Computer Module 4
Excel & Data & Computation

- Create your own PowerPoint
- Key rules to make presentations effective
- Deciding the best option for presentation
OBJECTIVES

Level 1
• To learn Excel basic functions
• To practice Excel functions and formulas (related to business concepts/examples)

Level 2
• To generate graphs based on data
Computer Module 1 Contents

LEVEL 1
C4.1. Excel Basics, Functions, Excel worksheet creation

LEVEL 2
C4.2. More Practice: Graphing and differences between: line and bar graphs, pie chart, scatter plots
LEVEL 1

Introduction to PowerPoint
Data Entry
Basic computation
C4.1 Excel Basics

Basic Excel functionalities to enter and compute data
Listed topics show ideas of key functions: facilitators at each site will show more visually and directly on computers

Includes contents from: Microsoft Excel tutorial
Microsoft Excel is a spreadsheet program (software application), that features calculation, graphing tools and various organization tools for data.
If you have trouble using or practicing on Excel, you can use Google Sheets to create a spreadsheet (you will need to create an account and the Facilitator will help you).

The functions are very similar, so if you know one of them, you can easily use the other!
Basic Terminology

- **Formula Bar**
- **Column header**
- **Selected Cell**
- **Total:** $162.00
- **Check Balance:** $361.00
- **Available:** $361.00
- **Row Header**
- **Row**
- **Column and Row Separators**
- **Sheet tabs**

Image source: https://www.computerhope.com/jargon/e/excel.htm
Create a Workbook

Create a workbook

1. Open Excel.
2. Select Blank workbook.
   Or, press Ctrl+N.

Microsoft Excel Tutorial:
https://support.office.com/en-us/article/excel-for-windows-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb
Enter data

To manually enter data:

1. Select an empty cell, such as A1, and then type text or a number.

2. Press Enter or Tab to move to the next cell.

To fill in a data series:

1. Enter the beginning of the series in two cells: such as Jan and Feb; or 2014 and 2015.

2. Select the two cells containing the series, and then drag the fill handle across or down the cells.
Add
/
Delete

Insert or delete a column

1. To insert a column, select the column, select **Home > Insert > Insert Sheet Columns**.

2. To delete a column, select the column, select **Home > Insert > Delete Sheet Columns**.
   
   Or, right-click the top of the column, and then select **Insert or Delete**.

Insert or delete a row

1. To insert a row, select the row, select **Home > Insert > Insert Sheet Rows**.

2. To delete a row, select the row, select **Home > Insert > Delete Sheet Rows**.
   
   Or, right-click the selected row, and then select **Insert or Delete**.

Insert a cell

1. Select one or more cells. Right-click and select **Insert**.

2. From the **Insert** box, select a row, column or cell to insert.
You can move cells in Excel by drag and dropping or using the **Cut** and **Paste** commands.

**Move cells by drag and dropping**

1. Select the cells or range of cells that you want to move or copy.

2. Point to the border of the selection.

3. When the pointer becomes a move pointer 🔄, drag the cell or range of cells to another location.

**Move cells by using Cut and Paste**

1. Select a cell or a cell range.

2. Select **Home > Cut** or press Ctrl + X.

3. Select a cell where you want to move the data.

4. Select **Home > Paste** or press Ctrl + V.
Number formats

- There are multiple formats that can be used to enter data in Excel
  - For example
  - Dates 01/01/2020
  - Number 1,2,3
  - Decimal 0.01
  - Percentage 100%

- For the full list of formats, see:
  https://support.office.com/en-us/article/available-number-formats-in-excel-0afe8f52-97db-41f1-b972-4b46e9f1e8d2?wt.mc_id=otc_exce
Formulas

You can include formulas (for addition, division, multiplication, average, etc.) by:

1. Typing formula inside the cell
2. Using Insert Function Option
3. Select Formula from Formula Tab
Common Formulas

SUM
- aggregates values from a selection of columns or rows from your selected range. \( \text{SUM}(\text{number}_1, [\text{number}_2], \ldots) \)
- Example:
  - \( \text{SUM}(B2:G2) \) – A simple selection that sums the values of a row.
  - \( \text{SUM}(A2:A8) \) – A simple selection that sums the values of a column.
  - \( \text{SUM}(A2:A7, A9, A12:A15) \) – A sophisticated collection that sums values from range A2 to A7, skips A8, adds A9, jumps A10 and A11, then finally adds from A12 to A15.
  - \( \text{SUM}(A2:A8)/20 \) – Shows you can also turn your function into a formula.
Common Formulas

