



**In Line with CBSE & in Tune with
Child's Aspirations
& their Technological Future**



**Follows
TIY (Teach it Yourself) Approach**



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Child's Aspirations
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Lesson 1

HARDWARE & SOFTWARE

» Learning Outcome



By the end of lesson 1, students will:

- Know about Hardware & Software.
- Understand the relation between a Computer, laptop, iPad & a smart phone.
- Recognize key hardware items & software variants.

» What is Hardware & Software?



Parts of a computer that we **CAN** touch & feel are called **HARDWARE**



Parts of a computer that we **CANNOT** touch & feel are called **SOFTWARE**



The beauty is that **HARDWARE** cannot work without a **SOFTWARE**



& **SOFTWARE** CANNOT work without a **HARDWARE**





As a human I have a **body** which is my **Hardware**. I have a **brain** that tells me what to do. That is my **Software**.

» How do Hardware & Software Work

My Interaction with computers is governed by a cycle of three things called **IPO**. These



Input Devices



Processing



Output Devices

- **Input** – Domain of **Input Devices**.
- **Processing** – Domain of **CPU** (Central Processing Unit).
- **Output** – Domain of **Output Devices**.



Input Devices. These are devices that Input Data to a Computer.

When we want a computer to type out “**HELLO WORLD**” we must type in “**HELLO WORLD**” as an input using a **keyboard**. This keyboard is an **Input Device**.



Other input devices:



Mouse | Mic | DVD | Web Cam | Joy stick | Scanner
Can you think & tell me some more Input Devices?



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Lesson 2

INTRODUCTION TO WINDOWS 11.0

➤ Learning Outcome



By the end of this lesson, Students will know:

- Basic areas of the opening screen.
- Working with desktop icons.
- Layout of the task bar & conduct of operations.
- How to work with multiple apps.
- Changing the wall paper & screensavers.

➤ Layout of Opening Screen

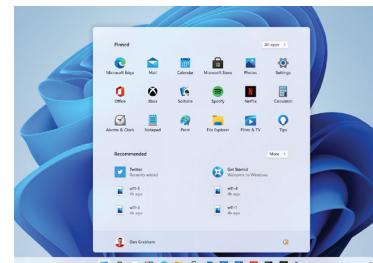
Sit in front of a PC loaded with **Windows 11**.

Its opening screen will look as this: 

It is called **Graphical User Interface (GUI)**.

This will help you interact with the software & do work.

We will now go over its key components.



1 Icons. We are **labeled Graphic Pictures** to **depict & open** the content of programs, files, folders & documents.



- Icons appear along the left edge of the GUI one below the other.
They can be moved using the mouse.
- See & tell us a few icons you see on your PC.
- Some desktop may have lot of icon and some a few.
- **Number of Icons on the desktop is all user based.**



② Taskbar. We are a horizontal bar at the bottom

of the GUI. We contain the icons of the:

Start Button | Frequently used tasks, apps, tools & utilities

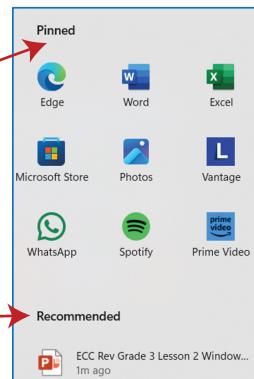


See the task bar on your PC & co-relate with this. If your PC is not having windows 11, you will find changes, but concepts are similar.

③ Start Button. It is a blue icon at the center of the taskbar.

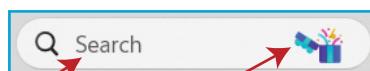


- Clicking shows list of apps pinned on it.
Upper half has list of pinned apps.
Lower has recommended apps.
- Recommended apps are recently opened apps.
- Pinned apps can be opened through this or by clicking the icons on the taskbar.



④ Search Box. This allows quick search of apps or documents. To search:

- Click in blank area next to the search icon or on.
- Dropdown containing suggested apps appears. Click on desired app.
- If desired app does not appear, type its name next to search icon. Icon of the desired app will appear. Click on it & start using.



⑤ Task View Button. Windows 11 has a new feature that allows us to create

multiple desktops. Clicking on it will show all the open apps.

If only two are open, only two will appear. Rest will appear blank.

This enables us to work on one desktop for one project & on another desktop for the other. **Default is two desktops.**



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Lesson 3

CONSOLIDATION OF COMPUTER BASICS

» Recap of Essentials

① **Computers** consist of hardware & software

What we can touch & feel is **hardware**

What we cannot is **software**.

② **Software** are instructions given to a computer.

Sys SW controls hardware & runs the apps.

OS provides hardware/user interface

App SW does a designed task



① **Windows 11** is an OS to run computer Hardware.

Its key components are:

Icons, Task bar, Start button, Search box, View task button, Notification area, Pinned apps & Widgets.



② **Desktop** have backgrounds & screen savers.

Apps are opened & run over these backgrounds.



» Identify for Me

① Name these Hardware Products



② Which out of these is an Operating System & which is an Application Software



» Make for Me

- Make a chart showing different components of a Desktop.
- Make a drawing in Paint. Save & use it as a screen saver.

» Quick Assessment

1 Answer the following

- (a) What is Hardware?
- (b) Name two output devices of a computer.
- (c) Name three input devices of a computer.
- (d) What is a screensaver.

2 Select True or False

- (a) Software are parts of a computer that can be touched.
- (b) Device that can be fixed inside a computer is called internal hardware.
- (c) Start button is found on the Task bar.
- (d) Computer battery status is shown by the widget.
- (e) Windows 11 is an example of presentation software.

