

JULY 23, 2019

ICT Senior One Teachers' Guide NCDC

Chapter 1: Introduction to ICT

Key words

- ICT
- Hardware
- Software
- Peripherals

By the end of this chapter, ensure that learners can:

- a) Explain what ICT is all about.
- b) Identify common ICT tools
- c) Describe the uses of ICTs in various fields.
- d) Explain the Safety precautions for the different ICT tools.

Introduction

In this chapter, the learners will learn about the meaning of ICT and appreciate its various applications in daily life. Ask them to imagine the world without ICT! How would communication, transfer of money, security, transport, learning and others in our lives be like?

Guide and observe learners as they read the introduction of this chapter in the learners' textbook. Moderate their responses to the posed question.

Meaning of ICT

Teacher Preparation

You will need: *ICT devices: Camera, Computer, Projector, Radio, etc*

Time: 6 periods

Teacher Instruction

Guide learners and assess their level of understanding of items in figure 1.1.
Demonstrate ICT and water systems to demystify the comparison of the two.

ICT stands for

I –Information,

C–Communication and

T - Technology.

Hardly a day passes when ICT does not intrude into our lives. ICTs are used daily and in one way or another, people are connected through telephone networks, the Internet and the World Wide Web. Refer to figure 1.1.



Figure 1.1: Common ICTs

Imagine Mr. Kaboyo making a telephone call to his mother Mukade Jalia to send her New Year greetings. In this case, Mr. Kaboyo and his mother are communicating using a technology (mobile telephone) and Information is the New Year greeting.

ICT can be compared with other systems. Let us compare ICT and a water system.

NOTE: ICT is electronic while a water system is mechanical.

Imagine a water system comprising of a water tank, water, taps, pipes and water moving through the pipes. This can be related to ICT as follows.

Table 1.1: Comparison of a water system and an ICT system

Water system component	ICT
Taps, water tank, pipes	Technology
Water	Information
Water flowing through pipes	Communication

Activity 1.1: Meaning of ICT

Guide learners in groups to move around the school or in their communities to identify ICTs familiar to them. Later in the learner’s book, guide their discussions as they present their findings in table 1.2 matching.

- In groups, look around your school or your community and identify at least 3 ICTs familiar to you. State the function of each of the ICTs identified in the table below.

Table 1.2: ICT tools and their functions

<i>ICT Tool</i>	<i>Function</i>
E.g Camera	Capturing photographs
1. Projector	Making projections for big audiences
2. Mobile phone	Making calls, chatting,
3. Laptop	Typing documents

- Select any two ICTs from figure 1.1 and identify the information they handle, the nature of communication that takes place and the technology used.

Projector: I-Pictures, slides, documents. C – Connection between computer and projector; can be wired or wireless. T – Lens, Projector type and its specifications.

- With the available ICT tool, practice using it and identify the I., C., and T in it.

Practice using the selected ICT tool.

Common ICT Tools

Teacher Preparation

You will need: *ICT devices: Camera, Computer, Projector, Radio, mobile phone.*

Time: 6 periods

Teacher Instruction

Guide and observe learners as they read the introduction of this section in the learners' textbook and assess their understanding of figures 1.2 to 1.5.

At the beginning of this chapter, the meaning of ICT was introduced. When we talk about ICT tools, we are referring to devices or objects used in ICT. As people need and use hammers, hoes, conveyor belts and pangas to process and manufacture food, they similarly use tools for data capture and processing, information storage and communication.

Therefore, ICT tools is not one solid thing but rather a collection of several electronic tools.

Figures 1.2 to 1.5 show some examples of basic ICT tools we interact with in our day to day activities.



Figure 1.2: Desktop Computer set



Figure 1.3: Television sets



Figure 1.4: Telephone hand sets



Figure 1.5: Radio

Activity 1.2: CommonICT tools

Teacher Preparation

You will need: *ICT devices: Camera, Computer, Projector, Radio, mobile phone, etc*

Teacher Instruction

Guide and observe learners as they discuss the characteristics of various ICT devices shown in figures 1.2 to 1.5.

In groups, identify the ICT tool provided by name and characteristic(s). Summarise your findings in table 1.3.

