# SMART
# COMPUTING

*Teacher's Resource Book-4*

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 - Computers: A Journey of Innovation

This lesson can be taught in two periods.

## Period 1

## Teaching objectives

- To understand the five generations of computers
- To understand how they improved over time

## Learning outcomes

By the end of the lesson, the students will be able to classify computers into different generations based on the technology used. The students will also be able to briefly describe the 4th generation of computers.

## Lesson plan

Time period: 40 minutes

**Introduction: 5 minutes**

Have a discussion about desktop computer features with your students before starting the lesson. You can ask them to list the basic components of a desktop computer or describe what they do. Tell them about the various stages that the modern desktop computer went through to get to where it is now.

**Main Lesson: 30 minutes**

Read pages 4 and 5 with your students. Discuss the history of computers with them. Tell your students that before computers, simple math operations were performed by hand using tools like Abacus. If you can get a toy abacus to show in class, that will be helpful.

Proceed to have a detailed discussion with your students about the five generations of computers. You may have a discussion towards the end to clear any doubts that the students may have.

Bring different photos of computers from different generations and ask your students the differences between them. Their responses could be: different in sizes, storage space were different, the amount of electricity used, more people used to operate the computer, etc. You can write their responses on the board. Alternatively you can ask them the following questions:

- *What differences can you find between the computers shown?*
- *Which one would you choose to use and why?*

Ask the students to do exercise C in their notebooks.

## Period 2

### Teaching objectives

- To understand the integrated circuit and highlight its impact on the computer industry
- To understand how the Internet was formed

### Learning outcomes

By the end of this lesson, students will be able to explain how integrated circuits helped computer to evolve. They will also understand the importance of Internet and how it was formed.

### Lesson plan

Time period: 40 minutes

**Introduction: 5 minutes**

Show a picture of integrated circuits to your students. Ask them if they know what it is. Allow them to share their thoughts.

**Main lesson: 30 minutes**

Ask the children to read pages 5 and 6 with your assistance. You can show them photos of computers that dated in these generations. Let the students know that an IC led to the invention of the microprocessor which is an integral part of all computers today.

Recall some details about the operating system. Tell the students that before Microsoft Windows, the most common operating system was **DOS** (**Disc Operating System**).

Explain how computers are classified based on how they process and present data to users. Analogue computers provide accurate data, but users may struggle to read it clearly. On the other hand digital computers provide output that can be read easily. You can give the example of an analogue clock and a digital clock.

While discussing about the 4th generation computers, write the word CPU on the board. Ask the students what it stands for. Show a photograph of CPU to explain that the CPU has a microprocessor inside the system unit.

While discussing about networks in this lesson, you can guide students through the computer lab; pointing out the cables that connect the various computers. You may need to explain that some computers are connected even if the cables are not visible. Explain that a network is a group of computers connected through wired or wireless means.

Demonstrate how all computers in the lab can access resources like printers and scanner by using the print command. Demonstrate how a file or a document can be accessed from one computer to another through a LAN connection.

Let the children read the fifth generation on page 6 with your assistance.

Ask them the following question: *What do you understand by the term artificial intelligence?*

Explain that it is a way to teach machines how to learn from experiences. Give them relatable examples, such as Siri or Alexa, that they likely use on a daily basis without realising the artificial intelligence systems. You could also give them examples of YouTube and Spotify platforms that uses AI systems to suggest videos and songs based on your past choices. Fun filters that turn your face into a scuba diver or other characters use AI, particularly computer vision and face recognition.

Explain that a computer that thinks like a human is supposed to have artificial intelligence. Once the meaning is clear, ask them why there is a need for artificial intelligence in a computer.

**Lesson wind up: 5 minutes**

Recap what has been taught in the lesson. You can do the exercises as classwork or homework.

## Match the following:

1. IC                        First Generation

2. IBM 701                   Third Generation

3. Transistors               Artificial Intelligence

4. Fifth Generation          Second Generation


## Answer the following:

A. Which generation of computer are we currently using?
B. Differentiate between third and fourth generation of computers.