3 Select the correct option

- (a) ----- is an example of presentation software.
Excel Photoshop Power point
- (b) Wall paper is changed by clicking on ----- option.
Personalize wallpaper Screensaver
- (c) Desktop icons with a small label are called.
Buttons Icons Starters
- (d) Search box is used to search-----
Icons Documents Lost Property

4 Fill in the blanks

- (a) Snap feature allows you to-----.
- (b) A computer has ----- types of software's.
- (c) A software can be opened by-----.
- (d) Time taken by a computer to start is referred as -----.
- (e) What is the number of the latest release of windows-----.

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Lesson 4

INTRODUCTION TO MS WORD



➤ Learning Outcome

By the end of this lesson, Students will know:

- What is MS Word.
- Layout & functions of areas of the opening screen.
- Understand basic word operations.

➤ What is MS Word?

MS Word is a Word Processing program used to make simple & complex documents



It is part of **Office 365** that contains apps like Word, Excel & power point.



It can be **Downloaded** on a PC



We can **Make** documents like Letters, stories & articles



Format them in creative ways



Add Pictures & QR Codes containing videos & presentations. Plus we can **Save** them on our PC



» Opening Windows

- To open app, click **Start**  In window that opens select. 

Home page opens.

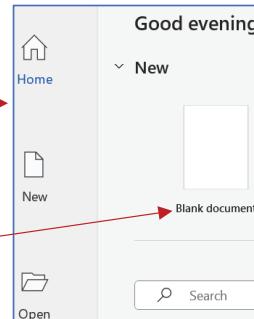
Gives option to open existing

- document or make a new one.

To make a new document, select **blank document**. Word 2019 window opens.

- This window has a temporary blank page with a temporary name Document 1.

To save give the document a **name** before you close it.

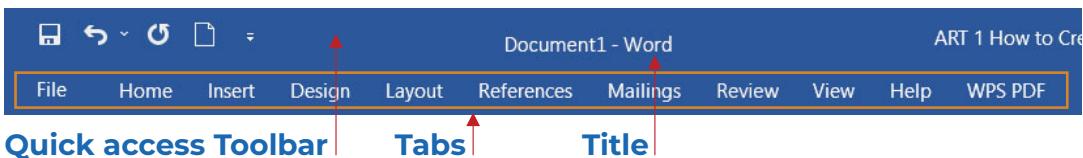


Opening Screen consists of three main parts:

- **Ribbon** at the top with tabs below it.
- **Document working area** in the center.
- **Status bar** at the bottom,

1 Ribbon

Appears on top. **Right part of the ribbon has:**

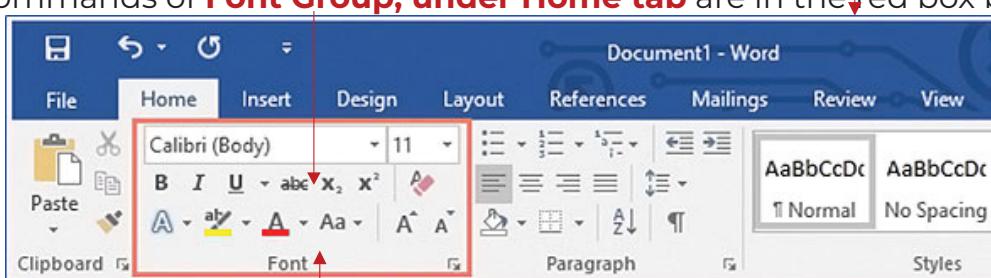


Left part has

Icons to minimize, maximize & close. 

2 Tabs Pallet

- It has **nine tabs** from **File** in the right to **View** in the left.
- Each **Tab** has a **group** of related **commands**.
- Commands of **Font Group, under Home tab** are in the red box below.



Clipboard

Font

Paragraph

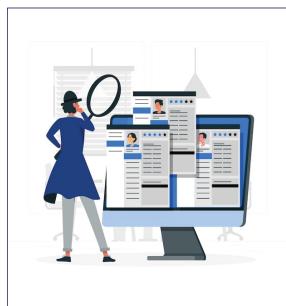
Style

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Lesson 5

MS WORD – EDITING



» Learning Outcome

By the end of this lesson, Students will know about

- Making a simple document containing two or more sentences & two or more paragraphs.
- Tools & Methods for selection of text to be edited.
- Editing actions including undo, redo, moving, copying, pasting, cutting & deleting.

Editing is revising the content, grammar & presentation of what you write

Editing ensures what you have written is free of common errors.



Editing can be done as you write, or after the document is completed. **We shall learn both**



» Basic Editing Operations



In a document, **mistake** can occur:

- As you write it.
- Mistakes noticed as & when you revise it.
- In both cases we need to **SELECT the TEXT**.

To study this lesson make a small document containing two paragraphs of two sentences each.



➤ Making a Word Document

To make your first word document follow the steps giving in the voice bubbles below:



① Selection of Text to be Edited

- Text to be edited could be a single character, a word, a couple of words, a sentence, multiple sentences, a para, or more.
- To select click before the first and after the last character.

The text to be edited could be a single character, a word, a couple of
It gets highlighted or selected

② Selection Bar

By default, a blank document in Microsoft Word has header at the top, footer at the bottom, text body in the center of the page, and left and right margins.

Along the left margin is a narrow, invisible strip known as the **Selection Bar** (Selection Area).

③ Selection Tools

Word supports two tools to do the selection:

- Use of a **Mouse**.
- Use of a **Keyboard**.

④ Selection Using a Mouse

Word offers six options for this:

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Lesson 6

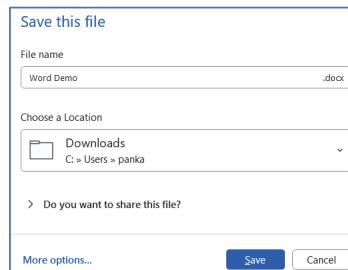
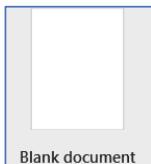
CONSOLIDATING WORD & WORD EDITING

Identify & Tell Me

1. What is this icon.  Where does it exist.
2. What is this icon.  Where does it exist.
3. What is this icon.  What does it do.
4. What is this icon.  What does it do.

