-D perspective

The columns look like skyscrapers seen
from a helicopter – or have I just seen
too many American movies? Maybe we
want to fly around the skyscrapers to
see them from another angle:

1. Click on one of the vertical axes.
There should be a small black square
at the top and bottom of the axis.
2. Click on one of the black squares. Now
there should be black squares at the
top and bottom of every axis.
3. When the mouse is over any of the
black squares, it will turn into a small,
thin cross. Drag the cross.

draw at this point

bottom of the diagramm
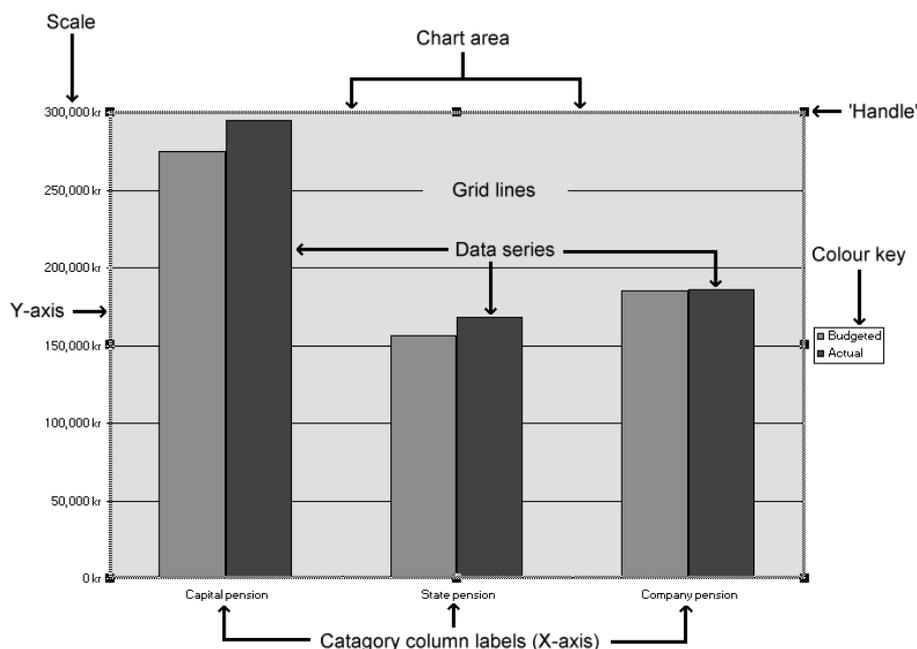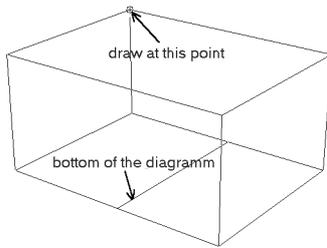
More than once all my attempts at formatting have ended in an illegible mess. Luckily, all formatting can be cancelled by right-clicking the chart, choosing **Chart Type** and clicking in the **Default Formatting** check box, followed by **OK**..

Save chart

The chart is part of the workbook, and will be saved together with it.

1. Press Ctrl+S and save the workbook using the name `PENSIONS.XLS`. Let the file remain on the screen.

We have now gone through the majority – and the most important – principles of formatting charts. In the following section, you will create a couple of other charts, but I won't detail each individual formatting step.

A chart on this sheet

A chart can be placed directly on the spreadsheet, which is very sensible when the spreadsheet takes up as little space as our pension model.

1. With the cursor in any cell in the area **A1:C4**, click the **ChartWizard** button.
2. Follow the guide step by step to set up a bar chart, but stop at step four.

Notice that even though you did not mark the area A1:C4, the Wizard automatically expects you to use it for your chart. Most of Excel's functions work like this. (Ctrl+* is automatically used by these functions).

In step four, choose:

3. Click **Finish** to add the chart, in a frame, to the spreadsheet.
4. The frame is selected (small tags, called handles are placed around the edge of the frame). Drag one of the handles to change the chart's size, or on the **Chart area** to move it.
5. Double-click the chart's objects to alter their format (the font size needs to be changed). When you have made the changes you want, click any cell in your spreadsheet, which takes you back into it.