**Draw a picture of transistor in your answer sheet.**

## Exercise Answers

**A. Fill in the blanks with the correct answers:**

1. 1st generation
2. Transistors
3. Integrated circuit
4. Parallel processing hardware and artificial intelligence
5. Microprocessor

**B. Read the information given below and find out the hardware.**

1. Vacuum tubes
2. Integrated circuit
3. Microprocessor

**C. Write some lines for each generation of computer from first generation to 4th generation.**

First generation computers consumed more power and generated heat. Input was based on punched cards and paper tape. Output was given in the form of printouts.

Transistors massively reduced the size of the computers and improved the performance manifold of second generation computers. Their instructions were stored in their memory.

The third generation of computers used integrated circuits (IC). On a single integrated circuit, there are thousands of transistors. These transistors are connected to each other.

Fourth generation of computers are built around microprocessors. A microprocessor consists of millions of transistors. These transistors can only be seen through a microscope. It controls all functions of the device.

## Lesson 2 – Working with Windows

This lesson can be taught in two periods.

### Teaching objectives

- To introduce students to an operating system and its role in managing a computer's resources
- To familiarize students with the Windows environment, including desktop icons, start menu, and basic navigation
- To teach students how to manage files and folders, including creating, copying, moving, renaming, and deleting them

### Learning outcomes

By the end of this lesson, students will have a better understanding of system management. Students will also be able to make changes to the settings and add devices. They will also be able to navigate the control panel and explore its various options.

### Lesson plan

Time period: 40 minutes

**Introduction: 5 minutes**

Start the chapter by introducing various operating systems to the students. Find out if they are familiar with Bill Gates, the man who founded Microsoft. Inform them of Windows 7 and the existence of earlier operating systems, such as Windows 95, 98, XP and so forth.

**Main Lesson: 30 minutes**

Take your students to the computer lab for this lesson. Introduce them to the various components of the desktop display. Show them how to make new folders and rename them, as well as how to change *Wallpapers*. They may be familiar with copying and moving files and folders.

Describe icons and their functions on a computer. They can be compared to quick links or shortcuts that make it easier for us to open files and programmes. You can let the students explore the desktop and identify common icons such as 'This PC', 'Recycle Bin' and any others. Discuss what each icon represents and what may happen if they double click on it.

Teach the importance of keeping the desktop organised and to not delete or move icons without first understanding their purpose, as this can affect the computers performance.

Explain that 'My Computer' or 'This PC' is like a house where all of the important things on the computer files live. Describe how files from the Internet are delivered in the download folders.

Let the students read pages 8 to 10 with your assistance. You can tell your students that the computer is sometimes called This PC or My Computer in various windows version.

You can compare the 'My Computer' icon as the front door to your house. When you click on it, it's like opening the door to see all the rooms inside. Each room is a drive or place where your computer stores various files. You have a room for your toys and games (which are your files and documents). Just like your house has different rooms for different things, 'My Computer' shows you where everything lives on your computer.

Explain to your students that on a computer, the Recycle Bin icon is like a trash can in your classroom. When you don't need a piece of paper anymore, you throw it in a trash can. Similarly, when you don't need a file or a folder on your computer, you can put it in the Recycle Bin. In the similar way, you can take something out from the trash can if you change your mind in real life. Similarly, you can also go to the Recycle Bin and take the file back.

Explain the 'Control Panel' icon to your students using the example of a toolbox for your computer. A toolbox is needed to fix things in your house. The control panel works in the same way. You can change the settings to make your computer work just how you like it. You can do things like make your screen brighter, change the volume and even add new programs. It's like having a set of tools to help look after your computer and make sure it's just right for you.

To see if they are understanding the lesson, you can ask them questions given below:

- *What is a control panel?*
- *Can anyone tell me what the control panel does?*
- *Why is it important?*
- *Can you show me how to open a programme from the desktop?*
- *If you wanted to save a picture from the Internet where would you put it on the computer?*
- *How can you change the background picture on your desktop?*
- *Who can you ask for help if you are having trouble with your computer?*

Explain 'Windows Explorer' like a big library in your computer where you can find all your files and folders. Imagine yourself having a bookshelf at home with all your favourite books, games and pictures. Windows Explorer is just like that but it's on your computer. You can open it to see everything you have saved, like your homework, drawings or photos. It's a place where you can organise your things into different sections so you can find them easily when you need them. Tell them that just like a librarian helps you find books in a library, Windows Explorer helps you find your files on the computer.

Discuss with your students about finding things on your computer. It's like a treasure hunt. Click on the folder icon on your taskbar to open it. You'll see lots of folders where your treasures could be hidden. You can open these folders to find your files.

