SMART
COMPUTING

Teacher's Resource Book 3

LearningWell

Contents

Introduction

In terms of machine development and application, no machine has advanced as rapidly as the computer. Not long ago, computers were massive structures with miles and miles of wiring that only performed tasks that are now considered very simple.

Computers are now an integral part of our daily lives. There is no escaping this wonderful machine, whether we are at work, on vacation, studying at school or college, or simply going to the grocery store.

It is becoming increasingly important that children learn how to use this machine at the earliest possible opportunity. That opportunity comes in the form of computer education at school. Still, any type of education provided at the early stages of learning must not only be comprehensive but also presented in a way that is simple for both the teacher to explain and the students to understand. This is where **Smart Computing** stems from.

The ***Smart Computing*** series comprises five books. These books provide information on the awareness of devices found in people's homes and how to use them.

Introduction to the teaching guides

Lesson plans, useful tips, and worksheets with interesting learning activities are all included in the teaching guide. A list of goals and learning outcomes appears in each lesson. You can create your lesson plans by using the provided sample plans. The lesson plans comprise introductory activities lasting 3 to 5 minutes, which explain the concepts being taught. This is followed by 30 minutes of explanation and a 5-minute recap. Sample worksheets have been provided where need be for additional support. Answers to exercises within the lessons have also been provided.

Lesson 1 – The Central Processing Unit (CPU)

Teaching objectives

- To understand the main part of the computer
- To understand the various components and their functions.

Learning outcomes

By the end of the lesson, the students will understand what the Central Processing Unit is and also learn about its parts.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

You can take the children to the computer lab for this lesson. You can also have a CPU in your class to demonstrate its various parts. Before starting the lesson, ask the students to name the parts of a television. Listen to their responses and ask them to read the chapter.

Main Lesson: 30 minutes

Let the children read pages 4 and 5 with your assistance. After reading the pages, write the words **motherboard** and **processor** on the board. Ask the children what they know about these terms and write their answers on the board. You can tell them that just as human beings have a brain to recall memories, a computer also has a brain that helps it to store information.

Ask the students to differentiate what RAM, ROM and hard disk. Explain how data in ROM is kept stored even if the power source is disconnected. On the other hand, data in RAM is lost upon power supply disconnection.

Share with the students that in the early days, graphic cards had to be installed in the system separately whereas now they are built-in within the system. Try to show pictures of different types of cards to the children.

At the end of the lesson, show the children what CPU casing looks like and why is it important to cover the box. Also instruct them that these objects should always be handled by a grown up as the CPU contains wires and could be damaged if they're not being taken care of.

Lesson wind-up: 5 minutes

Recap what was taught in the class. The exercises on pages 6 and 7 can be done in class work or homework.

Extra task: Ask the student to collect and bring images of the CPU and its parts. They can use the Internet under adult supervision. Ask them to stick the pictures in their notebooks and also name the parts.

Exercise answers

A. Choose the correct answer.
1. Motherboard
2. Processor
3. RAM
4. Hard disk
5. Graphic card

B. Answer these questions.
1. A motherboard is the main board that carries all the components of a CPU.
2. Graphic cards increase the video processing power of a computer system when playing games.
3. The processor is the "brain of a computer". It processes all the data which a computer can handle.

C. Find the missing letter.
1. S<u>TO</u>R<u>A</u>GE
2. M<u>OT</u>H<u>ER</u>B<u>OA</u>RD
3. M<u>EM</u>O<u>R</u>Y

Lesson 2 – Embedded Computers

Teaching objectives

- To understand what embedded computers are
- To understand where they are found

Learning outcomes

By the end of the lesson, the students will be able to understand what embedded computers are and what functions they have.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Begin by asking students to name places where they have seen computers. This could include their homes, schools, local businesses or even public places like libraries and parks.

Once they have identified these locations, ask them to discuss the purpose of computers in these places. For instance, computers at supermarkets are used for billing, while those at schools are used for fee calculations and digital learning.

Main Lesson: 30 minutes

Read aloud pages 8 and 9 with the children. Tell the students that there are computers everywhere these days. Discuss the different places where computers are used and also discuss their purpose.

The lesson talks about embedded computers being used at a petrol pump. Expand the discussion to include less obvious application for computers, such as those embedded in appliances or technology.

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises given on pages 10 and 11 can be done as class work or homework.