In reality, the chart is in a frame, on top of the spreadsheet, and is taken to be an object - a picture. The arrow keys let you move the cursor under the chart's frame. This also means that you can place the chart over some of the spreadsheet's data.

Selecting data

You will now create a pie chart of the data in column **C**, but you'll want to use the text from column **A**.

1. Select cells **A1:A4**.
2. Hold the Ctrl key down while using the mouse to select cells **C1:C4**.

	A	B	C
1		Budgeted	Actual amount
2	Capital pension	$75,000.00	$95,000.00
3	401(k)	$153,000.00	$168,500.00
4	Pension Plan	$85,000.00	$86,250.00
5			
6	Total	$313,000.00	$349,750.00

It is very important that the area selected in column **A** is the same size as

that selected in column **C**. In principle, you will not be using **A1** for anything in the chart, but if you do not select this cell, the program will not understand how text and data belong together.

Now we are ready to create the chart:

1. Click **ChartWizard**, choose **Pie**, and the sub-type **Pie with a 3D visual effect.**
2. Click **Next** until you are on step four.
3. Choose **As object on sheet1** and click **Finish**.
4. Position the pie chart under the bar chart and alter the sizes so that they match each other.

Click once on the pie chart - now all three layers are selected. Click again, on the smallest bit, and now only it is selected. Drag the piece away from the center of the circle (it is called 'exploding' the chart).

Printing charts

You cannot be sure that the two charts can be printed on the same page before Excel has created the printout:

1. Click any cell in the spreadsheet so that the chart is *not* selected. Click on the **Print preview** button. If the printout will fill more than one page, then return to your spreadsheet and make the charts smaller, or move them slightly. Notice the dotted page break on your spreadsheet, which makes it easy to see if everything will fit on one page.
2. The gridlines are useful on the working screen, but are distracting (to say the least) on a printout. Click the **Setup...** button and the **Sheet** tab and deselect printing gridlines.

If you would like to print out just the pie chart, double-click it in the normal view and choose **Print Preview**. Excel automatically chooses the landscape format – not so dumb at all!

Household Budget

I would very much like to see both the husband's and wife's income shown graphically. Here's how:

1. Select the area **A2:N5** and create a bar chart on a new sheet in your workbook.

Excel has no difficulty in understanding that the first selected column and row should be used as text!

Now create a chart that compares **Total income** and **Total expenditure** like this

1. Select **A2:N2**, hold Ctrl now and continue selecting **A6:N6** and **A24:N25**.
2. Create a column chart and notice that again, Excel has correctly understood the appropriate area as text.

Remember that each selection must contain the same number of cells…!

Delete a chart on a speadsheet by selecting it and pressing Delete.

Working with worksheet tabs

Naming tabs

We now have three sheets with different data. They should have more meaningful names:

1. Double click the tab called **Sheet1**.
2. The text **Sheet1** is automatically selected. You can use up to 31 characters, including spaces. Type **Household Budget 1999** and press Enter.
3. Double click **Chart1** and type: **Salary-column**. Press Enter.
4. Double click **Chart2** and type: **Results-column**. Press Enter.

The order of the sheets should also be changed. You will want to work with the budget often, so that should be placed first.

1. Grab hold of the **Household Budget 1999** tab and drag it to the left. A small picture of a page by the cursor shows you that you are holding a spreadsheet. A small triangle indicates where the sheet will be placed when you release the mouse.
2. Drag the sheet all the way to the left and release it.

Deleting a sheet

We have unnecessary sheets in the workbook.

1. Select the unused sheets as follows: Click on **Sheet2** and hold Ctrl down while you continue clicking on **Sheet3** and **Sheet4** (if you have more empty sheets, select these in the same way).
2. Right-click one of the selected tabs to open the object menu. Choose **Delete**.
3. A dialog box warns you that the deletion will be permanent. Click on **OK** (Enter) to accept.