**Lesson wind-up: 5 minutes**

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

## Sample Tasks

- Create bingo cards with different desktop icons instead of numbers. Call out the functions, and ask the students to mark the corresponding icon.
- Assign each student an icon and have them act out the icon's function while the others guess which icon they are.
- Use cards with different file types and have students decide which ones should be "deleted" and placed in a mock Recycle Bin.
- On a computer, let students practice moving unwanted files to the Recycle Bin and then emptying it.
- Have students create their own Recycle Bin from cardboard boxes and decorate them with eco-friendly materials.
- For a classroom activity, you could create a simple matching game with cards that show different settings you can find in the Control Panel. Students can match the setting to what it does, like matching a picture of a speaker to a card that says "change the volume." This can help them understand what kinds of changes they can make in the Control Panel.
- Have students practice creating, renaming, and organizing folders within Windows Explorer to understand the structure.

## Exercise Answers

**A. Answer the following questions.**

1. Windows Explorer is the File and folder management program of Windows. The basic purpose of Windows Explorer is to allow the user to see, copy, delete and manage their files on the hard drive of the computer.

2. It contains the folders which are automatically made by Windows. This includes Downloads, Favourites, My Documents, My Music, My Pictures, My Videos, Saved Games and Searches.

3. On the left is a list of locations in the Windows OS. The right side is blank.

**B. Complete the following statements.**

1. Downloads folder
2. background, icons and a task bar
3. recycle bin
4. Windows Explorer
5. search box

**C.  Fill in the blanks with correct answers.**

1. Personalize
2. Computer
3. My pictures
4. Windows explorer
5. USBs

# Lesson 3 – Mastering Word

## Teaching objectives

- To learn how to select a font
- To learn how to change the colour of the font
- To learn how to insert a headline in a document
- To learn to print and save a file

## Learning outcomes

Students will learn how to navigate Microsoft Word and use its basic features. They will also practise creative writing and storytelling. Students will understand the importance of saving work regularly. They will gain experience in presenting their work and providing feedback.

## Lesson plan

Time period: 40 minutes

### Introduction: 5 minutes

Let the students read from the lesson. You can demonstrate how to open a document on the computer. Take students to the computer lab where they will learn in groups through peer learning.

### Main Lesson: 30 minutes

Explain the concept of a headline to the children. It is the title of an article and is usually bold and larger than the rest of the text. You can show them how to select the *Insert tab* on the ribbon at the top of the page. Click on 'Header' in the *Insert tab*. This will drop down a menu of different header styles. Choose a style and click on it. The header section will then appear at the top of the document. Type the headline into the header section. Format the headline by selecting the text and choosing a font size and style that makes it stand out.

You can explain what a font is while reading about it in the lesson. It is the design of the text and different fonts can be used for different purposes. Show them where it is located on the computer screen. Click on the font dropdown menu and show a list of all the available fonts. Scroll through the list with the children and let them see the different font styles. Have the children click on the font they want to apply to their text. Let them type something and change the font multiple times to see how it affects the appearance of their text. Next, you can show them how to change the colour of the font. You can ask the students to type some text or select the text they want to change the colour of. Go to the *Home tab* on the ribbon. Look for the font section. This is where they will find different options for formatting text. Click on the Font Colour button. It looks like a letter a with a colour bar palette underneath it. They can click on the colour they want to apply on a selected text.

Discuss the importance of saving the work. Here's how you can explain to the children:

Imagine you are building a tower with blocks. If you don't glue the blocks together, what happens if someone bumps into it? It might fall down and you would have to start over. The same thing can happen with your work on the computer. If you don't save your work in Microsoft Word, several things could happen. There could be a power outage. If the electricity goes off suddenly, your computer will turn off and everything not saved will be lost. Sometimes computers can stop working properly. If Microsoft Word or the computer crashes and your work is not saved, it will be lost. So, always remember to save your work regularly. A visual demonstration can be very effective in helping them understand the importance of saving their work.

You can also demonstrate the saving and printing of a file to the students. Make sure to demonstrate these steps live on a computer and let the students practise under supervision to ensure they understand the process. Encourage them to ask questions and explore the different options available in the Save as and Print dialogue boxes.