When & where do you see

These three dialogue boxes:



Make for Me

- A chart showing different components of a Word Window.
- A word document titled “My School”. The document should give:
 - Name of the school & its address.
 - Name of the principle.
 - Your class, section & name of the class teacher.
 - What you like best in your school.



Quick Assessment

1 Select True or False

- (A) Shortcut for copy is Shift + C.
- (B) Shortcut for printing is Ctrl + P.
- (C) Shortcut for open is Ctrl + O.
- (D) Shortcut for exiting a document is Alt + F4.



2 Fill in the blanks

- (A) Document name is displayed on _____ Bar.
- (B) Number of pages in the document appear at _____
- (C) Language can be selected at _____
- (D) We can type in all caps using _____ Font.

3 On the opening screen of MS Word

- (A) Where is the Quick access toolbar located?
- (B) Of the 13, name any three groups present on the ribbon.
- (C) Where is the Zoom slider located?
- (D) Where is the Title Bar located?

4 Give Short Answers

(A) With MS Word we can -----

(B) To open a new word document-----

(C) To open an existing word document-----

(D) What actions do Undo & Redo perform-----

5 Match the Icons to the questions

- (A) Undo is done using.
- (B) Cut is done using.
- (C) Font style is changed using.
- (D) Show me the Open Button.



6 Imagination Building

- (A) Take a photo of the opening screen. Take an A4 printout in landscape mode.
Then use it to explain the key areas on it.
- (B) Show your creation to teacher & friends.

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Lesson 7

INTRODUCTION TO MS PAINT

» Learning Outcome



We were introduced to paint in Grade 2. Keeping in mind its important, we shall go over it again & tell you more

By the end of this lesson, Students will know:

- What is MS Paint.
- Layout & functions of areas of the opening screen.
- What all we can do with paint?
- Using paint for working on images.

» What is MS Paint

MS Paint (also called Paint) is a Graphic Editing **App** in Windows to create, edit & manipulate images & drawings

It is great for simple image drawing, cropping, resizing & adding basic shapes & text into images.



Images are saved in Windows BMP, JPEG, GIF, PNG & TIFF formats.



» Opening Paint App

Follow: **Windows >**

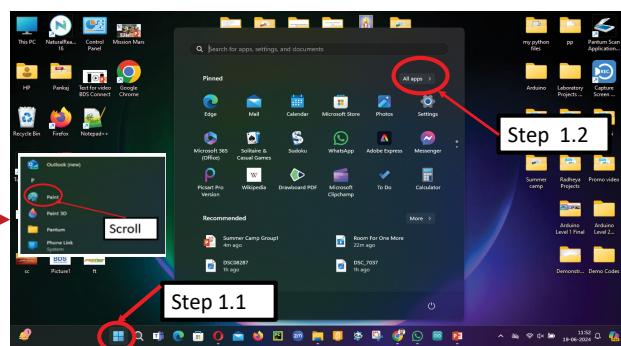
Start > All apps >

In window that opens

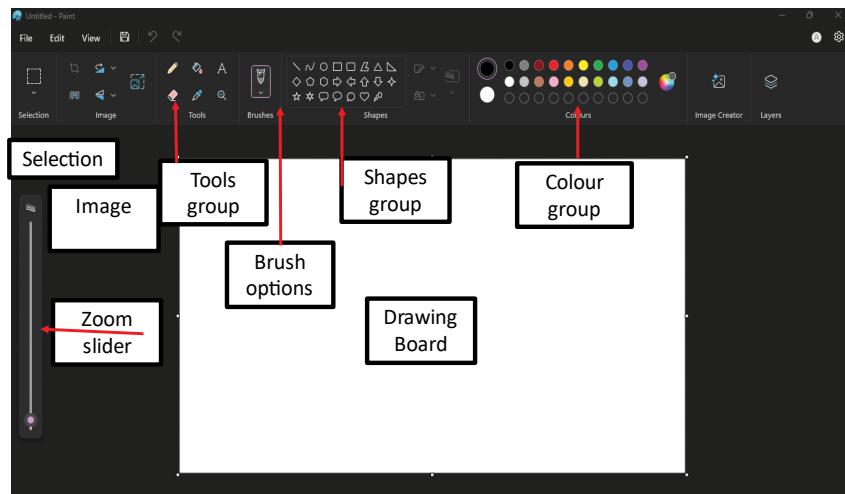
Scroll to Paint.

Select **Paint**.

App will open.



» Key Areas of Paint Screen



1 Basic Tools Group

See the six, left to right, top to bottom.

Pencil

- To draw any shapes or figures.

Fill

- To fill colour in the shapes drawn.

Text

- To add any text in the picture.

Eraser

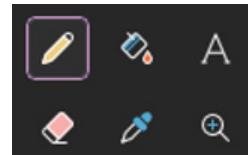
- To erase the shapes or figure.

Colour picker

- To pick a colour from an area

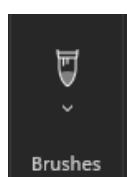
Magnifier

- To zoom in/zoom out the picture.



To Use: Click on the tool in the pallet. Go to drawing board. Keep left mouse button clicked & move the tool as desired. **Try this procedure.** You will use it throughout Paint and in **other multimedia apps as well.**

2 Brush Option



This dropdown contains 8 options. Example are a **brush that mimics the impression** of a pencil, or a crayon, water colours marker, oil brush, air brush or calligraphy brushes. **Select the option you need. Procedure of use is same. Try this yourself**

3 Shapes Group



It is used for creating shapes. It has **23 predefined shapes** 6 basic shapes, 6 polygon or star shapes, 4 arrows, 3 callouts shapes, 2 symbols & 1 line. Method of use is same.