Table 1.3: ICT Tools and their characteristics

Name of ICT tool/s	Characteristics
E.g. Computer	<ul style="list-style-type: none"> • Electronic tool
	<ul style="list-style-type: none"> • Has hardware and software
	<ul style="list-style-type: none"> • Can store information temporarily or permanently
Projector	<ul style="list-style-type: none"> • Electronic tool
	<ul style="list-style-type: none"> • Uses light for projection
	<ul style="list-style-type: none"> • Has adjustments for image sharpness
Camera	<ul style="list-style-type: none"> • Has a lens
	<ul style="list-style-type: none"> • Flash light
	<ul style="list-style-type: none"> • Has memory; in built and external

Activity 1.3: Identifying ICT tools with their specialized professional fields or areas

Identify and state some ICT tools and what they can be used for in specialized fields such as communication, manufacturing, teaching and learning, health and medicine, security, climate and weather, management.

Guide learners in a brainstorming session of the task. Some of the answers may include X-ray machines, biometric thumb recognition machines, ATMs, photocopiers, security cameras.

Use of ICTs in my society/Application of ICT

Teacher Preparation

You will need: *Cases of real life examples where ICTs are used in our communities to provide services and share them with the learners.*

Time: 6 periods

Teacher Instruction

Guide and observe learners discuss the applications of ICTs in various areas.

At the beginning of this chapter, you learnt that ICTs are used to collect information and share it. In all situations, the ICT devices are used by people or programmed by people to work without people managing them.

In our society today, use of ICT is on the increase in all areas. ICTs are used to collect and communicate information in our homes, schools, hospitals, banking halls and many other places. ICTs are also used in the entertainment industry, security, agriculture and transport.

In the security sector, ICTs are used to monitor sensitive areas like banking halls, airports, screening bags for unwanted materials and objects and many others. However good ICTs may be, in some cases, they pose challenges.

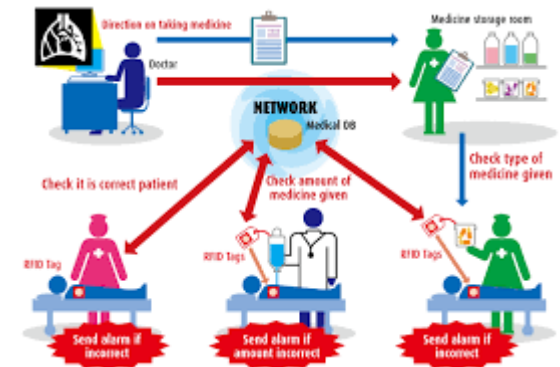
Let learners form groups in preparation for this activity.

Activity 1.4: Application of ICTs

- a) While in groups, learners identify the ICT devices used in each of the application areas shown in Table 1.4 and what they are used for. Note that an application area can have as many ICT devices as possible. Table 1.4 has some of the responses

Table 1.4: Application of ICTs

Application area	Name of ICT Device	What is it used for?
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Home	Mobile phone	Sharing information in form of SMS, pictures, emails, voice messages between users.
	Digital Camera	Recording intruders
School	Digital Camera	Recording intruders
	Computer with Report card system	Generating termly reports and other student details
Entertainment		
Security		
Hospitals	Computer with medical records system	Keeping patient records in electronic format
Transport		
Agriculture		

Learners give any advantages and disadvantages of using ICTs in their society.

Expected responses. The learners are free as many responses beyond what is given in this box.

- Eases communication; fast and convenient.
- Cost effective to process data/communicate
- Bridges cultural/geographical gaps, makes the world a global village.

Before reading the extract below if possible, take learners to visit a supermarket which uses ICT (Or to any other accessible ICT facility). Let them watch and ask question about the ICTs used and the benefits of using the ICTs.



Figure 1.6: Electronic Point of Sales (EPOS)

ICTs in business

Most supermarkets, especially the big ones, have adopted the use of Electronic Point of Sales (EPOS). If you have bought an item from a shop and it was scanned to determine the amount you need to pay, you have used an EPOS. An Electronic Point of Sales (EPOS) is a Self-contained, computerized equipment that performs all tasks of a store checkout counter. It allows payments by cash, bank or credit cards, verifies transactions and generates a sales receipt. It also coordinates inventory data. With this technology, the shop owners are able to know the items that are bought most, what is left in the

stores and the items that are running out.

With learners discuss the extract above and explain any unknown terms.

Activity 1.5: Application of ICT in business

- a) Guide learners in groups to identify the ICT devices used in any business in their area and what they are used for.
Let the learners present their findings to the rest of the class.

Guide learners in identifying a business and the ICT devices used there. Possible answers:
Mobile phone calculator to compute totals, etc

- b) Let learners discuss and make a presentations on the different ways in which a mobile phone can be used as an ICT tool to support business activities. Validate their answers.

Ask learners their opinion about why they think it is important to maintain ICTs tools before reading the extract below.

