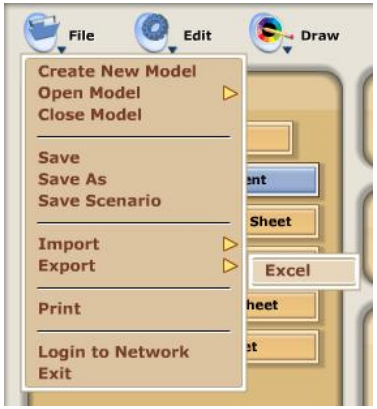
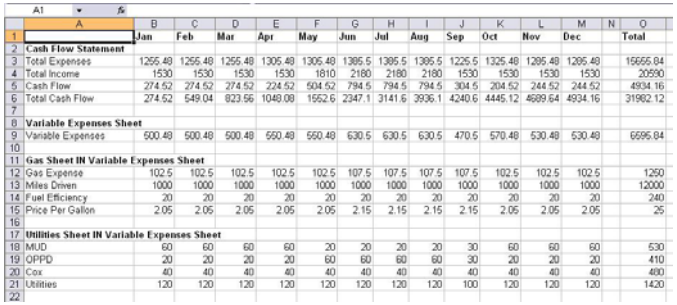
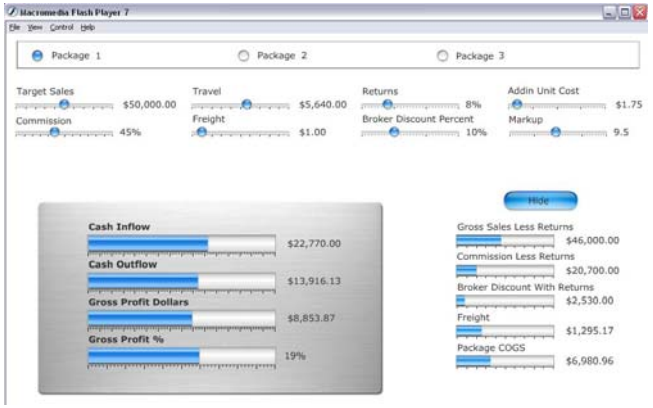
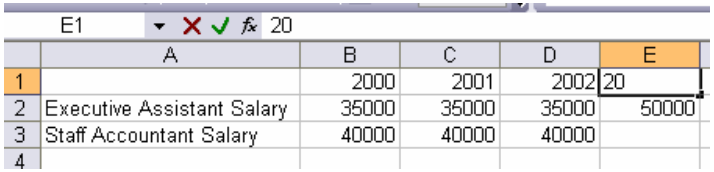
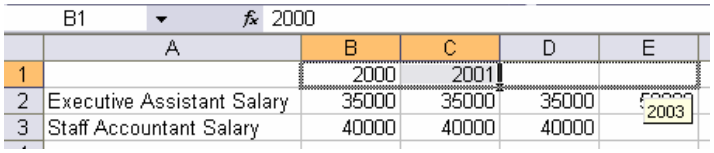
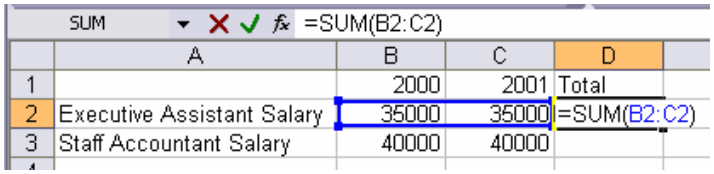
The Function	How Planners Lab handles it	How Excel handles it
Constructing Understandable Assumptions	A main advantage of the Planners Lab model is the ease with which the models can be constructed, understood, and conveyed to other people. The following small example highlights the point. **Equations:** **Profit** 1 Expenses = 40000, PREVIOUS*1.03 2 Income = 50000, PREVIOUS*1.05 3 Savings = Income - Expenses	In Excel, this diagram would be shown as follows: C6 fx | | A | B | C | D | |---|---|---|---|---| | 1 | | 1 | 2 | 3 | | 2 | Expenses | 40000 | =B2*1.03 | =C2*1.03 | | 3 | Income | =50000 | =B3*1.05 | =C3*1.05 | | 4 | Savings | =B3-B2 | =C3-C2 | =D3-D2 | | 5 | | | | |
Advantages of both products	Planners Lab is a modeling language, rather than a calculator. This means that assumptions and English language equations like the following can be used instead of the cryptic formulas of Excel. **Equations:** **Labor Costs IN Corner Coffee Shop** 1 Number Of Employees = (Customers IN Business / 20) / (Employee Services Per Hour) 2 Employee Services Per Hour = 10 3 Hourly Wage = 8.00 4 Total Wage Cost = Hourly Wage * Number Of Employees * 8 5 Manager Cost = 2100.00 6 Total Labor Costs = Manager Cost + Total Wage Cost	But Excel does easily format large amounts of tabular data. I3 fx =B3 | | G | H | I | J | K | L | M | N | O | |---|---|---|---|---|---|---|---|---| | | | | Sales v Targets Combo | | | | | | | | | Q1 | Q2 | Q3 | Q4 | Total | | | | | Sales Target 1 | 1000 | 1500 | 2500 | 500 | 5500 | | | | | Sales Forecast 1 | 750 | 1200 | 2000 | 1000 | 4950 | | | | | Percentage 1 | 75 | | | | | | | | | | Q1 | | | | | | | | | Sales Target 2 | 1200 | | | | | | | | | Sales Forecast 2 | 1400 | | | | | | | | | Percentage 2 | 117 | | | | | | | | | | Q1 | | | | | | | | | Sales Target 3 | 1500 | | | | | | | | | Sales Forecast 3 | 1700 | | | | | | | | | Percentage 2 | 113 | | | | | | | Format Cells Number | Alignment | Font | Border | Patterns | Protection Category: General Number Currency Accounting Date Time Percentage Fraction Sample 1000 General format cells have no specific number format.

