GRAPHICS AND INFORMATION Management

George L. Ekol
Foreword

The African Virtual University (AVU) is proud to participate in increasing access to education in African countries through the production of quality learning materials. We are also proud to contribute to global knowledge as our Open Educational Resources (OERs) are mostly accessed from outside the African continent. This module was prepared in collaboration with twenty one (21) African partner institutions which participated in the AVU Multinational Project I and II.

From 2005 to 2011, an ICT-integrated Teacher Education Program, funded by the African Development Bank, was developed and offered by 12 universities drawn from 10 countries which worked collaboratively to design, develop, and deliver their own Open Distance and e-Learning (ODEL) programs for teachers in Biology, Chemistry, Physics, Math, ICTs for teachers, and Teacher Education Professional Development. Four Bachelors of Education in mathematics and sciences were developed and peer-reviewed by African Subject Matter Experts (SMEs) from the participating institutions. A total of 73 modules were developed and translated to ensure availability in English, French and Portuguese making it a total of 219 modules. These modules have also been made available as Open Educational Resources (OER) on oer.avu.org, and have since then been accessed over 2 million times.

In 2012 a second phase of this project was launched to build on the existing teacher education modules, learning from the lessons of the existing teacher education program, reviewing the existing modules and creating new ones. This exercise was completed in 2017.

On behalf of the African Virtual University and our patron, our partner institutions, the African Development Bank, I invite you to use this module in your institution, for your own education, to share it as widely as possible, and to participate actively in the AVU communities of practice of your interest. We are committed to be on the frontline of developing and sharing open educational resources.

The African Virtual University (AVU) is a Pan African Intergovernmental Organization established by charter with the mandate of significantly increasing access to quality higher education and training through the innovative use of information communication technologies. A Charter, establishing the AVU as an Intergovernmental Organization, has been signed so far by nineteen (19) African Governments - Kenya, Senegal, Mauritania, Mali, Cote d’Ivoire, Tanzania, Mozambique, Democratic Republic of Congo, Benin, Ghana, Republic of Guinea, Burkina Faso, Niger, South Sudan, Sudan, The Gambia, Guinea-Bissau, Ethiopia and Cape Verde.

The following institutions participated in the teacher education program of the Multinational Project I: University of Nairobi – Kenya, Kyambogo University – Uganda, Open University of Tanzania, University of Zambia, University of Zimbabwe – Zimbabwe, Jimma University – Ethiopia, Amoud University - Somalia; Université Cheikh Anta Diop (UCAD)-Senegal, Université d’ Antananarivo – Madagascar, Universidade Pedagogica – Mozambique, East African University - Somalia, and University of Hargeisa - Somalia
The following institutions participated in the teacher education program of the Multinational Project II: University of Juba (UOJ) - South Sudan, University of The Gambia (UTG), University of Port Harcourt (UNIPORT) – Nigeria, Open University of Sudan (OUS) – Sudan, University of Education Winneba (UEW) – Ghana, University of Cape Verde (UniCV) – Cape Verde, Institut des Sciences (IDS) – Burkina Faso, Ecole Normale Supérieure (ENSUP) - Mali, Université Abdou Moumouni (UAM) - Niger, Institut Supérieur Pédagogique de la Gombe (ISPG) – Democratic Republic of Congo and Escola Normal Superior Tchicote – Guinea Bissau

Bakary Diallo

The Rector

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Production Credits

This second edition is the result of the revision of the first edition of this module. The informations provided below, at the exception of the name of the author of the first edition, refer to the second edition.

**Author**
George L. Ekol

**Reviewers**
Esther Fomsi
Hernani Chantre

**AVU - Academic Coordination**
Dr. Marilena Cabral

**Module Coordinator**
Hernani Chantre

**Instructional Designers**
Elizabeth Mbasu
Diana Tuel
Benta Ochola

**Media Team**
Sidney McGregor
Barry Savala
Edwin Kiprono
Kelvin Muriithi
Victor Oluchot Otieno

Michal Abigael Koyier
Mercy Tabi Ojwang
Josiah Mutsogu
Kefa Murimi
Gerisson Mulongo
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AVU Multinational Project II funded by the African Development Bank.
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Welcome Message

Welcome to the module: Graphic and Information Management. You are going to gain very exciting experiences while working with this module. As you know, Information and Communication Technologies (ICTs) have over the years become indispensable management and communication tools. At the global level, the use of ICTs has become so central that the definition of literacy has become expanded beyond basic reading and writing skills to include ability to use ICTs in almost all activities.

This module gives basic skills in three areas:

1. Spreadsheets;
2. Database management applications; and
3. Presentation software.

Module Rationale

Teachers must have basic ICT skills in order to remain professionally competitive and competent in this digital era. Spreadsheets and database management tools make it possible for you to manage teaching as well as other classroom elements, such as class lists and facilities. At school level the tools would be useful in the management of school resources. Presentation tools are a flexible way of making classroom and seminar illustrations. Therefore, you will find it important to learn how to use these management tools for your future ICT use.

General objective(s)

By the end of this module you should be able to use:

- A numeric productivity tool (e.g. Microsoft Excel) as part of effective educational communication and the design of teaching and learning materials.
- A database management tool (e.g. Microsoft Access) as part of educational resources management system.
- A graphic productivity tool (e.g. Microsoft PowerPoint) as part of effective educational communication and the instructional design of teaching and learning materials.
Specific Learning Objectives (Instructional Objectives)

Unit 1: Working with Spreadsheet Software. (50 hours)

Objectives

• Create and edit workbooks of data
• Enter and edit data and formulas
• Cut, copy, paste, and use files
• Explain and use absolute and relative cell references
• Create and modify charts
• Format and print spreadsheets and charts
• Use lists, databases, and AutoCorrect
• Work with paste, logical, financial, and date functions
• Link worksheets
• Save files as Web pages
• Work with data maps

Unit 2: Working with Database Software (40hrs)

Objectives

• Create an empty database and add tables
• Work with tables
• Sort data
• Create relationships
• Create relational database

Unit 3 Working with Presentation software. (30hours)

Objectives

• Create slides
• Insert, duplicate and delete slides
• Insert graphics into slides
• Add animations
**Prerequisite Course or Knowledge**

Before you embark on this module, you should have completed the following modules:

- Module 1: Introduction to ICT -- keyboard skills, operating systems
- Module 2: Text-based Productivity Tools -- word processing

**Pre-Assessment: Graphics and Information Management.**

The questions below will help you establish your level of knowledge of the applications that you will learn in this module. Later on in this module, you will use the answers to these questions to gauge how much knowledge you will have gained. Please put a cross (X) against your answers to the questions below.