**Lesson wind-up: 5 minutes**

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

## Sample Task

Ask the students to create a story book in Microsoft Word. Have each student think of a short story idea using all the features they have learned in the lesson. Ask students to give constructive feedback on each other's work.

## Exercise Answers

**A.  Tick the ( ) the correct answers.**

1.  Word processor
2.  File tab
3.  Recent
4.  Exit
5.  Save As

**B.  Answer the following questions.**

1.  Times New Roman, Arial, Calibri

2.  Click *File tab* and select 'Print', a print menu will appear. Select your connected printer and click 'Print'. Your document will be printed.

3.  Click the File tab, there is an option of 'Save As' click on it. Type a name of document in file name option, click on the 'Save' button.

# Lesson 4 – Understanding PowerPoint

## Teaching objectives

- To understand the purpose of using MS PowerPoint
- To learn its main features

## Learning outcomes

By the end of the lesson, the students will be able to navigate the MS PowerPoint interface, use toolbars and access various features. They will also be able to share ideas more clearly and effectively through the use of text, images and multimedia.

## Lesson plan

Time period: 40 minutes

### Introduction: 5 minutes

Start with a brief overview of what MS PowerPoint is and its uses in different fields. Encourage students to come up with ideas for a magical adventure.

- *Where will they go?*
- *Who might they meet?*
- *What challenges they might encounter?*

### Main Lesson: 30 minutes

Take your students to a computer lab for the lesson. Introduce them to Microsoft PowerPoint and its various features. You can show them how to create a new presentation, select themes, use templates and insert text and images.

Allow the students to read from the text with your assistance. You can explain to them that the *Home tab* is where we find all the tools we need to create a presentation. The *Home tab* is organised into groups. Each group has a set of related tools. Point to the *Slide* section and show the students that you can add new slides and decide what layout they should have. Next point to the *Font* section and you can ask them to try changing the text size and colour. Show the students they can organise the text, make lists or aligning text to look neat by using the *Paragraph* section. Show them how to add shapes and lines to their slides by using the *Drawing* section. Give the students enough time to follow the instructions for the given sections in that lesson.

Point out the *Insert tab* on the MS PowerPoint ribbon at the top of the screen. It has different groups with buttons for adding various elements. Explain the purpose of the *Insert tab* by showing them what they can add to their slides. There could be pictures, shapes and even videos. The *Images* section is where we can add pictures from our computer or the Internet. If there is a need to add music or a video, Media is the group to use.

Coming to the *Design tab*, explain that this tab is like an artist's palette of MS PowerPoint. Using the tools, we can make our slides look beautiful and professional. You can discuss with them how to choose themes and colours that match the content of their presentation.

While discussing about *Slideshow tab*, explain that it is where we can see our slides come to life. It is like a 'play' button for our presentation. You can teach the students how to start the presentation from the beginning by clicking on '**From beginning'** or from a specific slide by choosing '**From current slide'**. Show them how to move forward and backward through the slides using the arrow keys on the keyboard. If available, demonstrate the '**Presenter View'**, which lets the presenters see notes an upcoming slides while the audience can only see the current slide. Let the students practise starting and navigating through a slideshow. They can take turns presenting a slide to the class.

You can ask them the following questions to see if they are understanding the lesson:

- *What is MS PowerPoint used for?*
- *Can you show me how to create a new slide?*
- *How do you add pictures or video to your slides?*
- *How would you change the design or theme of your presentation?*
- *Can you explain how to save your MS PowerPoint presentation?*

At the end of the lesson, remind your students to save their work before shutting down the computer.

**Lesson wind-up: 5 minutes**

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

## Sample Task

As a practical exercise, ask the students to create a short presentation about their favourite animal, using the tools in the Home tab to format their slides.

Create a mini-project where students can practice inserting different elements into a slide. For example, they could make a slide about their favourite hobby and include a picture, a shape, and a text box describing the hobby.

## Exercise Answers

A. **Answer the following.**

1. .ppt
2. Clipboard, Slide section, Font section, Drawing section, and Paragraph section
3. This tab is used to add multimedia elements such as (pictures, videos and sounds) into a presentation.
4. Go to the Home tab and click the New Slide option. A new blank slide will appear on screen.

5. You should always view your slideshow before presenting them to others. This way you can make sure that the presentation is free from all sorts of errors.