Synergy between Excel and the Planners Lab	Excel spreadsheets can be created directly from a Planners Lab model. This allows for the following: (1) Building models in a natural language and then using Excel's power for tabular report formatting and exporting to Excel from Planners Lab:  This export process results in a very neatly organized Excel spreadsheet: 	(2) The ability to launch sophisticated interactive dashboard displays from within the Planners Lab where the dashboard creation engines operate from Excel spreadsheets.  The dashboard selected will appear:  Vice versa, Planners Lab can import data from Excel spreadsheets to load Planners Lab models written in English equations.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Total
2	**Cash Flow Statement**														
3	Total Expenses	1255.48	1255.48	1255.48	1305.48	1305.48	1385.5	1385.5	1385.5	1225.5	1325.48	1295.48	1295.48		15655.84
4	Total Income	1530	1530	1530	1530	1810	2180	2180	2180	1530	1530	1530	1530		20590
5	Cash Flow	274.52	274.52	274.52	224.52	504.52	794.5	794.5	794.5	304.5	204.52	244.52	244.52		4934.16
6	Total Cash Flow	274.52	549.04	823.56	1048.08	1552.6	2347.1	3141.6	3936.1	4240.6	4445.12	4689.64	4934.16		31982.12
7															
8	**Variable Expenses Sheet**														
9	Variable Expenses	500.48	500.48	500.48	550.48	550.48	630.5	630.5	630.5	470.5	570.48	530.48	530.48		6595.84
10															
11	**Gas Sheet IN Variable Expenses Sheet**														
12	Gas Expense	102.5	102.5	102.5	102.5	102.5	107.5	107.5	107.5	107.5	102.5	102.5	102.5		1250
13	Miles Driven	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		12000
14	Fuel Efficiency	20	20	20	20	20	20	20	20	20	20	20	20		240
15	Price Per Gallon	2.05	2.05	2.05	2.05	2.05	2.15	2.15	2.15	2.15	2.05	2.05	2.05		25
16															
17	**Utilities Sheet IN Variable Expenses Sheet**														
18	MUD	60	60	60	60	20	20	20	20	30	60	60	60		530
19	OPPD	20	20	20	20	60	60	60	60	30	20	20	20		410
20	Cox	40	40	40	40	40	40	40	40	40	40	40	40		480
21	Utilities	120	120	120	120	120	120	120	120	100	120	120	120		1420
22															

Time Periods with the COLUMNS keyword	Using the statement below, you can create six columns titled 2000, 2001, 2002, 2003, 2004, and Total. **Column Statement:** **COLUMNS 2000 - 2004, Total** The "COLUMNS" keyword defines time periods. This can be defined in any way, e.g., 2000, 2001, 2002, 2003, 2004 or 2000 – 2003, 2004. "Total" is defined as a special column (see following).	Performing the same operation in Excel requires that the names of all columns be typed out separately.  E1 20 A B C D E 1 2000 2001 2002 20 2 Executive Assistant Salary 35000 35000 35000 50000 3 Staff Accountant Salary 40000 40000 40000 4 An alternate method would be to highlight the first two values in a pattern and drag it across multiple cells using the square at the bottom right corner of the highlighted area.  B1 2000 A B C D E 1 2000 2001 2 Executive Assistant Salary 35000 35000 35000 3 Staff Accountant Salary 40000 40000 40000 2003
Special time periods	To create a special column in Planners Lab, name the column in the Column Statement as shown above, and then define it in the Special Column Equations section depicted below: **Special Column Equations:** **COLUMN Total = SUM(COL 2000 THRU COL 2004)** In this case, the column "Total" is defined as the sum of years 2000 through 2004.	To define a special column in Excel, a formula must be created for one of the cells in the new column.  SUM =SUM(B2:C2) A B C D 1 2000 2001 Total 2 Executive Assistant Salary 35000 35000 =SUM(B2:C2) 3 Staff Accountant Salary 40000 40000 Highlighting the cell containing the formula will display a small square in the bottom right corner of the highlighted cell. At this point drag the box as far down as the special column will extend.