Sample worksheet

Look at the pictures. Tick the objects that have an embedded computer.

traffic lights

sofa

hand blender

television

table

tree

Exercise Answers

A. Answer the following questions.
1. Embedded computers are designed to carry out one task.
2. Cars, petrol pumps and washing machines

B. True or false
1. true
2. true
3. false
4. true
5. false

C. Fill in the missing letter.
1. Computer
2. Embedded
3. Machines
4. Sensor
5. Electronics

D. Jumbled word puzzle

camera   robot   laptop   mobile

Lesson 3 – What operating system does?

Teaching objectives

- To understand what an operating system is
- To understand the different functions of an operating system

Learning outcomes

By the end of this lesson, the students will be able to define the term operating system and its functions.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Begin the class by asking some simple questions:

How does a car work? Does it have an engine? Would a car start moving on its own or does someone drive it? How do they use their TVs at home? Why do they need the remote control?

Allow them to share their answers. Elicit that machines operate by following instructions that are given to them.

Main Lesson: 30 minutes

Take the example of the television. Tell the students that for the machine to start working we need to switch it on. The television would start telecasting any programme that is running on a particular channel (done by the operating system of the TV). If we want to watch a particular programme, we use the remote control to go to that specific channel and watch it (instructions given to the TV by the user).

Ask the following questions:

- *How is data put into a computer?*
- *How does a computer decide what to do with the information it receives as input?*
- *Does it need instructions to work?*
- *Where do these instructions come from?*

Now relate the above example to the use of a computer system. Tell them that different software and data are present in the computer and a special system called the operating system helps to manage, control and use these data/programs on the computer. Whenever a user gives it a command or instruction, it performs that task.

Let the students read pages 12 and 13 with your assistance. Ask them questions for better understanding. Tell them that the operating system keeps running in the background until the computer is turned off. Go through the functions of the operating system and ensure that the children understand them.

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises can be done as homework or classwork.

Exercise Answers

A. Choose the correct answer.
1. operating system
2. program
3. RAM
4. data
5. operating system

B. Answer these questions.
1. All programs, run through the operating system in order to use any of the hardware including mouse and keyboard. It is responsible for memory management. It manages the file system. It controls all devices through device drivers.
2. Operating system is the most important program in a computer. It is the first program that runs when the computer is turned on. It is the last program that ends when the computer shuts down.
3. Microsoft Windows and Apple Macintosh

C. State True or False
1. True
2. True
3. False
4. True
5. True

Lesson 4 - Understanding Windows

Teaching objectives

- To understand about the popular operating system Microsoft Windows
- To learn about its main features

Learning outcomes

By the end of this lesson, students will be able to understand Windows operating system and its main features.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Take the children to the computer lab. Switch on a computer and let the children see as the operating system Microsoft Windows starts loading. Let them explore what a desktop is and what the small buttons on the screens are called.

You can write the main features of Windows operating system on the board and let the children tell their purposes.

Main Lesson: 30 minutes

Let the children read pages 16 and 17 with your assistance. Ask them the following questions:

- *How do you turn on the computer?*
- *What do you see on the desktop?*
- *How do you open a programme?*

Give them a demonstration of the different features mentioned in the lesson. Let the children come in pairs and have them try what recycle bin icon, start button and shortcuts do. Recall the chapter on files and folders. Demonstrate how to create a shortcut for a folder.

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises can be given as classwork and homework.

Exercise Answers

A. **Fill in the blanks with correct answers.**
   1. Windows
   2. Shortcut
   3. Recycle Bin
   4. Right-click
   5. Start button

B. Match the following

1. Maximise button   □

2. Minimise button   ─

3. Close button   ×

C. Explain the following terms

1. A shortcut is an icon that can be created for any file or program. It allows you to open that file or program directly.
2. The Computer icon takes you to new window which shows all the devices that are attached to a computer.
3. The Start Button is located at the bottom left on screen. It also has a dedicated key on the keyboard which has a windows icon on it. It contains all the options you need to work in operating the computer.
4. The control panel is a feature of Microsoft Windows that allows you to view and change the settings of the system.
5. The search box allows you to search for files and programs on your computer.

Lesson 5 – Understanding Word

Teaching objectives

- To learn how to start the Microsoft Word and learn about its features
- To learn how to use the different tabs in the application
- To know what the clipboard does
- To learn how to use the font, paragraph, style and editing sections
- To understand how to save file

Learning outcomes

By the end of this lesson, students will be able to use Microsoft Word effectively.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Show a printed document to students and explain that it was created using Microsoft Word. Describe some features of the document and tell them that they will be looking at each one of these in detail in this lesson.

