South Sudan

Secondary
ICT
Information Communication Technology
Teacher's Guide

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Secondary ICT has been written and developed by Ministry of General Education and Instruction, Government of South Sudan in conjunction with Subjects experts. This course book provides a fun and practical approach to the subject of Information Communication Technology, and at the same time imparting life long skills to the pupils.

The book comprehensively covers the Secondary **1** syllabus as developed by **Ministry of General Education and Instruction.**

Each year comprises of a Student's Book and a Teacher's Guide.

The Student's Book provides:
- Full coverage of the national syllabus.
- A strong grounding in the basics of mathematics.
- Clear presentation and explanation of learning points.
- A wide variety of practice exercises, often showing how mathematics can be applied to real-life situations.
- It provides opportunities for collaboration through group work activities.
- Stimulating illustrations.

**All the courses in this primary series were developed by the Ministry of General Education and Instruction, Republic of South Sudan.
The books have been designed to meet the primary school syllabus, and at the same time equiping the pupils with skills to fit in the modern day global society.**

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Printer
Puts text and images from the computer to paper.

Monitor
Displays information on a screen.

Case
Contains the brains of your computer that processes information, including the central processing unit (CPU) and other parts.

Keyboard
A device for typing letters, numbers and symbols into the computer.

Mouse
A hand held device for moving a cursor around the screen.

Modem / Router
Sends network signal to the computer used to connect many computers to the network or the internet.

South Sudan

ICT TEACHER'S GUIDE

This book is the property of the Ministry of General Education and Instruction.

THIS BOOK IS NOT FOR SALE

FOREWORD

I am delighted to present to you this Teacher's Guide, which is developed by the Ministry of General Education and Instruction based on the new South Sudan National Curriculum. The National Curriculum is a learner-centered curriculum that aims to meet the needs and aspirations of the new nation. In particular, it aims to develop (a) Good citizens; (b) successful lifelong learners; (c) creative, active and productive individuals; and (d) Environmentally responsible members of our society. This textbook, like many others, has been designed to contribute to achievement of these noble aims. It has been revised thoroughly by our Subject Panels, is deemed to be fit for the purpose and has been recommended to me for approval. Therefore, I hereby grant my approval. This Teacher's Guide shall be used to facilitate learning for learners in all schools of the Republic of South Sudan, except international schools, with effect from 4th February, 2019.

I am deeply grateful to the staff of the Ministry of General Education and Instruction, especially Mr Michael Lopuke Lotyam Longolio, the Undersecretary of the Ministry, the staff of the Curriculum Development Centre, under the supervision of Mr Omot Okony Olok, the Director General for Quality Assurance and Standards, the Subject Panelists, the Curriculum Foundation (UK), under the able leadership of Dr Brian Male, for providing professional guidance throughout the process of the development of National Curriculum, school textbooks and Teachers' Guides for the Republic of South Sudan since 2013. I wish to thank UNICEF South Sudan for managing the project funded by the Global Partnership in Education so well and funding the development of the National Curriculum, the new textbooks and Teachers' Guides. I am equally grateful for the support provided by Mr Tony Calderbank, the former Country Director of the British Council, South Sudan; Sir Richard Arden, Senior Education Advisor of DfID, South Sudan. I thank Longhorn and Mountain Top publishers in Kenya for working closely with the Ministry, the Subject Panels, UNICEF and the Curriculum Foundation UK to write the new textbooks. Finally, I thank the former Ministers of Education, Hon. Joseph Ukel Abango and Hon. Dr John Gai Nyuot Yoh, for supporting me, in my role as the Undersecretary, to lead the Technical Committee to develop and complete the consultations on the new National Curriculum Framework by 29 November 2013.

The Ministry of General Education and Instruction, Republic of South Sudan, is most grateful to all these key stakeholders for their overwhelming support to the design and development of this historic South Sudan National Curriculum. This historic reform in South Sudan's education system is intended to benefit the people of South Sudan, especially the children and youth and the future generations. It shall enhance the quality of education in the country to promote peace, justice, liberty and prosperity for all. I urge all Teachers to put this textbook to good use.

May God bless South Sudan. May He help our Teachers to inspire, educate and transform the lives of all the children and youth of South Sudan.

Deng Deng Hoc Yai, (Hon.)
Minister of General Education and Instruction, Republic of South Sudan

Contents

Unit 1: APPLICATION SOFTWARE

Specific learning experiences

Learners should draw on their prior learning experiences and individually refine their skills in the use of applications such as word processing, spreadsheets, and graphic design.

In small groups they should investigate and manipulate data in MS Excel, e.g. into tables, and produce statistical measures such minimum, maximum, range, mode, mean and standard deviation. They might use data, e.g. from population census to sort the population into categories such as gender, age groups, education levels etc. They should analyse and produce simple charts (e.g. bar and pie)

Individually and in small groups the learners should use graphic applications such as MS Powerpoint, MS Publisher, and graphic software (e.g. paint) to prepare products that could be presented in different formats and integrated into report documents.

They should be able to describe how data are manipulated using different application software and know how to integrate data in different formats, e.g. Word, Excel, Powerpoint, Publisher, and Paint in reports. They should recognize the importance of computer applications in daily activities and in the future.

Key enquiry questions

1. How can abstract data be manipulated into meaningful information?
2. How do we integrate data in different formats, e.g. Excel, PowerPoint, graphics etc. into a document?
3. What is the importance of computing in today's world?
4. How can students demonstrate the importance of ICT to others e.g. parents?
5. How adequate are present MS applications for the world beyond the 21st century?

Learning outcomes	
Knowledge and understanding	Know about application software and how to manipulate data using, e.g. word processing, spreadsheets and graphic design
Skills	• Identify the right tools for appropriate use. • Write and edit documents. • Manipulate data. • Make creative use of graphics. • Produce multimedia products.
Attitudes	• Appreciate the role of application software in daily life activities • Value the importance of computer applications for data processing

Contribution to the competencies	Links to other subjects
1. **Critical thinking**: data processing, organization, graphic design 2. **Communication**: information presentation 3. **Co-operation**: team work	1. Fine Arts: Design 2. Languages: Writing 3. Maths: Formulae & functions 4. All subjects: Statistical data

Teaching application software

In ICT, technology changes over time, but the concepts of handling, converting and integrating data into information are fairly constant and this is reflected in this unit. Terms like "software" and "applications" appear only as examples - the main emphasis are "finding things out", "developing ideas and making things happen", "exchanging and sharing information on various application software" and "reviewing, modifying and evaluating apps as technology progresses".

The learners should be taught how to use various application softwares for a particular task and given opportunities to do so. They may present their findings from an investigation using several forms of information - pictures, graphics and text. The highest levels of capability, should ideally be reached by the end of this unit in regards to this unit's learning outcomes. The learner should be able to describe and demonstrate how data are manipulated using different application software and how to integrate data in different formats.

Guide the learner to Know and understand the difference between system and application software.

Promoting co-operative learning

This involves learners being given structured opportunities to collaborate with others in their class to both improve and consolidate their subject expertise. Activities which get all the children actively engaged in doing something are the best examples.

Such activities could include learners to:

- Discuss on various topic, issues or an activity
- Contribute to a collaborative activity;
- Quizzing each other on their knowledge of a topic
- Discussing for a set period of time about a particular topic and recounts what has been said before the roles are then reversed.

UNDERSTANDING MICROSOFT WORD

RESOURCES REQUIRED: Adequate computers enough for the whole class (with MS Word and access to the internet), Secondary ICT students textbook and teacher's guide.

Beginning the lesson: engage the learners in brainstorming discussions on the importance of computing in today's world. Begin the lesson with the following questions:
   a) What is a word processing program?
   b) What are some of the word processing programs present today?
   c) What is MS word and what are some of its usage?
   d) How adequate are MS applications for the world beyond the 21st century?

Note: For an effective learning outcome, the students should be able to work as independent as possible and be able to learn all the basic functions and application of MS word. The teacher should provide teaching and learning opportunities that match student's individual needs and interest. The teacher should provide room for creative thinking to improve the students understanding on MS Word functions.

LEARNING OBJECTIVES
By end of this section, students should be able to:
   1. Know about MS word, its usage and importance in the field of ICT.
   2. Identify the right tools for appropriate use.
   3. Write and edit documents.
   4. Manipulate data.
   5. Make creative use of graphs.
   6. Save documents and share them online.
   7. Appreciate the role of application Software in daily life activities.
   8. Value the importance of computer applications in data processing.

WHAT IS EXPECTED OF THE TEACHER?
In this section, the teacher is supposed to do the following:
   1. Read and gather information about MS Word in order to familiarize with the topics within the section. Note making can be an important tool to improve on understanding before embarking on the lesson.

1. Introduce Microsoft Word as a word processing application to the students, its usage and importance in the field of ICT.
2. Help the students investigate, manipulate and integrate data in different formats. (In this case, students should be able to create and save documents in various formats using MS word.
3. Help the students know the importance of computing in today's world.

INTRODUCTION

Microsoft Word (simply referred to as Word) processing application program/package specially designed for performing various word processing tasks, such as **typing, editing and printing out of textual information.** It also allows adequate control over the creation and presentation of the typographic work. Microsoft Word also offers facilities for basic graphic design, statistical report of a document, spelling and grammar checking tasks, etc. These and numerous other features and facilities Word offers make it stand out among word processing programs, as well as make the difference between it and other mechanical devices for word processing (e.g. typewriter). Other word processing software include:

a) Word perfect by the Corel Corporation.
b) Open office by Apache
c) Pages by Apple.

Basic manipulation in MS Word
1. Understanding the component of the computer and their usage in data integration manipulation and presentation in MS Word i.e. the use of the mouse, keyboard, monitor, printer, external and internal storage devices.
2. Creating and saving new documents.

Advanced Data manipulation in MS Word
1. Understanding the usage of MS word tools and preferences to meet user needs. I.e. changing the page set up, changing the font, inserting shapes and images, editing shapes and objects, autocorrect and spelling and grammar checking, changing the print preview and printing of documents. **(refer to the notes on the student's book on page 7-20)**
2. Sharing the document using email applications.

Suggested assessment guidelines

To make sure that each student is able to understand all the functions of MS word in word processing:

1. Use application questions to make the lesson more exciting for example let the students create documents such as formal and informal letters, Curriculum Vitae CV, Public Notices among others using the available Word templates.
2. Sort the students in random groups so that fast learners can help their slower counterparts.
3. Liase with the school's administration so that students with special need can be accounted for during the entire lesson.

Encourage individual work. However co-operation in groups and pairs can be an effective tool in understanding.

Name some of the application softwares you have come across and their functions.

-Ms Word
-Ms Excel
-Ms PowerPoint
-Ms Publisher
-Ms Paint

Allow the learners to discuss about the above application software. Encourage them to say which software does what.