**B. True and False**

1. FALSE
2. FALSE
3. TRUE
4. FALSE
5. TRUE

## Lesson 5 – Working with Spreadsheets

### Teaching objectives

- To understand MS Excel used for organising, calculating and analysing data
- To discuss its usage and implementation in real-life situations

### Learning outcomes

By the end of the lesson, the students will be able to understand the concept of spreadsheets as a grid of cells used for organising and analysing data. They will recognise that spreadsheets are versatile tools for various tasks. They will learn how to input data (numbers, text) into cells. They will understand the importance of formatting data (font size, bold, etc.) to make it visually clear. They will use spreadsheets to plan events, answer questions and solve real-life problems.

### Lesson plan

Time period: 40 minutes

#### Introduction: 5 minutes

Provide a printout of a blank spreadsheet with grids, highlighted cell, and cell address and letters. Encourage students to suggest possible applications for this program. After students have provided answers, label and discuss the functions of spreadsheet terms such as row, column, cell, cell address, active cell and range.

#### Main Lesson: 30 minutes

Let the students read the lesson with your assistance. Explain the concept of rows, columns, cells, worksheets and grid on a spreadsheet. Introduce programs for it and explain how data is organised on a spreadsheet.

Describe a workbook as a collection of pages (like a notebook). In MS Excel, a workbook is like a digital notebook that holds multiple sheets (worksheets). Each sheet is a separate page within the workbook.

Next, explain that a worksheet is a single page within an MS Excel workbook. It is where you organise and analyse data. Think of it as a table with rows and columns. You can enter numbers, text and formulas into cells on a worksheet.

Show them a physical notebook with multiple pages. Explain that each page is like a worksheet in MS Excel and the entire notebook is the workbook. Relate this to MS Excel by opening a new workbook and creating multiple worksheets.

You can take the children to the computer lab to practise working on Microsoft Excel. Ask your students to open MS Excel and create a new workbook. Add a few worksheets (tabs) by right-clicking on the sheet tabs at the bottom. Rename the worksheets (for example sheet 1, sheet 2, etc.).

Teach them how to enter data (numbers, text) into cells. Show them how to navigate between worksheets using the sheet tab.

Discuss with your students about MS Excel being a part of our daily lives. MS Excel helps us manage our money. We can create a budget spreadsheet to track our pocket money, allowances or savings. Students can learn to input their weekly expenses (snacks, toys, etc.) and calculate their remaining balance. Teachers use MS Excel to keep track of students' results and attendance. Explain how data is organised and how formulas can calculate averages or totals.

Discuss the various types of data. There are three types of data values. Text data type (labels). Text data includes words, sentence and any other alphanumeric characters (letters, numbers, symbols). Relate this to the content they write in their school notebooks or on a piece of paper. In an MS Excel cell, one can type text directly. Remind the students that text data helps us describe things, write messages, and organise information.

The next type of data value is number. It is used for numeric values in MS Excel. It includes both whole numbers (5, 10, 100, etc.) and decimal numbers (3.14 or 0.5, etc.). Show the students that they can directly type numbers into cells. They can use them for calculations such as adding, subtracting or finding averages.

The third type of data value is formulas. You can explain that formulas are like magic instructions for MS Excel. They allow us to perform calculations and make our spreadsheets smarter. You can teach them simple formulas like SUM (add numbers) and AVERAGE (find the mean). Show how to write a formula using the equals sign (=).

Discuss about entering data in spreadsheets in a creative way. Imagine the spreadsheet as a battleship grid. Each cell is like a spot on the ocean where ships hide. Teach students to enter ship coordinates (like A1, B3) into cells They can mark hits (X) and misses (O) using different colours. What would be the goal? Sink the opponent's ship by guessing their coordinates! You can let your students practise working on the spreadsheet through this example. Give them ample time to do their work.

Discuss about how the cells work in MS Excel. Imagine an Excel spreadsheet as a big grid made up of tiny squares. Each tiny square is called a cell. Cells are where you can type text, numbers or formulas. Every cell has a unique address. The address is a combination of the column letter and the row number. For example, cell A1 is the first column (A) and the first row (1). Cell B3 is the second column (B) and the third row (3). To go to a specific cell, click on it. You can also type the cell address directly in the formula bar at the top.

To see if they are understanding the lesson, you can ask them the following questions.

