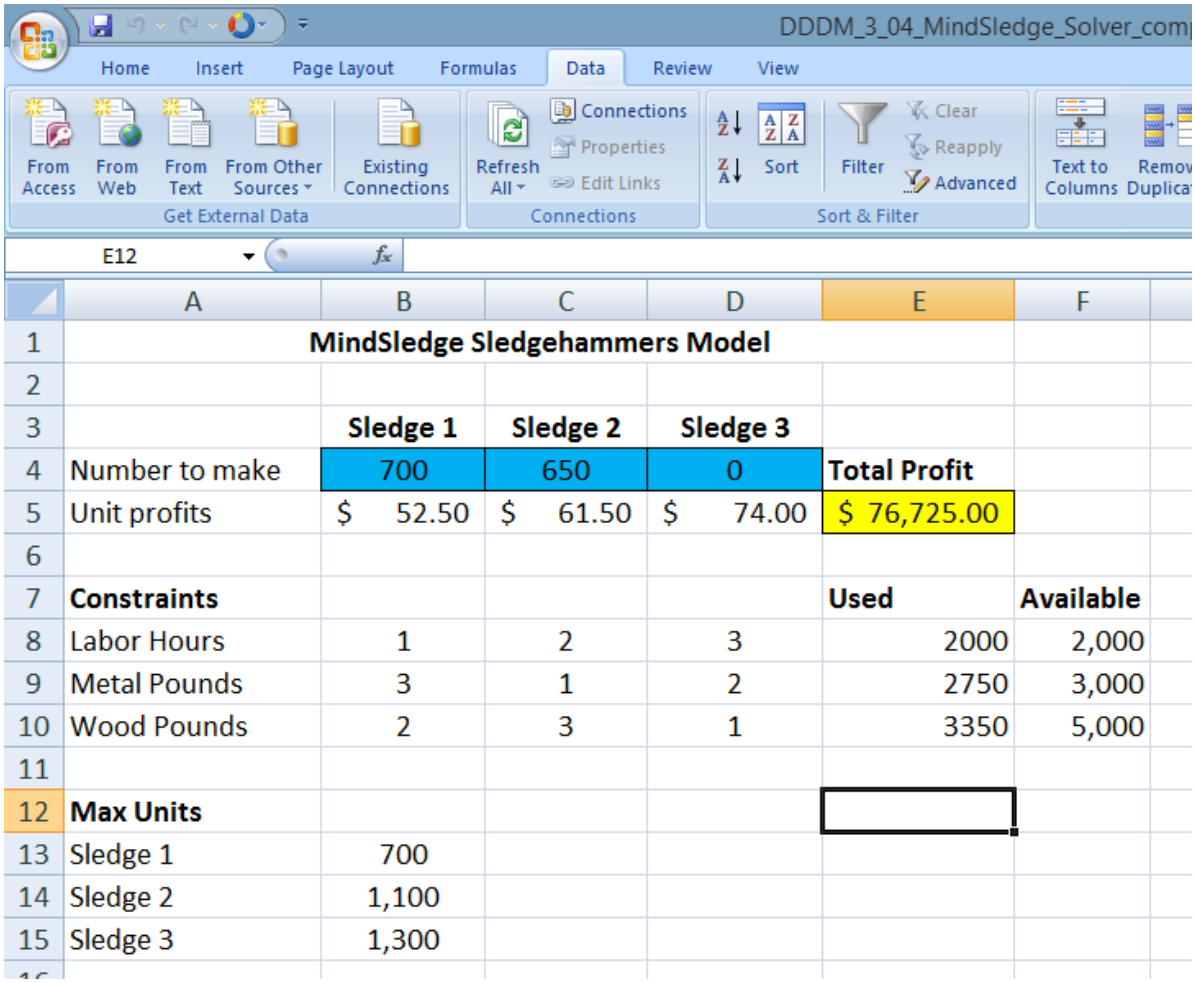