Keyboard

Activity 1.2
1. In groups, look at a keyboard.
2. Identify the buttons highlighted in the text above.
3. What do you see on the screen or monitor when you press some of the buttons?
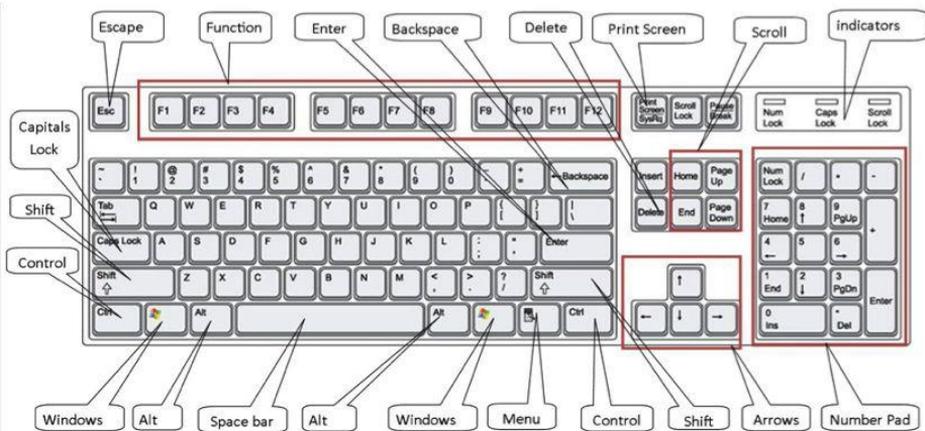
Get an actual keyboard and take the learners through the key functions.

Let them physically manipulate the keys and say what happens on the computer screen.

Activity 1.5

In pairs, review the instructions on The View Title by following them on your computer.
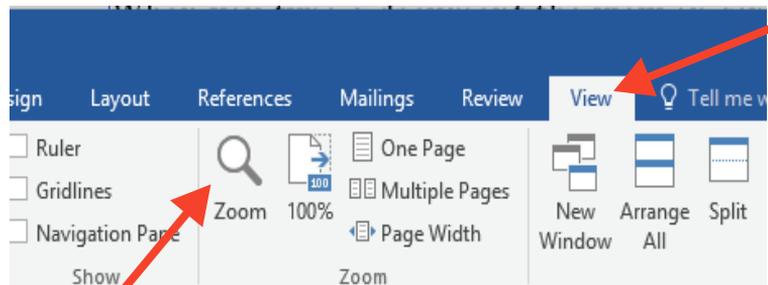
Insert tile.

Activity 1.6

In groups,use the insert box on a practice document to see what you can do with it.

This is a practical exercise. Each group to record what happens as they play with the various options on insert tile.

The Font title

The Tools title

This has a helpful button to check the spelling in your whole document.

Miss-spelt words are underlined in red as you make the error. It is quicker to correct all the errors at the end, rather than do them one by one. You do this by going to **Tools.** Click on **Spelling**. The spell-check will give you options.

You can also highlight a word you are not sure of and the click on the ABC symbol on your toolbar.

Activity 1.10

In groups, practice using the commands on the toolbar in a document. This is a practical activity. Let the learners use the commands and have them note the functions of each.

Activity 1.11

Work in groups.

Step One

Imagine that you are setting up a filing system and decide what files you will need. For example, you will need a file for membership, for staff issues, for funders, for training and so on. Where possible your computer files should be the same as your office paper files. Make a list of all the separate files you think you will need and write them on a piece of paper and then go to your computer.

Step Two

Switch the computer on and click on the icon [symbol] saying **My Computer**. Then click on **C drive**. Then click on the folder marked **My Documents**. Go with your mouse to **File.** Click on **New**. Click on **Folder**. Make the folders you need by typing the name and remember to press enter each time you have typed in the name of the folders from the list you made in Step ONE.

Now, under the main heading of My Documents you will have separate folders with different titles. Every time you use Ms Word and click **Open** these folders will appear and you can open an old document by clicking on the folder and then on Open. The list of documents in that folder will then appear. When you click on Save As, the list of folders will also appear. Save your new documents or letters or anything you type in the correct folder.

Step Three

You can now file all your old documents into the right folders. Switch on your computer and click on My Computer. Click on C and then on My Documents. All the folders and all the old documents should appear on the screen. Simply put your cursor on a document and hold the left mouse button down. Now drag the file document to the right folder and release the button. If some of your documents are on the C drive and not on My Documents, you first have to move them to My Documents. Click the right mouse button on the document and a new box of commands will open. Then click on Send To and then on My Documents.
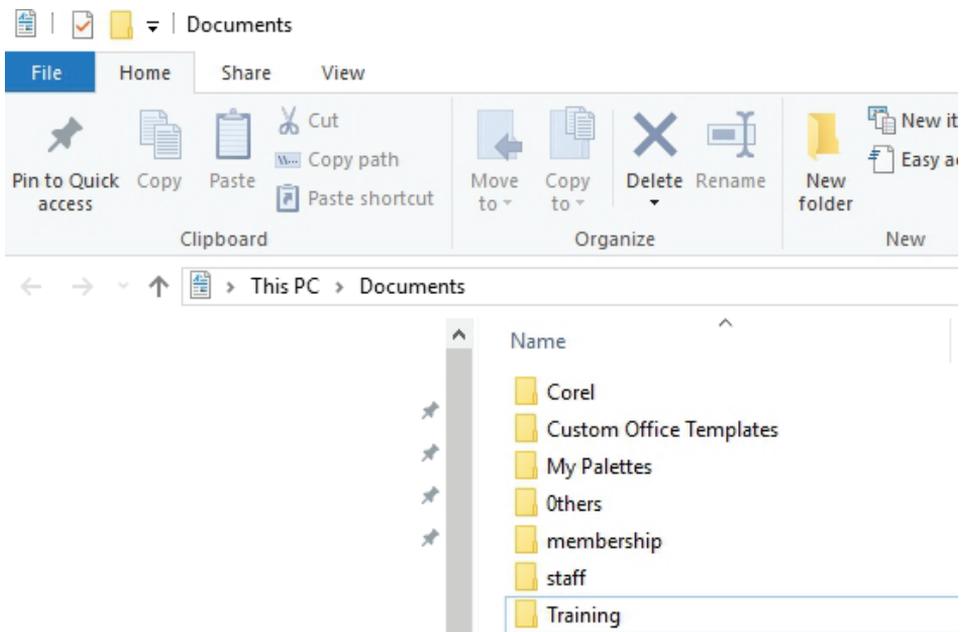
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1.2 MS EXCEL

In this section learners should be expected to work as independently as they can during introductory lesson so that they can demonstrate their ability to complete MS excel tasks and achieve the learning intention on their own or in small groups.

The teacher should provide teaching and learning opportunities that match children's individual needs and interests.

In teaching this unit do not confine your approach to closed, low-level questions, especially during introductory stage. Adopt a model of showing the pupils as a class how to do something in excel on the computer, and then getting them to practice it in that lesson and to repeat that practice in subsequent lessons.

Introduce these unit by defining the basic tools used in MS excel.

Guide the learner to manipulate the database columns as needed to match the desired target format.

Basic Manipulation

- Inserting/Adding Columns – Simply select the column to the right of the column you wish to add, right click, and select "Insert"
- Deleting Columns - This process can be handled simply by selecting the column that is not needed, right clicking and selecting "Delete"
- Moving Columns – Select the column you wish to move, right click, select "Cut", select the column to the right of where you want the column to go, right click, and select "Paste"

Advanced Manipulation

- Create a separate worksheet in the same workbook that has the source data.
- Copy the target format field names into a header record (the first row) on the worksheet.   You may have to use **Copy | Paste Special** and select **Transpose** in order to copy field names listed vertically to be listed across the worksheet
- Enter the equals sign (=) in the first column and first row under the newly copied file header row.   Click over to the source file, select the corresponding field in the first row under the source file's header row and hit Enter.   Repeat this process until you have mapped one field for all of the values in your target database
- Copy the row containing these new formulas down your spreadsheet to at least as many rows as you have records in your source file
- Create a blank worksheet. Copy the entire worksheet using Select All (the box in top left corner of the workbook) and use Paste Special. Select the option to paste Values only
- Save the newly created target file

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Activity 1.13 expected answers

1.
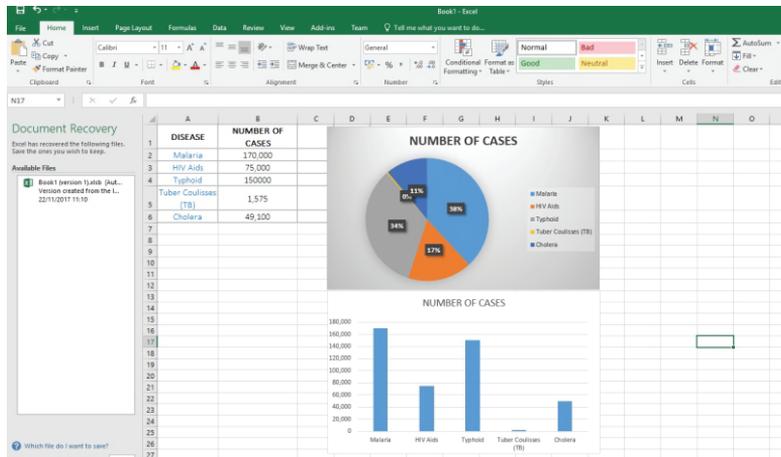
2.
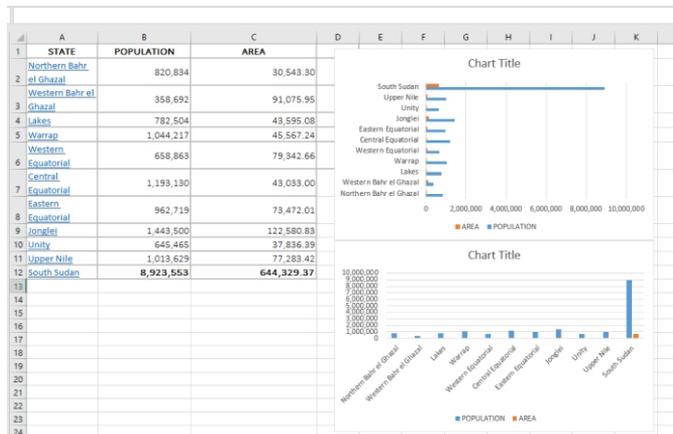
1.3 MS POWERPOINT

Microsoft PowerPoint is publishing application from Microsoft, differing from Microsoft Word in that the emphasis is placed on page layout and design rather than text composition and proofing. It lets you easily create slide presentations and tell a powerful story in your presentations this is a tool of great importance and how useful largely depends on how familiar the learner will get with the software.

Guide the learners to familiarize themselves with MS PowerPoint and prepare professional presentations on the various topics they can relate with in daily life in school and in the community.

General tips of making a good Powerpoint presentation.

1. **Simplicity** – MS PowerPoint was designed as a convenient way to display graphical information that would support the speaker and supplement the presentation. It uses slides with a horizontal or "Landscape" orientation. The message and the ability to tell a story may get derailed by slides that are unnecessarily complicated and feel busy. Slides should have plenty of "white space" or "negative space." Do not feel compelled to fill empty areas on your slide with your logo or other unnecessary graphics or text boxes that do not contribute to better understanding. The less clutter you have on your slide, the more powerful your visual message will become.