- *What is a spreadsheet?*
- *What are cells?*
- *What is a cell address?*
- *How do you enter data into a cell?*
- *What are columns and rows?*

- *What is a formula?*

Ask students to create a simple addition formula (for example, =A1+B1).

Lastly, you can discuss about how to use AUTOSUM in MS Excel. Tell them that it is a handy feature that automatically generates some formulas for a selected range of sets. It is perfect for quickly calculating totals and subtotals. You can teach them by giving a small demonstration. Suppose you have a column of numbers (for example monthly sales). Select the cell immediately below the last value in the column (for e.g. Cell B7). Go to the home tab. In the editing group, click the AUTOSUM button. MS Excel will automatically generate the sum formula for the selected range (for e.g. B2:B6). Press enter to complete the calculations.

### Lesson wind-up: 5 minutes

Recap what was taught in the lesson. You can do the given exercises as a classwork or homework.

## Sample Task

Imagine you're running a sports league (hockey, cricket, etc.). Enter the names of the teams, along with their wins, losses and points. Use formulas to calculate rankings and visualise standings.

## Exercise Answers

**A. Answer the given questions.**

1. Microsoft Excel is a spreadsheet program. It is like a digital table where you can organize, store, and calculate data. The information is arranged in rows and columns. It is a powerful tool used for tasks such as budgeting, creating charts, and analysing data.
2. MS Excel finds its use in various aspects of our life. It can be used in educational, financial and mathematical or statistical calculations. It also helps in analysing data with the help of various charts.
3. To find a cell's address, combine the row number and column letter.
4. By default, there are three worksheets in MS Excel 2013.

**B. Fill in the blanks.**

1. Organise
2. .xls
3. AUTOSUM
4. Cell

**C. Activity**

Students to complete the activities.

## Lesson 6 – Computer Viruses

### Teaching objectives

- To learn what computer viruses are, how they spread, and their impact on devices
- To explore various types of malware, including viruses, worms, Trojans, spyware and adware
- To discover ways to protect against malware, such as using antivirus software, avoiding suspicious downloads and being cautious online

### Learning outcomes

By the end of this lesson students should be able to explain what can happen if a computer is infected with a computer virus. They should be able to define the three types of computer viruses: viruses, worms and Trojans. They should also describe how to protect your computer from computer viruses.

### Lesson plan

Time period: 40 minutes

**Introduction: 5 minutes**

Explain that a computer virus is like a tiny, invisible bug that can sneak into your computer. Explain that just like you can catch a cold when someone else is sick, a computer virus spreads from one computer to another. These bugs can hide inside other programmes or files, just like how a tiny spider might hide in a cosy corner of your room. You can take the children to the computer lab and show them on a computer that when they run a programme or open a file, the virus wakes up and starts copying itself. Viruses can even do harmful things, like making your computer slow down or deleting important files. You can show them different types of antivirus software that are installed in the computers to make them safe from viruses.

**Main Lesson: 30 minutes**

Encourage kids to write short stories or draw comics about computer viruses and how antivirus software saves the day.

Explain to the students about how the computer viruses come into your computer. They can come from different places for example emails, downloads, removable hardware and websites. Explain to them that sometimes it can arrive in email attachments. So if you get an email from someone you don't know, be careful! They can also hide in programmes or files we download from the Internet. It is like finding a hidden treasure chest, but inside, there is a sneaky virus waiting to jump out! You can also show them the different devices through which viruses can be transferred to your computer. Ask them to imagine a USB drive or a memory card. If it's infected, it can spread the virus to other computers when plugged in. There are some websites that can secretly pass on viruses. It is like a secret handshake between the website and your computer! Explain to your children that just like washing our

hands keeps us healthy, we use special tools called antivirus software to detect and remove these bugs from our computers. We need to update the software often to stay safe! Test your students by asking these questions:

- *What would you do if you received an email attachment from an unknown sender?*
- *How can you protect your computer from viruses?*

You can explain to the students about the problems that may rise when the computer is infected with viruses. Some problems are mentioned below:

- *Sluggish performance*
- *Unexpected shutdowns and crashes*
- *Missing files*
- *Frequent error messages*
- *Pop-up windows everywhere*
- *Overworked hard drive*
- *Data theft and destruction*

Encourage students to think critically about safe practises.