Main Lesson: 30 minutes

You can start the discussion by asking students which programme they use to type and print their documents. Encourage them to participate in the discussion. You may then introduce them to Microsoft Word.

Allow students to read from the chapter and during the introductory class demonstrate how to start Microsoft Word on the computer. Demonstrate the different tabs to the students through peer learning. This chapter may take around 5 periods to complete. You can give them tasks as classwork or homework.

Demonstrate how to use the mentioned features in the lesson. Once you are done with the demonstration, you can assign students with random tasks and let them practise in class.

Lesson wind-up: 5 minutes

Ask students to give you a recap of the points they have learned in the lesson. The exercises can be done as classwork or homework.

Sample Task

Ask the children to create a Word document containing two paragraphs on their school or favourite place. Ask them to format and enhance the document using the tools they have studied in the lesson to make their work attractive. They should take a printout and submit it in class.

Exercise Answers

A. Choose the correct answers.
1. Word
2. Page
3. Home
4. four
5. paragraph

B. Answer the following questions.
1. Justified text means both left and right sides are aligned.
2. Clipboard, font, paragraph, styles and editing.
3. The Insert tab offers buttons for inserting various objects in the document.
4. The set of four buttons in the bottom row of the ribbon align the text, ending or placing it at a certain position. For example, in left aligned text, all lines start from the left side of the page. In right aligned text, all lines start from the right side of the page. In centralized text, equal space is left at the both ends of the text. Justified text means both left and right sides are aligned.

Lesson 6 – Routine problems and their solutions

Teaching objectives

- To understand problems of computer and how to solve them

Learning outcomes

By the end of the lesson, the students will be able to understand how to solve simple problems in the computer.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Let the students understand that if there is a problem with the hardware, it should be handled by a computer expert. The problems can be simple and can be easily repaired but if they are complicated, a grown up should be involved.

Main Lesson: 30 minutes

This lesson can be done in the computer lab. Let the students read the pages 28 to 30 with your assistance.

Demonstrate on how to look after a computer and solve simple issues. You can revise the concept of the CPU and ask the students what is inside the CPU casing. Let them look at the casing and check if the power is on. Ask children about how to keep their computer clean and safe. Instruct them that for complex problems, they should ask a grownup for help. They should never insert objects into a computer system and never eat or drink near them.

After reading from the text, ask the children to discuss the problems in pairs.

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises can be done as homework or classwork.

Exercise Answers

A. Mark tick for true and cross for false statements.
   1. false   2. true   3. false   4. true   5. true

B. Fill in the blanks.
   1. power supply or motherboard
   2. restart
   3. problem with Windows
   4. technician
   5. Ctrl + S

C. What will be your first step if,
1. Check if the computer is plugged in properly in a socket.
2. Plug in the mouse into a different USB port.
3. Restart your computer.

Lesson 7 – The Living Internet: Basics

Teaching objectives

- To understand the purpose of the Internet
- To understand how to share files in daily life.
- To learn how to visit and use websites

Learning outcomes

By the end of the lesson, the students will be able to understand how the Internet is used for different things. For example, sharing files, communication and sharing information.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Start the class by finding out what the students understand by the term Internet. Ask them to describe the Internet in their own words. You could have a brief discussion about their Internet usage, including the things they usually do online.

Main Lesson: 30 minutes

Let the children read pages 32 and 34 with your assistance. Discuss the different uses of the Internet given in the lesson. Describe to the students what emails are and how they made our lives easier. To further explain the benefits of emails, you can compare email services with the postal service. You can then take the children to the computer lab, have them type a document and send it to a friend's email address.

Navigation has been made very easy through the Internet. In the past, people used maps to go around a city or when travelling. Now they can simply use the navigation tools on their mobile phones.

You can also let them explore safe Internet surfing. Also let them be aware of the dangers while they surf on the Internet, also not to share any information as there are lots of fake websites.

To make sure they are paying attention, write **uses of Internet** on the board and you can ask children to answer in groups.

Lesson wind-up: 5 minutes

Recap what was taught in the classroom. The exercises given in the lesson can be done as classwork and homework.

Exercise Answers

A. Fill in the blanks.
1. Internet
2. communication
3. file sharing and web surfing
4. Tablet computers
5. video and audio

B. Answer the following questions.
1. To share a file, you have to open an email program, type in your friend's email address, attach the file and hit the Send button.
2. Websites are files on the Internet with an address.
3. File sharing and web surfing.