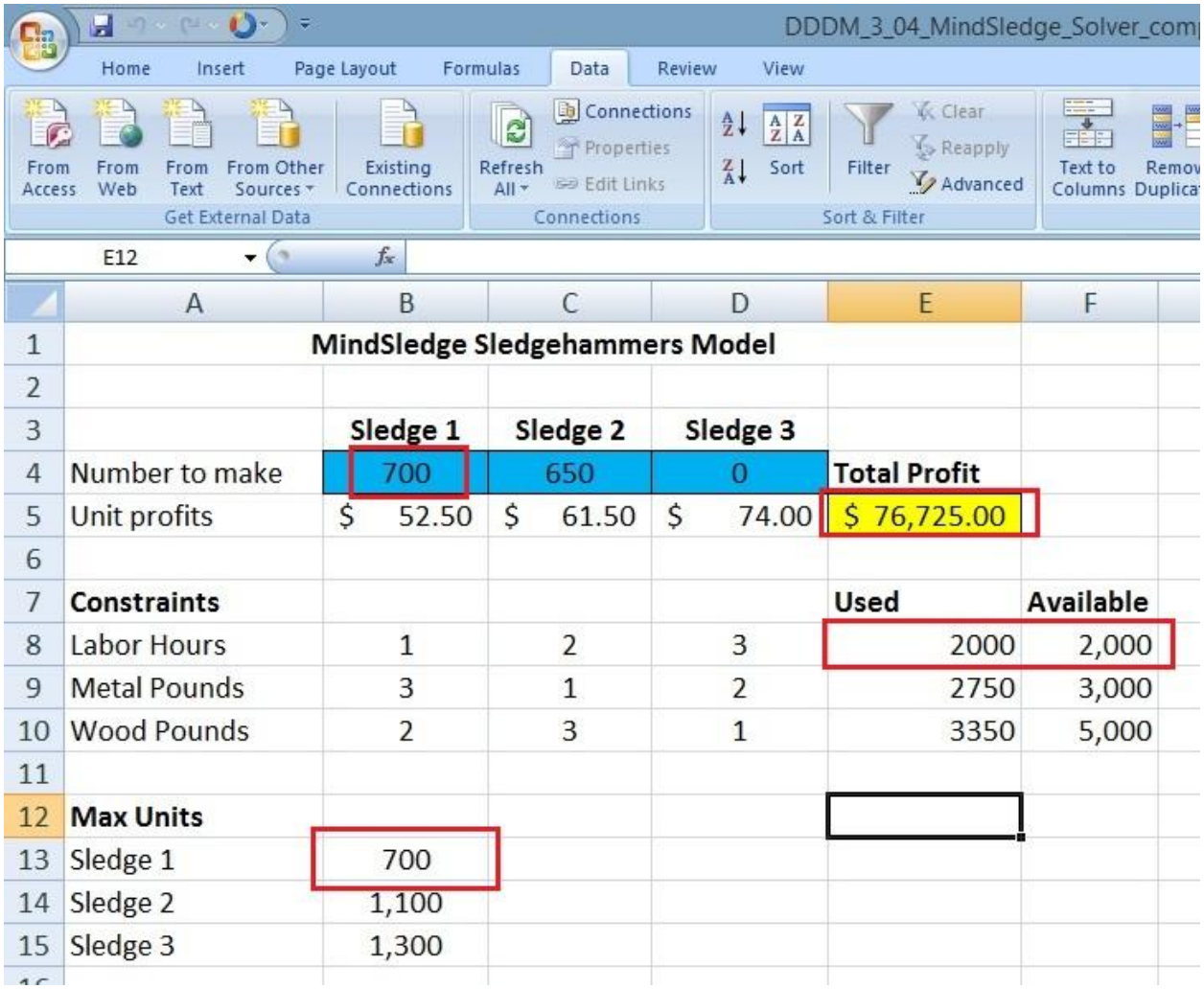
MindEdge LEARNING