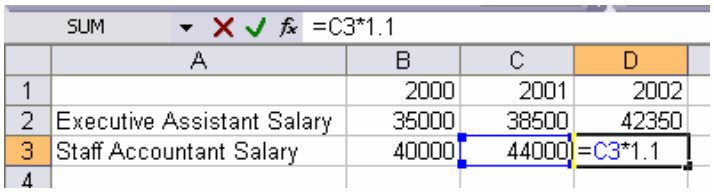
Another example of building understandable assumptions	Creating assumptions in the Planners Lab uses plain business words in the user's own language. Ordinary equations are used to define computations and relationships. **Equations:** **Cash** 1 Total Sales = 75000, PREVIOUS*1.05 2 Price Per Unit = 5000 FOR 3, 6000 3 Revenue = Total Sales * Price Per Unit 4 Expenses = .70 * Revenue 5 Profit = Revenue - Expenses The resulting table displaying these figures: **Table:** Variable Name | 2000 | 2001 | 2002 | 2003 Total Sales IN Cash | 75000 | 78750 | 82687.5 | 86821.88 Price Per Unit IN Cash | 5000 | 5000 | 5000 | 6000 Revenue IN Cash | 375000000 | 393750000 | 413437500 | 520931250 Expenses IN Cash | 262500000 | 275625000 | 289406250 | 364651875 Profit IN Cash | 112500000 | 118125000 | 124031250 | 156279375	When using Excel, it is necessary to reference a cell location directly when including it in an equation, such as the multiplication operation below. D5 =0.7*D4 A | B | C | D | E 1 2 Total Sales | 75000 | 78750 | 82687.5 | 86821.875 3 Price Per Unit | 5000 | 5000 | 5000 | 6000 4 Revenue | 375000000 | 393750000 | 413437500 | 520931250 5 Expenses | 262500000 | 275625000 | 289406250 | 364651875 6 Profit | 112500000 | 118125000 | 124031250 | 156279375 To get the value in D5, multiply 0.7 by D4. It is also possible to name a cell by typing a name into the Name Box above the "Row Number" column, and then reference it using the assigned name. See example below: SalesYr1 700 A | B | C | D 1 2 Sales | 700 | 770 | 847 SalesYr2 =SalesYr1*1.1 A | B | C | D 1 2 Sales | 700 | 770 | 847

<table>
<tr>
<td>Previous</td>
<td>
The PREVIOUS keyword references the value directly previous to it in an equation. Whatever value appears last in the equation is used for all remaining time periods.

Administrative Salaries
1 Executive Assistant Salary = 35000, PREVIOUS * 1.10
2 Staff Accountant Salary = 40000, PREVIOUS*1.10

The table below is created:

Table:
<table>
<tr><th>Variable Name</th><th>2000</th><th>2001</th><th>2002</th><th>2003</th></tr>
<tr><td>Executive Assistant Salary IN Administrative Salaries</td><td>35000</td><td>38500</td><td>42350</td><td>46585</td></tr>
<tr><td>Staff Accountant Salary IN Administrative Salaries</td><td>40000</td><td>44000</td><td>48400</td><td>53240</td></tr>
</table>
</td>
<td>
In Excel, the formula in D3 must be entered in with a cell reference multiplied by 1.1. This formula must be entered in each of the four calculated cells in this example.

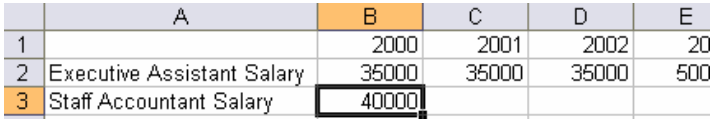


</td>
</tr>
<tr>
<td>FOR</td>
<td>
The FOR keyword will fill in the specified value across the specified number of columns.