Inserting a sheet

As noted earlier, a workbook can contain up to 255 spreadsheets.

1. Right-click a tab and choose **Insert** on the object menu. The **General** tab in the **Insert** dialog box lets you choose between inserting a spreadsheet, a chart and other more advanced objects. The **Spreadsheet solutions** tab lets you create models based on built in templates. You can experiment with these later if you want to – personally I am not especially enthusiastic about them (I am a bit of an old fashioned type; I know how things that I have created myself work, or, to put it another way; if mistakes are going to be made, I am quite capable of making them myself…).
2. Choose **Spreadsheet** on the **General** tab and press Enter. The spreadsheet will be inserted to the left of the sheet you right clicked.
3. Drag the new sheet, **Sheet 1**, to the right until it is the last in the workbook.

Copying sheets

If you'd like to use a sheet should in another workbook, or if you need to create a nearly identical sheet in the same workbook, you can copy it to a new position.

1. Open the DECORATING – CANADIAN.XLS file. The spreadsheet is to be copied to HOUSEHOLD BUDGET.
2. Right-click the spreadsheet tab and choose **Move or Copy…** on the object menu.
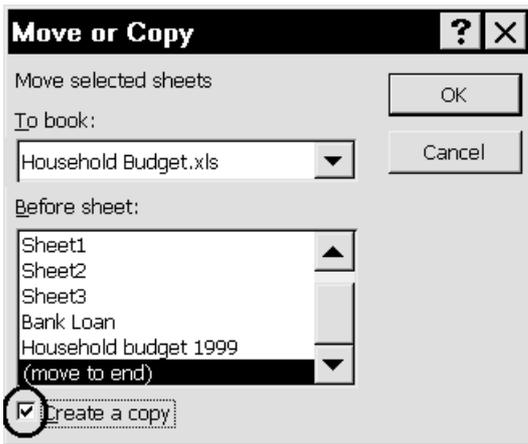
3. Specify that the sheet should be co-pied to HOUSEHOLD BUDGET.XLS in the dialog box.
4. Check the **Create a copy** field (click on it).
5. Choose **(move to end)** in the **Before sheet** field.
6. Click **OK**, and the screen will shift to **Household Budget**.
7. The sheet will be called **Sheet2(2)** because there already is a **Sheet2** in the workbook. Double-click the tab and edit the name to **Decorating**.
8. Go back to the DECORATING – CANADIAN.XLS by clicking on the **Window** menu, followed the file's name.
9. Close DECORATING – CANADIAN.XLS.

Functions

When Microsoft originally developed Excel, no one imagined that spreadsheets would be used for as many tasks as they are today. That Microsoft wants the program to be used in as many ways as possible is evident from the many functions it contains.

A function is a built-in formula, built up in a very specific way:

=Function name(arguments)

You have already seen examples of a function, namely the function for adding cells together: =SUM(cells). All functions begin by giving the operation the program should carry out, while the cells that should be operated on are given in brackets (the arguments).

These arguments can be an area, single cells or even another function.

For example, the function =SUM(C3;D5;C8) adds the three given cells. A semicolon separates the arguments and is called a 'List separator' (this is defined in Windows Control Panel/Regional settings).

Average

The function

=AVERAGE(B3;C48;SUM(F4:G12))

calculates the average of the numbers in **B3**, **C48** and the sum of the area **F4:G12**. Pay special attention to how the included function SUM is 'complete' – it has its own arguments within brackets.

A little exercise:

We'd like to create a formula to calculate the average income and expenditures in our Household Budget. In **P2** type the heading **Average**, and the formula in **P4** (type it directly in the formula line):

=AVERAGE(C4:N4)

Copy the formula so that every item in the budget has an average calculated for

it. Notice that this function is identical, except for its name, with the SUM formula in column **O**. Format the column like column **O** (this is best done by selecting **O2:O31**, clicking on the **Format painter**, and dragging over cells **P2:P31**). You may want to create a printer area covering just these cells (see page 60).

