

CHAPTER 12 GOAL SEEKING

INFocus

Many of the calculations we perform in Excel take existing values and use them to determine the result.

However, sometimes we know the result, but don't know the values that are required to achieve that result. **Goal Seek** is a special type of **what if** tool that determines which cell in a worksheet needs to change to reach the required answer.

In this session you will:

- ✓ gain an understanding of **Goal Seek** components
- ✓ learn how to use the **Goal Seek** tool.

UNDERSTANDING GOAL SEEK COMPONENTS

Goal Seek uses the result that you want and calculates one of the values that you need, to achieve it. Goal Seek requires three components: a **formula** to run values through; a **target value**

to achieve and; a cell that it can **change** while testing the values. The cell to be changed must be referred to in the formula. The following example illustrates the components of Goal Seek.

Goal Seeking Example – Water Storage Figures

Shown below is a summary table of water storage figures that displays the **Capacity** and current **Volume** held. The formula uses these figures to calculate the resulting **% Full**.

The **Current Total** row shows the actual figures for water storage. The **Target** row has been created to run Goal Seek in and uses the actual figures as a starting point.

	A	B	C	D	E
1					
2	Water Storage Data				
3		Capacity	Volume (ML)	% Full	
4					
5	Current Total	1773000	904000	51%	
6					
7	Target	1773000	904000	51%	
8					
9					

Changing cell

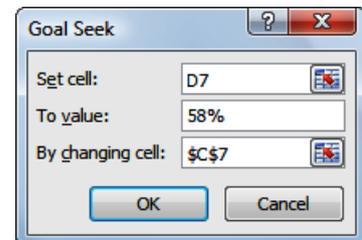
Set cell

Let's examine the data against the requirements of the **Goal Seek** procedure.

Cell **C7** holds the volume. This is the cell that we want to **change** in order to change the percentage. It must not contain a formula.

Cell **D7** holds a **formula** that calculates the percentage full. This is the formula that we want to run values through (or **set**) until it reaches a **target value** (in this example: **58%**). The **set** cell must contain a formula.

The target **value** for **D7** is entered in the **Goal Seek** dialog box when you run **Goal Seek**, as shown.



	A	B	C	D
1				
2	Water Storage Data			
3		Capacity	Volume (ML)	% Full
4				
5	Current Total	1773000	904000	51%
6				
7	Target	1773000	1028340	58%
8				
9				
10				
11				
12				
13				
14				
15				
16				

Goal Seek Status

Goal Seeking with Cell D7 found a solution.

Target value: 0.58

Current value: 58%

Step Pause

OK Cancel

Goal Seek will pass different figures through **C7** until the resulting percentage in **D7** is **58%**.

Goal Seek displays the result in a message box and replaces the value of the cell you nominated to change (in this example: **C7**). You can elect to accept the results and update the worksheet, or discard the results. In this example, Excel calculates that the volume stored must increase to **1028340 ML** for **58%** of the storage capacity to be achieved.

USING GOAL SEEK

Goal Seek can be used to solve quite complex problems. All you need, to ensure that it will work, is a **set cell** that contains a formula, a **changing cell** that contains a variable and a target **value**

that you want to achieve. Even formulas with several variables can be used, although you can only vary one of the variables at a time. This example uses Goal Seek with the **PMT** function.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file E842 Goal Seek.xlsx...

1

Click on cell **B7**

The **PMT** function is visible in the formula bar. Range names have been used to make the formula easier to read...

2

Click on the **Data** tab of the ribbon, then click on **What-If Analysis**  and select **Goal Seek**

This will display the Goal Seek dialog box...

3

Click in **To value** and type **-30000**

4

Click in **By changing cell** then click on cell **B5**

5

Click on **[OK]** to calculate the new term

The **Goal Seek Status** dialog box will appear, displaying your target and the closest value it was able to achieve...

6

Click on **[OK]** to replace the value in **B5**

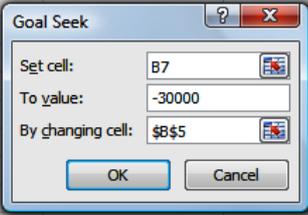
This tells us that if we pay \$30,000 each month, we will have the loan paid off in 212 months, rather than 240

1

	A	B	C	D	E
1	Construction of New Building				
2					
3	Loan Amount	\$ 3,400,000.00			
4	Interest Rate	8%			
5	Term in Months	240			
6					
7	Monthly Repayment	-\$28,438.96			
8					

4

3	Loan Amount	\$ 3,400,000.00			
4	Interest Rate	8%			
5	Term in Months	240			
6					
7	Monthly Repayment	-\$28,438.96			
8					



The dialog box shows: Set cell: B7, To value: -30000, By changing cell: \$B\$5. Buttons: OK, Cancel.

5

Goal Seek Status	
Goal Seeking with Cell B7 found a solution.	
Target value:	-30000
Current value:	-\$30,000.00
<input type="button" value="Step"/> <input type="button" value="Pause"/> <input type="button" value="OK"/> <input type="button" value="Cancel"/>	

6

	A	B	C	D	E
1	Construction of New Building				
2					
3	Loan Amount	\$ 3,400,000.00			
4	Interest Rate	8%			
5	Term in Months	212.0186885			
6					
7	Monthly Repayment	-\$30,000.00			
8					

For Your Reference...

To **run Goal Seek**:

1. Click on the cell containing the formula
2. On the **Data** tab, click on **What-If Analysis** 
3. Enter the **To value** and **By changing cell**
4. Click on **[OK]**

Handy to Know...

- A more sophisticated version of **Goal Seek** is **Solver**, which is also found on the **Data** tab. This enables you to apply constraints to the variable cell to control the outcome (Solver is an Add-In that may need to be installed if it is not visible on the **Data** tab).