**Lesson wind-up: 5 minutes**

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

## Sample Tasks

- Create a list of common online threats (viruses, phishing emails, etc.). Have kids search for examples online and discuss how to avoid them.
- Encourage kids to write short stories or draw comics about computer viruses and how antivirus software saves the day.
- Show kids how to use antivirus software by setting a positive example. Demonstrate how to install and update antivirus programs, run scans to check for viruses, follow safe online practices (e.g., avoiding suspicious downloads). Explain that just like washing hands keeps us healthy, using antivirus tools keeps our computers safe.

## Exercise Answers

A. **Mark ( ✓ ) for true and ( ✗ ) for false statements.**

1. True
2. false
3. True
4. True
5. False

**B. Describe the following terms.**

1. Viruses: They copy themselves and spread their copies to other computers. Viruses need to attach themselves to a program or file on computer.
2. Worms: These are different from viruses in that, they do not need a program to attach themselves to. They can exist and operate independently.
3. Trojans: They work by deception. Outwardly they seem to be useful but inwardly they could be damaging to your computer. They are mostly sent by criminals who can get benefit from the information taken from your computer.

**C. Match the following.**

Data Loss - The most destructive activity of virus
Loss of control - Actual user does not control the system.
Hardware damage - Computer equipment is damaged.

**D. Write some signs of viral infection in a computer.**

1. Infected computer usually behaves erratically.
2. Files corrupt frequently.
3. Several folders do not open and the computer often freezes.
4. You get lots of error messages.
5. Your hard disk light blinks even when the computer is idle.

# Lesson 7 – The Living Net: Websites

## Teaching objectives

- To learn what a website is and how it is constantly growing and changing
- To understand how navigating from one website to another is like moving through a network of paths
- To identify different types of websites and their purposes, such as educational, entertainment, news and ecommerce sites

## Learning outcomes

By the end of the lesson, students should have a foundational understanding of websites, their significance and how to navigate the Internet responsibly and safely. This knowledge will prepare them for more advanced topics in technology and digital literacy.

## Lesson plan

Time period: 40 minutes

### Introduction: 5 minutes

Explain what Internet is. Tell your students that it is a vast network of connected computers that allows people to share information, communicate and access resources. Discuss how the Internet impacts our daily lives, from communication to research and entertainment.

### Main Lesson: 30 minutes

Let the students read lesson with your assistance. You can write some of the questions on the board and let the students brainstorm. Some of the questions are as follows:

- *Can you explain what Internet is?*
- *What are some of the things you like to do on the Internet? Can you name some rules you should follow when using the Internet?*
- *Why is it important to keep your personal information private on the Internet?*
- *How can your actions on the Internet affect you on others?*

You can explain to your students about the Internet in a creative way. Imagine Internet is like a big city with lots of different buildings. Each building is a website and each one has a different purpose.

Explain about different types of websites by starting with Search Engines. Imagine you are in a huge library with billions of books but there is no librarian to help you find what you need. That is how a search engine acts like. It is a special programme on the Internet that helps you find the web pages you are looking for, just like a librarian helps you find books in a library. When you have a question, or you are looking for something specific, you type words into the search engine. These are called keywords. The search engine then quickly looks through millions of web pages and finds the ones that have the information you need.

Ask your students questions about search engines:

- *What are the most popular search engines?*
- *How do search engines work?*
- *What are some alternative search engines to Google?*

Talk about news websites. Explain that they are like the place where you can get the latest from. They tell you what is happening in the world right now.

Discuss social media websites, blogs, ecommerce websites, community websites, fun and games. You can describe about these websites in a creative manner to your students.

Social media websites are like places where friends meet to chat and share stories and pictures. Blogs are like cosy spots where people write about their thoughts and share their hobbies. Online stores or ecommerce websites are like big shopping centres where you can look at toys, clothes and all sorts of things to buy. There are some websites that are non-profit. The share their missions, raise awareness and encourage donations or volunteer participation. Others are online forums and community websites. They allow users to discuss topics, ask questions and connect with others who share similar interest. Just like there are websites for news and television, some are of similar types for children also. These websites are educational, entertainment and interactive. These are shown in a child friendly manner, helping kids to stay informed.

Discuss about what other things are done on Internet. There are fun websites that offer games for grown-ups and children. Ensure that the children know all the important things to look for when they are on gaming website.