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Lesson 8

INTRODUCTION TO mBLOCK 5



➤ Learning Outcome

By the end of this lesson students

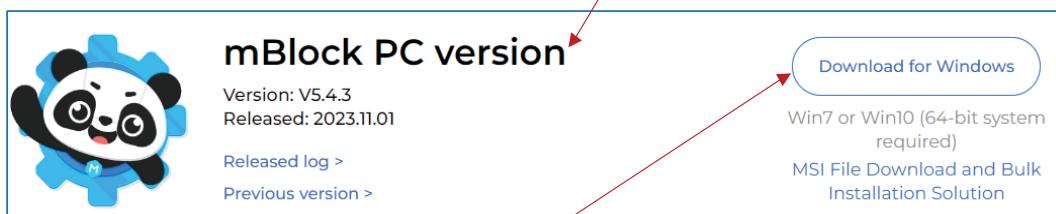
will be comfortable with:

- Downloading of mBlock 5.
- Key areas of the opening screen.

➤ Introduction to mBlock 5

① Downloading of mBlock 5

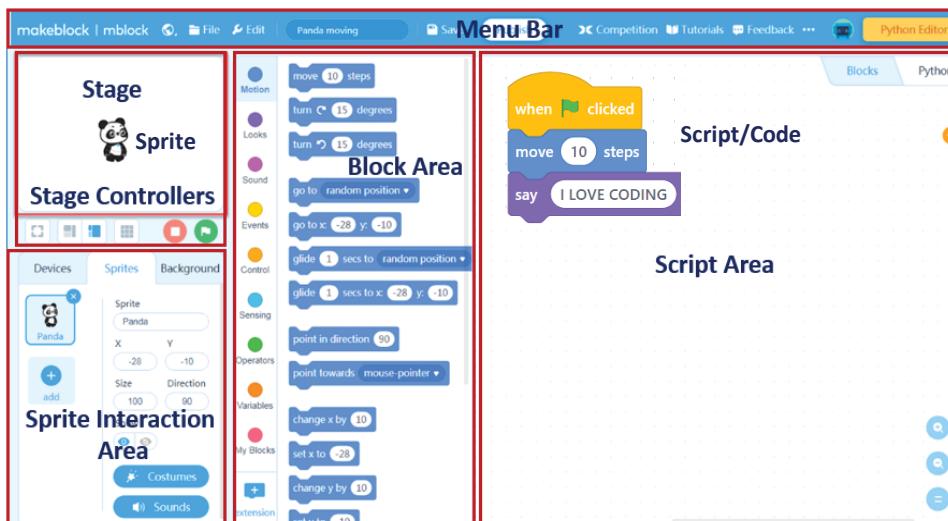
- Google mBlock 5, or use web link <https://mblock.cc/pages/downloads>
- In the window that opens scroll & select mBlock PC Version.



- Then click on download for windows. This is suitable for lap top as well.
- Follow the prompts & install on PC.

② Key Areas/Components of Opening Screen

Key areas of mBlock 5 opening screen are shown on this image.



» Let us Start

To start learning, open mBlock 5 (follow me in mBlock as you read).

1 Sprites?



I am a **2 D image** called **Sprite**.
I am the **default sprite** & appear on the **Stage**.

I am not alone. I have lots of friends.

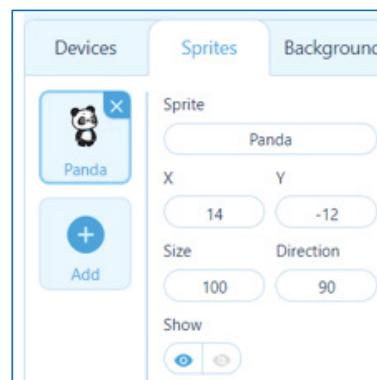
We all exist in the **Sprite Library**.



2 Sprite Interaction Area (SIA)

In this area we do coding preliminaries like:

- Selecting between sprites & devices.
- Adding backgrounds & sounds.
- Positioning the sprites on the stage.
- Controlling size.
- Controlling orientation.
- Hide & Show.
- Working with costumes.



3 Block Pallet / Block Area



I am a Block. We are of different categories with each category performing different set of functions.



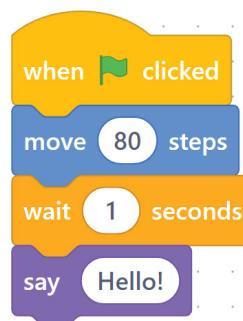
I am a Block Statement. To code I need to be moved to script area. I have Same Color as the Block. I have many siblings

We both exist in the **Block Pallet**

which is also called **Block Area**.

4 Script

- These are stepwise instructions, given to a sprite to **do the assigned task**. It contains two or more blocks.
- It is also called the **program or code**.



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BASIC OPERATIONS OF MBLOCK 5



➤ Learning Outcome

By the end of this lesson students will be comfortable with:

- Sprite, Background & sound libraries.
- Concept of story line & Drag/Drop for coding.
- Executing simple coding projects & saving them.
- Coding with multiple triggers.

➤ mBlock 5 Operations

1 Selecting Sprites for Coding

• To select Default Sprite:

In SIA select **sprites**.

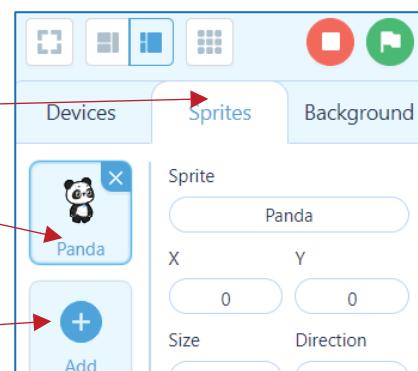
Default sprite Panda appears in stage & here.