Other functions

As there is a big difference between the arguments that different functions need, Microsoft has chosen to build in a guide to help you create functions called the **FunctionWizard**.

Calculating loan payments

We are going to create a model to calculate the exact repayment on the bank loan in the Household Budget:

1. In HOUSEHOLD BUDGET.XLS, rename **Sheet1** to **Bank loan** and press Enter.
2. Type the following model in the spreadsheet:

|	A	B
1	**Bank loan**	
2		
3	Total loan	$ 9,250.00
4	Interest	7.75%
5	Payments	48
6		
7	Repayment amount	

3. In **B7**, type in the formula for calculating the monthly payments. We do not know exactly which arguments the formula uses, so click the **Function guide** button (Shift+F3).
4. All functions are listed by category. The most used functions are in the **Most recently used** category. But let us see how many functions are

actually available in total. Click the **All** category and scroll through the list in the **Function names** list. They are listed alphabetically.

5. Now click the **Financial** category and scdrop-down the list in the **Function names** field until you find the function **PMT**. Click on it:
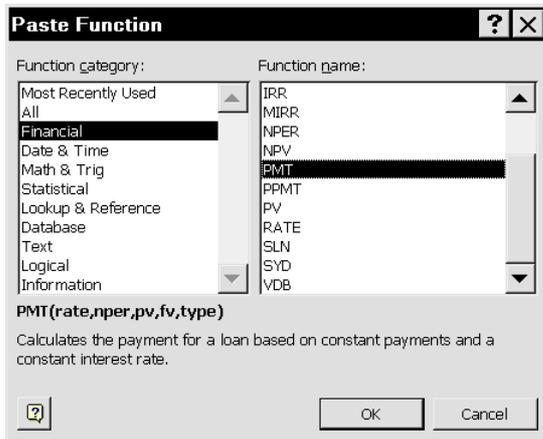
6. For this function, the text in the grey area is helpful (unfortunately this not always the case!)
The first payment is nearly all interest, and very little principal, and the last payment is nearly all principal and very little interest – but the total monthly payment is the same.

7. Click on the **OK** button. The dialog box disappears. The field on the left side of the formula line lets you choose other functions.

8. Now we are ready to type in the necessary data. Only the fields with bold type text need to be filled in. The **Rate** is the interest rate on the loan. **nper** is the total number of payments to make, while **nv** is the total amount you have borrowed:
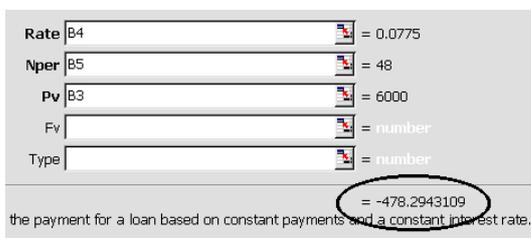
As shown in the picture, you should point to the cells containing the relevant information rather than typing the values in the fields. The dialog box may hide the cells containing data, but by grabbing the grey area, you can drag it to the bottom of your screen.

9. First click in the **Interest** field, so the cursor is blinking in it, then click on **B4**.

10. Now click on **Nper** and on **B5**.

11. Then click on **Nv** and on **B3**

12. But something is wrong! The gray area above the **OK** button shows the result of the calculation – it is far too big! The interest is annual. The payments are monthly. At the moment we have accepted that we will pay 8.5% interest *per month* for 48 months. This is an expensive loan!!

13. Change the **Rate** field to a monthly interest rate: **B4/12** (click in the field after **B4** and type **/12**).

14. The result in the **Value** field should now be minus 2,216.99. Press **Finish** (Enter).

Note that the cells are formatted with the currency format automatically (it is a financial function we have used).

If you use a function regularly, you will remember what arguments it uses. When this is the case, you can just type the formula directly in the formula line – the Wizard is only for when you need help in building the function.

Why are the payments negative?