**QUESTIONS**

1. **What is data?**
   - a) Any piece of recorded information
   - b) What one reads from a textbook
   - c) I do not know
   - d) Information collected from research only

2. **What is a worksheet?**
   - a) It is like a piece of rough work
   - b) A blank page of document
   - c) A spreadsheet page that shows cells in rows and columns
   - d) I do not know

3. **What is a formula?**
   - a) A calculation
   - b) An expression of steps to be undertaken by a computer
   - c) Only used in chemistry to make chemicals
   - d) I do not know

4. **What is a graphical chart?**
   - a) It is like a pie showing slices of phenomena
   - b) It is like a flip chart showing points for discussion
   - c) It is like a path to a place
   - d) I do not know
5. What is a database?
   a) It is an exclusive collection of numerical information
   b) It is a geographical place where researchers work
   c) A collection of similar information arranged systematically
   d) I do not know

6. I have seen people using computers and projectors casting things on a wall or screen but do not understand how it is done.
   a) This statement is not true because I have seen it happen and I know how it is done
   b) The statement is completely true
   c) I know some aspects of what they do but not to do it myself
   d) I know some of things but not know how to make things move about on the screen

7. Have you used a computer to create a list of items (such as furniture) before?
   a) Yes
   b) No
   c) Too long ago I do not remember
   d) I have just seen it happen but have not done it myself

8. A class register is a good example of a database. This statement is:
   a) True
   b) False
   c) Partly true
   d) I do not know

9. Have you used a spreadsheet application before?
   a) Yes
   b) No
   c) Too long ago I do not remember
   d) I have just seen it happen but have not done it myself
10. Have you used a database application before?
   a) Yes
   b) No
   c) Too long ago I do not remember
   d) I have just seen it happen but have not done it myself

11. Have you used Microsoft PowerPoint before?
   a) Yes
   b) No
   c) Too long ago I do not remember
   d) I have just seen it happen but have not done it myself

12. Computers cannot be used in a similar manner as flip charts. This statement is:
   a. True
   b. False
   c. Partly true
   d. I do not know

ANSWERS

1. Data is the smallest unit of information that could be further processed. For example, the number of pupils, number of girls and number of boys. When processed the data is transformed into information

2. A worksheet is a grid of rows and columns, and the intersection of a row and column is a cell.

3. A formula is an expressed calculation of data. This calculation could be addition, division, multiplication, or subtraction. It can also be a combination of one or more of the mentioned operators.

4. A graphical chart presents information into graphs such as a pie chart showing how many students are male and how many are female. Bar charts could be a good presentation of class performance

5. A database is a collection of related information in one or more files or tables. Information in a file or table is described, by one or more attributes, in a systematic and consistent way.
6. Used to classify level of knowledge (marks ranging from 1 – 4 where full knowledge is 4)

7. One example of a database is that of a class register in which records similar information for each pupil. This information could be name, sex, age, and attendance.

8. Used to classify level of knowledge (marks ranging from 1 – 4 where full knowledge is 4)

9. Used to classify level of knowledge (marks ranging from 1 – 4 where full knowledge is 4)

10. Used to classify level of knowledge (marks ranging from 1 – 4 where full knowledge is 4)

11. Used to classify level of knowledge (marks ranging from 1 – 4 where full knowledge is 4)

12. There are some applications, such as Microsoft PowerPoint that could be used to make presentations in a manner that some people use flip charts and/or blackboards.

Comments for learners’ Progression

You have established your current levels of knowledge and experiences with the use of spreadsheets, database management tools and presentation tools. This knowledge is very important as a beginning point for teaching and learning. It indicates the areas that you will need to concentrate on in order to increase your knowledge and use of ICT in teaching and learning. As a teacher you will need to know the areas that learners want emphasis to be laid. The following sections will introduce the key concepts to you and how they will be applied in this module. You will also be introduced to specific functions of spreadsheets, database management and presentations with practical examples of specific applications.

Recommended Readings/Resources

Reading 1


Abstract: This tutorial will show you how to use the powerful tools in Excel 2013 for organizing, visualizing, and calculating your data.

Rationale: This tutorial offers over 28 lessons on excel including other resources and quizzes that will help the learner master the use of MS Excel.
Reading 2
Complete Reference: Youtube: Microsoft Excel Tutorial for Beginners #1 - Overview
https://www.youtube.com/watch?v=8L1OVkw2ZQ8

Abstract: This is a video that shows how to use MS Excel. The step by step guide along with the illustrations are invaluable tools for every learner.

Rationale: With a video, a learner can quickly visualize how each step taken changes the look of the excel workbook. This video presents that visual representation which will guide the learner through his mastering of the software.

Reading 3

Abstract: This tutorial introduces you to MS Excel 2013 training course

Rationale: Every category takes you through a step by step process with screen shots to enable you visualize each step

Reading 4

Abstract: The reading gives explanations and tutorials on the use of the basic Microsoft Excel.

Rationale: You will find easy to use guidance and tutorials on the activities that you will be introduced to in this module.

Reading 5

Abstract: A step by step introduction to MS Access with illustrations of the dialogue boxes that you will interact with when using Access.

Rationale: It is an easy to read and follow guide to using Access. You will find additional examples to what has been provided in this module.
Reading 6

Complete reference: Quackit

http://www.quackit.com/microsoft_access/microsoft_access_2013/tutorial/create_a_database.cfm

Abstract: A tutorial on MS Access 2013 from Microsoft with illustrations of the dialogue boxes that you will interact with when using Access.

Rationale: It is an easy to read and follow guide to using Access. You will find additional examples to what has been provided in this module.

Reading 7

Complete Reference: Youtube

https://www.youtube.com/watch?v=eQMc30gSPN8

Abstract: A video from Youtube showing step by step how to use MS Access 2013

Rationale: The video is very interactive and enables you see how each icon in MS 2013 is used. It takes you through the process of creating tables, forms queries, reports e.t.c in Access

Reading 8

Complete Reference: PowerPoint 2013 videos and tutorials

https://support.office.com/en-gb/article/PowerPoint-2013-videos-and-tutorials-bd93efc0-3582-49d1-b952-3871cde07d8a

Abstract: Series of videos that teach how to add special effects to slides on PowerPoint

Rationale: After creating slides, it is important that you add special effects to the slides to enhance your presentation. This reference teaches you how to do so.

Reading 9


Abstract: this reference teaches the basics of creating, editing, and sharing presentations with Microsoft PowerPoint 2013.

Rationale: The readings show how to create slides from scratch and also use existing PowerPoint templates and themes. It also shows how to add and edit text, images, graphs, video, and animation; format slides for consistency; and add speaker notes to ensure a smooth delivery.
Reading 10

Complete Reference: PowerPoint tutorials


Abstract: This reading presents tutorials for different versions of PowerPoint.

Rationale: This reading will give you more information on how to produce well-designed slides that you could use in seminars as well as classrooms.

Resources

Complete reference: A complete computer set with Microsoft Office suite installed. The version of the office suite should not be earlier than 2007. In other words, any of the following is desirable Ms Office 2007, 2010, 2013, or 2016 is accepted. An Internet connection is very desirable.

Rationale: With Microsoft Office suite installed, you can have access to the three basic software covered in this module namely MS Excel, MS Access and MS PowerPoint. Having an Internet connection will give you the opportunity to access other online resources. You can look up the required readings and useful links if you have an Internet connection.

Useful Links

Useful Link 1

Title: Excel 2013

URL: http://www.gcflearnfree.org/excel2013

Screen capture:
**Description:** This website takes you through all the fundamentals of Ms Excel. Presented in different categories, you will have the opportunity to practice the skills presented at the end of each lesson.

**Rationale:** It offers over 28 lessons on Excel including other useful resources and quizzes to enable you test your knowledge

**Useful Link 2**

**Title:** How to Use Excel - Excel Tutorials for Beginners

**URL:** [http://spreadsheets.about.com/od/excel101/a/Excel_beg_guide.htm](http://spreadsheets.about.com/od/excel101/a/Excel_beg_guide.htm)

**Screen capture:**

**Description:** How to Use Excel is a Series of Excel Tutorials designed with the absolute beginner in mind. These tutorials include step by step examples and will show you how to use Excel to create a basic spreadsheet.

**Rationale:** It provides step by step procedure on how to use Ms Excel.
Useful Link 3
Title: Introduction to Microsoft Excel 2013 Free Tutorial
URL: https://www.webucator.com/tutorial/learn-microsoft-excel/index.cfm
Screen capture:

**Description:** In this website you'll learn about the basics of Microsoft Excel, how to use it, and the relevant vocabulary. You will find out how the spreadsheet can be used in a variety of circumstances and you can organize information. The page gives a lot of practical skills.