Lesson 8 - Understanding Chrome

Teaching objectives

- To understand what browsers are
- To learn about Google Chrome
- To understand the seven sections in the control menu
- To understand what bookmarks are and how they work.

Learning outcomes

By the end of the lesson, the students will learn about browsers. They will also learn about Google Chrome and its features.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

Recall main points of using the Internet with this lesson. Students will gain knowledge of Google Chrome window components, how to use the back and forward buttons, how to type the address and how to stop an action.

Main Lesson: 30 minutes

Let the children read pages from 36 to 38 with your assistance. You can ask the following questions:

- What programme do they need to surf the Internet?
- Do they know of common browsers? Ask them to name a few.

Give them a handout of Google Chrome window. For each of the Chrome window, point it on your screen and ask students to repeat the words.

Address box

Back arrow

Forward arrow

Control button

Cancel button

Ask them to follow the sections mentioned in the lesson. Let them try in groups of twos or threes if there are lots of children in the classroom. Let them know how to use bookmarks. You can give them real life examples where you put the bookmark in a book to save the page where you have read up to. In the same way, bookmarks in Google Chrome or any other browsers are used to save the pages you want to visit again.

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises given in the lesson can be done as classwork and homework.

Sample Task

Ask students to open Google Chrome on their computer and navigate to a web page address that you have written on the board. Click on a text link. Now go back to the first web page. Close Chrome.

Exercise Answers

A. **Fill in the blanks with the correct answers.**
   1. browser
   2. Google Chrome
   3. star button
   4. page address
   5. Control menu

B. **Match the following.**
   1. Control button has all the options you need to operate Chrome.
   2. Control menu is divided into seven sections.
   3. Zoom option enables you to increase the size of pages.
   4. Full screen is the button beside + button.
   5. New window opens a new window.

C. **In which section of Chrome do these options appear?**

Options	Section
Bookmarks	Second
Exit option	Seventh
History and downloads	Second
Zoom option	Third
Edit option	Fifth
Save page as	Fourth
Help option	Sixth

Lesson 9 – The Coming Revolution: Wearable Computers

Teaching objectives

- To understand types of future technology and their uses

Learning outcomes

By the end of this lesson, students will understand how the future technology will play a pivotal role in daily lives.

Lesson plan

Time period: 40 minutes

Introduction: 5 minutes

You can bring some photos of latest technologies in the class and ask the students if they can guess their names. You can bring old CDs or cassettes and try to play a song or try a digital music streaming service and discuss how the sound quality has improved through technology.

Main Lesson: 30 minutes

You can start the lesson by reading pages 42 and 43 with children. For this lesson you can display slides and start a discussion. Ask students to think about the function of each item and describe how each has changed over time. Show them the different types of phones and ask students to identify them. Ask them: What do you think it is? How do you know it's a phone? What is the purpose of it?

You can tell the students that in the past phones were large, bulky and heavy to carry around. Now we have high tech cell phones that are slim, light and even have access to the Internet. They have cameras, games, music and navigation installed in them.

You can show the children some photos of latest technology like a shoot up screen with a laser keyboard that comes out of a pen. Also show your students how technology has helped disabled people to work on the computer using a vocal joystick. Also there is something called a tongue device which is implanted or pierced into a person's tongue that is as small as a grain of rice. This device helps the disabled to become more independent.

Technology will keep getting better and better. It can be good for some people but bad for others. The future will hold many more surprises for us and help us to be a much updated society. Show them different photos of vacuum cleaners. They are robotic nowadays. You can also show photos of wearable devices like smartwatches, smart glasses, mind reading machines!

Lesson wind-up: 5 minutes

Recap what was taught in the lesson. The exercises given in the lesson can be done as classwork and homework.

Sample Task

Give a task to the students to find out about latest technologies and ask them to provide comparison to the early days. Ask them to prepare a poster.

Exercise Answers

A. Answer the following questions.
1. Computer size has been reduced while their processing capabilities are being increased. The wearable computers have half inch screen at top right for display.
2. It displays information on a tiny screen and could interact via Internet by giving voice commands. It allows the user to take photos, do video chats, check for appointments, and access maps for direction and search the web. It can be connected to the mobile phones to receive and send messages take pictures and many more.
3. Smart watch, Smart glasses, Activity trackers

B. Rearrange the following letters
1. Wearable
2. Display
3. Watch
4. Google
5. Mobile