2. **Limit bullet points & text** - presentations are for the benefit of the audience. But boring an audience with bullet point after bullet point is of little benefit to them. But the best PowerPoint slides will be virtually meaningless without the narration (the presenter) the slides are meant to support the narration of the speaker. Instead of a copy of PowerPoint slides, it is far better to prepare a written document which highlights your content from the presentation and expands on that content. Audiences are much better served receiving a detailed, written handout as a takeaway from the presentation, rather than a mere copy of PowerPoint slides. If you have a detailed handout or publication for the audience to be passed out after your talk, you need not feel compelled to fill your PowerPoint slides with a great deal of text. Remember to never, ever turn your back on the audience and read text from the slide word for word.

3. **Limit transitions & (animation)** - animations, such as bullet points, should not be animated on every slide. Some animation is a good thing, but stick to the most subtle and professional. A simple "Wipe Left-to-Right" (from the "Animations" menu) is good for a bullet point, but a "Move" or "Fly" for example is too tedious and slow. Listeners will get bored very quickly if they are asked to endure slide after slide of animation.

For transitions between slides, use no more than two to three different types of transition effects and do not place transition effects between all slides.

4. **Use high-quality graphics -** Use high-quality graphics including photographs. Take your own high-quality photographs with a digital camera, purchase professional stock photography, or use the plethora of high-quality images available on line (be cautious of copyright issues, however). Never simply stretch a small, low-resolution photo to make it fit a layout – doing so will degrade the resolution even further. Avoid using PowerPoint Clip Art or other cartoonish line art and today the inclusion of such clip art often undermines the professionalism of the presenter. There are exceptions, of course, and not all PowerPoint art is dreadful.

5. **Have a visual theme –** there is always a need of a consistent visual theme throughout a presentation, but most templates included in PowerPoint have been seen by the audience countless times. The audience expects a unique presentation with new content, and thus the need to shy away from any supporting visuals, such as the ubiquitous PowerPoint Design Template, that suggests the presentation is formulaic or prepackaged. You can make your own background templates which will be more tailored to your needs. You can then save the PowerPoint file as a Design Template (.pot) and the new template will appear among your standard Microsoft templates for your future use.

6. **Use appropriate charts -** Presenters are usually guilty of including too much data in their on-screen charts. There are several ways to display data in graphic form:
    1. **Pie Charts.** Used to show percentages. Limit the slices to 4-6 and contrast the most important slice either with color or by exploding the slice.
    2. **Vertical Bar Charts.** Used to show changes in quantity over time. Best if you limit the bars to 4-8.
    3. **Horizontal Bar Charts.** Used to compare quantities. For example, comparing sales figures among the four regions of the company.

4. **Horizontal Bar Charts.** Used to compare quantities. For example, comparing sales figures among the four regions of the company.

5. **Line Charts.** Used to demonstrate trends.

7. **Use color well.** Color evokes feelings. Color is emotional. The right color can help persuade and motivate. Color usage can increase interest and improve learning comprehension and retention. Colors can be divided into two general categories: Cool (such as blue and green) and Warm (such as orange and red). Cool colors work best for backgrounds as they appear to recede away from us into the background. Warm colors generally work best for objects in the foreground (such as text) because they appear to be coming at us. Common PowerPoint slide color scheme includes a blue background with yellow text.
If you will be presenting in a dark room (such as a large hall), then a dark background (dark blue, grey, etc.) with white or light text will work fine. But if you plan to keep most of the lights on (which is highly advisable) then a white background with black or dark text works much better. In rooms with a good deal of ambient light, a screen image with a dark background and light text tends to washout, but dark text on a light background will maintain its visual intensity a bit better.

8. **Choose your fonts well** - Fonts communicate subtle messages in and of themselves, thus the need to choose fonts deliberately. Use the same font set throughout your entire slide presentation, and use no more than two complementary fonts (e.g., Arial and Arial Bold). Make sure you know the difference between a Serif font (e.g., Times New Roman) and a Sans-Serif font (Helvetica or Arial). Serif fonts were designed to be used in documents filled with lots of text. Serif fonts are easier to read at small point sizes, but for on screen presentations the serifs tend to get lost due to the relatively low resolution of projectors. San-serif fonts are generally best for PowerPoint presentations. Gill Sans is somewhere in between a serif and a sans-serif font and is professional yet friendly and "conversational." Regardless of what font you choose, make sure the text can be read from the back of the room.

9. **Use video or audio -** Use video and audio when appropriate. Using video clips to show concrete examples promotes active cognitive processing, which is the natural way people learn. Using a video clip not only will illustrate your point better, it will also serve as a change of pace thereby increasing the interest of your audience. You can use audio clips (such as interviews) as well. Something to avoid, however, is cheesy sound effects that are included in PowerPoint (such as the sound of a horn or applause when transitioning slides). The use of superfluous sound effects attached to animations is a sure way to lose credibility with your audience.

10. **Slide sorter -** people comprehend better when information is presented in small chunks or segments. By getting out of the Slide View and into the Slide Sorter view, you can see how the logical flow of your presentation is progressing. In this view you may decide to break up one slide into, say, two-three slides so that your presentation has a more natural and logical flow or process. In this view you will be able to capture highlights of your entire presentation from the point of view of your audience. You will be able to notice more extraneous pieces of visual data that can be removed to increase visual clarity and improve communication.

Guide the learners to appreciate the role of Powerpoint in business meetings and in schools.

Devide the learners in gropus of 5. Let them deveolp a powerpoint presentation on any topic and present it to the rest of the class. Let them vote for the best group presentation and give reasons why this was the best. Look out for;
-Use of colour
-Use of video clips for illustration
-Page design
-Use of appropriate fonts etc.

1.4 MS PUBLISHER

Introduce this topic by drawing on learner's experience of graphical capabilities of applications such as MS word and MS PowerPoint. Let the learner discuss the limitations of designing a graphical document in the applications which they have learned.

MS publisher is a designer software, guide the learner to identify basic graphic functions, the learner should be able to describe the functions and purpose of this tools; and there are quick tips which in are designed to save the user time in creating a publication or to show an option that is not easily found.

1) **Prepare before You Start:** If you are designing a brochure, newsletter, etc., always obtain, edit, and organize the images that you will be using in the publication. This will enable Publisher to keep going back to the same file source (saves time) and you won't need to go hunting for images to fill in parts of the publication. It is also helpful to sketch out what your publication will look like before you begin. This will also save time from having to re-work entire sections or having to move objects around to make things fit because you didn't layout the publication properly.

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2) **Select Objects Tool & Grouping:** The Select Objects Tool can be used to draw around a group of objects, which selects all of them and then they can be moved, deleted, etc., as a group. You can also use that same method or click on multiple objects with the use of the CTRL key, then click on the Group icon below the objects. This is an effective tool if you need to move a large amount of objects to different areas of your publication.

3) **Insert Pages Options:** You can insert additional pages into a publication by going to the Insert-Page option in the menus. There are options in the dialog box depending upon what kind of publication you are working on. These options will allow you to insert blank pages, duplicate objects, and insert only a single page and more.

4) **Filling Space:** When creating a publication users will occasionally be confronted by running out of content for a page, but not wanting to extend other content from other areas of the publication. Since objects in Publisher can be easily modified, some good options are to increase the size of your images, add a caption text box, change the font to a larger style, or increase the font size in certain text boxes. Any of these options will quickly fill up any blank space on your current page.

5) **Print Review:** When you first click on Print a preview with various options will open up that will allow you to check how your publication will look before printing. It will often show you that graphics have been placed too close to the margins, items are hidden, objects aren't aligned, etc., so it is a good way for you to fix these problems before you spend valuable time and money printing first, then having to fix these things after.

The benefits of the MS Office Publisher are endless. Being a user-friendly application, it will help the learner to manage his or her work and help you get the job done with its organized and easy to understand interface. Learners will no longer have to hire people to do different aspects of your graphical design publications.

1. Using MS publisher create a birthday invitation card for your friends.
2. Design an exam report book and a timetable.
3. Design a calendar for next year.
4. Take your calender home, What did your parents or guardians think about it?

Timetable

Name:

Time / period	Monday	Tuesday	Wednesday	Thursday	Friday

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1.5 MS PAINT

Begin by demonstrating the program and showing what it can do through a PowerPoint presentation.

In MS paint the objectives should be;

1. Personal, social and emotional development
   - work as part of a group or class, taking turns and sharing fairly
   - select and use resources independently
2. Mathematical development
   - Guide the learner to talk about, recognize and recreate simple patterns
   - use language such as 'circle' or 'bigger' to describe the shape and size of flat shapes
3. Knowledge and understanding of the world
   - The learner should use information and communication technology to support their learning
4. Physical Development
   - handle tools with increasing control
5. Creative development
   - Explore color, texture, shape, form and space in two dimensions
   - Use their imagination in art and design
   - Express and communicate their ideas, thoughts and feelings by using a widening range of suitable tools.

Guide the learners

- To Open MS Paint.
- To search for the Toolbox, Color box, Drawing Area.
- To identify each icon of the Toolbox.
- To draw a particular shape - Ellipse.
- Making use of the Rectangle Tool to make drawings.
- Using the Eraser Tool to remove any unwanted part in the diagrams.
- Closing the Paint Program.

Importance of computing in today's world

Computer technology may include any machine that receive commands and perform calculations or services accordingly

Emphasize on the importance of computer technology in modern world and guide the learner to talk about how computer technology is used to serve and connect people in the modern world.

Guide the learners to share their experience on how Desktops, laptops and computer devices have helped to connect the world together by helping communities, government and organizations that rely on computer technology to produce or innovate the majority of things in their lives, such as food, services, entertainment, care, communication, education and transportation.

In Activity 1.18 guide leaners in discussing the importance of computers in the transport sector, specifically air transport.
What would happen if the computers failed at the Juba International Airport?
-earoplanes will be late
-Accidents can happen,
-baggage can be lost etc.

Guide the learners to master common keyboard shortcuts for PC and Mac computers. These are:

- CTRL + O = Open
- CTRL + S = Save
- CTRL + P = Print

- CTRL + X = Cut
- CTRL + C = Copy
- CTRL + V = Paste

Some ways on how computers can be used in Juba International Airport.

1. To ensure that planes stay on schedule and that they fly safely.
2. Allows you to easily modify travel arrangements at any airport.

3. Computers are necessary for the use of pre- screening measures.

4. Computers are crucial to an airport's air traffic control services.

5. Computers are central to the efficient communication and recording of an airplane's flight data.

Likely problems if there were no computers or they failed at Juba
International Airport.
-Flights would be late,
-confusion due to inability to check into the planes.
-Security threat due to lack of screening
-Poor communication between incoming flights and the ground crew.

The learner should research and discuss in small groups the importance of computing in today's world .

Some expected answers include.