**Rationale:** You will find more hands-on examples on how to use Microsoft Excel.

Useful Link 4
Title: How to Use Microsoft Access (with Pictures) - wikiHow
URL: http://www.wikihow.com/Use-Microsoft-Access
Screen capture:
**Description:** it gives a step by step illustration of how you can use MS access. The illustrations are very vivid for every beginner

**Rationale:** A picture is worth a thousand words. This link uses series of pictures to acquaint a learner with MS access.

**Useful Link 5**

**Title:** Access 2013 videos and tutorials - Access - Support - Office.com

**URL:** [https://support.office.com/en-us/article/Access-2013-videos-and-tutorials-a4bd10ea-d5f4-40c5-8b37-d254561f8bce](https://support.office.com/en-us/article/Access-2013-videos-and-tutorials-a4bd10ea-d5f4-40c5-8b37-d254561f8bce)

**Screen capture:**

**Description:** If you’re new to Access, it is important that you start with these Access tutorial videos for training with Access 2013. You can download these video Access tutorials or watch them online.

**Rationale:** It presents series of videos which a learner can choose from to get acquainted with MS access
Useful Link 6
Title: Learn Access Now
URL: http://www.learnaccessnow.com/
Screen capture:

**Description:** This link categorizes the different lessons offered. Each category has sub-lessons you can go through to master the use of Ms Access.

**Rationale:** It acquaints you with the MS Access environment. It also helps you learn terminologies you will encounter in your use of MS Access.

Useful Link 7
Title: How to use Microsoft Office PowerPoint
URL: http://www.wikihow.com/Use-Microsoft-Office-PowerPoint
Screen capture:
**Description:** Gives a visual representation of every step you need to follow when using MS PowerPoint.

**Rationale:** The screen capture and illustrations serve as powerful tools for learning how to use PowerPoint. This link provides all of that to enable the learner successfully create presentations.

**Useful Link 8**

Title: Microsoft PowerPoint Tutorials


**Screen capture:**

![Microsoft PowerPoint Tutorials]

**Description:** The tutorials listed on this page are designed to take beginners by the hand and to teach them the basics of using the program.

**Useful Link 9**

Title: How to use Microsoft Powerpoint

URL: [http://teacherworld.com/pptutorial.ppt](http://teacherworld.com/pptutorial.ppt)

**Screen capture:**
Description: A PowerPoint tutorial that acquaints you with the Ms PowerPoint environment.

Rationale: Understanding the PowerPoint environment and getting acquainted with terminologies is very crucial in your learning how to use MS PowerPoint. This link provides just the right tutorial to enable you accomplish this.

Useful Link 10

Title: PowerPoint in the classroom

URL: http://www.actden.com/pp/

Screen capture:

Description: Seven lessons on the use of powerpoint with emphasis on classroom usage. It also has teachers’ guide and tutorial that could be printed.

Rationale: The lessons are not only an expansion of the activities in the module, but they have been simplified into a natural conversational language.
Useful link 11

Title: Online practice modules


Screen capture

Description: A collection of practice modules. In addition to the PowerPoint and excel that have been covered in this module are other reading of interest to teachers.

Rationale: You will find it interesting to explore other applications for future study in the use of ICT in teaching.

Course Overview

This Module is the third in the collection of ICT course modules. It relates to your ability to use numeric data, database management, and presentation tools in educational communication. The main purpose of this course module, therefore, is to equip you with basic computer skills relating to numerical data, database management and presentations.

Course Outline

Units

Unit 1: Working with Spreadsheet software

Unit 2: Working with Database management software

Unit 3: Working with Presentation software
Course Units Organizer

A unit organizer is an instructional tool that is used to illustrate to a learner how the units covered in a module are interrelated and how they could be studied. Once you have prerequisite knowledge of modules 1 and 2, you could decide to start with any unit in this module. The units in this module do not follow any particular order.

Required Materials

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<th>Unit</th>
<th>Hardware</th>
<th>Software</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1: Working with spreadsheet software</td>
<td>A computer</td>
<td>Spreadsheet application software (for example Microsoft Excel)</td>
<td>Tutorials and learning materials relating to the basic spreadsheet application (e.g. Microsoft Excel) functions. Examples of spreadsheet applications such as class lists, school-based financial reports and stock charts.</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Unit 2: Working with Database Management Software</td>
<td>A computer</td>
<td>Database management application software (for example Microsoft Access)</td>
<td>Examples of a database management application (e.g. Microsoft Access) educational facilities such as class lists, school-based financial reports and stock charts.</td>
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</tr>
<tr>
<td>Unit 3: Working with Presentation Software</td>
<td>A computer</td>
<td>A presentation application software (for example Microsoft PowerPoint)</td>
<td>Resources on the basic functions of a presentations application (e.g. Microsoft PowerPoint) functions relating to the presentation of text, formatted and numerical, and graphical presentation of data. Lesson plans, class notes, or seminar notes for use during teaching or seminar presentations</td>
</tr>
</tbody>
</table>
Unit 1: Introduction to Spreadsheets

Learning Outcomes

By the end of this activity, you should be able to:

• Explain what a spreadsheet is
• Create and enter data and formulas in worksheets
• Copy, paste and cut cells of data and formulas in worksheets
• Explain and use absolute and relative cell references
• Use lists and AutoCorrect
• Link worksheets
• Work with data maps

Summary of the learning activity

In this activity, you will learn the basic principles of, and steps involved in, creating a workbook of numeric information. You will also be exposed to manipulation of data in a workbook.

Unit content

As you teach, you will need to keep records of information about pupils and other resources. These records are indicators of the teaching, learning and management of resources that take place in a class and school in general. The records would be used in future to show pupil progress and accountability of resource management.

Imagine you have a science class of 54 pupils. Out of this number of pupils, 27 are girls and 27 are boys. You need to create a table showing information about the class. This table should show the following information on each of the pupils: name, sex and marks obtained in the four tests that you have given them. You also want to show individual marks in each of the tests, the totals for each of the pupils and the average mark. You will also need to show difference in performance, if any, between boys and girls with a view to putting in measures to reduce the differences.

Picture that each one of the pupils is a case: a case with a name, sex, and has obtained marks in the four tests in science. The whole class picture can be viewed as a table in which there are 54 cases.

The table can be drawn and kept using a word processor or hand written. In both cases, you would have to calculate the total marks and average marks for each of the cases manually. Using a word processor, you probably have to remember to sort the lists of the cases in an alphabetical order. However, a hand written list would need a lot more time to prepare.
In the lessons below, you will learn how to use a spreadsheet to create a worksheet of the information, and how to make basic calculations.

Table 1 shows an outline of the class performance list that has been described above.

Table 1: My Science class

<table>
<thead>
<tr>
<th>NAME</th>
<th>SEX</th>
<th>TEST 1</th>
<th>TEST 2</th>
<th>TEST 3</th>
<th>TEST 4</th>
<th>TOTAL MARKS</th>
<th>AVERAGE MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akabondo, Janice</td>
<td>Female</td>
<td>65</td>
<td>70</td>
<td>56</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhebhe, John</td>
<td>Male</td>
<td>60</td>
<td>68</td>
<td>50</td>
<td>73</td>
<td>251</td>
<td>62.75</td>
</tr>
<tr>
<td>Chirwa, Banda</td>
<td>Male</td>
<td>66</td>
<td>70</td>
<td>60</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kakuba, Harriet</td>
<td>Female</td>
<td>66</td>
<td>73</td>
<td>64</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using Spreadsheets

In order to use a computer to create and manipulate the class performance information, the applications you will need to use are Spreadsheet Applications or Database Management Systems. In this Unit you are going to learn how to use spreadsheets.