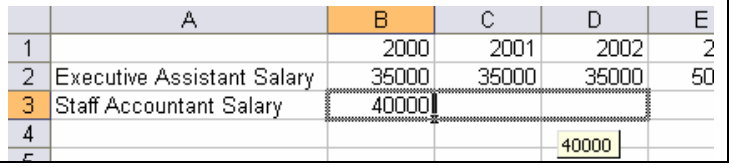
Administrative Salaries
1 Executive Assistant Salary = 35000 FOR 3, 50000
2 Staff Accountant Salary = 40000 FOR 3, 55000

Below is a view of the data that is generated from the above equations:

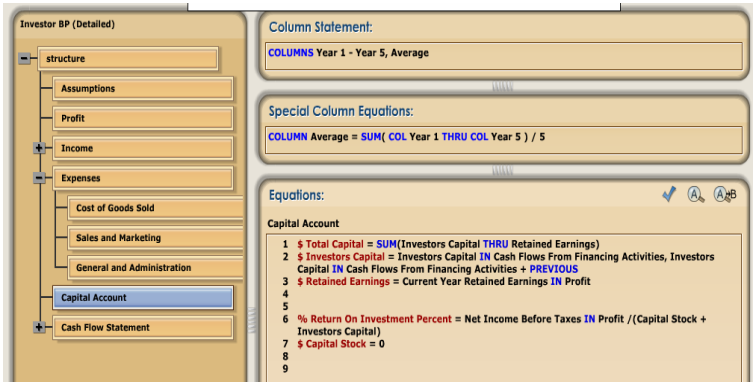
Table:
<table>
<tr><th>Variable Name</th><th>2000</th><th>2001</th><th>2002</th><th>2003</th></tr>
<tr><td>Executive Assistant Salary</td><td>35000</td><td>35000</td><td>35000</td><td>50000</td></tr>
<tr><td>Staff Accountant Salary IN</td><td>40000</td><td>40000</td><td>40000</td><td>55000</td></tr>
</table>
</td>
<td>
First, enter a value into the first cell in the row. Next, locate the small square at the bottom right hand corner of the highlighted cell. Then, drag the small square across the number of columns to be pasted to.

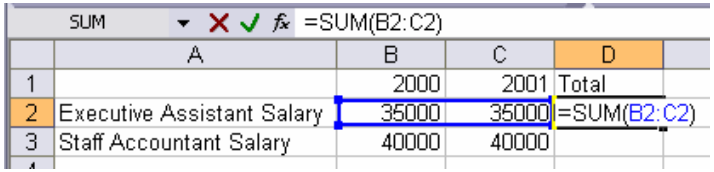


After releasing the mouse button, the 40000 value will be copied across all three columns specified.



</td>
</tr>
</table>

Maintenance and updates of complex models	The Planners Lab approach is to modularize large complex models into small understandable and manageable chunks. This is done using a “family” tree hierarchy. No such explicit feature exists in Excel. Data can be passed back and forth between any of the nodes in the family tree.  Within any node of this “family” tree structure, variables from other nodes can be referenced by using the “IN” keyword. Line 3 from the picture above has been expanded for easy viewing below. `3 Retained Earnings = Current Year Retained Earnings IN Profit` This indicates that Retained Earnings is equal to the variable “Current Year Retained Earnings” in the node named “Profit”.	In Excel multiple “sheets” can be created and reference from one sheet to another is allowed. For example:  When accessing values on other spreadsheets, the cell to be selected is clicked after flipping to that sheet. Alternatively, the sheet name followed by a ‘!’ and then the cell reference is also acceptable, as in the example below. C4 =Income!B4-Expenses!B4 |	A	B	C	D	E	F
---	---	---	---	---	---	---
1	**Year**		**0**	**1**	**2**	**3**
2						
3	**Discount Rate**	10%				
4	**Cash Flows**		-10000	3000	4200	6800
5						
6	**Net Present Value**	$1,188.44				
7							

SUM	Summing variables is accomplished by creating a new variable, and then setting this new variable equal to the SUM of variables to be added up. **Equations:** **Administrative Salaries** 1 Executive Assistant Salary = 35000 FOR 3, 50000 2 Staff Accountant Salary = 40000 FOR 3, 55000 3 4 Total Salaries = SUM(Executive Assistant Salary, Staff Accountant Salary) Any variables from any nodes can be included. To include a variable from a different node in the tree, see the IN statement above.	Summation in Excel is accomplished by first selecting a cell to store the sum. In the example below, that cell will be D2. Click on D2 and type an '=' sign followed by the word SUM and an open parenthesis '(' Next, click and drag the mouse to highlight the row or column of cells to be added. The range will appear automatically in the formula bar and in the cell itself. Finish by typing a close parenthesis ')' and then clicking on the green check box in the formula bar.  SUM =SUM(B2:C2) A B C D 1 2000 2001 Total 2 Executive Assistant Salary 35000 35000 =SUM(B2:C2) 3 Staff Accountant Salary 40000 40000 Cell D2 will now display the value equal to the sum of the cells selected.
SUM THRU	The difference between SUM THRU and the previous SUM is that SUM THRU allows a shorthand list of contiguous variables to be added up. **Administrative Salaries** 1 Exec Salary = 35000 FOR 3, 50000 2 Rent = 1600, 1600, 1600, 1900 3 Janitorial = 1600, 1600, 1600, 1900 4 5 6 Total Expenses = SUM(Exec Salary THRU Janitorial)	See SUM above.