• AVERAGE
The AVERAGE function should remind you of simple averages of data such as the average number of trainees in a given training program with many classes of various numbers of trainees.
= AVERAGE(number1, [number2], …)
Example:
• = AVERAGE(B2:B11) – Shows a simple average, also similar to (SUM(B2: B11)/10)
Common Formulas

LEVEL 1
• AVERAGE
• MEDIAN
• MODE
• ADD / SUM
• SUBTRACT
• MULTIPLY
• DIVIDE

LEVEL 2
• COUNT
• CONVERT
• CONDITIONAL FORMULAS
• INSERT FILE/PATH

Common Formulas

Facilitators can reference & show:

Create a file that looks like below

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type of Cost</td>
<td>Startup Costs (Total)</td>
<td>Variable Costs (per unit)</td>
<td>With Startup Costs</td>
<td>Divide Startup Costs by the number of months</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Item</td>
<td>Cost</td>
<td>Item</td>
<td>Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sewing Machines</td>
<td>900 Fabric</td>
<td>3.99</td>
<td>Startup Costs</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Business cards</td>
<td>20 Thread</td>
<td>0.5</td>
<td>Number of months to repay startup costs</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Labels</td>
<td>0.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Startup Costs Total</td>
<td>Variable Cost Total</td>
<td>Startup Costs (monthly)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To add numbers

Formula to add numbers

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing Machines</td>
<td>900</td>
</tr>
<tr>
<td>Business cards</td>
<td>20</td>
</tr>
</tbody>
</table>

Startup Costs Total = B4 + B5

Result from addition

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Item</td>
</tr>
<tr>
<td>4</td>
<td>Sewing Machines</td>
</tr>
<tr>
<td>5</td>
<td>Business cards</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Startup Costs Total</td>
</tr>
</tbody>
</table>
To add multiple numbers in a column

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>With Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric</td>
<td>3.99</td>
<td>Star</td>
</tr>
<tr>
<td>Thread</td>
<td>0.5</td>
<td># of star</td>
</tr>
<tr>
<td>Labels</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Variable Cost Total</td>
<td>=SUM(D4:D6)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric</td>
<td>3.99</td>
<td></td>
</tr>
<tr>
<td>Thread</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Labels</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Variable Cost Total</td>
<td>5.19</td>
<td></td>
</tr>
</tbody>
</table>
To divide numbers (division)

**Formula for division**

<table>
<thead>
<tr>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>With Startup Costs</strong></td>
<td><strong>Cost</strong></td>
</tr>
<tr>
<td>Startup Costs</td>
<td>2000</td>
</tr>
<tr>
<td># of months to repay startup costs</td>
<td>12</td>
</tr>
<tr>
<td><strong>Startup Costs (monthly)</strong></td>
<td><strong>=F4/F5</strong></td>
</tr>
</tbody>
</table>

**Result from formula**

<table>
<thead>
<tr>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>With Startup Costs</strong></td>
<td><strong>Cost</strong></td>
</tr>
<tr>
<td>Startup Costs</td>
<td>2000</td>
</tr>
<tr>
<td># of months to repay startup costs</td>
<td>12</td>
</tr>
<tr>
<td><strong>Startup Costs (monthly)</strong></td>
<td><strong>166.666667</strong></td>
</tr>
</tbody>
</table>
Additional Tips

Formulas
You can also build larger formulas that perform operations on multiple cells. Here are some examples (formulas in parentheses happen first):

\[ f_a = \frac{A1+B4}{C8} \]
This adds cell A1 and B4, then divides the result by cell C8.

\[ f_b = A1+B4+C9 \]
This adds cells A1, B4 and C9.

\[ f_c = (A1+B4) \times A2 \]
This adds Cell A1 and B4, then multiplies by cell A2.

Spreadsheets allow you to perform more complicated operations using standard commands called formulas.

Functions
These are some other commonly used functions:

\[ f_a = \text{AVERAGE(first value, second value, ...)} \]
Calculates the arithmetic mean or average for the values in a range of cells.

\[ f_b = \text{MIN(first value, second value, ...)} \]
This determines the smallest value in a given list of numbers.

\[ f_c = \text{MAX(first value, second value, ...)} \]
This determines the largest value in a given list of numbers.

For more information about spreadsheet functions, see the links to tutorials for LibreOffice Calc and other spreadsheet software in the Technology Skill resources in the Next Steps section.
More Practice

These spreadsheets correspond to concepts presented in Training Module 3 on Business and Financial Concepts
LEVEL 2

In Level 1, we learned about creating spreadsheets to enter and compute data.