What is a spreadsheet?

According to the web-based dictionary (the Webopedia), a spreadsheet is, “A table of values arranged in rows and columns. Each value can have a predefined relationship to the other values. If you change one value, therefore, you may need to change other values as well.” (source: Webopedia, http://www.webopedia.com/ Consulted in August, 2006)

The computer programmes that are used to create and manipulate spreadsheets are called spreadsheet applications or spreadsheet programmes. According to the webopedia, these Spreadsheet applications (sometimes referred to simply as spreadsheets) are computer programs that let you create and manipulate spreadsheets electronically. In a spreadsheet application, each value sits in a cell. You can define what type of data is in each cell and how different cells depend on one another. The relationships between cells are called formulas, and the names of the cells are called labels (source: Webopedia, http://www.webopedia.com/TERMS/spreadsheet, Consulted in August, 2006).
The science class performance list can, therefore, be turned into a spreadsheet using a spreadsheet application. Is the word spreadsheet confusing you? It should not. The word is used to mean the table of information as well as the programme or application that is used to create the tables or sheets of information. In order to avoid any confusion, you may use spreadsheet to refer to the product and spreadsheet application or programme to refer to the programme.

Using the spreadsheet you can make calculations to give you the results that you want. For example, you do not need to use a calculator or any mental additions to give the total marks for your students in the performance table. The spreadsheet application can do it for you. However, you would need to put a formula in the cell where you want the result or the information to be placed. Using the formula you will be able to tell the spreadsheet to make the calculation and give you the result. According to the webopedia (Online), a formula is:

1. An equation or expression.
2. In spreadsheet applications, a formula is an expression that defines how one cell relates to other cells.

A formula uses the following operators:

- **Start with an equal sign:** `=`
- **Additions:** `+`
- **Subtraction:** `-`
- **Multiplication:** `*`
- **Division:** `/`
- **Brackets:** `()` are used to nest some operation especially if you are using more than operators in one expression.

To multiply the value in one cell by that of another, you need to identify the cells by their coordinates. For example: `=A2*C2` means to multiply the value in cell A2 by the value in cell C2, the answer will be in cell D2.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>=A2*C2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1: An example of a part of a worksheet**
Using Microsoft Excel

Now, let us use one of the spreadsheet applications, called Microsoft Excel, to create the class performance worksheet.

Learning Activity 1: Creating Worksheets

Using the Microsoft Excel programme, create a worksheet of your class, indicating the column labels showing name, sex, test 1, test 2, test 3, test 4, total marks, and average mark from cell A1 to H1. Enter the cases in the rows below the labels and use formulas to give the total marks and average marks.

Required facilities

Either actual or made up class performance list

Procedure

1. Start Microsoft Excel. You will notice a blank worksheet that looks like the one below

![Figure 2: A typical Microsoft workbook or worksheet](image-url)

Start entering data into the worksheet. If you look at the worksheet below, you will notice that the Label “Name” is cell A1; the Label “Sex” is in Cell B1

2. Enter the labels up to cell H1

3. Enter all the cases (information about each pupil) according to the labels starting from cell A2 ending in cell F2. Your worksheet should look like the one below
4. Use the enter and tab keys to move from one cell to another as you enter data.

Very good, you have now been able to enter data in cells. Now, let us move on to using formulas.

**Using Formulas**

You are now going to complete entering information under the columns “total marks” and “average marks” of the worksheet.

1. Put the formula in cell G2. In essence, the formula must add up all the marks that have been obtained in the four tests. This means that you have to find the sum of the four marks.

   There are two ways of doing this: one of the ways is adding up all the cells like this
   \[=C2+D2+E2+F2\]

   The other way of adding up a series of cell values is by using the SUM function. Do you remember, from your knowledge of arithmetic, what SUM means? It means adding up some figures. You want to find the sum of the values in C2, D2, E2 and F2. The formula is:

   \[=\text{SUM(C2:F2)}\]

   The means, find the sum of values in the range of cells from C2 to F2. You use this function when there is no cell in between the cells (C2 and F2) that must left out.

   Have you noticed how brackets have been used? You will learn about the use of brackets in the next few moments.

   Repeat the above steps, using either of the two expressions (cell n + cell n, etc. or SUM (celln: celln), in the column of cells F3, F4 and F5.
Finding the Average

How would you find the average marks, in column G? You need to remember the meaning of the term average. It is the sum of a number of values divided by the number of the values. In this case it means the sum of marks in the four tests divided by four. This essentially means the sum of values in columns C, D, E, and F, then divide the final value by 4.

How many operations can you identify in this operation?

That is right, there are two operations: addition and division. You need to use brackets. There are three possibilities:

1. \((C2+D2+E2+F2)/4\)
2. \(\text{SUM}(C2:F2)/4\)

Have you noticed any familiarity with the part of adding the cells C2 to F2?

That is correct! That is what you did in column G.

The third method of finding the value in column H is: \(\text{cellG}/4\), \(\text{G2}/4\) would do it.

Now for your practice, fill in the column H from H2 to H5

Now that you have learnt how to use addition, division and brackets, try using the subtraction and multiplication functions. Do a lot of practice on using various formulas.

Learning Activity 2: Editing, copying cells and formulas

Working on the same worksheet, put your cursor on cell G2. Pay attention to the pane just above A1: you will notice the indication of the Cell where your cursor is: G2. That part of the sheet is called Name Box. Next to it you will see the information or formula that is the cell G2. That part of the sheet is called Formula bar.

Figure 4: Illustration of name box and formula bar
You can copy the value of a cell or formula in a cell and paste it in another cell. However, you should remember that if you put a cursor in one cell if you type anything in that cell, what was there is replaced. Try that in one empty cell, say J2. To avoid over-writing what is in a cell, click and work from the formula bar to edit what is in a cell.

**Copying cells**

1. Put your cursor in cell J2 type =C2. This means that the value in J2 should be the same as what is in C2. Press the enter and do the same for J3 =C3 up to J5

That is a way of copying information from one cell to another.

**Copying formulas**

Formulas are copied a little differently from cell values.

2. Put your cursor in G2 and Click edit in your control panel, followed by copy. G2 will look active with what appears to be running dots.

3. Put your cursor in G6 and click edit followed by paste, then press the enter key. The formula and not value will be copied. The value will be different.

Now that you have learnt how to copy cell values and formulas, complete the whole class performance worksheet. Use the copy and paste technique to complete this task.

**Using cell references**

Up to this time in your module, you have learnt, among other things, cells and how to refer to them. You use their positions in terms of their Columns and Rows. For example, the first cell in a worksheet is A1 (intersection of A column and Row 1). You have also learnt how to refer to a range of cells. Do you remember this when you were carrying out the sum operation? You referred to a range of cells like C2:F2 to refer to the values in the cells C2, D2, E2 and F2, thus from cell C2 to F2. This was a range of cells in Row 2.

There are two types of references: relative and absolute cell references.

If you copied the formula that is in cell F2 and pasted it in cell F3, the values C2 and E2 would change in cell F3 to reflect the cells which are related or near the formula to make it applicable to the values near it. The formula in F3 would, therefore show as =SUM (C3:E3). This is referred to as relative reference.

If you do not want the formula to adjust its cell references, then you have to turn the expression from relative to absolute reference. For example:
If you were to copy the formula (=C2*D2) and you did not want to change the value of the cell C2, then you would have to change what goes into E2. To turn it into an absolute reference you would edit the formula to put dollar signs before the parts of the reference that should not change. It would, therefore read =$C$2*D2. On coping this formula to E3 it would result in =$C$2*D3. So where as D2 has been changed to D3 you will notice that $C$2 remained the same.