1. Grid computing is flexible, secure, coordinated resource sharing among individuals, institutions, and resources.
   - Grid computing enables the virtualization of distributed computing resources such as processing, network bandwidth, and storage capacity to create a single system image, granting users and applications seamless access to vast IT capabilities. Just as an Internet user views a unified instance of content via the World Wide Web, a Grid user essentially sees a single, large, virtual computer.
   - Grid computing will give worldwide access to a network of distributed resources CPU cycles, storage capacity, devices for input and output, services, whole applications, and more abstract elements like licenses and certificates.
2. Cloud computing helps in:
   - Big data analysis
   - File storage
   - Backup
3. Utility programming:
   - Scalability - Utility computing can integrate other technologies, such as virtualization that includes storage virtualization, network virtualization, and workload management.
   - High Availability – this provides redundancy at every layer including server as well as platform.
   - Manageability- Utility computing provides a platform to deploy any number of servers on a platform with scalable CPU, memory and storage. System administrators can edit,

configure, and design applications using web based drag and drop editor.

4. Distributed computing
   - Reach Many Users - the users of a system are not in one place. However, system functionality implies a means of cooperating on some task or data.
   - Fault Tolerance - you plan for (hardware) failures and provide a backup system to take over (more or less seamlessly)
   - Load Sharing - you require so much computing power that it is uneconomically to place everything of a system on one machine
   - Reuse Functionality Or Data - there is useful functionality available in one place, that you require in another (e.g. a database)
   - Coordinated Control - you need to control a physically distributed system (e.g. a production plant) where connecting every sensor and actor to a central controller is prohibited by cable cost or Fault Tolerance issues.

Data integration & manipulation

Introduce this unit by drawing on learners past experience with applications such as word processing in MS word. Engage the students in defining what is data interpretation and manipulation and how it has been used in today's world.

Allow learners to demonstrate and share their own experience on a personal level about how they have integrated data for presentation or personal use.

The emphasis of this unit is on getting learners to be familiar with the technology behind application software.

1. What is an application software?
2. What is the importance of application software in today's world?
3. Define data manipulation and integration.
4. Which are the main software used to manipulate data.
5. What is the importance of MS excel in data manipulation?
6. What is a spreadsheet?
7. Why is a MS excel a spreadsheet?
8. How can you demonstrate the importance of ICT in your community?
9. Define and explain the uses of these application software.
    - MS word
    - MS excel
    - MS Powerpoint
    - MS publisher
    - MS paint
10. What is the importance of computing in south Sudan?

Answers

1. An application program is a computer program designed to perform a group of coordinated functions, tasks, or activities for the benefit of the user.
2. The students to list the importance of application software and relate to specific areas where these software are used.
3. **Data manipulation** is the process of changing data in an effort to make it easier to read or be more organized.
    Data integration involves combining data from several disparate sources, which are stored using various technologies and provide a unified view of the data
4. MS word, MS excel, MS PowerPoint, MS paint.
5. The students to describe the importance of MS excel in daily use.

    *   Easy Arithmetic Solutions
    *   Formatting Options
    *   Charts for Analysis
    *   Bring all the data in one place
    *   Human Resource Planning
6. A spreadsheet is a file made of rows and columns that help sort data, arrange data easily, and calculate numerical data.
7. MS excel has the unique ability to calculate values using mathematical formulas and the data in cells.
8. The student to expound further on the importance of ICT in the society on:
    *   Solving problems & improving solutions
    *   Protecting people & organizations
    *   Furthering education
    *   Improving communication

9. The learner to explain the uses of application softwares they have learned in this unit.
10. The learner to relate the uses of computing to immediate environment (south Sudan).

Unit 2: INTERNET

Specific learning experiences

Based on their prior knowledge about the internet the learners should learn about the World Wide Web (www), advanced web browsers and search engines. They should learn about the internet and its role in communication and information services. They should be able to explain that the www contains a very large amount and range of information and that not all of this information is reliable.

They should learn this individually and in small groups by using for example Google to explore, e.g. the countries that are members of the United Nations (names of their capital cities, population data, geographic location, etc.).

They should view a website such as Wikipedia and look for various information, e.g. meaning of words, human evolution, climate change, school subjects, etc. by navigating pages and sites using the hyperlinks. They should be able to download and save files.

Key enquiry questions
1. What is the www and how is it organized?
2. How can one navigate pages and sites in www?
3. How can one find specific and valid information in the internet?
4. What role do the internet and www play in information services?

Learning outcomes	
Knowledge and understanding	Know about advanced search engines and search strings to search for information on the internet and extract and use the relevant information, e.g. AltaVista, Google, Bing, and Wikipedia.
Skills	• Use advanced web browsers and search engines (e.g. Google) • Explore for information in the internet • Be able to download and save information from the internet

	• Be able to recognize that www is a huge information resource center.
Attitudes	• Appreciate the role of internet in information provision • Enjoy navigating the internet. • Appreciate that information must be viewed critically

Contribution to the competencies	**Links to other subjects**
• <u>Critical thinking</u>: judgments regarding use of the internet. • <u>Communication</u>: Internet • <u>Co-operation</u>: sharing information and collaborating in the internet.	All subjects: Information sharing

Introduction

In introducing this unit, first start off by defining terms used in the internet. It is best to have the learners give their own definitions of terms and later coming up with a class definition.

Also, allow the learners to share their own experience on a personal level about how they have interacted with the internet.

2.1 HISTORY OF THE INTERNET

Emphasis here is on how the internet has evolved since inception years. Point out to learners that internet developed from a necessity to advance and share technology. When nations compete for power, whoever has the best technology advancement emerges as the powerhouse.

Draw from the learner's personal experiences that knowledge is power, but not as a weapon but a tool to be shared by all.

Another area of emphasis is technological development and the drivers of change in the manufacturing industry and commerce. Talk about what drives the national economy and how it is affected by ICT.

Teacher guide to Activity 2.1

1. Discuss various ways the internet could be used to resolve conflicts in the society.
2. How can internet be used to promote culture in south Sudan.
3. Discuss various ways in which internet can be used in sharing data & information from different schools in various states e.g. schools in Jubek with schools in Jonglei state.

Various ways the internet could be used to resolve conflicts

(1) using available data on events and social dynamics to monitor and predict escalations of tensions or violence.

(2) Harnessing the increased access to the internet and mobile telephones to promote positive peace messages.

How internet be used to promote culture in south Sudan.

-Easy exchange of stories.
-Can easily access cultural activities from other regions.
-Stories can easily be published online.
-Anyone can contribute therefore making it diverse.

Various ways in which internet can be used in sharing data and information from various schools.

-You can use it to share number of students in say secondary 1
-You can use it to compare exam results from different schools.
-You can use it to share experiments and their results.
-You can use it to record the number of teachers in each school.

Uses of the internet in daily life

Another important area to emphasize is the importance and daily usage of the internet for personal or public use, the internet is almost a necessity in today's modern world.

How much time is spent daily on internet usage?

Have the learners used the internet in their day to day

life or their parents or guardians, teachers, siblings, or friends?

What were they looking for in the internet? Did they achieve what they wanted? Were they satisfied?

Advantages of the internet

Modern life has become easier for people to interact. This is due to the immense contribution of the technological advancement in regards to communication creating a need for information sharing. Point out that internet has made our life easier and more convenient. We can use internet to communicate with people around the world, doing business by using internet, make new friend and know different cultures, searching information, studying and etc.

Emphasize that the internet not only allows for communication through email but also ensures easy availability of information, images, and products amongst other things. Every day the internet continues to provide a new facility, something new that is immensely convenient and that makes life easier for web users.

Disadvantages of the internet

Learners may spend too much of their time through the internet.
Learners are likely to neglect their studies and or loose concentration.
They may spend more time on watching movies or chatting with their
friends through internet.
Guide the students in letting them know the negative consequences of
the internet.
Emphasize on the need for caution on time spent on the internet for
non-education purpose.

Safety rules for using the internet

Guide learners in discussing the importance of safe internet usage.
The dos and don'ts. Emphasize the importance of protecting computer by
installing up to date anti-virus software. Encourage the learners to be
vigilant by demonstrating how easy it is falling victim to cybercriminals.
Reiterate that, just like any activity, safe internet usage have to be
practiced every day. Learners can recount instances when they felt
vulnerable while 'surfing'.

Teacher Guidelines for Activity 2.3(refer Student's Book p.62)
1) Ask each group to explain the roles and evolution of the internet in
   the communication and information sector.
-Advertising
-Socializing
-Education
-Banking
-Online shopping

2) Guide the students in discussing the roles of internet in today's
   modern world. Help define and clarify terms, encourage the learners
   to draw on personal experiences when giving examples.

-Let the learners share personal experiences as much as
 possible.

Methods/ways to connect to the internet

Point out to the learners the difference of the methods of internet connection in detail and which is more suitable depending various suitability.

Let learners talk about their preference and which they have used.

2.2 GETTING ONLINE

First start off by defining terms used while being online. Guide learners on the process of getting online from stages of connectivity to web surfing. Encourage the learners by demonstrating how easy it is to get online. Practiced several times to better them. Learners can recount instances when they have experience difficulties when they forget the steps in the process.

Point out to the learners various web browsers commonly used; their interface, the features, usage, tools and general settings.

2.3 SEARCH ENGINES

First define what is a search engines? Which ones do people prefer most? Let learners identify which of these they have used and which they prefer and why?

Point out the features people normally look for when deciding which search engine they prefer. Guide the students in using various search engines commonly used. Show learners the tips on how to make their search more effective.

Guide learners on how to decipher web search results. The relevance of intended web search results. Emphasize the importance of learning how to filter search results. Show on getting started by first defining the terms. Allow Learners to search for key words on the internet and find which the best results is.

1. Learners should complete the exercise in their notebooks on the meaning for the following words.
   - ✓ Human evolution
   - ✓ Population of South Sudan
   - ✓ Capital cities of all countries.
   - ✓ Climate change
   - ✓ Hygiene

This is a practical exercise.

2.3 ELECTRONIC MAIL

First, start by describing what an email is. Why we use it, then illustrate the interface tools, icons, features and the general settings of the some of the most used email service providers.

Emphasize the importance of mastering how to communicate via email in today's corporate settings and why it is the standard norm as an official communication channel.

Guide learners on how to attach files as word document, pdf and other media format in an email and the process of downloading media content from the internet.

Point out the advantages of email communication and let the learners participate in appreciating the need to have a formal communication via email. Engage the students in sharing their experience when interacting or communicating via email.

Guide learners in understanding the disadvantages of email communication. Point out how emails can be a target from cyber criminals.

Revision
Exercise 2
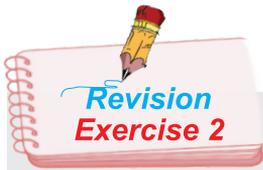
1. What is internet?
2. What is a web browser?
3. What is a search engine?
4. What is the difference between web browser and search engine?
5. Explain various ways in which the internet could help the economy of South Sudan grow.
6. What is the disadvantage of internet in the society?
7. Send your class teacher an email about your study plan.

Answers

1. Internet is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols

2. Web browser is a software application for retrieving, presenting and traversing information resources on the World Wide Web.

3. search engine is a program that searches for and identifies items in a database that correspond to keywords or characters specified by the user, used especially for finding particular sites on the World Wide Web

4. Web browser is programmed to browse a webpage, and search engine is to search for a webpage.

5. Disadvantage of internet in the society

   - There is a lot of wrong information on the internet. Anyone can post anything, and much of it lacks authenticity.