This is auto highlighted & is now ready to code.

• To select a new sprite:

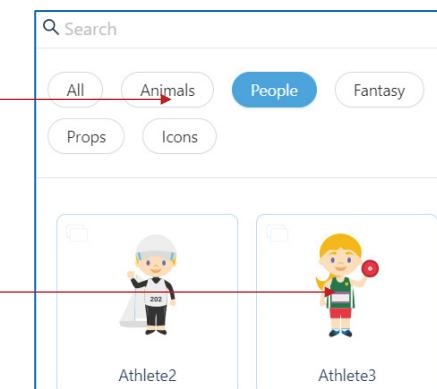
Click on **Add**.

Sprite library window opens.



Sprite Library is:

- A library of sprites built into the app.
- It is divided into multiple categories.
- Clicking on a category opens it.
- If you know the name, you could also use the search icon on top left.



Select the sprite you desire (say athlete 2)

& click OK.

- It gets added in SIA below the last sprite Panda.
 - It also gets added in the stage.
- Separate them using the mouse.



2 Deleting a Sprite

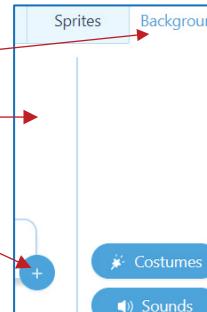
- To delete a sprite, in SIA select the sprite to be deleted. Click on this X.
- It asks for confirmation.



On confirming, it is deleted.

3 Adding a background

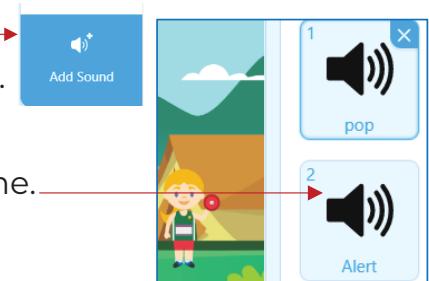
- In SIA select Background. This window opens.
- In this window click on: Background library opens. It is similar to sprite library. Has images of backgrounds.
- Select the background. Click ok.
- It gets added to the stage.



4 Adding a Sound

Default sound on a sound block is POP. To add new sound:

- In SIA, click on sound icon.
- In window that opens click on: Sound library opens. It is similar to sprite library.
- Select the sound (Alert) & click ok.
- All sound appears next to the stage as a costume.
- Sound also gets added to dropdown of sound block.



5 Point to Note

- Sprites & backgrounds get added to the **stage**.
Sound gets added to the **sound block**.
- All three have costumes.
These can be seen by selecting costumes in SIA.



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Lesson 10

STARTING PROJECTS WITH SPRITES



» Learning Outcome

By the end of this lesson students will be comfortable with:

- Basic movements of a Sprite.
- Making a sprite talk & show itself perform.
- Adding sound, recordings & music to sprites.

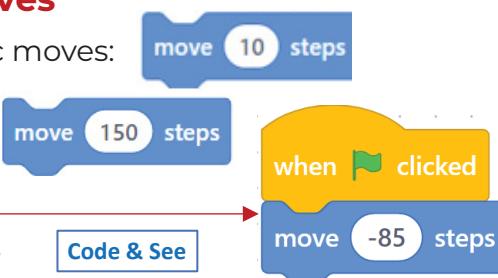
» Basic Movements of a Sprite

We have three categories of basic moves:

1 Forward & Backward Moves

We have three categories of basic moves:

- For forward move
change to positive number
- For backward move
change to negative number



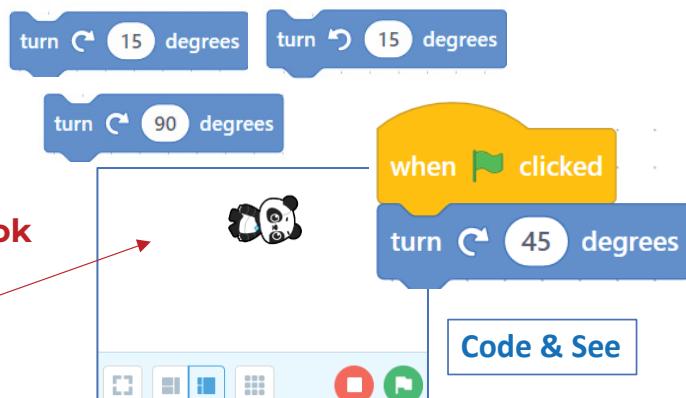
2 Left & Right Turns

- Done by **turn blocks**.

They turn a sprite right or left by specified degrees.

- Problem is the **Unrealistic look**
it gives when the code is run on the stage.

This is due to it being a 2D image.



Robots are 3 D

They **run in the real world & not on a Stage**.

They give the **real life feel of a turn**.

Let us see a **live demonstration**





Automatic Parking System.

- In this project, a car is entering a parking lot. At its entrance an attendant or a display tells the car to go and park itself at a given slot.
- The car then goes & reverse parks in that slot all by itself. Driver need not do anything.

Scan QR Code to see Video:

This is just to give you a taste of things to come in this book series.



③ Sprite Pointers

We have two of them

• Point sprite in specified direction.

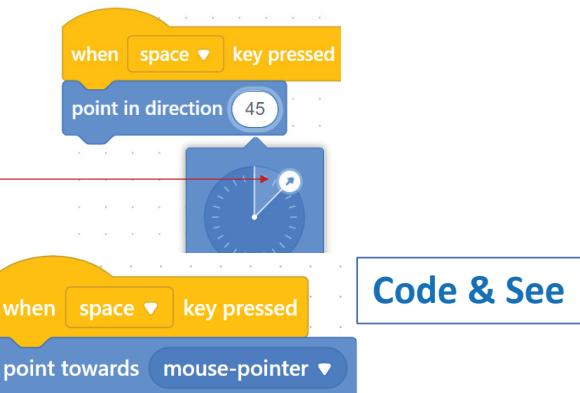
The direction can be set in two ways:

- Entering degree in white roundel.
- Using the blue arrow in this dropdown.