You have now created one worksheet in your workbook. You are going to create another worksheet but in the same workbook. Save your work and give it a name. Remember file names should refer to the type of work you have created.

At the bottom of the workbook that you have been working on, right at the foot of the screen, you will notice that there are tabs labelled Sheet 1, Sheet 2, and Sheet 3. Right click on the tab Sheet 1 and Rename the sheet to Science class.

**Learning Activity 3: Creating Charts**

From your science class, it is important to keep gender desegregated data that would make it possible for you to show the difference in performance between the girls and boys so that you will be able to take any remedial measures.

Click on Sheet 2 and create a sheet showing the following: The number of boys and girls that have got the following grades A, B, C and D from your science class.

Using the average marks of each pupil, give the pupils the grades of A, B, C and D according to ranges used in your school system. Break this information into columns that show Boys and Girls. 1. Use the formulas to give the totals. 2. Create a bar chart to show the distribution of grades and class performance. The table below shows the number of pupils (boys and girls) that got grades A to D.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>20</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 5: Illustration of references*
Table 3: Table showing performance statistics

<table>
<thead>
<tr>
<th>Grade</th>
<th>Boys</th>
<th>Girls</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>27</strong></td>
<td><strong>27</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

Procedure

1. Highlight the block of cells that contain the values, including the total marks column and not the Total Row.
2. Click Insert and select Chart.
3. Select columns.
4. Select the type of bar chart you want from the templates given by the wizard, and click next.
5. Click on the Series tab to label the series of Boys by typing “Boys” in the space that says Name.

Figure 6: showing a step for labelling series
6. For the Category (X) labels, Click on the icon in the field spaces, pointed at as category X, then select the cells that contain the grades A to D in the grade column of your table. That will enter something like: =Sheet2!$B$10:$B$13. In this case it is the range of values from cell B10 to B13 as absolute references. That is where the grades A to D are in the example above.

7. Click on Series 2, for Girls and Series 3 to label the other two series

8. Click next

9. Label the Chart by giving the appropriate chat title, X-axis, which is Grades, and Y-axis, which is Number of Pupils or Frequency.

10. Click Next and select to save the chart as a new Chart, and click Finish. The chart should look like the one below

![Figure 7: The final chart of science class performance](image)

Well, congratulations! You have just created an impressive worksheet and chart showing gender-desegregated data using a graph as an illustration.

How many worksheets do you have in your workbook? How about charts? Look at the bottom of your workbook for that information. Rename the sheets and chart to reflect the information you have. Please save your work.
Formatting

Formatting of sheets and charts involves changing the characteristics of your worksheet to make it look the way you want. You can change column sizes. Here is how:

1. Click on the letter that represents the column at the top of the column. It becomes shaded.
2. Either double click on the top part of the column or use the cross your cursor has become, to drag the column to the size you want.

For other types of formatting, click on Format, in the task bar, and select the types of formatting you want.

Formatting numbers

One important level of formatting is that of numbers. You can format numbers to make them display as decimal, currency, date, and others. Select a column of your worksheet and click on Format and Cells.

Unless changed, the date number is set in one way. Try to type the date in any cell by tying a number from 1 to 12, slash and any other number between 1 and 31. What do you notice? Use the format date function and see how to change the formatting.

Learning Activity 4: Printing

Open a new worksheet, in the same book by clicking on sheet 2, 3 or 4 at the bottom of the workbook; rename the sheet from sheet n to formatting. Enter any labelled data and format the date, currency, and decimal points.

Create a simple list of subscription to show the names, individual subscription, date paid, amounts paid and total amounts paid.

You can print the sheets and charts using the print function, just as you learnt on word-processing. However, it is possible to print only certain areas in Excel. Here is how:

1. Select an area you want to print, by dragging the areas
2. Choose File, Print
3. Deselect the print area or change where it says print what. Click on selection
4. Choose whatever, other options and click OK

You are almost at the end of this Unit now. However, you have at this point got the basic steps in using Microsoft Excel. The remaining topics on AutoCorrect, Linking worksheets, and Working with data maps should be easy.

Autocorrect is a feature that enables the program to correct words or items that may be
Wrongly spelt. You can set autocorrect to enable Excel to correct words as you are typing.

Click on Tools and select Autocorrect to see how you could set up the system for autocorrect. It is helpful if you want to avoid retying or checking spellings every so often. Autocorrect would correct you as you type according to the parameters that you set.

**Linking worksheets**

This function enables you to link the various worksheets and workbooks that you create. This facility helps you to move from one sheet to another by clicking on certain designated texts. For example, to link a sheet a to another sheet b Type a text that you would want to use click in order to move. Click in that cell and click insert and hypertext. Find, by browsing the file that has the sheet that you want to link to. Click on the relevant word under Browse for (either a file or a web site).

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td>Test 1</td>
<td>Test 2</td>
<td>Total</td>
<td>CA</td>
</tr>
<tr>
<td>2</td>
<td>George</td>
<td>57</td>
<td>61</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mary</td>
<td>60</td>
<td>58</td>
<td>118</td>
<td></td>
</tr>
</tbody>
</table>

For example, to link the workbook on class performance to another workbook, say on school facilities, firstly there must be such a file (on school facilities) already existing. Try to create one, if you do not have one. Somewhere (one cell) in your class performance worksheet type a word Class facilities. Put your cursor in the cell where the text Class facilities is and click, Insert, then click hypertext, Click File under browse for in order to browse and to find the workbook School facilities to which you want to create a link. Then click ok. The text will change color to blue to show that it has been linked. For example, the text CA in E1 is linked to a web site.

**Maps**

Maps are used to work with geographical information. For example, if you want to create a map of data from countries or regions of a country. One of the columns would have geographical data and the next information from or about the countries.

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marg</td>
<td>Female</td>
<td>Kenyan</td>
</tr>
<tr>
<td>Noel</td>
<td>Male</td>
<td>Zambian</td>
</tr>
</tbody>
</table>

For more information on how to work with maps, click Help, select index, and then type in Map.
Using the Help function

For immediate help functions within Microsoft Excel, please click the File tab on the Ribbon and choose Help.

Required Readings

Source: GCF LearnFree.org
URL: http://www.gcflearnfree.org/excel2013

Required Resources

A computer with Microsoft Office installed. The office version should be either, office 2007, 2010, 2013 or 2016

Useful Links

Title: How to Use Excel - Excel Tutorials for Beginners
URL: http://spreadsheets.about.com/od/excel101/a/Excel_beg_guide.htm

Key Concepts (Glossary)

Cell: an intersection of a column and row in a spreadsheet. This is the area that holds a value of information or data.

Formula: an expression that gives an instruction for a calculation

Spreadsheet: a sheet, which contains rows and columns where the information and formulas are put, within application.

Workbook: refers to a number of worksheets that are together in the same file

Worksheet: is the same as the spreadsheet defined above.
Formative assessment

Your school has asked you to make an analysis of the final year examination results over the last two years in the major subjects. In the analysis you have been asked to remember the element of gender: you should show if there has been relational differences in performance between male and female candidates. Use the existing information in the school to answer:

1. Using worksheets and charts please calculate and show the performances over the last two years. Discuss this problem with at least one of your fellow students.

2. (Optional) As you were learning how to use Excel, you may have encountered some challenges or problems. What were these problems? What challenges do you think you would face in teaching the application to secondary school pupils? Discuss this question or set of questions in an essay of not more than 600 words.
Unit 2: Introduction to Database management systems

Learning Outcomes

By the end of this unit, you will be able to:

- Create an empty database and add tables
- Work with tables
- Sort data
- Create relationships
- Create relational database

Summary of the learning activity

In this activity, you will learn how to use a database management system to organize information in a systematic and consistent way. If you are a teacher you will be able to manage such information as pupils records and records of classroom facilities. In addition, you will be able to retrieve such stored information much more efficiently. You will also be able to create reports based on the information that is stored in a database. The information presented in this module could be applied in various job areas not just teaching.