   - There are predators that hang out on the internet waiting to get unsuspecting people in dangerous situations.

   - Some people are getting addicted to the internet and thus causing problems with their interactions of friends and loved ones.

   - Pornography that can get in the hands of young children too easily.

   - Easy to waste a lot of time on the internet. You can start surfing, and then realize far more time has passed than you realized. Internet and television together of added to the more sedentary lifestyles of people which further exacerbates the obesity problem.

   - Internet has a lot of "cheater" sites. People can buy essays and pass them off as their own far more easily than they used to be able to do.

   - There are a lot of unscrupulous businesses that have sprung up on the internet to take advantage of people.

   - Hackers can create viruses that can get into your personal computer and ruin valuable data.

- Hackers can use the internet for identity theft.
- It can be quite depressing to be on the internet and realize just how uneducated so many people have become in today's society.

6. What is the disadvantage of email communication?

- Emails may carry viruses. These are small programs that harm your computer system. They can read out your email address book and send themselves to a number of people around the world.

- Many people send unwanted emails to others. These are called spam mails. It takes a lot of time to **filter out** the unwanted emails from those that are really important.

- Emails cannot really be used for official business documents. They may be lost and you cannot **sign** them.

- Your mailbox may get **flooded** with emails after a certain time so you have to empty it from time to time.

7. Learner should correctly be able to upload a word document (study plan) and be able to send it to their teacher.

Specific learning experiences

The learners should learn about computers and their operating systems. They should know about frequently occurring simple computer problems and the tools used to troubleshoot these problems.

They should learn in small groups using the correct procedures and tools to correct simple computer problems, such as power failure, computer hanging up, printer not responding, passwords forgotten, virus attacks, etc.

They should also learn how to recover the computer using the correct troubleshooting procedures and techniques, e.g. rebooting, reinstallation, roll back, etc.

Key enquiry questions

1. What is an operating system and what does it do?
2. What is troubleshooting and why is it important?
3. What are common computer faults/problems?
4. How are faulty computers/files recovered?
5. What are troubleshooting procedures and techniques?
6. What is hardware and software support?

Learning outcomes	
Knowledge and understanding	Understand the correct procedures to troubleshoot simple computer problems and the reasons for using them
Skills	• Investigate common computer faults • Use appropriate troubleshooting procedures and techniques • Perform troubleshooting of simple computer problems
Attitudes	• Commitment to a logical approach to the correction of errors

	• Show patience and logical thinking in addressing faults • Appreciate the value of protection and recovery measures
Contribution to the competencies	**Links to other subjects**
• <u>**Critical thinking:**</u> correcting faults and errors • <u>**Co-operation:**</u> team work	All subjects: Use of applications

Teaching troubleshooting

In this unit the learner should demonstrate ability to perform basic maintenance and repair on hardware and assist in software troubleshooting. The learner should be able to explain and demonstrate the purpose of preventive, corrective, adaptive and perfective maintenance of computer device.

The teacher to demonstrate different steps of troubleshooting process to the learners who will recreate the process on demonstration computers. Test to see if learners can correctly diagnose ICT problems and select the correct solution.

The learner should be able to demonstrate installation of new software and Identify common failure on hardware and software resources tha t require maintenance.

The teacher should Match Learning Activities to syllabus objectives: Here are a few ways to approach your content for different objective types.

Knowledge: the teacher may give learners a grid with one column listing common "trouble areas." The other columns can then have various headers, but the rest of the areas will be blank. It could be things like: What causes this? Why is this an issue? What are the long term effects of this issue? Corrective actions? You can then have people work in pairs and take one of the common issues and work through the other column headers to arrive at why things are happening the way they are and what can be done. Learners can then teach this information back to the rest of the group and you can add value as needed to help with clarification.

Common Trouble areas	What causes computer to hang up?	Software problems	Why is this an issue?	-Because the I keep loosing my work
			What are the long term effects?	-Cannot finish work on time. -Machine might crash
			What are the corrective measures?	-Re-install the software.

Skills: Depending on what "trouble areas" are, the teacher may consider a "find and fix" solution. How this might work is by presenting a group with a simulated work area that has 10 things that are problems/incorrect. The teacher can then have one group identify what those issues are and then the other groups must physically make the changes to ensure safety. This can help the learner to make sure that the appropriate skills and technique are present to make needed changes.

Attitude: There are times when learners have both the knowledge and skills to be successful but it turns out that they do not want to change or act differently. There are times that this is not a training issue, but there are times that the learner simply need to address an attitude change. In this case, the teacher might consider a peer discussion technique, where a person needs to "convince" the other of the benefits of making changes to address selected "trouble areas." While attitude changes are a very personal thing, this helps shift the thought process for individuals and helps empower people to make different decisions in the future.

Have students identify specific problems, difficulties, or confusions. If students are unable to articulate their concerns, the teacher should determine where they are having trouble by asking them to identify the specific concepts or principles associated with the problem.

The teacher should make students articulate their problem solving process. In a one-on-one class session, the teacher may ask the learner to work his/her problem out loud. This slows down the thinking process, making it more accurate and allowing the teacher to access understanding. When working with larger groups the teacher can ask learners to provide a written "two-column solution." Have learners write up their solution to a problem by putting all their calculations in one column and all of their reasoning (in complete sentences) in the other column. This helps them to think critically about their own problem solving and helps the teacher to more easily identify where the learner may be having problems.

The teacher should in precise terms as possible, write out the knowledge/skill/attitude objectives that he/she is hoping to address. Do they currently have the knowledge to be successful? Do they currently have the skills to apply that knowledge? Do they have the right attitudinal understanding to help them meet the goals?

Once the teacher have this, the creation of a participant-centered experience is much easier.

Frequently, when working problems, students are unsure of themselves. This lack of confidence may hamper their learning. It is important to recognize this when students come to the teacher for help, and to give each student some feeling of mastery. Do this by providing positive reinforcement to let students know when they have mastered a new concept or skill.

Operating system

Guide the learner to understand that an operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows the user to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is useless.

The learner should define and demonstrate that computer's operating system (OS) manages all of the software and hardware on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access computer's central processing unit (CPU), memory, and storage. The operating system coordinates all of this to make sure each program gets what it needs.

Common faults in operating systems

Introduce these section with emphasizing the importance of an operating system which allows a computer's hardware components, including processors and drives, to communicate with its software components, such as applications and data instruction sets hence the need to be familiar within common faults that are likely to occur in an OS.

The teacher should develop a critical thinking strategy for learners who can trouble shoot and problem solve OS faults.

The teacher should model the problem solving process rather than just giving students the answers. As the teacher work through the problem, consider how learner might struggle with the concepts and make your thinking clear.

The teacher should also have students work through problems on their own. Ask directing questions or give helpful suggestions, but provide only minimal assistance and only when needed to overcome obstacles. Students can frequently help each other, and talking about a problem helps them think more critically about the steps needed to solve the problem. Additionally, group work helps students realize that problems often have multiple solution strategies, some that might be more effective than others.

Teacher guidelines for Activity 3.1

1. In Discussing the importance of troubleshooting the Expected responses should be an overview summary of the understanding of the unit in relations to troubleshooting and everyday uses of computers.

   - Waste of time when you have to keep re-booting
   - You can loose work already done.

2. The learners should define the uses of an operating system in computer device and expound further in the roles computer play in the society. This should be an assessment of the role operating systems play in making a computing function.

Role of Operating System

1. Managing Resources: Programs that manage the resources of a computer such as the printer, mouse, keyboard, memory and monitor.

2. Providing User Interface: Graphical user interface is something developers create to allow users to easily click something without having to understand how or why they clicked an icon. Each icon on a desktop represents code linking to the spot in which the icon represents. It makes it very easy for uneducated users.

3. Running Applications: The ability to run an application such as Word processor by locating it and loading it into the primary memory. Most operating systems can multitask by running many applications at once.

4. Support for built-in Utility Programs: This is the program that find and fixes errors in the operating system.

5. Control Computer Hardware: All programs that need computer hardware must go through the operating system.

Hardware and software support

The teacher should guide the learner to define what hardware and software support is. The learners should be able to explain with example the process of providing diagnostic, troubleshooting, maintenance and repair services to a computer device.

Common computer faults and diagnostics

There are many different things that could cause a problem in a computer. Though, troubleshooting will always be a process of trial and error—in some cases, the learner may need to use several different approaches before finding a solution; other problems may be easy to fix.

As learners gain more experience with troubleshooting, they will start to learn more about what causes common problems and how to fix them.

The learners should write down each steps they take. This way, you'll be able to remember exactly what you've done and can avoid repeating the same mistakes. If you end up asking other people for help, it will be much easier if they know exactly what you've tried already.

1. In groups the learners should be able to discuss and demonstrate the correct procedure for troubleshooting common computer problems like;

- Password forgotten
- Computer too slow
- Virus attack
- Printer not responding.

This should be an assessment test on whether the students have mastered the relevant skills in troubleshooting common computer skills. Assessment is the process of gathering and interpreting evidence to make judgements about student learning. It is the crucial link between learning outcomes, content and teaching and learning activities. Assessment is used by learners and their teachers to decide where the learners are at in their learning, where they need to go, and how best to get there. The purpose of assessment is to improve learning, inform teaching, help students achieve the highest standards they can and provide meaningful reports on students' achievement.

Troubleshooting procedures and techniques

In this unit the learner should understand correct procedures and techniques to troubleshoot common computer problems and use the right tools in doing so. The learner should also be able to explain in the theory the reasons for using these procedure and techniques.

The teacher should provides students with opportunities to use their newly acquired knowledge and skills in meaningful, real-life activities and assists in working at higher levels of thinking. In doing so the learner will be able to take on the responsibility for their own learning and will be able to take personal action to solve problems, resolve conflicts, discuss alternatives, and focus on thinking as a vital element of the troubleshooting.

The learner should identify various solutions. After the nature and parameters of a problem are understood, learners will need to select one or more appropriate strategies to help resolve the problem. Learners need to understand that they have many strategies available to them and that no single strategy will work for all problems. The teacher should encourage students to record their ideas in lists to determine regularities, patterns, or similarities between problem elements.

The teacher should evaluate the learners ability to troubleshoot simple computer faults regularly. It's vitally important that the learner have multiple opportunities to assess their own problem-solving skills and the solutions they generate from using those skills. Frequently, learners are overly dependent upon their teachers to evaluate their performance in the classroom. The process of self-assessment is not easy, however it involves risk-taking, self-assurance, and a certain level of independence. But it can be effectively promoted by asking students questions such as "How do you feel about your progress so far?" "Are you satisfied with the results you obtained?" and "Why do you believe this is an appropriate response to the problem?"

Teacher's guideline to activity 3.5 (refer Student's Book p.94)

1. Guide the learner to discuss how to recover a computer through;
   - Rebooting
   - Reinstalling.

   This will determine what learners already know and where there are gaps and mis-conceptions.