Handling and maintaining ICT tools

Taking care of your ICT Tools is just as important as taking care of your books. The internal and the external parts of the computer and other ICTs have to be cared for. Taking care of ICT tools is supposed to be done by all people who use these ICT tools. However, as a learner you cannot do all care and safety activities. Activities that require one to open up these tools are left to people who have undergone specialized training on how to do it. As a user and student of ICT, there are certain tasks you can perform to ensure your ICT tools are clean and here are a few:

- **Keep Dust Away:** Dust your computer to keep it free of dust and dirt.
- **Keep Food Away:** Do not eat or drink while working on the computer.
- **Use Clean and dry Hands:** Make sure your hands are clean before you type on the keyboard or click the mouse.
- **Treat with Respect:** If you are having problems with your computer, ask for help. Do not bang or hit the computer.
- **Keep Off:** Seeing that the computer is connected to electricity, this means that lightning could be conducted to your computer through the electrical connection. For this reason it is best not to use your computer during a storm.
- **Stop Virus Attack:** A computer virus is a program written by a person on purpose to harm other peoples' computers. A computer virus is passed from one computer to another when you share and download files without the protection of antivirus software. For this reason you should get permission before downloading files.





Teacher Preparation

You will need: *Tools used in ICT maintenance operations; Blower.*

Teacher Instruction

Guide and observe learners demonstrate the handling and maintaining of various ICT tools. For instance they can use a blower to blow dust out of a computer.

Guide learners in a brainstorm on the functions of the maintenance tools given in table 1.5.

Some Computer laboratory safety and maintenance tools and their functions are summarized in the table below.

Table 1.5: Maintenance tools and their functions

Maintenance tool	Function
Dust blower	<ul style="list-style-type: none">• Can be regularly used to blow dust out of computer equipment.

Air conditioner	<ul style="list-style-type: none"> • Regulates computer lab temperatures
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Activity 1.6 Handling and maintaining ICT tools

- i. Other than a dust blower and an air conditioner, ask learners to identify any other ICT maintenance tools in the computer laboratory and state their functions.
- ii. Let learners identify a computer which needs cleaning and clean it up with the necessary tools.
- iii. Ask learners to make a report of the steps followed and tools used in the cleaning process in (ii) above.

ICT Safety Precautions

Time: 6 periods

Guide learners to make a visit to the computer laboratory and identify the Do's and Don't's in a computer laboratory.

Inform learners that as ICT users, it is very important to take precautions when using ICT tools to avoid getting health problems. They will learn more about this in the chapter on Health and Safety. Inform learners that to ensure that ICT tools are properly used with caution, manufacturers provide user manuals for every ICT equipment.

Activity 1.7: ICT Safety precautions

Ask learners in groups, to discuss the “Rules that govern the use of the computer laboratory”

Find out from learners why it is important to protect ICT tools.

ICT Tools security threats and measures

Ask learners to read the text in their text book.

ICT tools like any other tools need protection because they can be exposed to a number of risks such as theft, virus, vandalism and others. However, care must be taken in terms of handling, when they are in use and after use to protect them and make them less expensive to maintain. Physical security, Electronic security and Document/files and network security are very critical in addressing the measures of protecting and caring for ICT tools. Some examples of these security measures include burglar proofing for physical security, use of passwords for electronic security and use of firewalls for network security.

Activity 1.8: ICT tools security threats and measures

- i) Take the learners for a walk around the school computer installations and let them identify some security and safety concerns.
- ii) Let learners identify how computers need to be protected in order to be used for a long period of time. In groups, discuss security and safety measures to safe guard these computers in line with Physical security, electronic security and Document/files and network security.

User Manuals

Teacher Preparation

You will need: *Photocopies of a sample user manual of any available ICT tool/device; projector, camera, laptop/computer. You may ask learners if possible to come with samples of the manuals of any ICT tool device*

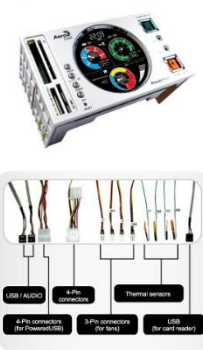
Teacher Instruction

Guide as they discuss all sections of the user manual.

Ask learners in groups to study and identify the features in a user manual before reading the extract below in their textbook.

A user guide or user's guide, also commonly known as a manual, is a technical communication document intended to give assistance to people using a particular system. A User guide (see image below) contains instructions on installing, using, or troubleshooting a hardware or software product.

PowerWatch - User Manual



USB 2.0 High Speed Card Reader provides you the easiest and the fastest way to access your storage cards. By integrating the latest USB 2.0 technology, the "PowerWatch" brings you the extremely fast speed up to 480Mbps/Sec. You can easily write/read files and images to the storage cards.