IF–THEN–ELSE	IF – THEN – ELSE equations use the following format: Equations: Sales 1 Price Per Unit = 50 2 Customer A Volume Per Purchase = 10000 3 Customer A Discount = IF Customer A Volume Per Purchase > 9000 THEN .15 ELSE 0 Line 3 contains the IF – THEN – ELSE statement. 3 Customer A Discount = IF Customer A Volume Per Purchase > 9000 THEN .15 ELSE 0 In this case, the resulting values are as follows in table view: Table: Variable Name | 1 | 2 | 3 Price Per Unit IN Sales | 50 | 50 | 50 Customer A Volume Per Purchase IN Sales | 10000 | 10000 | 10000 Customer A Discount IN Sales | 0.15 | 0.15 | 0.15	IF – THEN – ELSE equations in Excel reference cell locations rather than variables. In the following example, B5 is an IF – THEN – ELSE statement indicating that if B4 is greater than 9,000 that a discount of .15 would be displayed in row 5, otherwise a zero is displayed. B5 =IF(B4>9000,0.15,0) A | B | C | D 1 | 1 | 2 | 3 2 | Sales 3 | Price Per Unit | 50 | 50 | 50 4 | Expected volume per purchase | 10000 | 10000 | 10000 5 | Discount | 0.15 | 0.15 | 0.15

NPV

Net Present Value is accomplished in Planners Lab by using the following syntax:

Variable name = NPV (Cash In, Cash Out, Discount Rate)

Equations:

Product 1

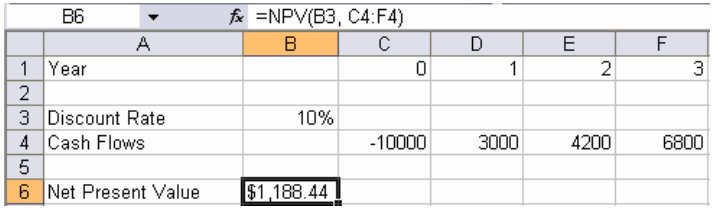
```
1  Discount Rate = .10
2  Cash In = 0, 9000, 15000, 20000
3  Cash Out = 10000, 6000, 10800, 13200
4  Net Present Value = NPV(Cash In, Cash Out,Discount Rate)
```

The table below shows us a NPV of $1,188.44 at the end of 2003.

Table:

Variable Name	2000	2001	2002	2003
Discount Rate IN Product 1	0.1	0.1	0.1	0.1
Cash In IN Product 1	0	9000	15000	20000
Cash Out IN Product 1	10000	6000	10800	13200
Net Present Value IN Product 1	-9090.91	-6611.57	-3456.05	1188.44

Net Present Value in Excel is accomplished by the following:

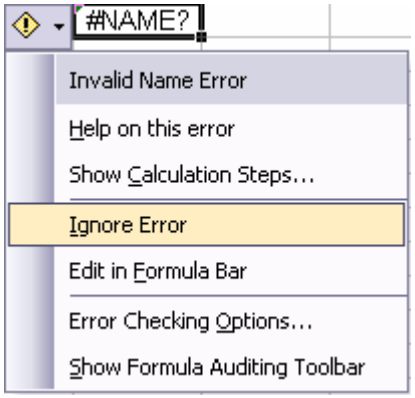


	A	B	C	D	E	F
1	Year		0	1	2	3
2						
3	Discount Rate	10%				
4	Cash Flows		-10000	3000	4200	6800
5						
6	Net Present Value	$1,188.44				

A main difference between Planners Lab NPV and Excel NPV is that Planners Lab allows calculations on the variables that make up the cash flow, while Excel works on the cash flow values directly.

Planners lab is assumptions oriented, while Excel is numbers oriented.