To do this, simply click on blue arrow & move it to the desired direction.

• Point towards mouse-pointer.

As we move the cursor on the stage, sprite points towards that.



Code & See

» Making a Sprite Talk & Show itself Perform



Looks Blocks

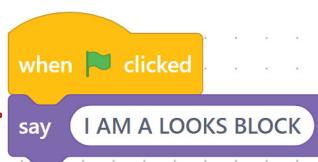
These enable a sprite to speak & think. It also helps control their looks, colour, effects, appearing, hiding, switching backgrounds & between backgrounds in the stage.

Scratch performs 19 **Actions** under **Looks Blocks**.

These are performed in response to an **Event**

They are also referred as **show blocks**.

We shall now see the Three Basic Actions.



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LEARNING SCRATCH CAN BE FUN



Learning Outcome

By the end of this lesson students will be comfortable with:

- Use of Pen Block Extension of scratch.
- Use of Music Block Extension of scratch.
- Create SW based music.

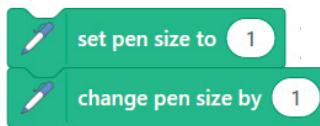
Pen Utility of mBlock 5

To open the pen utility, select sprites. Then select 

In the window look for Pen, select Add. Window showing 9 green block statements opens. These can then **be used by the sprite as a pen.**



- Two set the Size of pen nib.



- Three set the Color of the pen.



- Two move pen Down & Up to make or not make the impression.



- One is for Erase & one for Stamp.

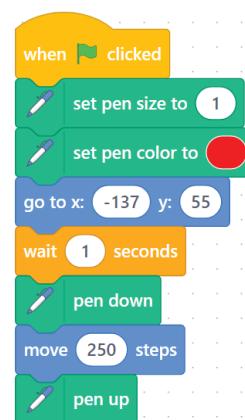


1 Drawing a Straight Line

Procedure is same as drawing with a pen in class.

It is done in following steps:

- Select **Pen size & color.** Line 2 & 3.
- Select the **start point** & give a wait. Line 4 & 5
- Put the **pen down** & move to draw the line. Line 6 & 7.
- Lift the **pen up**, line 8 & run the code. Line is drawn.



Now if we run it again, it appears as though the pen is moving up & down the same line. To show it as a new move, use **erase all** block in line 2. This enables a reset.

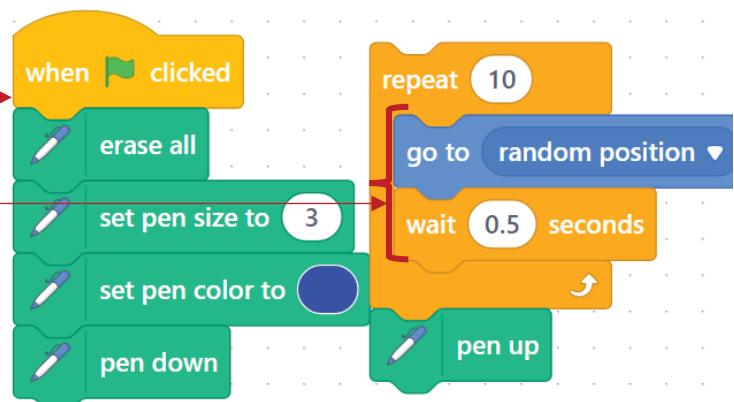
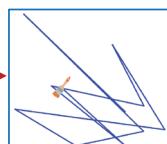
Run & see the difference.



Draw few lines starting at different points.

2 Lines Drawn Randomly

- Line 2 to 5 define the pen.
- Line 6 directs sprite (Brush 2) to goto random position.
- Lines 6 & 7 are put in a repeat loop (10).
- Final look of stage.



3 Moving in a Square

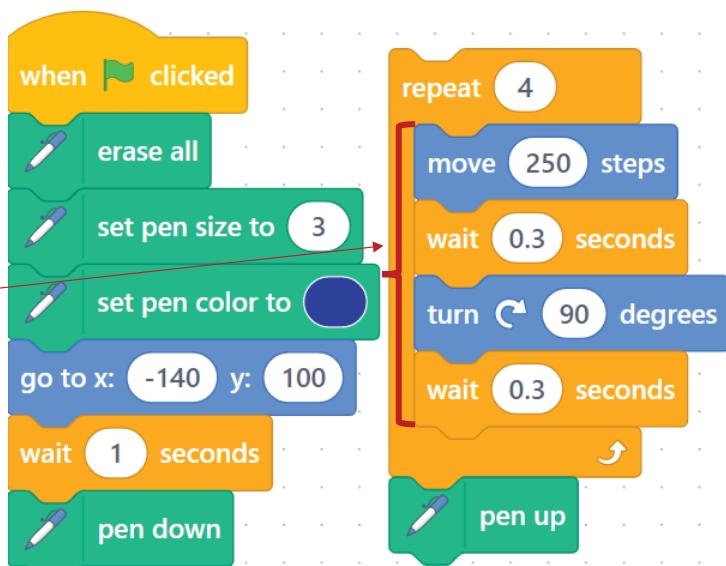
It is done in following steps:

- Lines 2, 3 & 4 define the pen. Line 5 selects the start point & give a wait.
- Line 7 puts the pen down.
- Lines 8 to 11 define making of one side of square & turning to make the second.

We now have two options:

Repeat lines 8 to 11 four times or put them in a repeat loop repeating 4 times.

- Line 12 lifts the pen up. In a similar manner draw a rectangle.