2. The learner should be able to explain and demonstrate the steps for rollback troubleshooting technique. This is a Formative assessment that will enable learners to learn through the process of feedback and opportunities to practice and improve on the skills acquired.

Revision Exercise 3

1. What is troubleshooting?
2. What is hardware and software support?
3. What is an operating system?
4. What are the common computer faults?
5. What are the correct procedures to troubleshoot simple computer problems and the reasons for using them?
   - Power failure
   - Computer hanging up
   - Computer too slow
   - Printer not responding
   - Password forgotten
   - Virus attacks
6. Why should we protect our computer from virus attacks?
7. Define the following terms
   - Rebooting
   - Reinstalling
   - Rollback
8. Describe the procedures and techniques used when troubleshooting.

Answers

1. What is troubleshooting? The process of solving a problem or determining a problem to an issue. Troubleshooting often involves the process of elimination, where a technician will follow a set of steps to determine the problem or resolve the problem.

2. What is hardware and software support? This is the process of providing diagnostic, troubleshooting, maintenance and repair services to a computer or similar device. Hardware and software support covers all IT hardware and software including networks, desktops, laptops, mobile devices, and printers.

3. What is an operating system? An operating system or OS is a software program that enables the computer hardware to communicate and operate with the computer software. It performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers. All computers and computer-like devices have operating systems, including laptops, tablets, desktop, smartphones, smartwatch etc.

4. What are the common faults in an operating system? Failure to boot, improper shutdown, spontaneous shutdowns/restart

5. What are the correct procedures to troubleshoot simple computer problems and the reasons for using them?

   The Computer Won't Start: A computer that suddenly shuts off or has difficulty starting up could have a failing power supply. Check that the computer is plugged into the power point properly and, if that does not work, test the power point with another working device to confirm whether or not there is adequate power.

   The Screen is Blank: If the computer is on but the screen is blank, there may be an issue with the connection between the computer and the screen. First, check to see if the monitor is plugged into a power point and that the connection between the monitor and computer hard drive is secure. If the problem is on a laptop, then you may need to get a professional to fix it as some of the internal wires may be worn.

Abnormally Functioning Operating System or Software: If the operating system or other software is either unresponsive or is acting up, then try restarting your computer and run a virus scan. To avoid having this happen, install reliable anti-virus software.

The Screen is frozen: When computer freezes, there may be no other option than to reboot and risk losing any unsaved work. Freezes can be a sign of insufficient ram, registry conflicts, corrupt or missing files, or spyware. Press and hold the power button until the computer turns off, then restart it and get to work cleaning up the system so that it doesn't freeze again.

Computer is Slow: If the computer is slower than normal, you can often fix the problem simply by cleaning the hard disk of unwanted files. You can also install a firewall, anti-virus and anti-spyware tools, and schedule regular registry scans. External hard drives are great storage solutions for overtaxed CPU's, and will help your computer run faster.

Slow Internet: To improve your Internet browser performance, you need to clear cookies and Internet temporary files frequently. In the Windows search bar, type '%temp%' and hit enter to open the temporary files folder.

Overheating: If a computer case lacks a sufficient cooling system, then the computer's components may start to generate excess heat during operation. To avoid your computer burning itself out, turn it off and let it rest if it's getting hot. Additionally, you can chec k the fan to make sure it's working properly.

The learners should also correctly describe procedures to troubleshoot Power failure, Computer hanging up, Computer too slow, Printer not responding, Password forgotten, and Virus attacks and explain the reasons for using them from what they have learned in the book.

6. Why should we protect our computer from virus attacks? Antivirus software protects the computer from incoming threats and seeks out, destroys and warns of possible threats to the system. It is the job of the antivirus software to keep up with the latest threats. This is achieved by daily updates of the antivirus database definitions, which counteract the latest threats to provide constant protection.

7. Define the following terms
   - Rebooting- is the process by which a running computer system is restarted, either intentionally or unintentionally.
   - Reinstalling - This is the process of installing a software program over the version that is already installed
   - Rollback - is an operation which returns the database to some previous state.
8. Describe the procedures and techniques used when troubleshooting.

   Rebooting - when you restart your computer you're clearing off the current state of your software and starting over again. You're basically dumping out the junk and starting over again fresh. This may include whatever problems you've run into.

   Reinstalling - This step is commonly performed when a program has worked in the past, but now is experiencing issues that cannot be resolved.

   Rollback – this method returns a hardware product or software program back to an earlier version after encountering issues with a later version.

Specific learning experiences

The learners should learn about device settings, access control, security and privacy in computers and similar devices such as smart phones and tablets.

They should learn this in small groups by creating their own user protected accounts on the computer, setting user names and passwords. They should also set permissions for directories and files sharing (read, write, execute, etc.) for different user groups. They should be able to set up security software such as firewall, antivirus, spamware, etc.

They should learn how to setup phones and tablets by creating a personal profile, passwords, lock/unlock codes, and access to networks (Wi-Fi, mobile broadband, Bluetooth, GPS).

They should be able to explain what access control in electronic devices means and state the importance of security and privacy in an electronic device.

Key enquiry questions

1. What are device settings and access control?
2. What is security and privacy?
3. How can one secure and protect a device and a user account?
4. Why are security and privacy issues so important in electronic devices (computers, phones)?

Learning outcomes	
Knowledge and understanding	Understand the need for and methods of access control, security and privacy, and know how to set up password protected accounts.

Skills	• Perform set up of electronic devices • Carry out set up of access control for electronic devices • Apply security measures to electronic devices
Attitudes	• Appreciate the role of access control • Appreciate the need for security and privacy in electronic devices • Respect the regulations for the right of access to information

Contribution to the competencies	Links to other subjects
• <u>Critical thinking:</u> security, privacy, and right of access to information • <u>Co-operation:</u> sharing of information	**Citizenship:** Personal safety, security and respect for the rights of others

Teaching access control

In introducing this unit engage the students to share their experience on the ease of access of tools and programs when using a computer device.

Access control is one of the most fundamental mechanisms for data protection. In response to modern threats against computer systems, operating systems implementations have incorporated increasingly sophisticated models of access control. These models are powerful, but also extremely complex. A very strict policy can contain tens of thousands of rules.

The learner should be guided to understand that access control is central to any study of security. Verifying that access control is correctly implemented is essential, because meaningful verification requires formal derivations and proofs.

Introduce the students by defining what access control is. The learner could share their knowledge on the device settings and security and privacy in computer devices.

Creating admin accounts

Guide the students to follow the steps as illustrated in the learner's book on how to create an admin account. Learners should create their own protected account on the computer and be able to set user name and passwords.

The teacher should guide the learner to appreciate the importance of user protected accounts because the most important rule for controlling access to resources is to provide the least amount of access privileges required for users to perform their daily tasks. Many tasks do not require administrator privileges. However, because previous versions of Windows created all user accounts as administrators by default, users logged on to their computers with an administrator account. Without User Account Control (UAC), when a user is logged on as an administrator, that user is automatically granted full access to all system resources.

However, most users do not require such a high level of access to the computer. Often users are unaware that they are logged on as an administrator when they browse the Web, check e-mail, and run software. While logging on with an administrator account enables a user to install legitimate software, the user can also unintentionally or intentionally install a malicious program. A malicious program installed by an administrator can fully compromise the computer and affect all users.

With the introduction of user account control, the access control model changed to help lessen the impact of a malicious program. When a user attempts to start an administrator application, the User Account Control dialog box asks the user to click Yes or No before the user's full administrator access token can be used. If the user is not an administrator, the user must provide an administrator's credentials to run the program.

Because user account control requires an administrator to approve application installations, unauthorized applications cannot be installed automatically or without the explicit consent of an administrator.

Teacher's guideline to Activity 4.1

1. The learners should create in groups a user protected account on a computer with a user name and password.
2. The learners should be able to demonstrate their knowledge on the importance of having a password protected user account.

    1. To protect your private information.

    2. To prevent unwanted prying into your business.

    3. To Monitor others' use of your device(s).

    4. In Case of theft.

Setting permissions for directories
At the end of this sub-unit the learner should be able to set permissions for directories and file sharing e.g. read, write, execute etc. for different user groups.

Device settings

Introduce this sub-unit by guiding the learner on some of the feature found in devices setting like computers, tablets, smartphones etc. Typically, settings exist for every app you use and for every device. It is usually denoted by a recognizable icon of a gear, which often looks similar between most apps and operating systems.

Guide the learner to define what is device settings based on his prior knowledge based on access control.

Introduce to the learner on device setting on various operating systems and guide the learners to understand the differences and the similarities of these functions and capabilities in their respective OS settings.

Typically device settings will control things like:

- appearance (e.g. colors, size)
- privacy
- connections (e.g. wifi, internet)
- actions (e.g. my swipe action in gmail is "delete" by default instead of "archive")
- security
- notifications (e.g. especially for social media apps)
- general management

Let the learners look through the settings on any devices and for each app Investigate what can be controlled, or changed. Then they can customize apps and devices based on your needs.

Security and privacy settings

The term "privacy" is used frequently, yet there is no universally accepted definition of the term, and confusion persists over the meaning, value, and scope of the concept of privacy. At its core, privacy is experienced on a personal level and often means different things to different people in modern society, the term is used to denote different, but overlapping, concepts such as the right to bodily integrity or to be free from intrusive searches or surveillance. The concept of privacy is also context specific, and acquires a different meaning depending on the stated reasons for the information being gathered, the intentions of the parties involved, as well as the politics, convention and cultural expectations. The learners should be guided on meaning and the importance of security and privacy in electronic devices.

Internet and new computer devices offers so many opportunities to explore, create and collaborate. And to make the most of the web, it's important to keep yourself safe and secure. Whether you're a new Internet user or an expert, the learning should be geared to helping the learner use computer devices and also navigate the web safely and securely.

Setting up security software

The teacher should guide the learner in necessary steps for installing security software. The learner should demonstrate the skills of applying security measures in computer devices.

The learner should be able to define, explain the uses and practically install various security softwares (antivirus, firewall, spamware).

Activity 4.5 (refer Student's Book p.121)

1. By following the steps given in the textbook, the learner should be able to demonstrate how to set up firewall software in a computer.
2. The learners should demonstrate his knowledge of security software by discussing the importance of a security software in a computer.

   1. To keep your information protected.

   2. For your computer's overall health, helping to prevent viruses and malware.

   3. Helping programs run more smoothly.

Revision Exercise 4
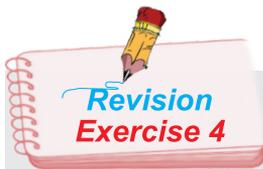
1. What is access control?
2. What are the ways of creating new admin account?
3. How do you create a new admin account via control panel
4. What is the importance of having a password protected account?
5. What is a NTFS?
6. How do you test if a drive is NTFS formatted?
7. What are device settings in an electronic device?