Excel: Solver



	A	B	C	D	E	F
1		**MindSledge Sledgehammers Model**				
2						
3		**Sledge 1**	**Sledge 2**	**Sledge 3**		
4	Number to make	700	650	0	**Total Profit**	
5	Unit profits	$ 52.50	$ 61.50	$ 74.00	$ 76,725.00	
6						
7	**Constraints**				**Used**	**Available**
8	Labor Hours	1	2	3	2000	2,000
9	Metal Pounds	3	1	2	2750	3,000
10	Wood Pounds	2	3	1	3350	5,000
11						
12	**Max Units**					
13	Sledge 1	700				
14	Sledge 2	1,100				
15	Sledge 3	1,300				

Solver is a very useful spreadsheet tool when performing linear programming and modeling. The spreadsheet provided for Excel in this assignment has the Solver programming completed for you. The problem being asked in this spreadsheet is: " How many sledge hammers must the company produce to maximize its total profit, keeping in mind that the company has certain constraints?" In this case, the company can only produce 700 of sledge type 1, 1100 of sledge type 2, and 1300 of sledge type 3. Also, the company has a limited amount of labor, metal, and wood products available. All of these constraints must be taken into account when solving the problem for the maximum total profit. The first step is to open the spreadsheet.



	A	B	C	D	E	F
1	**MindSledge Sledgehammers Model**					
2						
3		**Sledge 1**	**Sledge 2**	**Sledge 3**		
4	Number to make	700	650	0	**Total Profit**	
5	Unit profits	$ 52.50	$ 61.50	$ 74.00	$ 76,725.00	
6						
7	**Constraints**				**Used**	**Available**
8	Labor Hours	1	2	3	2000	2,000
9	Metal Pounds	3	1	2	2750	3,000
10	Wood Pounds	2	3	1	3350	5,000
11						
12	**Max Units**					
13	Sledge 1	700				
14	Sledge 2	1,100				
15	Sledge 3	1,300				

In this spreadsheet there are a number of things to notice. In this company's situation, the optimal production level is to make 700 Type 1 sledgehammers and 650 Type 2 sledgehammers. This would produce a profit of $76,725. The limiting variables in this analysis were the production limit of Type 1 sledgehammers and the limit of labor hours.

