Lesson 15 Formulas

We are now going to start the mathematical features in a serious manner. We are going to learn all about formulas. Formulas are very important part of Excel and is vital to have this knowledge.

We are going to break this down into four parts.

Below is a completed Data File for the year. This is similar to a financial Statement for a year, showing income and expenses.

Annual Personal Budget for Student Name			
			Percent of Income
Income	**$**	**33,000**	
Expenses	$	17,124	
Car Payments	$	3,646	
Mortgage Payments	$	8,503	
Total Spent	**$**	**29,274**	**89%**
Remaining (Savings)	***$***	***3,726***	**22%**

The calculations on the Budget Summary worksheet use formulas and functions that reference the data entered in these two other worksheets.

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Creating a Basic Formula

When formulas and cell references are used Excel will automatically recalculate when data is changed.

Formulas are used to calculate a variety of *mathematical outputs* in **Excel** and can be used to create almost any *custom calculation* required for your objective. When constructing a *formula* in **Excel** , you use *cell addresses* that when addred to a *formula* , become **cell references**. This means that **Excel** uses,or *references*, the number entered into a *cell location* when performing the calculation.As a result,when the numbers in the cells that are *referenced* are changed, **Excel** automatically recalculates the *formulas* and produces a **new result.** This is what gives **Excel** the ability to create a variety of *what- if* scenarios,which will be explained later in Part 3.

So let us begin and show how basic formulas are constructed We will start working on the **Budget Detail** *worksheet*. To complete this worksheet, we will enter some *data*,and then *create* a few *formulas* and *functions*. **2**

	A	B	C	D	E	F	G	H
1	***Regular Expenses***							
2	**Expense**	**Monthly Spend**	**Percent of Total**	**Annual Spend**	**Last Year Spend**	**Percent Change**		
3	Utilities	$ 250			$ 3,000			
4	Cell Phone	$ 100			$ 1,200			
5	Food	$ 300			$ 2,250			
6	Gas	$ 125			$ 1,200			
7	Clothes	$ 100			$ 1,000			
8	Insurance	$ 127			$ 1,500			
9	Entertainment	$ 200			$ 2,250			
10	Vacation	$ 100			$ 2,000			
11	Miscellaneous	$ 125			$ 1,558			
12	***Totals***							
13	**Number of Expense Categories**							
14	**Average Spent**							
15	**Minimum Spent**							
16	**Maximum Spent**							

Formulas and functions will be added to the highlighted cells to provide calculations that will be automatically updated as data changes.

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In the table below there are categories listed in the range. **A3:A11.** When you consruct a **Personal Budget** the *categories* are detailed on the basis of how you spend your money. *Every individual* has a different *budget* ,therefore the *categories* will differ. It is important for you to know what each **Category** includes**. 3**

Note: What is used are just an example for you to understand how Basic Formulas are constructed.

Category	Definition
Utilities	Electricity, heat, water, home phone, cable, Internet access
Cell Phone	Cell phone plan and equipment charges
Food	Groceries
Gas	Cost of gas for vehicle
Clothes	Clothes, shoes, and accessories
Insurance	Renter, homeowner, and/or car insurance
Entertainment	Activities like dining out, movie and theater tickets, parties, and so on
Vacation	Vacation expenses
Miscellaneous	Any other spending categories

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The amount of **money spent** each month for each *category* as well as the amount of money spent **last year**, is already *entered into* the *worksheet*. We will **write formulas** that will *calculate* the *annual* amount spent, the **percent** of the **total spent** each category represents, as well as the **percent** change from *last year's* spending to the **current year**.(Everything in yellow is where we will be working.)

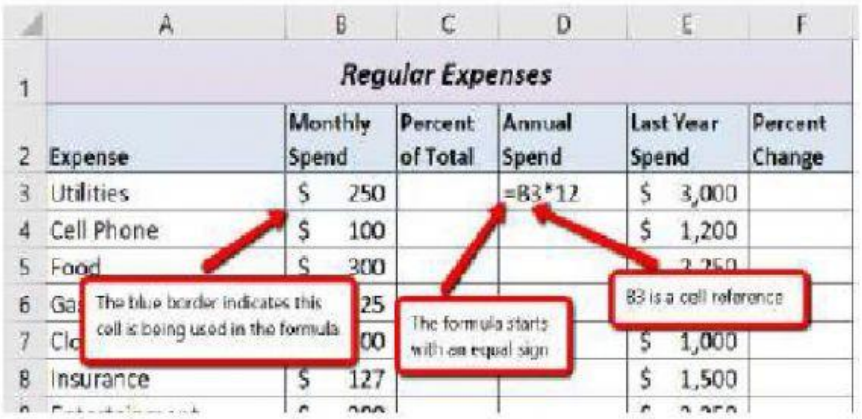
This first formula will calculate the **Annual Spend** values. The formula will be worked so that it takes the values in the **Monthly Spend** column and then by **12** *(this being the total months of the* year). This will show how much money will be *spent per year* for each of the

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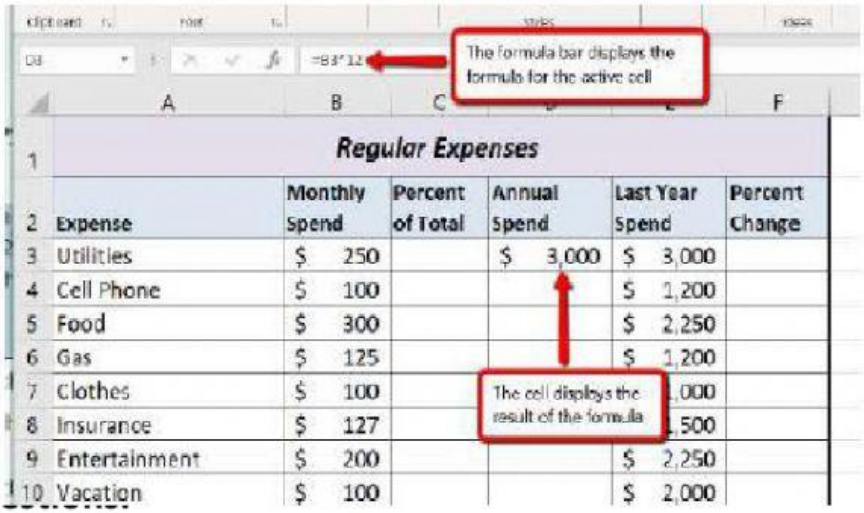
categories listed in **Column A**. Since the first category is **Utilities,** we will start by *creating* the *formula* to *multiply* the **Monthly** spent amount in **B3 by 12.** This *formula* will be created in **D3**- the **Annual Spend** cell for the **Utilities** category. The *formula* will be written as this:- **=B3*12.**

Formulas always start with the equal sign. This signifies to Excel that the contents of the cell should be calculated, not just displayed as basic text or numbers.

Entering the Formula=B3*12



After entering the Formula (D3 total)



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1. **Why is it necessary to use formulas?**

2. **From your Definition list say what category each of the three will be listed in?**

   a. Petrol

   b. House landline phone

   c. Sneakers

3. **Explain how you would write the formulas for : Insurance, clothing and food?**

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