Unit content

In the previous unit, you learnt how to use spreadsheets to process and present information. In this unit, you are going to learn about database management. In the previous unit, you stored data in a spreadsheet. In this unit, you will store data in a database. There are a lot of times when you want to view individual records or cases as opposed to seeing the entire picture. There are times when you want to retrieve information about cases in a much more effective way. You may not want to calculate anything but keep information in order to retrieve at a later stage. You may also want to have similar data that is stored and acted on in the same way. A database software can help you do all that.
What is a database?

Machajewski (n.d) in Study.com (2003-2016) defines a database as a container that stores data. However, the data stored in such a container is organized and is thus called information. This information is organized on a computer in such a way that it can be easily accessed, managed, and updated (TechTarget, 2005-2016). The computer can thus easily find the desired information. What kind of information can we store in a database? The information could be people, products, phone numbers, pictures, videos e.t.c. A typical example of database is the phonebook on our mobile phones. We call this a database because it contains the contact’s name, address, phone numbers, and sometimes, e-mail address, facebook and WhatsApp contacts. All this information on our mobile phones are so organized that we can easily retrieve a contact’s details without any hassles. That is typically what a computer database does.

In this Unit, we will learn how to use a database management software to create and work with databases. We will be using Microsoft Access 2010 version. To do this make sure you have Microsoft Office suite installed on your computer.

Planning a database

Before you design the database you need to plan. Planning a database makes it easy for you to capture all the needed information so that nothing is left out. It is suggested that this planning should be done on paper. You can ask yourself series of questions and write down the answers to these questions on a paper. As you go through the information on the paper over and over again, you will see other essential things you had initially omitted which are necessary for your database. You need to think of the information attributes that you would like to use to store and, therefore, query the database with. These are the elements that would help you to describe the records. Would you like to keep records of achievements or penalties that a pupil might obtain during his or her term in the school? Well, then you would need to have fields where you would record such data about each pupil.

Planning involves asking oneself certain questions. The major questions would be:

1. What is the purpose of the database? What is the problem I want the database to solve?

2. What data do I need to collect? In other words, what objects do I need to include in my database? The answer to question 2 largely depends on the purpose you identified in question 1. For example, if the purpose of the database is to manage students’ records in a school, then your objects would include the following:

   - Student’s name: (first name and last name)
   - Sex
   - Identification number
3. Are there databases that exist that keep such information?
4. How would you like to describe the information that is to be stored in the database or how would you like to interact with the database? What information about each record would you like to keep?
5. What fields will you use?
6. From among the fields, is there one that is key? Is there one that will be unique and differentiate each individual record from the others?

Learning Activity 1: Creating a Database

Having written down the answers to these questions, you can now create your database. To do this, follow the steps below:

Procedure

The steps we are using below is based on Access 2010. Other higher versions of Access follow the same principles but with few enhancements.

1. Using file management skills, you learnt in Module 1 and Module 2, create a folder, where you will be putting all the Access projects.
2. Start Access from your programs menu. If you are using Windows 8, go to the bottom left of your task bar. Click on Start and scroll to locate Access.

Fig. 1: Start Menu
3. Select a blank database file. At your extreme right, type a file name for your database in the File Name box (in this case type the name: Pupils)

4. Click on the Folder icon near the File Name box to locate the folder you created in Step 1 for all the Access files

5. Click on the Create icon.

6. Double click create table by using wizard option. You will have a screen like the one below.

![Fig 2: Screen capture showing available database templates in Access](image)

Once you have created a database, you will find a screen that looks like the one below:

![Fig.3: Screen capture showing blank database in datasheet view.](image)

Before we can go further, let us understand the different parts that make up a database. There are basically six parts to a database and they include:
Each of these parts have their specific roles. We will start with the first part: **Tables**.

A **Table** is a very essential part of a database. In MS Access, data is usually stored in a table, so tables are very fundamental to Access database. Before creating your own table, you need to understand certain terminologies associated with tables. These are:

**Fields:** A field refers to columns. So what we call a column in Ms Excel is a field in Ms Access. Each field must have a name and no two fields should have the same name.

**Records:** A record refers to rows. What you call a row in Ms Excel is a Record in Ms Access. Every record contains a field value. For example, record 1 can be a student's name and the fields will include first name, last name and phone number.

**Primary Key:** this is a unique identifier that differentiates each record in a database. It can be a field or groups of fields that identifies a record in a table. In a database, no two records should ever be the same. However, if, for instance, in a school or a firm, two students or employees bear the same first name and surname, the primary key differentiates both records. For students, the primary key could be their matriculation numbers, while for employees, it could be their staff ID number.

It is important for each table in a database to have related information, that is, each data in a table should refer to the same subject. In other words, if you want to create a database for a university, one table should contain list of students, another for academic staff, another for non-academic staff, another for students’ courses and so on. This makes an Access database a collection of related tables.

**Practice**

From what has been discussed so far, answer the following questions:

1. Define a database
2. Explain what a record is
3. Explain what a field is
4. Discuss why a primary key is important in a database
Learning Activity 2: Creating Tables

Look at the figure above. When you create a blank database, you will see a table that is created named Table1. This is the default name given to your table. You will need to save this table later with a different name. The Table automatically opens in datasheet view. This view enables you to perform different operations on the data such as adding, deleting, updating and searching data etc. There are two views offered in Access 2010, the Design view and the Datasheet view. Riazameen (2014) describes the difference in both views. He explains that the design view is used to design the structure of the table or change the structure of an existing table. You can also specify the primary key, name, data types and description of fields in this view. The datasheet view on the other hand is used to enter, delete or modify data in a table. The table in this view is displayed in rows and columns. The name of each field is displayed at the top of the column as header. Each row contains a complete record. By default, however, Access Tables open in datasheet view. Look at the blank database we created (see figure 3), did you notice a column with ID? That ID is the unique identifier or primary key that makes each record unique. Let us assume that we are creating a Table of employees in a Center in a University. To create the table on the blank database, follow the steps below:

- Go to click to Add (you will notice that a box appears prompting you to choose what you want to add).
- Choose Text (did you notice that immediately you chose text, field 1 came up?)
- Change the name of the field by clicking on it. Type the name you want to give it in this case, type Last Name
- Repeat these steps to add another field, name it Middle Name
- Repeat the same steps and name it First Name

Now see what your screen looks like below. This is what your table should look like in datasheet view.

Fig 4: Screen capture showing Table 1 in datasheet view.
At this point, it is best to change to Design view. This will enable us set our primary key. To do this, follow the steps below:

- Go to the Home menu.
- At the top left, you will notice the View icon, click on the dropdown arrow just below this icon.
- Click on Design View (you will notice that a Save As box comes up)
- Type a Name for your table (in this case type CIIT Staff List) and click Ok

**Points to Remember about Tables**

- Each table name must be unique. No two tables in the same database should have the same name.
- The table name should describe the data in the table. So if the table is a list of employees in a school, Name it thus.
- Though Table names can have up to 64 characters, but try to keep the name short

**Working in the Design View**

You will notice a marked difference between your data in the Design view and the datasheet view. See fig below.