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	A	B	C	D	E	F
1	**MindSledge Sledgehammers Model**					
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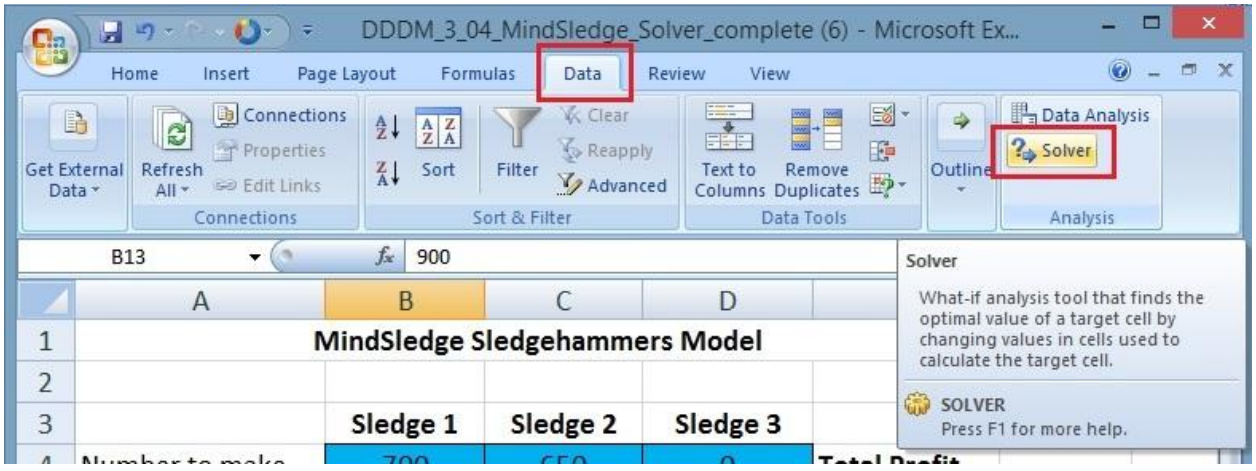
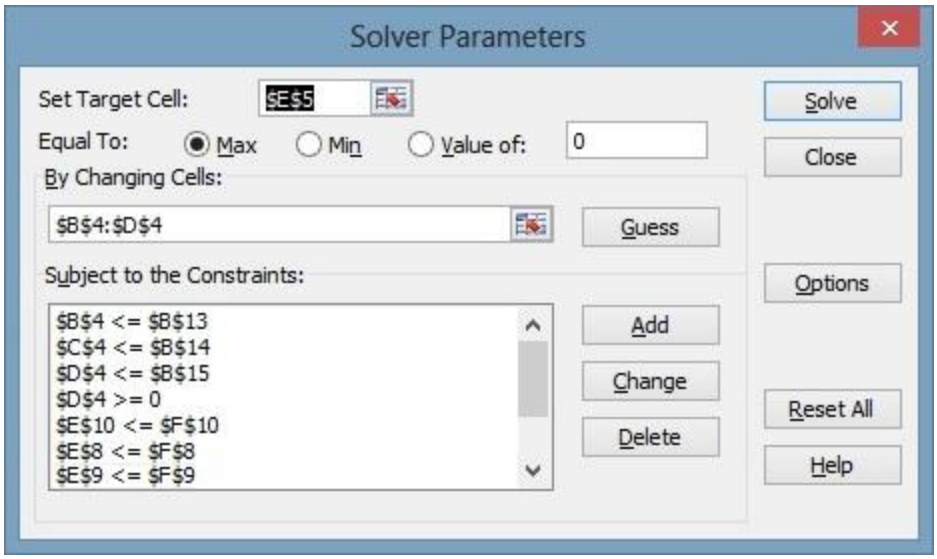
3		**Sledge 1**	**Sledge 2**	**Sledge 3**		
4	Number to make	700	650	0	**Total Profit**	
5	Unit profits	$ 52.50	$ 61.50	$ 74.00	$ 76,725.00	
6						
7	**Constraints**				**Used**	**Available**
8	Labor Hours	1	2	3	2000	2,000
9	Metal Pounds	3	1	2	2750	3,000
10	Wood Pounds	2	3	1	3350	5,000
11						
12	**Max Units**					
13	Sledge 1	1,200				
14	Sledge 2	1,100				
15	Sledge 3	1,300				

Sheet1 Sheet2

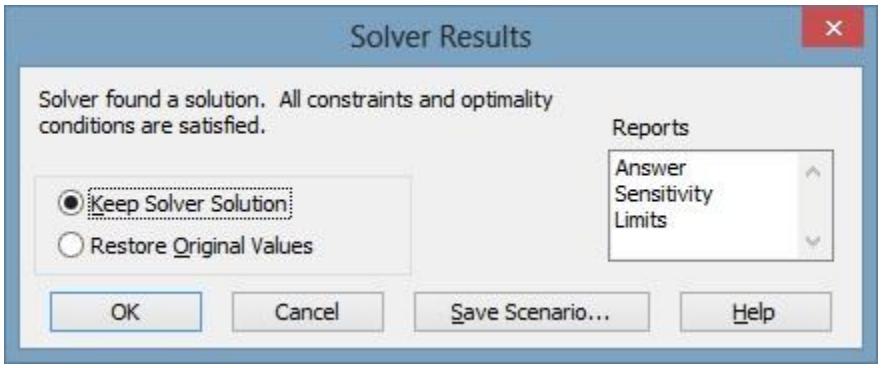
To see the effect of changing one of these variables, let's change the production limit of Type 1 sledgehammers to 1200.