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Lesson 12

INTRODUCTION TO ROBOTICS



» Learning Outcome

By the end of this lesson, Students will:

- Know the procedure to code & run devices including robots & sensors.
- They will also start learning how to de-bug a problem when the robot does not perform as coded to do.

» Tools to Learn Robotics

Robotics is putting machines to work for humans through Coding.



» Introduction to Mobile Robots

- **Codey Rocky** is the best preassemble robot in the market to teach Robotics & in turn Coding to children.
- **It teaches children:**
 - From grade 1 to 12.
 - Programming languages Scratch & Python.
 - From simple game or animation to AI, Teachable machines & Data Chart.



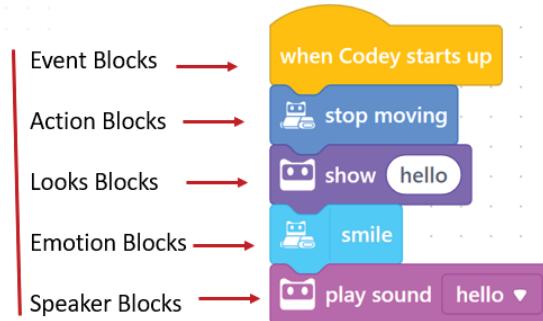
- **To make any Robot or a machine work**, we need to do three things:
 - **Write** the code on a PC or laptop using application software mBlock 5.
 - **Upload** it into the brain (temporary memory) in the motherboard of the robot.
 - **Run** that code & make corrections if required.
- **The motherboard** of any robot has ports to connect input devices like sensors & mics. and output devices like a display.
Not possible on sprite.
- **It also follows** the IPO cycle of a computer.



1 Blocks of Codey Rocky

There is no difference in coding Sprites & real robots like Codey Rocky.

- Codey has many blocks.
- To start with we shall focus on only five blocks. These are: →
- They are similar to, same category blocks of sprites.



In mBlock 5, have a look at all blocks of Codey & their block statements.

2 Operating Modes for Running the Code

- Once the Code is made, it must be run. To run we have two modes (see in SIA) – **Live & Upload**.
- **In Live mode**, device **remains connected** using USB cable while the code is run. This is because the code has not been put in its brain, but the code **is still live on the PC**.
- **In Upload mode**, we can remove cable once the **code is uploaded**.
This is because the **code has been uploaded** from the PC to its brain.



3 Procedure to Upload

- Connect PC to Codey.
Click Connect icon in SIA



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CONSOLIDATING SCRATCH

Recap of Essentials



1. **Scratch** is a Block Based Coding language.
2. **Sprites** are images coded to perform on stage.
3. **mBlock 5 & Scratch 3.0** are SW used for this.
4. **Coding** is done in script area using block statements.
5. **Backgrounds & Sounds** can be added to our code.
6. **Sprites, Backgrounds & Sounds** exist in libraries.
7. **Drag & Drop** is the key concept.

1. Sprites can be moved using **Motion Blocks**.
2. They can speak & think using **Looks Blocks**.
3. They can play sounds & music using **Sound Blocks**.
4. Multiple moves, voices & sound need **wait** block to run.
5. **Procedures for working** with sprites, backgrounds & sounds are similar.



1. **Robots** are machines requiring **Coding** to work.
2. Coding of **Robots & devices** is supported by mBlock.
3. **Coding Procedures** are similar to sprites.
4. Coding is done on a PC & then **uploaded** in its brain.
5. We spent a day with two robots **Codey Rocky & mBot**.

Identify & Tell Me

- What are these four blocks called & what do they do?
- What happens when you click these?



Devices Sprites Background

- What is the function of the following Icons of mBlock 5.



» Make for Me

Open mBlock 5. In SIA click on sprites. Take a photo of the screen. Get a print out in landscape mode. In this image mark the follow:

- Block statement area.
- Area for selection of Devices/sprites/backgrounds.
- Icon for enlarging the stage.
- Default sprite.
- Script area.
- Icon for adding sound.
- Icon for adding a sprite.
- Icon for increasing or decreasing the sprites size.



Code the following Story – “ **A young man is standing at a bus stand. One school boy & one girl are also standing. An elderly lady come and introduces himself to the man. She then asks the Man to tell him the bus number that goes to the railway station. The man tells him “Bus number 121”. The elderly Lady thanks him. They all keep waiting for the bus”.**

» Internal Assessment

① Select True or False.

- (A) Scratch was invented by Media Coding Lab Microsoft.
- (B) It is a block based visual coding language.
- (C) Children as young as 6 years can start learning it.
- (D) Scratch can only be learnt using images called Sprites.

② Select the correct option.

- (A) Sprites are.

Sensors 2 D images Motherboards

- (B) b) Backgrounds are added.

To the stage To sprites To sounds

- (C) c) Sprites exist in.

Block statements Libraries Script area

- (D) d) Stage can be enlarged by using which icon.



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Lesson 14

INTRODUCTION TO INTERNET

» Learning Outcome



By the end of this lesson students

will know:

- What is a network & what is a network of networks.
- Who invented the Internet & what it can do.
- The basic terms surrounding Internet.

» What is a Network

Earlier. As a student, my mom worked on her **Computer**.

It was called a **Stand Alone** computer.



Today. As a group of students we work on say 20 computers in our computer Lab.



Together these computers are called a **Network of 20 computers**.

» What is Internet

link multiple **computers** into one **network**, it called a **small Network**.

Link multiple **networks** into one network, it becomes a **large Network**.



Link multiple **large networks** into one network, it becomes **Internet**.



To summaries, Internet is a "**Network of Networks**". It is a **Global Network** & spans the entire world.

➤ Internet Can Send Letters

When. My **Mother** was in college, she used to send letters to **Grandma**, using the **Global Postal** system.