Some people will say that it is always negative when you owe money; but that is not the reason. The function tells you that money is 'flowing away' from you – when the loan is positive, the payments will always be negative.

But payments should be shown as positive numbers – we know that we have to pay. With **B7** selected, click again on the **FunctionWizard** (Shift+F3).

1. Type a minus in front of the cell reference in **nv** and press Enter.
2. Type **9** as the interest rate in **B4** (when the cell is formatted to a percentage it is enough just to type a number – the cell already includes the % sign).
3. Type a new loan amount and number of payments and check that the payment amount changes in every case.
4. Go back to the original amount again before proceeding.

The other two fields in the Wizard, **fv** and **type**, are optional, so we can leave them blank.

The option **fv** means 'future value'. When we leave this blank, it means that the loan is to be paid back in full in the number of payments we have specified. If you still owe $1,000 after you have made these payments, then enter 1,000 in the **fv** field.

The option **type** decides when in the period the payment is due, and can contain either **0** or **1**. When we leave it blank (**0**) it means that the payments are due at the end of the month (normal banking practice). If you insert a **1** they are due on the first of the month.

Press the **Help** button in the **Function-Wizard** dialog box for further explanations.

Here you should know that the function PMT isn't completely correct in the way it handles interest. Thus, the data you receive from your bank may be different than your own data.
In addition you should be aware that many banks constantly add specific charges to your loan – fees for funds transfers and such.

Naming cells in functions

Our formula is not very easy to read. It would be easier if the cells we used had more descriptive names. The text in column **A** is good. We can try and use it to name the cells **B3:B5**:

1. Select both the text and the cells that should be named, **A3:B5**.
2. Choose the Insert|Name|Create command.
   Notice that Excel has understood that the left column contains names and that these should be used in the right column. Press Enter.
3. Select **B3** and look at the name box. The cell is now called **Total_loan**. Check the names in **B4** and **B5** as well.

4. But the formula in **B7** doesn't know yet that we have given the cells names. We will now use the names in the formula. Choose Insert|Name|Apply. The three relevant names are already selected, so just press **OK** (Enter) and check the formula in **B7**:

=PMT(Interest/12;Payments;-Total_loan)

This makes the formula much easier to understand.

Save the workbook(Ctrl+S).

Links

One of the clever things with a spread-sheet is that you only need to store important numbers or formulas in one place. Other spreadsheets that need a number or formula can get it from there. If the **Total apartment costs** in **Household Budget** had been in another spreadsheet, we would have said that we had created a link to the cells.

The principle is very simple. I suggest that we start by practicing in a new workbook.

1. Open a new blank workbook by clicking the **New workbook** button.
2. In **A1**, type **Sales** and in **B1**, **25000**.
3. Click **Sheet2.** You can also press Ctrl+PageDown to move to the next sheet (Ctrl+PageUp moves to the previous sheet). In cell **A1**, type **Sale from Sheet1:** and adjust the width of column **A**.

You are now ready to get the number from **Sheet1**.

1. The link is to be created in **B1** on **Sheet2**. Start with the usual equals sign. The cursor is now anchored to the cell.
2. Click **Sheet1** tab. The tabs and formula line show you what is happening:
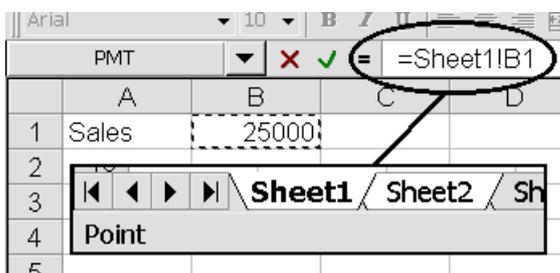
Both tabs are white, and the formula is referring to **Sheet1**. At the same

time the status line shows that Excel is 'pointing'.
3. Click **B1** and press Enter. Excel jumps back to **Sheet2**

The link is dynamic. That means that it does not only relate to the cell, but also to the name of the sheet. Let us check both:

1. Go to **Sheet1** (Ctrl+PageUp), and change the number in **B1** to **30000**.
2. Go back to **Sheet2** (Ctrl+PageDown) – the number in **B1** is updated. The link works.
3. Double-click the tab for **Sheet1**.
4. Rename the sheet to **Sale 1999** and press Enter.
5. Return to **Sheet2** (Ctrl+PageDown), and look at the formula in **B1**:

B1 on the **Sale 1999** sheet is the 'source' of our result, but cell **B1** on **Sheet2** is the 'dependant' cell.