CF Port: CF / CF II / MD / CF-Ultra / I / CF Extreme

SM Port: SM / XD ready

MS Port: MS / MS PRO / MS Duo(Adapter) / MS PRO(MS) / MS(MS) / HS MS PRO(MS) / HS MS PRO(DUO(Adapter) / MS PRO Ultra II

SD Port: SD / MMC / MMC II / MMC Duo(Adapter) / MS Duo(Adapter) / MS PRO(MS) / MS(MS) / HS MS PRO(MS) / HS MS PRO(DUO(Adapter) / MS PRO Ultra II

4-Pin connector (for PowerWatch)
3-Pin connector (for fan)
USB (for card reader)

Multi-slot card reader module

USB 2.0 High Speed Card Reader provides you the easiest and the fastest way to access your storage cards. By integrating the latest USB 2.0 technology, the "PowerWatch" brings you the extremely fast speed up to 480Mbps/Sec. You can easily write/read files and images to the storage cards.

CF Port: CF / CF II / MD / CF-Ultra / I / CF Extreme

SM Port: SM / XD ready

MS Port: MS / MS PRO / MS Duo(Adapter) / MS PRO(MS) / MS(MS) / HS MS PRO(MS) / HS MS PRO(DUO(Adapter) / MS PRO Ultra II

SD Port: SD / MMC / MMC II / MMC Duo(Adapter) / MS Duo(Adapter) / MS PRO(MS) / MS(MS) / HS MS PRO(MS) / HS MS PRO(DUO(Adapter) / MS PRO Ultra II

PoweredUSB

World's First Multifunctional Panel with PoweredUSB!!

IMPORTANT

1. 5V or 12V PoweredUSB connectors can ONLY be used for products with 5V or 12V power input, respectively.
2. Some products such as 3.5" external HDD may require both 5V and 12V power input simultaneously and therefore the PoweredUSB function does not apply to such products.
3. Please check the voltage requirement of your products before charging it with PoweredUSB.

What is PoweredUSB?

PoweredUSB is a brand new application for the computer market. It can be used as a standard USB2.0 port or simply use it as a charger for other products listed below.

Note: PoweredUSB cables must be purchased separately.

Features:

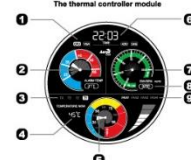
- Power contacts are designed for 5A at 5 and 12 volts.
- Color coded plug for different voltages.
- Full shielding provides maximum EMI protection.
- High-speed data transfer up to 480Mbps.

12V PoweredUSB for:
External CD/DVD Control
3.5" HD External Box
LCD monitor
Scanner

5V PoweredUSB for:
USB HUB
2.5" HD External Box
Cell phone charger
Cool charge

LCD DISPLAY

The thermal controller module



1. Channel indicator
2. Alarm temperature display
3. Temperature channel indicator
4. Current temperature reading
5. Current temperature display
6. 6.24hr time display
7. Fan speed indicator
8. Auto / Manual mode indicator
9. Fan channel indicator

Features:

- Detect and adjustable for 4 sets of temperatures.
- Detect and adjustable 4 sets of fan speeds.
- Adjustable alarm temperature.
- Celsius or Fahrenheit display.
- Alarm will buzz if temperature detected is over the alarm temperature settings.
- Alarm will buzz if fan speed drops below the settings or fail to work at all.
- Can switch between auto and manual mode for each channel individually.

Default Setting

T1	T2	T3	T4
Alarm 1	Alarm 2	Alarm 3	Alarm 4
85°C	55°C	55°C	45°C
149°F	131°F	131°F	113°F

There are 4 buttons for this thermal module (MODE / C/F / UP / DOWN / SET)

Browsing

CPU	VGA	HDD	CASE
Alarm 1	Alarm 2	Alarm 3	Alarm 4
T1	T2	T3	T4
RPM 1	RPM 2	RPM 3	RPM 4

CPU → VGA → HDD → CASE

1. Press "MODE" button to rotate through Channel 1 to 4 to see the readings.
2. Fan speed will increase or decrease automatically according to the temperature detected under auto mode.

Setting Alarm Temperature

1. Press "MODE" button to select a desired channel.
2. Press "SET" button for 3 seconds to enter the alarm temperature setting mode for that particular channel.
3. Press "C/F" "F-UP" or "DOWN" button to adjust the alarm temperature from 25°C-90°C(77°F-194°F).
4. Press "MODE" button for 3 sec again to return to normal mode.
5. Repeat step 1-4 to set other channels.