Today she sends it using the **Global Computer System called - Internet**

At that time. All her letters contained a **Postal Address**. The postal system used this address → to **deliver** the letters to her.



Today. **Internet uses IP Address** to **deliver** her letter. →
She just reads them on her phone.
She even talks right back.



➤ What Else Can Internet Do

My Father. Holds all his meetings over **Zoom using Internet.**



My Grandpa. Gets his daily news over **Google using the Internet.**

My Aunt. Does shopping **On-line using the Internet.**



My Brother. Does Travel bookings over **Yatra & others using the Internet.**



Above All.
Internet contains Information
Tons & Tons of it
& it is Mostly Free

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INTRODUCTION TO DRONES



» Learning Outcome

By the end of this lesson, Students will:

- Know the difference between an Aircraft, UAV & Drones.
 - Who is a Drone Pilot & why is he required.
 - Useful applications of drones in our life.
- Flying concerns & drone categories.

» What is a Drone

To understand, let us see two Machines:

- **Aircraft.** It is a machine that can fly in the air. Pilot sits inside & flies it. It is also called **Arial Vehicle (AV).**



- **UAV.** If the pilot in the above **AV** is removed it will become **Unmanned Arial Vehicle (UAV)**. In this case the pilot will sit on the ground & pilot the **AV, remotely** from the ground.



Now let us see another two machines.

- **Robot.** A robot is a **machine capable of sensing its environment**, to make decisions, and perform assigned tasks for us.



- **Drone.** It is a **robot that can fly in the air**.

It is a **UAV**. It is either:

- Controlled remotely from the ground by its pilot.
- Or **Coded** to fly on its own.



Flying on its own is called **Autonomous Flying**.

» Drone Pilot & Licensing

Drone Pilot. He is a person who sits on the ground, & pilots the drone using a remote Controller.



- Drone Pilots need a License to Fly. Example the photographer you see in marriages.

➤ Uses of Drones



Photography. Taking photos for fun.
Photos in events. Photos in difficult to reach locations. Shooting Movies etc..



Agriculture. Crop survey.
Crop & orchard spraying.
Precision agriculture.



Delivery. Medicines. Emergency food relief.
Pizza & allied items.

➤ Flying Concerns

Drones pose three big concerns:

Privacy. Flying at window level, drones can be used to **spy** & **invade privacy**.



Safety & Security. Flying in the air, it poses:

- A concern of **Deliberate Attack**.
- A concern of **an Accidental Injury**.



Noise Pollution. Spinning rotors can produce a lot of noise. In case of high speed & heavy delivery drones this **noise pollution** can be very high.



➤ Drone Categories

In India drones are classified into five categories:

- **Nano:** Less than or equal to 250 grams. Example Toy drones.
- **Micro:** From 250 grams to 2kg. Example Photography drones.
- **Small:** From 2kg to 25kg. Example Agriculture & delivery drones.
- **Medium:** From 25kg to 150kg. Example surveillance drones.
- **Large: Greater than 150kg.** Example Military drones.

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Lesson 16

MY TINKERING LAB

» What is Tinkering

English dictionary focuses on defining Tinkering as a **casual activity to repair or improve something**. Certainly this capability would not apply to a child in grade 3. However, if the meaning is changed to **focusing of mind on converting ideas into reality, it would apply very aptly.**

The point to note is that **tinkering cannot be taught. It has to be acquired.**

It needs time to acquire which can only be available at home.



I am three months and I am a **Born Learner**
I cannot be taught, yet **I learn & that to all by myself.**



I am three year. I have learnt three languages
Punjabi, Hindi & English. **All by myself.**



I know If I cry, then I get attention. This **IF & THEN**
is called CODING, humans **natural learning** language.



I am six year learning programming language
Scratch. Its **learning comes natural** to me



Chotu is the famous street mechanic of India.
Since age 6, he has been tinkering anything that
comes his way. Today at age 12 he is an expert auto
mechanic, all with no formal education



Let me combine my natural learning with Chotu's
skills. Let me tinker. Let me start small.



» Parenting & Tinkering

As a Parent:

- **Join** your child daily to help him independently explore his **Ideas & Interests**.
- **Start** by making it a goal to **Read** something along with him everyday. It will boost his comprehension, & problem solving skills.
- **Combine** reading with Asking open ended questions. Example, while reading about rain **Ask** “ What could happen if it started to rain after you got off the school bus”.
- **Get** to know your child's creative Dream, and help pursue it. If your child wants to do make an alarm, **Spend** an afternoon tinkering it to success.
- **Connect** him to a creative **Mentor** to be an anchor of his dream.
- **Empower** him to take creative **Risks to Try** beyond his comfort zone.
- **Next time** the weather allows, spend **Time in Nature**. It will give him the periodic Brain Boost developing curiosity & thinking skills.
- **Remember** tinkering helps him **Define his Purpose** himself, & is most effective between ages 6 & 12. Earlier done, the better.

Like **DIY** (Do it yourself), the **Key Driver of Tinkering** is an acronym **TIY**.

It has four interlinked meanings:

- **Trust** In Yourself.
- **Teach** It Yourself.
- **Think** It Yourself.
- **Tinker** It Yourself.

Sunil would not be **Sunil Gavaskar** if not for his infinite **believe in these four T's**.

Bill would not be **Bill Gates** if not for his belief in a **tinkering lab at home**.

It could **start with a table & few items**. But start it must. **So why wait?**

Recommended Lab Items.

1 Start with

**Pencil | Marker | Eraser | Clips| Pins | Ruler | Geometry box | Post it | Gule Dots
Wires | Chords | Glues | Cleaners | Scissors | Bands | Papers | Cards | Soft wood
Working table | Cutting Glass | Assorted boxes | Labels | Thermocole | Foam mats**

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OUR BOOK TITLES

Level-1



Level-2



Level-3