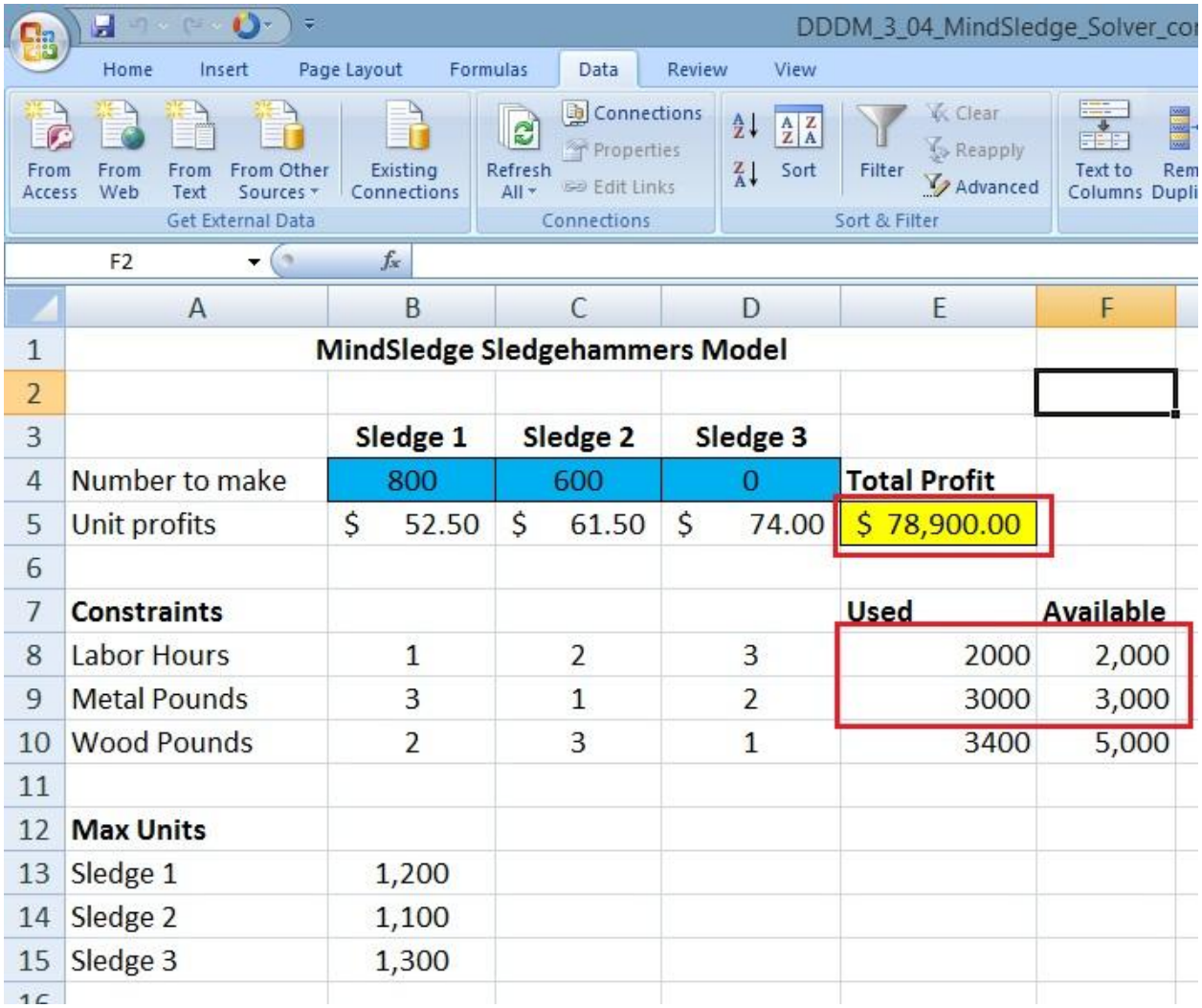
To use Solver, let's go to the "Data" tab and select "Solver". The following table will appear:



The table should be programmed exactly like the table above. If it is blank, then fill in the table exactly like the table above and then click "Solve" for the solver to run.



This window should appear. Selecting "Keep Solver Solution" will fill in the original table to produce the following table:



The result is an increase in profit of $2,175 to $78,900. The new results show that the optimal profit production level for this situation is to produce 800 Type 1 sledgehammers and 600 Type 2 sledgehammers. The new limiting variables in this outcome are the limits of labor hours and pounds of metal.