IRR	Internal Rate of Return is accomplished in Planners Lab by using the following syntax: Variable name = IRR (Cash In, Cash Out) **Equations:** **Cash** 1 Cash In = 0,450000,525000,750000 2 Cash Out = 1250000,65000,75000,80000 3 4 Internal Rate of Return = IRR(Cash In,Cash Out) 5 The table below shows us an IRR of 9 percent at the end of 2003. **Table:** 	Variable Name	2000	2001	2002	2003
---	---	---	---	---
Cash In IN Cash	0	450000	525000	750000
Cash Out IN Cash	1250000	65000	75000	80000
Internal Rate of Return IN Cash				0.09		Internal Rate of Return in Excel is accomplished by the following: B4 =IRR(B3:G3) |	A	B	C	D	E	F	G
---	---	---	---	---	---	---	---
1	Year	0	1	2	3	4	5
2							
3	Cash Flows	-70000	12000	15000	18000	21000	26000
4	Internal Rate of Return	9%						 A main difference between Planners Lab IRR and Excel IRR is that Planners Lab allows calculations on the variables that make up the cash flow, while Excel works on the net cash flow values directly.

Finding Mistakes	To find mistakes in the logical construction of any Planners Lab model, click on the “Validate Model” button. Important features to take note of: a. Nodes containing detected errors are highlighted red b. Syntax errors within nodes are highlighted yellow c. The Error Messages box at the bottom of the screen displays both the line number and type of the error 	Error checking in Excel is handled in a more “on-the-fly” basis. Whenever a cell is edited, Excel checks to see whether the formula or value is correct. If the value is not useable, Excel displays the following error messages in the cell with an error: #NAME? There are many error messages including #VALUE!, #DIV/0, #N/A, #REF!, #NUM!, #NULL!, and ###### Each error is caused by a different reason, and clicking on the Information box will allow access to more information on how to fix it. 

Playground	The Planners Lab “Playground” is for viewing model results and making temporary changes in equations to answer what-if and goal-seeking questions without permanent changes to the model itself. Playground visualization in Planners lab takes three different forms. Tables, Bar Charts, and Trend Line Charts. To select the manner in which to display results, click the playground button and choose one. 	

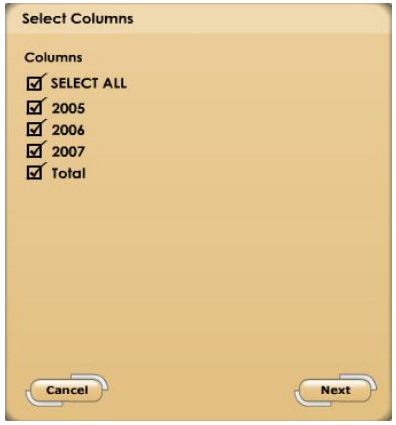
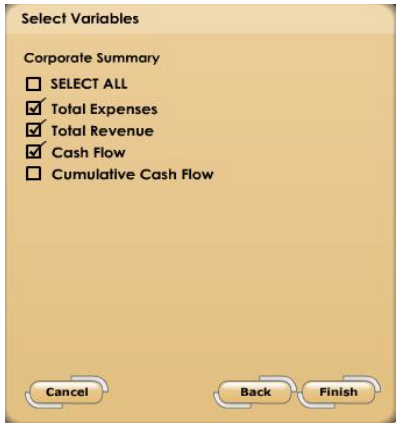
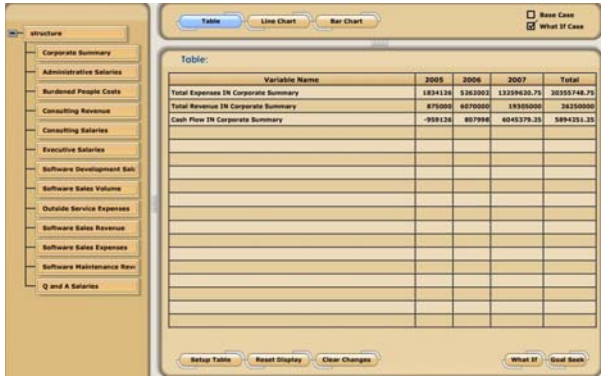
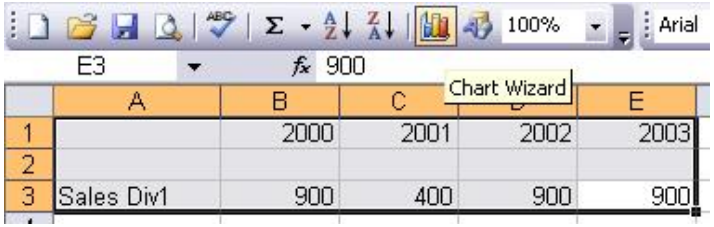
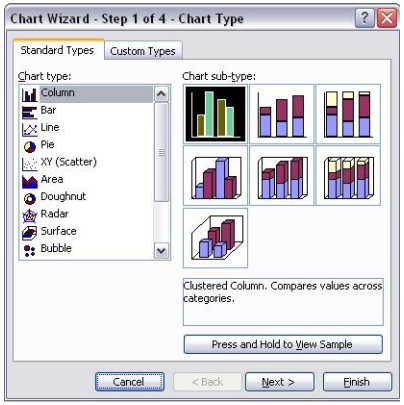
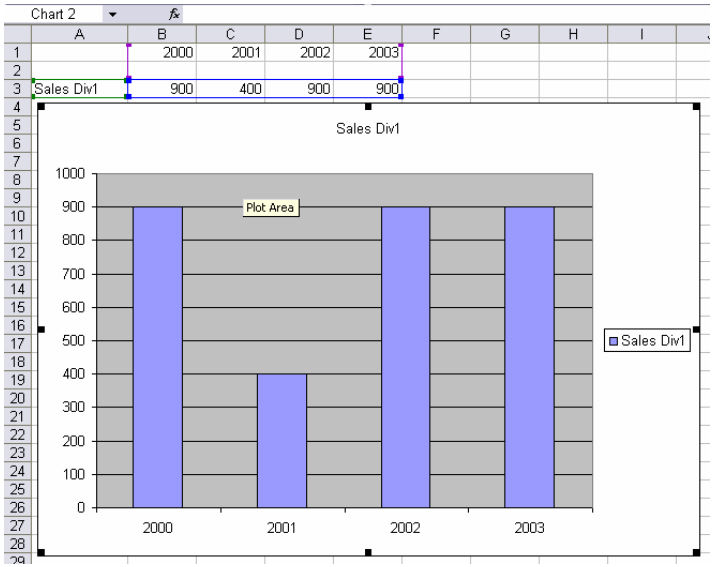
Variable Selection	First, pick a table view from the following dialogue boxes. Choose columns to report:  Choose variables to report:  	

