



## A review of all formulas we have seen so far

Please refer the example excel sheet used in class.

**Q1: What was the total budget for STEM education for NASA in FY2010?**

Budget: 177.166589

Formula: `=SUMIFS (Data! I:I, Data! C:C, "NASA")`

Idea: The sentence total budget for STEM education indicates a summation, data regarding the FY2010 is available at Data!!:I, and the agency NASA needs to be searched under the Data!C:C column as a criteria.

**Q2: What was the budget for STEM education for NASA in FY2010 where programs mention "K-12"?**

Budget: 61.078115

Formula: `=SUMIFS (Data! I:I, Data! C:C, "NASA", Data! E:E, "*K-12*")`

Idea: The sentence total budget for STEM education indicates a summation, data regarding the FY2010 is available at Data!!:I, and the agency NASA needs to be searched under the Data!C:C column as a criteria and as a second criteria the program description available under column Data!E:E needs to contain the substring "\*K-12\*".

**Q3: What percentage of the the budget (Q1 and Q2) was allocated to programs that had some focus on K-12?**

?: 34.47%

Formula: `=C9/C6`

Idea: Find the percentage.

**Q4: What percentage of the budget was allocated to NASA out of the overall budget dataset for FY2010?**

?: 2.59%

Total (all): 6850.57305      NASA: 177.166589

Formula: `=F16/F15`



Idea: Find the percentage by dividing the NASA budget by the total budget.

**Q5: Complete the following table:**

Funding Levels (2010Value-2009Value)/2009Value

Formula: =SUMIFS (Data!G:G, Data!\$C:\$C, \$C20)

*To lock or not to lock?*

Leave G:G unlocked; this allows the column to shift as you drag the cell to the right (across a row).

You need to lock C, as you only want to search from the agency name under the agency column.

*The power of locking the right indices:*

You get to get a lot of data from fixing the right aspects of a single formula to get all the data you need.

**Q6: Which agency had the largest growth in funding from FY2009 to FY2010?**

Agency: Energy

Formula: =INDEX (C20:C26, MATCH (MAX (H20:H26), H20:H26, 0))

Idea: Find the max growth using the MAX () function over the range H20:H26, then use the MATCH function to locate the row on which this appears. Follow this by the INDEX function that prints the value in the column on that row.

**Q7: What percentage of the budget of the agency in Q6 was "General STEM" (Column J)?**

?: 16.65%

All: 60.7928 [Cell Location E33]  
=SUMIFS (Data!I:I, Data!C:C, C29)

General STEM: 10.1236 [Cell Location E34]  
=SUMIFS (Data!I:I, Data!C:C, C29, Data!J:J, "General STEM")

Formula: =E34/E33



Idea: Find the allocated funding only under General STEM to the energy agency and divide it by the total funding allocated to the energy agency.