Setting Time

1. Press "SET" button once to enter time setting mode.
2. Press "C/F" "F-UP" or "DOWN" button to set the hour, press "SET" button again to set the minute.
3. Press "SET" button again to return to normal mode.

Setting Fan Speed

1. Press "MODE" button to select a desired channel.
2. Press "MODE" button for 3 seconds to enter the RPM setting mode.

3. Press "SET" button to switch between auto and manual mode.
- *When auto mode is selected, the "AUTO" will appear, and the fan speed is controlled by PowerWatch automatically.
- *When manual mode is selected, the "AUTO" will disappear, then press "C/F" "F-UP" or "DOWN" to set the fan speed.
5. Press "MODE" for 3 seconds to return to normal mode.
6. Repeat step 1-5 to set other channels.

Celsius / Fahrenheit


Under browsing mode, press "C/F" "F-UP" button to switch between Celsius and Fahrenheit.

Reset


The manufacturer does not recommend users to reset the setting unless necessary. Please use a sharp point object and push the "RESET" button once to reset all settings. Note: All previous settings will return to factory settings.

CONNECTORS


How to connect sensors and connectors (Please switch off the computer before connecting all cables)



Plug the 4-pin connector to the power supply.



Connect 3-pin fan connectors to Fan1, Fan2, Fan3 and Fan4 for the fans to be controlled.



Place the thermal sensors to the desired location with a thermal sticker.

Activity 1.9: ICT user manuals

- i). After studying the user manual provided for a given ICT tool, let them summarize its contents and present safety precautions there in.

Guide learners to make convenient groups, study the manual provided, prepare and make a presentation to the class.



Activity of Integration

ICTs are currently being employed in almost all fields in this modern era. Some of these fields are Education, Banking and Security. In the area of education, it is possible for a teacher in London to virtually conduct a lesson in a school in Uganda.

Tasks

- a) Explain how the lesson above can be conducted with ICTs.
- b) Explain the precautions that should be exercised when using the ICT tools in (a) above.

Assessment grid with Suggested responses

Output	Basis of evaluation	Criteria 1 Relevancy	Criteria 2 Accuracy	Criteria 3 Coherence	Criteria 4 Excellence
Explanation of how ICTs can be used to deliver a lesson	Use of ICTs	Score 3: Identifies at least 5 appropriate ICT tools/services used to deliver the lesson. These include: Camera, Computer, Internet,	Score 3: Explains the clear purpose for each of the identified ICT tools/services used to deliver the lesson (at least 5).	Score 3: Logical flow and clarity of the sequence in which the identified ICT tools/services are used to deliver the lesson (for at least 5 ICT tools).	Learner earns 1 point if s/he has added any exceptional response unsolicited in the instructions.
		Score 2: Identifies at least 3-4 appropriate ICT tools/services used to deliver the lesson. These include: Camera, Computer, Internet, Projector, Microphone, Speakers, Smart board.	Score 2: Explains the clear purpose for each of the identified ICT tools/services used to deliver the lesson (3-4)	Score 2: Logical flow and clarity of the sequence in which the identified ICT tools/services are used to deliver the lesson (for 3-4 ICT tools).	
		Score 1: Identifies at least 5 appropriate ICT tools/services used to deliver the lesson. These include: Camera, Computer, Internet, Projector, Microphone, Speakers, Smart board	Score 1: Explains the clear purpose for each of the identified ICT tools/services used to deliver the lesson (1-2)	Score 1: Logical flow and clarity of the sequence in which the identified ICT tools/services are used to deliver the lesson (for 2 ICT tools).	
Precautions required	Care for ICTs selected above	Score 3: Identifies at least 5 precautions for the selected ICT tools/services used to deliver the lesson.	Score 3: Explains how the precaution is realized for each of the identified ICT tools/services (at least 5).		Learner earns 1 point if s/he has added any

		Score 2: Identifies at 3-4 precautions for the selected ICT tools/services used to deliver the lesson.	Score 2: Explains how the precaution is realized for each of the identified ICT tools/services (3-4).		exceptional response unsolicited in the
		Score 1: Identifies at 1-2 precautions for the selected ICT tools/services used to deliver the lesson.	Score 1: Explains how the precaution is realized for each of the identified ICT tools/services (1-2).		
	Total				17

*2/3 of the score for all outputs is sufficient to conclude that a learner is competent.

Chapter Summary

Ensure that learners have learnt about:

- The meaning of ICT,
- Common ICTs at workplaces and their uses
- Application of ICTs in our daily lives,
- Handling and maintaining of ICT tools
- ICT safety precautions and Security threats.