TABLE VIEW BAR CHART VIEW	The tabular report for time periods and variables chosen:  At this point results can also be viewed as either a bar chart, or a trend line chart. To navigate between these different views, click on the Line Chart or Bar Chart buttons near the top of your screen. Bar chart for time periods and variables chosen:  	Bar charts in Excel are created using the table wizard. Highlight the cells to chart, and then click on the chart wizard.  Now, select the chart type from the chart selection menu 

LINE CHART VIEW What-If and Goal Seek analysis with the Table option	Line chart for time periods and variables chosen:  Users often want to ask to ask questions and make temporary assumption changes on a model. In the table view, note the What-If and Goal Seek buttons near the lower right side of the screen.  	The chart will appear on the screen and can be edited by replacing numbers in the cells that the chart is tied to and refreshing. 

After clicking on the What-If button, two new dialogue boxes will appear. The top box is called Equations; the bottom is called What-If Equations. These are the equations you may edit to perform a what-if analysis. To edit equations from a different node in the model, select that node from the tree to the left.

Click on one of the equations and this equation appears in the what-if equations box. Now, simply make any temporary changes in the equations.

What-If Analysis in Excel

To create a budget and test assumptions for revenue, it is possible to define different values for the revenue and glance between the scenarios to perform a type of what-if analyses. In effect, you are creating two separate tables of the same data. One to reference, and one to play with.

B9 f_x

	A	B
1		
2	Gross Revenue	50000
3	Cost of Goods Sold	13200
4	Gross Profit	36800
5		
6	Gross Revenue	150000
7	Cost of Goods Sold	26000
8	Gross Profit	124000

In the example above, the top scenario could be called Worst Case. Set the value in cell B2 to $50,000, and set the value in cell B3 to $13,200. The bottom scenario could be called Best Case. Set the values in B6 to $150,000 and B7 to $26,000.

Next, click on the See Results button. Changes are highlighted in blue and the table displays percentage changes when moused over.