That is the principle of a link.

Information

You can also create links between different workbooks, but this takes a bit of practice.

You also need to be very disciplined about it (as with all computer-related things). If you have linked several workbooks together, it is very important that you do not change either their names or their location (any changes have to take place in Excel with all the files open).

If you use Windows Explorer to move a source file, then any dependant workbooks will still be looking for the workbook's original name and position. The link will be broken, and Excel will ask you for the correct location.

Close the workbook without saving it.

Sorting & filtering data

I have chosen sorting and filtering to be the last two subjects dealt with in this booklet. This is just a short introduction to both subjects. Filtering can be used for relatively advanced procedures, which are not covered here.

Sorting

Close Household Budget and open the file DECORATING – CANADIAN.XLS.

You are going to sort the list to be in alphabetical order, but the way the spreadsheet is laid out at present will not allow this. The function expects there to be only one row of headings.

First you will have to move the **Exchange** rate and **Sales tax** cells further down in the spreadsheet:

1. Type **Exchange rate:** in **A21** and **Sales tax:** in **A22**.
2. Move **C2** to **B21** and **D2** to **B22**.
3. Delete **row 2** (which is now empty).
4. **Row 17** is not to be sorted, so it should be on its own. Insert a new **Row 17**. The **Total** formulas should now be in **Row 18**.

	A	B	C	D
1	Material:	Net:	Sales Tax:	Price:
2	Brush	19.00	2.85	21.85
3	Primer		15.75	120.75
4	Paint	20c.	70	170.20
5	Filler			
	...oves	19.25	2.89	
15	Face mask	19.95	2.99	22.94
16	Wood treatment	125.75	18.86	144.61
17				
18	Total:	1217.20	182.58	1399.78

The spreadsheet is now ready for sorting. All data to be sorted is placed together without blank rows and columns.

First, we will sort the materials alphabetically by name:

1. Select any material name in **column A**.
2. Click the **Sort ascending** button. The function leaves the first row alone – smart!
3. Now sort the materials in descending alphabetical order.
4. Select any price in **column E** and sort the data so that the most expensive things are at the top and the cheapest are at the bottom.

All spreadsheets can be sorted in this way, no matter what data they contain. All you have to do is check that the cells are adjoining (next to each other).

If you want to sort using several conditions, then use the Data|Sort function.

Filtering

To search for a particular entry, you'll want to use a 'filter.' As in sorting, to use this function, the areas must be adjoining.

Let's try this out using DECORATING – CANADIAN.XLS:

1. Select any cell in the area **A1:E16**.

	A	
1	**Material**	▼
2	(All)	
3	(Top 10...)	
	(Custom...)	
4	Brush	
5	Craft knife	
6	Craft knife blades	
	Edge filler	
7	Face mask	
8	Filler	
9	Filling knife	
	Glass-fibre	
10	Paint	

1. Choose Data|Filter, AutoFilter. The cells in the first row are now given a dropdown list, from which you can choose the value you want.
2. Click the drop-down list attached to cell **A1** and choose **Filling knife**.

All the other rows are now hidden and only the row that fulfills your criterion is shown. Note that the row numbers are shown in blue, and the little arrow on the drop-down list in **A1** is also blue. This shows that the list has been filtered, and in which column the criteria for the filtering have been defined.