Answers

1. What is access control? Access control systems perform authorization identification, authentication, access approval, and accountability of entities through login credentials including passwords, personal identification numbers (PINs), biometric scans, and physical or electronic keys

2. What are the ways of creating new admin account? The learners should demonstrate practically how to create a new admin account from what they have learnt.
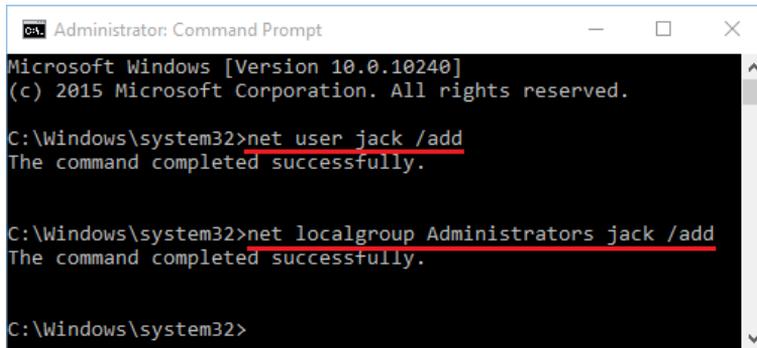   In windows 10

Method 1: Create Administrator Account from Command Prompt

➢ To get started, you need to open an elevated Command Prompt in Windows 10. Press the Windows key + X to open the Quick Access menu and click **Command Prompt (Admin)**.

Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)

Task Manager
Control Panel
File Explorer
Search
Run

Shut down or sign out   ❯
Desktop
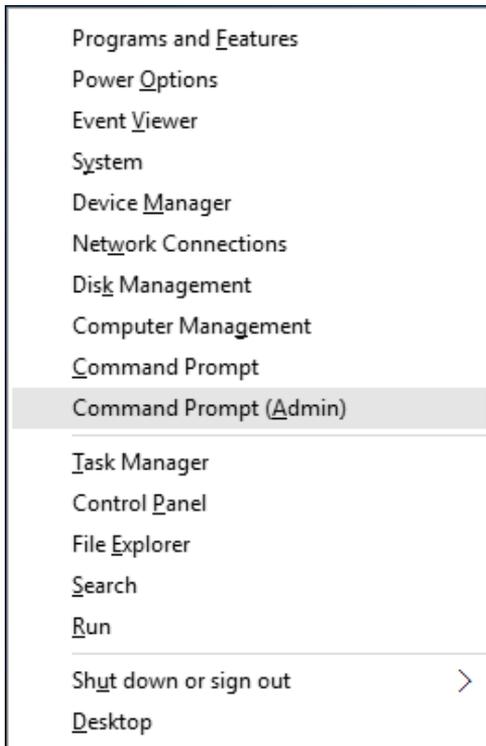
➢ Type the following commands to create a new local account and then join it to the Administrators group. Replace *Jack* with the name of your new local admin account.

```
net user jack /add
net localgroup Administrators jack /add
```


Now you've successfully added a new local administrator account in Windows 10.

Method 2: Create Administrator Account from PC Settings

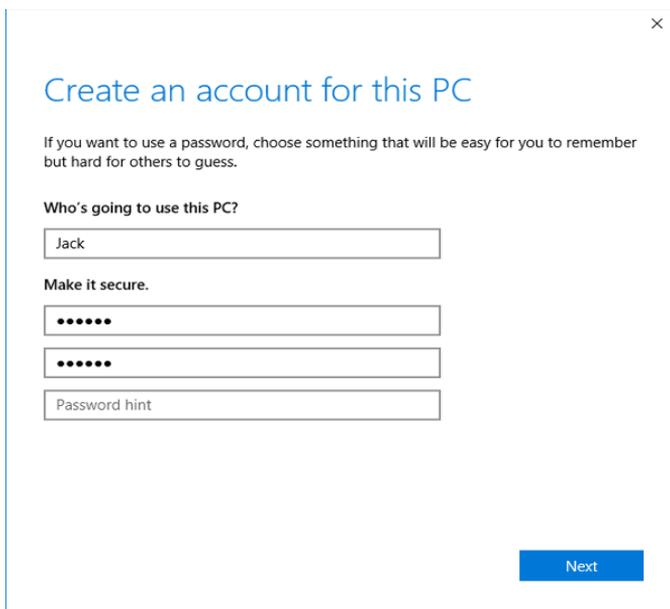Click on the Start button to open the Start menu. Select Settings.
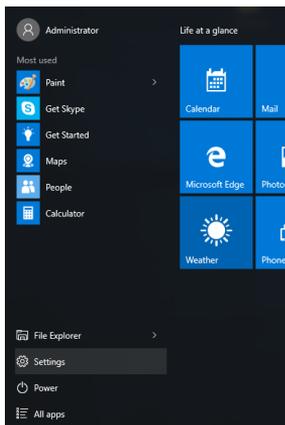
➢ The PC Settings window should open. Click on **Accounts**.
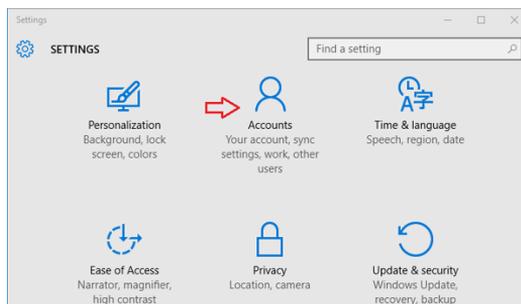
➢ From the left pane, click on the Family & others tab. Next click on Add someone else to this PC.

<center>60</center>
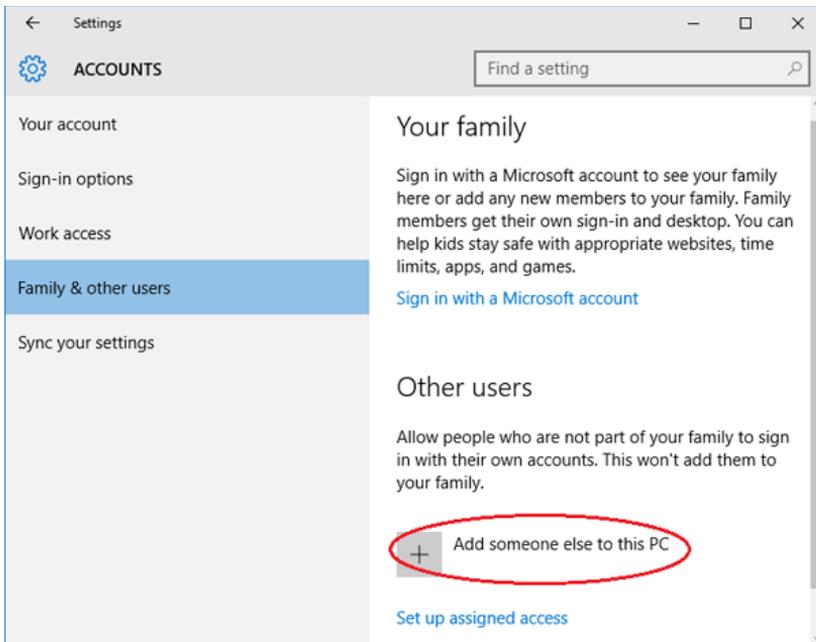
➢ Enter the name for your new local account, password and password hint. Click **Next**.

➢ Once you've clicked Next, you'll be taken back to the Accounts screen and now you can see the new account. By default, the newly-created account is a standard/limited account. From there click on the new user account you just created and then **Change account type**.

61
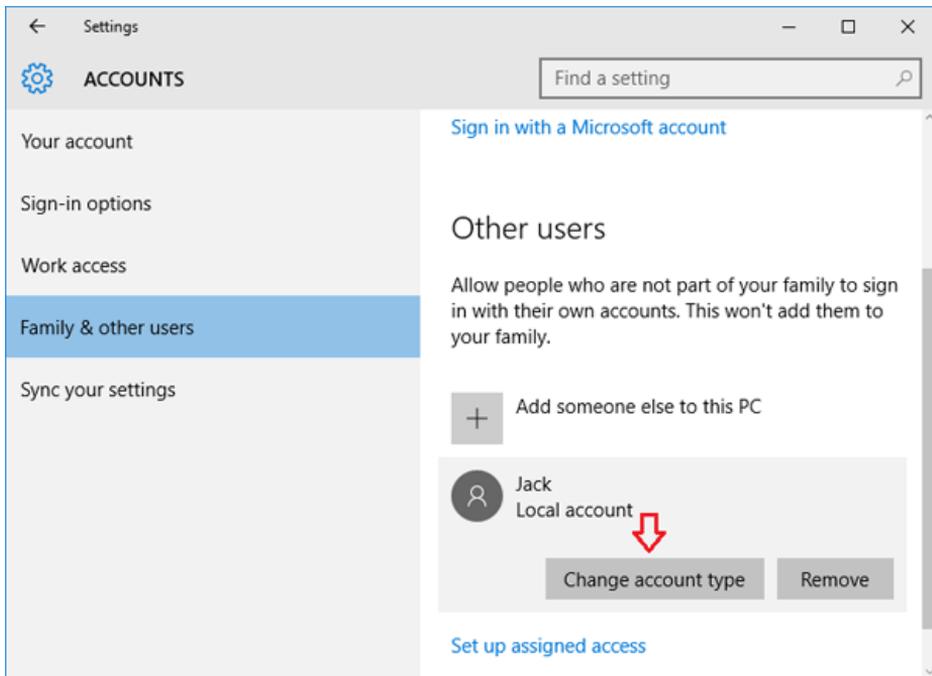
> ➤ When the pop-up window appears, change the account type from *Standard User* to *Administrator* and click **OK**.
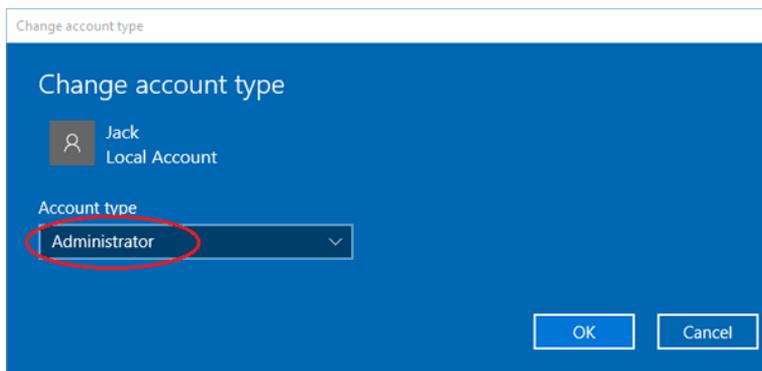
> ➤ So, this was about how to add a new administrator user account in Windows 10 computer.