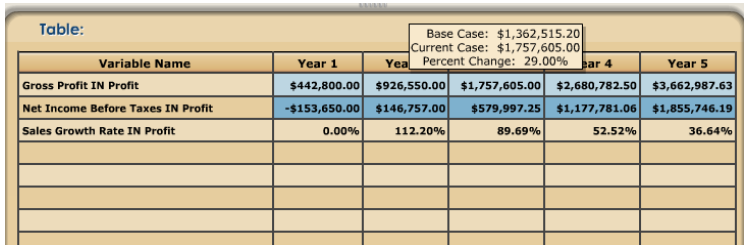
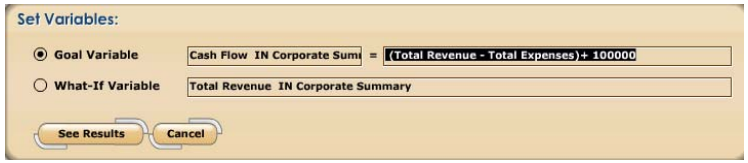
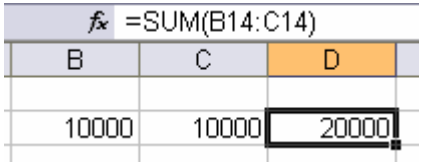
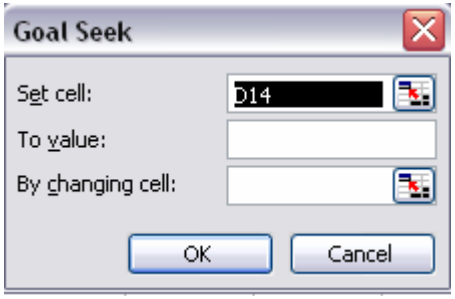
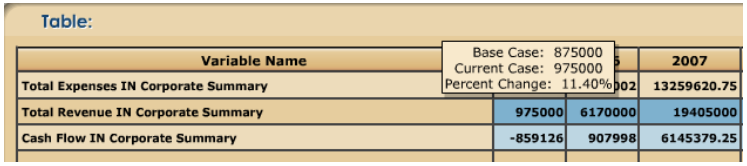


Table Goal-Seek	After clicking on the Goal Seek button, two new dialogue boxes will appear. The top box is called Equations; the bottom is called Set Variables. These are the equations that may be changed to perform a goal-seek analysis.  Select one goal variable, and one what-if variable that it depends on. Now, edit the goal variable equation to reflect the goal you'd like to achieve. 	For Goal Seeking in Excel, first set up a cell that is a formula dependant on at least one other cell.  Next, highlight the cell with the correct formula, then go to the Tools Menu and select Goal Seek. 

	Click on See Results, and Planners Lab will calculate the needed change in the What-If variable to achieve the requested goal. Any changes will be highlighted in blue in the table, and a mouse-over will reveal Percent Change figures.  Table: Base Case: 875000 Current Case: 975000 Percent Change: 11.40% Variable Name | 2007 Total Expenses IN Corporate Summary | 13259620.75 Total Revenue IN Corporate Summary | 975000 | 6170000 | 19405000 Cash Flow IN Corporate Summary | -859126 | 907998 | 6145379.25	Fill in the values and hit ok. At this point, Excel will solve the problem and return the appropriate value in the changed cell. Select OK to apply the changes permanently or Cancel to revert to previous data. *Note: This is a destructive process and anything changed by the goal seek is a real change. Data may be lost.*

Draggable Bar Chart option in the Playground	To access the draggable bar chart capabilities of Planners Lab select Bar Charts from the Playground menu at the bottom right side of the page. The What-If button will then be selected by default. To make a what-if change, click and hold down the top of any what-if variable's bar and move it the desired distance on the chart.  Before  After Once you have moved it to the location you want, release the mouse and Planner's Lab will re-solve the model with the what-if change.	There is no comparable function in Excel

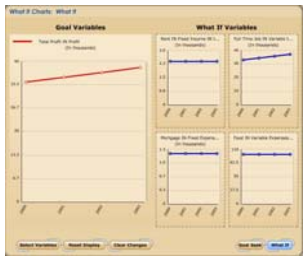
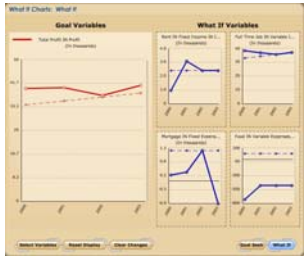
To use the draggable Goal Seek ability, click on the Goal Seek button.

Next, , click and hold down the top of any Goal Variable's bar and move it the desired distance on the chart.

Before

After

Once you have moved it to the location you want, release the mouse and Planner's Lab will re-solve the model with the goal-seek change.

Draggable Trend Line Chart option for What-If	To access the draggable trend line charting capabilities of Planners Lab select Trend Line Charts from the Playground menu. To make a what-if change, click and hold down any part of a what-if variable's line and move it to the desired point Dragging the line in between points will move the entire line.  Before  After Once the line or node is in the desired position, release the mouse and Planner's Lab will re-solve the model with your new what-if change. The base quantity is reflected by a dashed line.	There is no comparable function in Excel.

Draggable Trend Line option for Goal Seek	To make a goal-seek change to the line chart, click on the goal seek button. Next, click and hold down any part on any goal seek variable's line and move it to the desired point. In this format, only one goal variable and one what-if variable are selectable. However, you may switch between what-if variables by clicking on the charts to the right, and between goal variables by clicking on the names above the Goal Variables chart.  Before  After Once the line or node is in the desired position, release the mouse and Planner's Lab will re-solve the model with your new goal-seek change. The base quantity is reflected by a dashed line.	