Tell the students that sometimes the Internet becomes a bit unsafe. They should have a grown up to check out the website content before using it. Their parents should make sure they know who the children are interacting with online. Many games and social platforms websites have chat functions that can expose children to conversation with strangers. These websites also offer in-game or in-built purchases. Discuss with the students the importance of not making purchases without permission and be aware of settings that can prevent accidental purchases.

**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 Tasks

- Discuss the importance of being safe and respectful online.
- Have students search for specific information online.
- Compare news treatment across different websites.
- Place the world map on a wall or a table. Have students use strings to connect their Internet journey cards on the map, showing how data travels from their home to different parts of the world.

## Exercise Answers

**A. Match the following.**

Website-specific location and specific address
Search engine- sole purpose is to find things on internet for you
Google-most popular search engine
Blog-website for opinions and news presented otherwise

**B. Answer the following questions.**
1. A search engine is a type of website to find anything you want on the Internet.
2. Popular websites are news websites, social media websites, blogs, online stores
3. Social media is used for interacting with your friends without going to their places or calling them.
4. Blogs are websites for discussions and information. They could be on a single topic or on a broader category.

**C. Mark ( ) for true and ( ) for false statements**
1. True
2. False
3. False
4. True
5. False

**D. Rearrange the following.**

Search engine
Websites
Internet
Google
News

# Lesson 8 – The Coming Revolution: Computer-driven cars

## Teaching objectives

- To be able to identify and describe the key components and functions of self-driving cars
- To understand the safety, convenience and environmental benefits of self-driving cars
- To be able to use creative and create critical thinking to imagine the future of self-driving cars and their role in everyday life

## Learning outcomes

By the end of the lesson, the students will be able to explain what computer driven cars are and how they differ from traditional cars. They will learn about the technologies that make computer driven cars possible for example sensors, navigation and artificial intelligence.

## Lesson plan

Time period: 40 minutes

**Introduction: 5 minutes**

Start by briefly explaining what computer-driven technologies are. You can tell them that these technologies can be found in many places like our homes, schools and even in our toys.

**Main Lesson: 30 minutes**

Divide the students into small groups and ask them to brainstorm examples of computer driven technologies they know about or have seen. Give them a few minutes for this activity.

Have each group share their examples with the class. Encourage them how to explain how the technology works and why do you think it's driven by a computer. You can ask questions like:

- *What does this technology do?*
- *How does it use a computer to work?*
- *Can you think of any toys that might use computers to move or talk?*
- *Have you ever seen or heard cars that can drive themselves?*

You can also write a list of devices on the board. Ask the students to name them.

Let the students read the lesson with your assistance.

Discuss with your students about the benefits of self-driving cars. Their answers could be like this: safety, convenience, efficiency, environmental benefits, and accessibility. Ask them to explain each benefits in two to three sentences.

Let the students understand the technology used by these cars. They have sensors. The sensors are of different kinds built inside the car. They include cameras, radar, lidar, and ultrasonic sensors.

Another type of technology is computers which is the brain of a car. It processes all the information from the sensors. Give them example of AI which is a special kind of computer programme that helps the car experience and make decisions like a human driver would. Another type of technology is Maps and GPS that understands the location. The last type of technology is decision-making.

**Lesson wind-up: 5 minutes**

You can conclude the lesson by discussing what the future of computer driven cars would look like. You can do the exercises given in your lesson as class work and homework. Recall that has been taught in the lesson.

## Sample Task

Ask students to write a short story about a day in their life with a self-driving car. They should include how the car helps them get to school, visit friends, or go on an adventure. Encourage them to describe the features of the car and how it interacts with the world around it.

## Exercise Answers

**A. Fill in the blanks.**
   1. Control systems and distance measuring devices
   2. Computers
   3. Fuel
   4. Navigation
   5. Global Positioning System

**B. Answer the following questions.**
   1. reduction in number of traffic accidents, fuel efficient, improve the living standard
   2. video, infra-red, laser
   3. (use internet for research)

**C. Following are the functions of computer driven cars. Match them with the description given below.**

| | |
|---|---|
| Sensors | video, infra-red, laser, radar |
| Actuation | it takes input from drivers and delivers desired effects |
| Navigation | the ability to plan a route from vehicle's current position to the destination |
| Motion planning | it recognised moving obstacles |