Now, let us take the data to make illustrative graphs that help to communicate what the data says, visually.
Take a few minutes to create a new worksheet, that looks like this one:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Startup Cost Line Item</strong></td>
<td><strong>Cost</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lawyer to structure business</td>
<td>1750</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Domain name registration</td>
<td>6.95</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Business cards to Handout</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Sewing machine</td>
<td>899</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Fixed Cost Line Item</strong></td>
<td><strong>Cost</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Wages for me</td>
<td>1400</td>
<td>per month</td>
</tr>
<tr>
<td>12</td>
<td>Monthly Internet</td>
<td>40</td>
<td>per month</td>
</tr>
<tr>
<td>13</td>
<td>Magazine subscription</td>
<td>28</td>
<td>per month</td>
</tr>
<tr>
<td>14</td>
<td>Cell phone</td>
<td>39.99</td>
<td>per month</td>
</tr>
<tr>
<td>15</td>
<td>Insurance for my business</td>
<td>40</td>
<td>per month</td>
</tr>
<tr>
<td>16</td>
<td>Bank fees</td>
<td>5</td>
<td>per month</td>
</tr>
<tr>
<td>17</td>
<td>Service to host my site</td>
<td>6.95</td>
<td>per month</td>
</tr>
<tr>
<td>18</td>
<td><strong>Variable Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Fabric for baglining</td>
<td>3.99</td>
<td>per sq.meter</td>
</tr>
<tr>
<td>20</td>
<td>Labels for bags</td>
<td>0.7</td>
<td>each</td>
</tr>
<tr>
<td>21</td>
<td>Handles for bags</td>
<td>9.95</td>
<td>pair</td>
</tr>
<tr>
<td>22</td>
<td>Thread to sew bag</td>
<td>0.49</td>
<td>per 4 yards</td>
</tr>
</tbody>
</table>
Graphing Pie Chart

- You would like to see visually the breakdown of your fixed costs per month (excluding your wages).
- Let us create a pie chart to show the breakdown of fixed costs.
Graphing Pie Chart

• The selected data shows as illustrated → see pie chart

• You can play around with various functions
  • Try adding a Chart Title “Fixed Monthly Cost Breakdown”
  • Try adding Add Chart Element to label data values (see next slide)
<table>
<thead>
<tr>
<th>Fixed Cost Line Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business cards to Handout</td>
<td>$20</td>
</tr>
<tr>
<td>Sewing machine</td>
<td>$899</td>
</tr>
<tr>
<td>Total Startup Cost</td>
<td>$2675.95</td>
</tr>
<tr>
<td>Wages for me</td>
<td>$1400</td>
</tr>
<tr>
<td>Monthly Internet</td>
<td>$40</td>
</tr>
<tr>
<td>Magazine subscription</td>
<td>$28</td>
</tr>
<tr>
<td>Cell phone</td>
<td>$39.99</td>
</tr>
<tr>
<td>Insurance for my business</td>
<td>$40</td>
</tr>
<tr>
<td>Bank fees</td>
<td>$5</td>
</tr>
<tr>
<td>Service to host my site</td>
<td>$6.95</td>
</tr>
</tbody>
</table>

**Fixed Monthly Cost Breakdown**

- Monthly Internet: 6.95%
- Magazine subscription: 40%
- Cell phone: 39.99%
- Insurance for my business: 40%
- Bank fees: 5%
- Service to host my site: 6.95%

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Other graph types

- Now let’s try a new type of graphing with the same data
Types of Graphs

Bar Graph Option

Fixed Monthly Cost Breakdown

- Service to host my site: 6.95
- Bank fees: 5
- Insurance for my business: 39.99
- Cell phone: 40
- Magazine subscription: 28
- Monthly Internet: 40

Excel spreadsheet showing fixed and variable costs.
Types of Graphs

Line Graph Option
Tips: Which type of graph should I use?

**Line graphs** are used to track changes over short and long periods of time. When smaller changes exist, line graphs are better to use than bar graphs. Line graphs can also be used to compare changes over the same period of time for more than one group.

**Pie Charts** are best to use when you are trying to compare parts of a whole. They do not show changes over time.

**Bar Graphs** are used to compare things between different groups or to track changes over time. However, when trying to measure change over time, bar graphs are best when the changes are larger.

**X-Y Plots** are used to determine relationships between 2 different things. The x-axis is used to measure one event (or variable) and the y-axis is used to measure the other. If both variables increase at the same time, they have a positive relationship. If one variable decreases while the other increases, they have a negative relationship. Sometimes the variables don’t follow any pattern and have no relationship.

Tips from [https://nces.ed.gov/nceskids/help/user_guide/graph/whentouse.asp](https://nces.ed.gov/nceskids/help/user_guide/graph/whentouse.asp)
Contact

For questions, concerns, suggestions on curriculum, contact Center for Sustainable Development (CSD)’s education team:

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