You are to find the three most expensive materials:

1. First, remove the filtering by choosing the drop-down list in row **A1** followed by **(All)**.
2. Click the drop-down list in **B1** and choose **(Top 10...)**.
   This lets you build your own 'top ten' list.
3. In the dialog box, display the **Top 3 items** and press Enter:
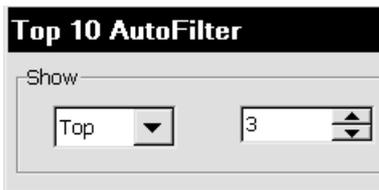
The designation **Top 10** isn't to be taken literally; you can specify how many items should be displayed.

4. Choose **(All)** on the drop-down list to make all entries visible.

User defined filters

You want to find all materials that cost more than 5 Dollars each. The problem is solved by creating a user defined filter:

1. Click the drop-down list in **E1** and choose **(Custom...)**.

2. Specify the filter criteria to be **larger than (>) 5** and press Enter. Four entries match the criteria.
3. Change the criteria to be **less than 5**. Nine entries match the criteria.
4. Create the criteria to display only entries with a sales price of **between 5 and 10 Dollars**:
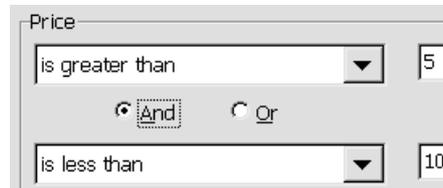
Two entries fulfill the criteria.

5. Remove the AutoFilter by selecting Data|Filter**,** AutoFilter. All entries are displayed again.

You can set criteria that filter entries after their names, or other text. For example, you can find all materials starting with 'P'.

1. Choose Data|Filter**,** AutoFilter.
2. Click the drop-down list in **A1** and select **(Custom...)**. Specify that the criteria should be **= P*** where the asterisk specifies that any and all characters are allowed after the P:
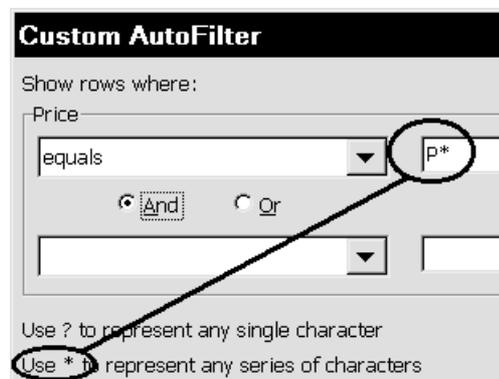
Two entries fulfill the criteria.

Until now you have only filtered using a single field (column). However now, you want to find the materials beginning with the letter **P** that *also* cost **more than $5.** This is done by filtering in both cells **A1** and **E1**, as here:

1. Click the drop-down list in **A1** and choose **(Custom...)**.
2. Type the criteria **Begins with** in the left field, and **P*** in the right field and press Enter.
3. Click the drop-down list in **E1** and choose **(Custom...)**.
4. Type the criteria **Greater than** in the left field, and **5** in the right field and press Enter.

Primer and **Paint** are the entries that fulfill the criteria.

If the you want to find entries that *either* begin with P *or* cost more than $10, you cannot use **AutoFilter**.

In this case you will have to use the **Advanced filter**. However, this function is not particularly user friendly. It is obvious that Microsoft thinks that advanced database tasks should be carried out in a database program like Access. Nevertheless, you can go a long way with AutoFilter -- providing that you are careful how you arrange your data.

'Where do you want to go tomorrow?'

So now we have reached the end of this booklet…or have we!!!

I hope you do not think so. If you are now inspired to investigate Excel further, to play with the program and let your imagination create new and exciting spreadsheet models, then I have achieved what I set out to do with this booklet.

It must be obvious from my comments throughout the booklet that I am fascinated by Excel. But you have probably found out yourself that it could still be improved in many areas. And that is what computers are all about…!

Programs can still only carry out the tasks that they have been programmed to do. We people make demands on the way a program works – and people make mistakes, which are then reflected in the program. The biggest danger with the fantastic development that is taking place in the computer industry now is that we users are becoming so fascinated with the technical side that we completely forget what we really need, we become 'hi-tech-freaks'.