![Screen capture showing Table 1 in design view.](image-url)
First, your table name has changed from Table 1 to the name you used to save it i.e. **CIIT STAFF LIST** (see left pane). Your table also has a different structure. You can now define your primary key, type table headers and other details. Do the following in your Design View:

- In the field named ID, type **Staff number**
- In the data type, choose **Text**
- In the description, give a brief description of what you expect in each **field** if necessary
- Move to the second field, type **Last Name** in the field name
- Under data type, choose **text**
- Under description, type **surname of employee**

**Practice**

For fields 3-6 type the following names: middle name, first name, sex, and phone number. Choose the appropriate data type and description for each field. When you are done, your table should look like the one below:

![Fig 6 complete Table in design view](image)

When you are done in the design view, switch to datasheet view and start filling the tables. This is what your table should look like after filling it in Datasheet view.
Save your table by right clicking on the table name above the primary key and then Click on save.

**Practice**

Follow the steps that you took in creating the pupils Table file and create another Table for Books. Remember to include the primary key.
Learning Activity 3: Searching for Tables

Have you noticed that Access creates databases in tabular form? Well, you remember that when you started creating the database you had options on how to create the tables. Using the table of information that you have entered, you can search or find information. You can sort the information using any order of fields.

How to search

You can search records or specific data of records using the Find function. It is pictured with Binocular on the Quick Access Tool Bar. Click that symbol and the Find and Replace dialog box will appear like the one below.

![Figure 8: A searching or finding dialogue box](image)

In the dialogue box, you have to type in what you want to search in the space Find what. Look in” asks you to specify the database file to search. Match area is where you specify which field to search, a specific one or all fields. Search: is where you indicate whether to search the entire database (All) or up/down. It is advisable to uncheck the Match case area to allow searching for both upper and lower cases.

Sorting data

You can sort the records using any of the fields. In the table click the top of the column and click the sort symbol A to Z or Z to A.
Practicing the relational database

Make the two Tables (pupils and books) related in such a way that a pupil could borrow a number of books, but obviously one book cannot be borrowed by more than one person.

Procedure

1. Remember the primary keys for both Tables.

2. Edit the Book Table file to include the Pupil ID (primary key from the Pupils Table file) by:
   a. Closing the Tables
   b. Clicking the open file icon or function
   c. Click on the Books Table file
   d. Click the Design icon on the database dialogue box and add the PupilID field
   e. Make the PupilID field a number type.

1. Close the design dialogue box

2. Click on the Books database file

3. Click on the Tools function from the menu and select relationships

4. A box with the two database fields will appear.

5. Double click on the Pupil ID and have another dialog box.

6. Click “Create new” for new relationships

7. Drop down the labels to indicate the tables that are on the left and on the right

8. Select the Pupil ID from both tables (Pupils and Books)

9. Click Create to finish

To lend books to a pupil with an ID number 1, follow the following steps:

1. Open the Books Table and type in 1 in PupilID field in the books table. To return the book, delete the Pupil ID in same field in the Books table.

2. View the tables and click the + sign preceding the Pupil’s name to show if a pupil has borrowed a book or the + sign preceding the book to show if a book has been borrowed.

You will find additional information on:

- Adding to the database
- Setting table relationships
- Making Queries
- Creating and using forms
- Creating and using forms
- Creating a report

**Required Readings**

Source: wikiHow

URL: http://www.wikihow.com/Use-Microsoft-Access

**Required Resources**


**Useful Links**

Source: GCF Learnfree.org

URL: www.gcflearnfree.org/access2010

**Rationale:** This link gives you a very detailed step by step note on how to use MS Access.
Key Concepts (Glossary)

**Database:** a collection of related information that is built for a given purpose. The information is systematically arranged and described so that every item included is described in the same way and related to the others.

**Field:** an area in the database where specific elements of information are entered when describing an item in a database. Fields are to Access what Columns are to Excel. So every column is called a field.

**Record:** an entire item that has been stored using a number of fields. All the elements, making up information about a pupil, are stored as a record.

Formative Assessment

As a teacher, you manage a classroom in which there are pupils and resources for both yourself and your pupils. There are various ways and tools used to manage them. One of the factors that determine the methods of managing the information is how you would like to use it. Make a list of all the resources that will be under your responsibility as a classroom teacher. What use will you put these resources to? Which of the two applications that you have learnt would you use to manage them? Would you use different applications for the different resources? Explain your answers in an essay of between 500 and 1000 words. You may discuss the reflection with a colleague.
Unit 3: Working with Presentation Software

Learning Outcomes

By the end of this unit, you should be able to:

1. Create slides
2. Insert, duplicate and delete slides
3. Integrate graphics into a slide
4. Add animations

Summary of the learning activity

This learning activity will enable you to create computer based slide presentations. You may have used the chalkboard or flip charts to make illustrations and or points for discussion. Presentation applications enable you to use the computer to make even more effective illustrations and presentations.

Unit content

As a teacher, you are required to use a number of teaching aids. Some of the classrooms based teaching aids are chalkboard, flip charts, models, maps and graphs. The evolution of information and communication technologies (ICTs) has made it possible to make the teaching aids more illuminating. One computer tool that can be used for illustration is a presentation. You can deliver the presentations through various media, namely: television, computer, overheads projectors, printouts and on the web. The computer based slides can be advanced, from one to the next, manually or automatically.

Through this activity, you will be asked to turn one of your lessons into slides. You will use a presentation program to create slides of a lesson. The slides could include graphs and other objects that make it easy for pupils to visualize and understand the subjects.
Using Microsoft PowerPoint

PowerPoint application is one of the applications that are in the Microsoft Office suite. The others that you have learnt, so far are: Access, Excel, and Word.

Here are some tips in slide creation:

1. You are communicating using the slides, be as clear as possible
2. Do not over-crowd a slide with too much text or information
3. Each slide must be simple, clear, and coherent.
4. Avoid having more than one subject or issue on one slide. You may have a few but clear bullets on a slide
5. Follow a logical sequence of new slides according to the subject under presentation as you progress in your presentation.

Learning Activity 1: Inserting, duplicating and deleting slides

Starting PowerPoint

1. Plan the presentation
   - What type of presentation?
   - How many slides will you need?
   - What information will be on each slide?

2. Start PowerPoint. The first screen will look like the one in the figure below:

![Starting PowerPoint](image)

Figure 1: Starting PowerPoint
Inserting a Slide

After working on your first slide and you desire to add more slides, go to the Home tab. Under the Slides group, click on New Slide and make a choice from the various office themes presented on the drop down menu as shown in the figure below.

Fig 2: A sample of templates in the Office Theme for inserting slides

Duplicating a Slide

Once you’re done with a slide and wish to use its content on your next slide, all you need to do is duplicate it. This can be done by clicking on the slide you wish to duplicate on the task pane, and then click on the new slide tool on the Slides group of commands just like when you would want to insert a new slide but this time click on Duplicate Selected Slides at the bottom of the drop down menu.

Or you can right click on the desired slide you wish to duplicate on the task pane, and then click on Duplicate Slide from the pop up menu that appears, as shown here.

Fig 3: Drop down menu that pops up when you right click on a
Deleting a Slide
You can delete a slide by right clicking on it from the task pane and clicking on delete slide.

Learning Activity 2: Creating Slides for presentation
Use one lesson in a subject of your choice; make a plan of topics and their logical flow. To carry out this activity, follow the steps below:

Open Microsoft PowerPoint (you will notice that a blank slide automatically comes up)
In the Title box, type Computer Science, in the subtitle box, type Internal Components of the Computer. You can also add your name as the presenter. To do this:
In the subtitle box, after typing your subtitle, type Presented by, Click Enter and then type your Name.

This is your first slide. See the figure below.