**Method 3: Create Administrator Account from the Local Users and Groups Console**

> ➤ Press the Windows key + R to open the Run box. Type **lusrmgr.msc** and press Enter.
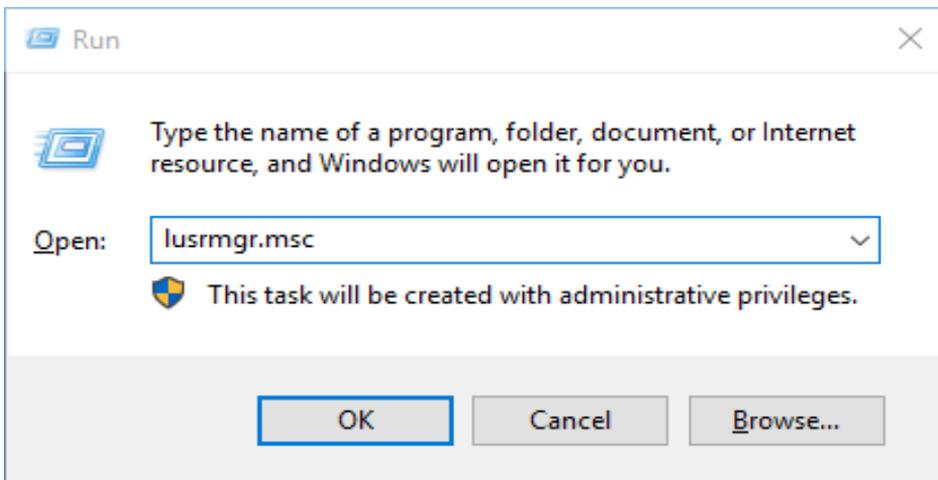
➢ When the Local Users and Groups console opens, right-click on **Users** on the left pane and select **New User….**
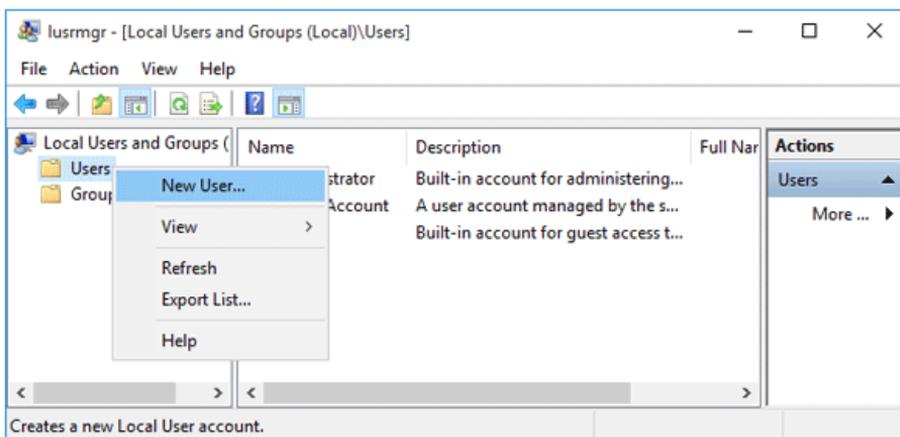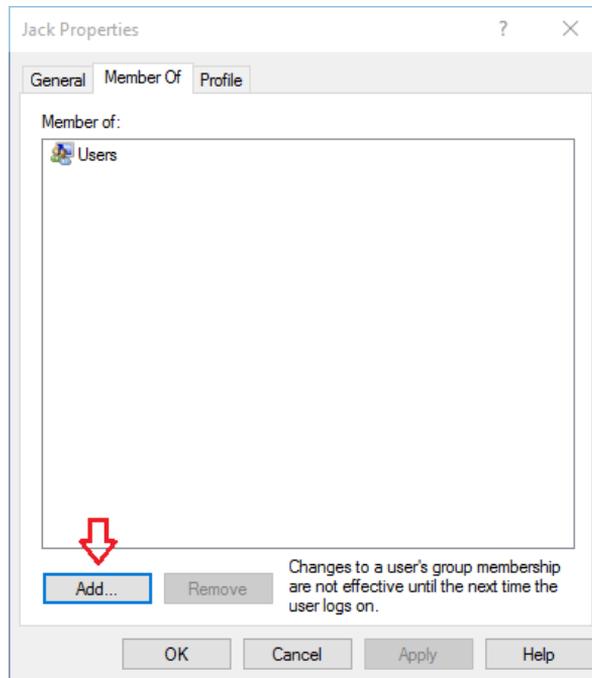

➢ Type the name for your new local account, password. Uncheck the "*User must change password at next logon*" option. Click on **Create** and then **Close**.
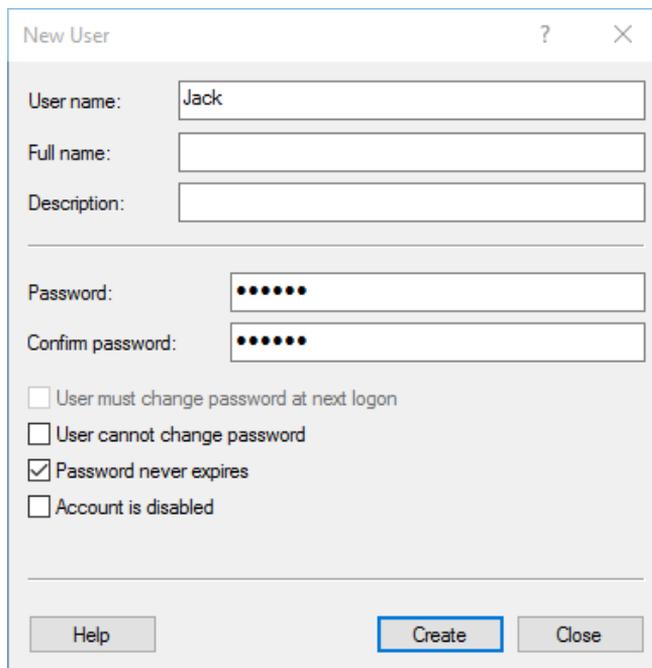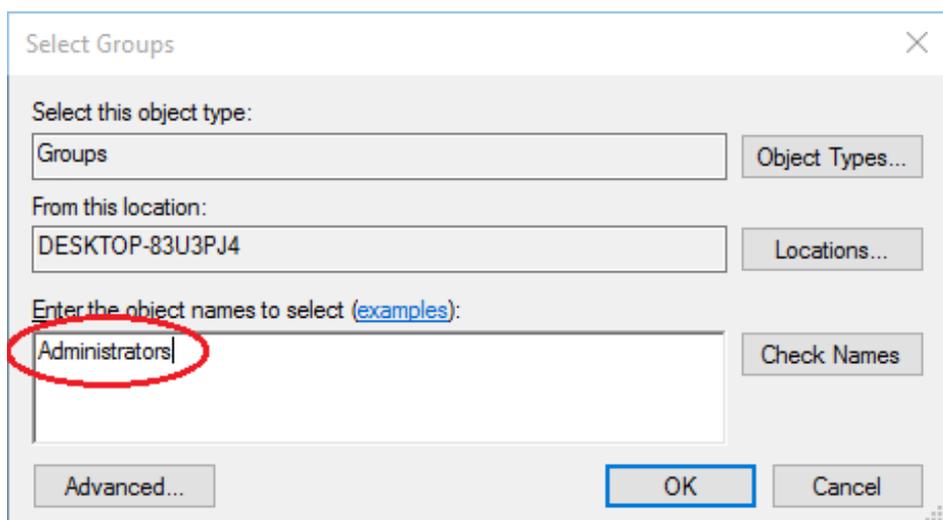
> ➢ Now you can see the newly-create account on the right pane. It is a limited account and we need to add it to the Administrators group. Double-click on the new account.
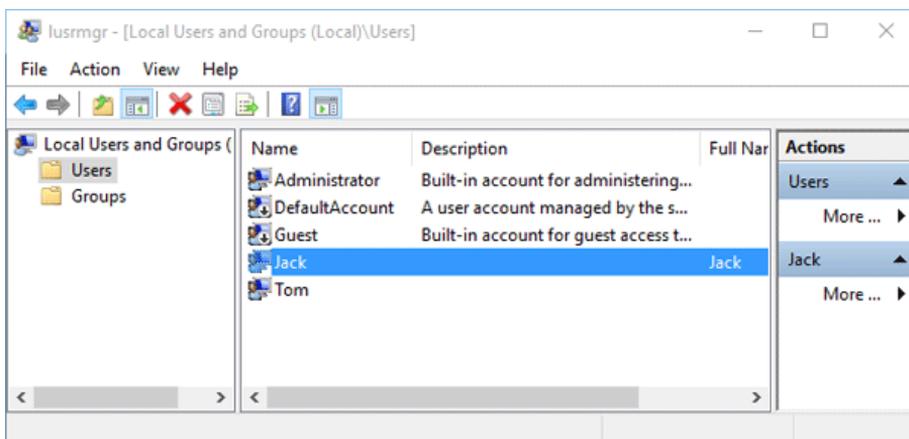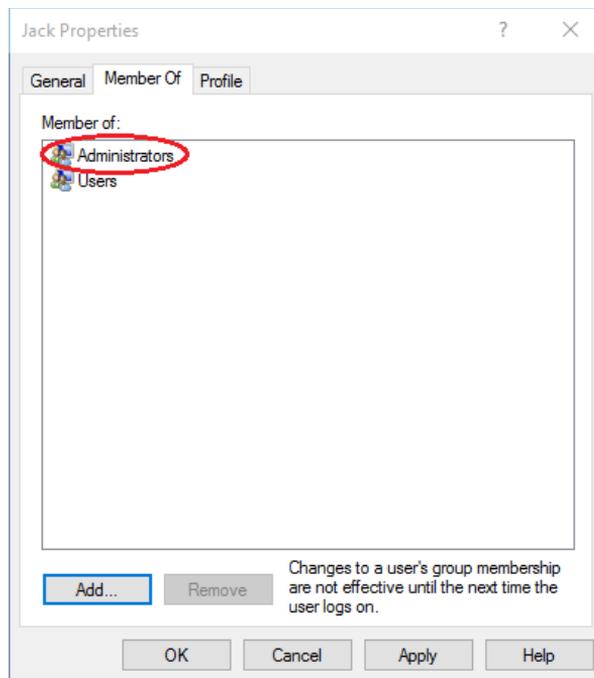

> ➢ When the Properties window opens, click on the **Add…** button.

> ➢ In the Select Groups window, type *Administrators* into the object names box. Click **OK**.

> ➢ Now you'll see your new account is also a member of the Administrators group. Click **Apply** for the changes to take effect.

> ➢ Reboot or log off. You can then sign into your new administrator account and perform admin tasks.

3. How do you create a new admin account via control panel? The learner should be able to write in theory the correct steps and procedures of which they have learnt practically in the text book of creating new admin account via control panel.

4. What is the importance of having a password protected account? The learner should demonstrate that they have understood the risks involved that creates a necessity for a password protection in computers.

5. What is a NTFS? NTFS (New Technology File System) is a file organizational system that stores and accesses information located on Microsoft Windows NT, Windows 2000, Windows XP operating systems

6. How do you test if a drive is NTFS formatted? In order for your computer to read and write data on the hard disk, it must be formatted using a specific file system. If you are using Windows 2000 or later (including Windows XP), your computer's hard disk should be formatted as either FAT32 or NTFS.

To check what file system your computer is using, first open "My Computer." Then right-click on the hard drive you want to check. In most cases, this is the C: drive. Select "Properties" from the pop-up menu. The file system (FAT32 or NTFS) should be specified near the top of the Properties window.

7. What are device settings in an electronic device? The should demonstrate full knowledge of device setting both practically and in theory be able to explain and perform set up of electronic device.