It is you, dear reader, who should decide what your programs should be used for and which way they should be developed.

Originally, computers were difficult to master. Ordinary users had to learn a mass of codes and were forced to think like computers…(!)

Then came the graphical user interface and the mouse. In one stroke, the computer was easier to use. The mouse was the new wonder tool, and we could all click and click without thinking about codes.

But it was not long before the worm in the apple (pun intended) became visible, or rather, felt! The mouse showed that it could easily give us arm problems, in both the wrist and shoulder.

So where are we now, and how does Excel fit in with these developments?

I am happy to say that Excel has, for the most part, been designed with the user in mind. Windows98/95, Word, and Excel are excellent examples of how the user has been able to influence program development. If you think that I have focused (too) much on how the keyboard can be used – well, you are right. Over the last few years I have learnt how to work fast and effectively without a mouse at the end of my arm. Once you have digested this booklet, and maybe worked through it a couple of times, I am sure you will see what I mean.

On the next pages you will find a glossary of the most used keyboard shortcuts. I suggest that you have the booklet open at these pages while you work further with this wonderful program.

Have fun …and remember what a wise man once said:

'Whether you think you can, or whether you think you can't, you're probably right!!' Henry Ford

F1.............................Help

F2.............................Activate the formula line

F3.............................Displays the **Paste Name** dialog box, if names are defined in the workbook

SHIFT+F3................Displays the **Function-Wizard**

CTRL+F3.................**Define Name** command

CTRL+SHIFT+F3 ....**Create Name** command

F4 (on formula line) .Absolute reference (**$**).

F4 ....Repeat last action (Ctrl+Y may also be used)

CTRL+F4.................Close window

ALT+F4....................Exit Microsoft Excel

F5.............................**Go to** command (the **Edit** menu)

CTRL+F5.................Restore window size

CTRL+F6.................Next window

CTRL+SHIFT+F6 ....Previous window

F7.............................Spell check

F8.............................Extend a selection (EXT displayed on status line).

F9.............................Calculates all sheets in all open workbooks

F10...........................Activates the menu bar

SHIFT+F10.............Activates the object menu

CTRL+F10...............Maximize the window

F11...........................Creates a standard chart on a new sheet, based on the selected data

F12...........................The **Save as** command

TAB..........................Move to the next field in a dialog box

SHIFT+TAB.............Move to the previous field in a dialog box

ALT+↓.......................Opens a drop-down list

ESC ....Cancel a command and close the dialog box

CTRL+PGDN ....Move to the next sheet in a workbook

CTRL+PGUP...........Move to the previous sheet in a workbook

CTRL+DEL..............Delete the text to the end of the line

ENTER ....End an entry

ALT+ENTER ....Insert a line shift in a cell

HOME......................Move to the first column in a row

CTRL+SHIFT+$ ......Format in currency format with two decimals displayed

CTRL+SHIFT+% .....Format in percentage format with no decimals displayed

CTRL+SHIFT+! ....Format with two decimals and thousand separators

CTRL+S...................**Save** command

CTRL+1...................Open the **Format Cells** dialog box

CTRL+B...................**Bold** text on and off

CTRL+I....................*Italic* text on and off

CTRL+U ....Underlined text on and off

CTRL+X...................Cuts the selected area

CTRL+C ....Copies the selected area

CTRL+V...................Inserts the contents of the clipboard

CTRL+Z...................Undo the last action

CTRL+D ....Fill downwards

CTRL+R ....Fill to the right

CTRL+Home ....Move to cell **A1**

CTRL+Arrow key.....Move to the last cell containing data in the direction of the arrow

CTRL+PLUS ....Open the **Insert** dialog box

CTRL+Space...........Select the column

SHIFT+ Space.........Select the row

The shortcuts might be a bit different on your machine depending on your keyboard and regional settings.

There are far more shortcut keys than those that I have listed here. You can find them by searching for **shortcut keys** in Excel's help program.