Fig 4: PowerPoint Title slide

The next step is to create a second slide for your presentation. There are several ways you can do this. If you are using Windows 8, Operating system, follow the steps below:

Method 1

- Click on the Insert Tab
- At the extreme left of the tool bar, you will see an icon New slide.
- Click on the drop down arrow by the icon (a box showing different slide templates will come up)
- Pick a slide of your choice (Note that the slide template you choose will depend on the kind of presentation you want make). For this presentation we are creating,
choose Title and Content slide

Method 2

- Right click on your first slide which you just prepared (a small box comes up)
- Choose New slide (note that with this method, you are not given options of different slide templates. The computer automatically selects a slide for you)

If you have inserted the Title and Content slide, let us prepare content on it. Follow these steps:

Steps

- In the Title box, type: The Internal Components of the Computer are:
- In the add content box, you will notice various options, click. Pictures (when you do that, the Insert Dialog box comes up prompting you to select an existing picture from one of the folders on your computer.
- Choose a picture.
- Then click Insert. (the picture will automatically be inserted into your slide.

If you don’t have an appropriate picture in your picture folder, follow the following steps:

- From the Title and Content slide, choose Online Pictures (make sure you have an internet connection before you do this). You will notice that a search engine comes up (e.g. BING).
- Type your search query in the search box, i.e. type the name of what you searching for.
- For the purpose of our presentation you will insert the motherboard. So type Mother in the search box. (pictures of motherboard will appear.
- Choose a picture of your choice and click Insert (the picture will download into the empty space on your PowerPoint slide.
- If the picture is too large, drag the handles and resize.

That is your second slide!

Be careful not to insert too many pictures on one slide. Insert just one or two pictures on a slide. We want the pictures to be bold and clear to the audience. Do not clutter a slide with too much information. Instead create another slide and insert more pictures. Remember we are doing a presentation on internal components of a computer. That is the reason why we are choosing these items. You only choose content that tallies with the objectives of your presentation.

You could equally label the pictures you have inserted. To label do this:

- Click on Insert Tab
• Choose Textbox from the Text group of commands
• Drag the text box on the screen
• Type the name of the object into the text box
• Resize the text box to fit under or above the picture

Practice

For our presentation, create three more slides. The third slide should show the CPU and RAM, the fourth slide should show the Hard disk and cooling fan and the last slide will be your conclusion, that is, Thank you. Don’t forget to label the objects

Learning Activity 3: Adding Animations

In this activity, we are going to animate the objects we have inserted into our slides. Adding animations to a slide creates an effect that could engage your audience and enhance retention. Animations sometimes could be used to give life to an object and create emphasis. Let us now add animation to the objects we have inserted. To do this follow these steps:

• Highlight the motherboard
• Click on the Animations Tab from the Ribbon (series of animations will appear)
• Choose an animation of your choice. (you will notice a number on the animation)

If you change your mind about using a particular animation, you could remove it by going back to animations and choosing NONE. You can equally add more than one animation to an object. To do this, follow the steps:

• Highlight the object
• Click on animation
• Click on add animation
• Choose any animation from the options (You can see how many animations you have added to an object by the number on the object. If you add two animations, you will see 1,2 and so on)

**NOTE:** Be careful not to use too many animations on one object because this could distract your audience. Two animations for an object would be just fine.

Practice

We animated the motherboard on the slide. Animate the other four objects.
Required Readings
Complete Reference: PowerPoint 2013 Essential Training
Source: Lynda.com

Required Resources
A complete computer set with Microsoft Office suite installed. Office 2007, 2010, 2013, and 2016 are most desirable

Useful Links
Title : Microsoft PowerPoint Tutorials
URL : http://www.electricteacher.com/tutorial3.htm

Key Concepts (Glossary)
- **Animation**: Making objects of slides dynamic or move in a certain way
- **Graphics**: refers to any image or graphs that are used to illustrate a subject or item
- **Slide**: a single page in presentations that could be used to present information
- **Slide transition**: is progressive movement from one slide to the next, in a single presentation
- **Template**: refers to an already made design of slide, which you could adopt for the format, color, and general design of your slides.
Formative Assessment

1. You have been asked by your school management board to make a presentation on the school how the school has fared in terms of acquisition and maintenance of furniture, equipment and buildings. The report should also include the changes, if any, in school enrolment especially with respect to the education for all principle that has been embarked by the Ministry of Education. Use Microsoft Word to prepare the report that should include tables of figures.

2. Make a PowerPoint presentation to help you present the report at the next Parent Teachers’ Association (PTA) Annual General Meeting.

3. (Optional) Please discuss how you would use the PowerPoint application to improve your teaching and learning activities. Which specific functions make the applications have an advantage over the chalkboard and which ones do not? Are there any areas that are still challenging with respect to making teaching aids more effective and efficient? Please show your responses to these questions to your instructor.

Summary of the Module

You have now come to end of the module. The module should have contributed to your ability to be an efficient teacher that is able to use ICT as a teaching aid. As a teacher, you know that teaching aids such as chalkboards make it easier to illustrate a point or subject. Presentations make it even easier to make illustrations in much more effective ways. A learner will be able to view a presentation over and over again if the presentation is computer based.

You have also learnt two ways of managing information in such a way that the information could be retrieved much faster. The numerical information can be managed more efficiently using spreadsheets while databases can be used to store units of information in a systematic manner. You have learnt how to use the graphics and information management systems for purposes of teaching and managing resources. You should be able to move on to advanced subjects and courses on the use of ICT in specific subject areas such as Mathematics and Science.

Summative Evaluation

You have completed three activities in this module on spreadsheets, database management systems and using presentations. By this time, you are expected to be able to create spreadsheets, use them in classroom management and create various types of reports. You are also expected to be able to use a database management application to store and manage information on classroom and school resources. Lastly, you are expected to be able to use a presentation application to create and present a lesson.
Criteria for Summative Evaluation

You will write three essays to test your knowledge on what you have learnt in this module. Each essay attracts 25 marks.

Questions

Please write three essays on:

1. What spreadsheets are and how you could use them as teaching aids and management tools. Pay particular attention to the attributes of information that you would use in the planning and management of the school as you write this essay.

2. What database management systems are and how you could use them as tools in teaching and school management. In your essay consider the opportunities that the application provides in storing and retrieving information that is related such as pupils, books and other resources.

4. With the use of PowerPoint, make a lesson plan and notes that you would use to teach Introduction to ICT. What opportunities and challenges can you identify that arise from the point of view of teaching methodologies?

Discuss the answers with a colleague and show them to the instructor near you.
References


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**Author Information/details**

Vitalicy Chifwepa (PhD)

Senior Lecturer, Department of Library and Information Studies, University of Zambia, P.O. Box 32379, Lusaka.

E-mail: vchifwepa@edu.unza.zm OR vchifwepa@yahoo.com

A senior lecturer teaching in information science, including information and communication technologies (ICTs). Has headed the Department of Library and Information Studies Department for many years. Has also acted as Director of Distance Education within the University of Zambia. He has recently completed his PhD in distance education. The thesis was “Model development for the application of ICTs in support of distance education students at the University of Zambia.”

**Reviewed by:**

Dr (Mrs) Esther Fomsi

Department of Curriculum Studies and Educational Technology

Faculty of Education

University of Port Harcourt

Nigeria

esther.fomsi@uniport.edu.ng
The African Virtual University Headquarters
Cape Office Park
Ring Road Kilimani
PO Box 25405-00603
Nairobi, Kenya
Tel: +254 20 25283333
contact@avu.org
oer@avu.org

The African Virtual University Regional Office in Dakar
Université Virtuelle Africaine
Bureau Régional de l’Afrique de l’Ouest
Sicap Liberté VI Extension
Villa No.8 VDN
B.P. 50609 Dakar, Sénégal
Tel: +221 338670324
bureauregional@avu.org