CONTENTS

1 Computer — A Machine

Learning Objectives :

After the completion of this chapter learners will be able to:

- **appreciate the concept of information processing by identifying information processes of a child,**
- **learn about various components of computer system and their interconnection,**
- **identify various components of a computer system as Input/Output devices, Memory (Primary and Secondary), Central Processing Unit.**

INTRODUCTION

In this chapter we will discuss about machines and the concept called information processing.

ACTIVITY :

List the names of various machines that you find around you at home or in school, under the correct column, and also write what the machine needs to perform the desired work (task).

Machine Name	Needs

"All machines work on instructions given to them."

ACTIVITY :

Let's play: "Simon Says".

(Note for the Teacher: 'Simon Says', is a game where one player (designated as Simon, is appointed as the leader) instructs other players. The others have to obey and follow commands given by Simon. The player who is not able to completely follow the instructions is eliminated and the last one to remain is the winner.

Teacher has to play the role of Simon and give instructions like Stand up, Sit down, Roll your hands, Hands on your waist, Close your eyes etc. At the end teacher must explain that we **listen** to instructions, **think** and **take appropriate action** as per instructions given.

Tobo: Dobo, would you like to play with me?

Dobo: What game?

Tobo: Riddle game!

Dobo: Okay! lets play.

ACTIVITY :

Help Dobo solve this riddle

I am your paternal grandparents' only son. I am your	
A magician and a boy were fishing. The boy was the magician's son, but the magician was not the boy's father. Who was the magician?	
Add 34, 15	

Write the steps that you think Dobo followed to solve these riddles.

Step 1	
Step 2	
Step 3	

In order to solve the above riddle we read the information and followed the instructions given in the information. Then we analyzed the information and gave the answer.

See/Hear/Feel/Smell/Taste → Think and Decide → Speak/Write/Take Action/Express

DO YOU KNOW

The first computer was invented by **Charles Babbage.** He is known as the **'Father of Computer'.**

INFORMATION PROCESSING IN HUMANS

Dad: Dobo, Hurry Up! First finish your homework. After that, you can chat with your cousin and later on, you may help your mother.

Dobo: Oh Dad! I will definitely forget something. So many things to do! At times I wonder, how a computer can do so many things at the same time without getting confused.

Dad: Oh it's so simple! As to solve a problem, we **take clues, think, decide** and then **tell the answer**. The same way the computer does the work for us.

Dobo: How?

Dad: Whatever is received by our brain through our sense organs (eyes, ears, nose, skin, tongue) is thought about by our brain and is called **Input**. What does our brain do?

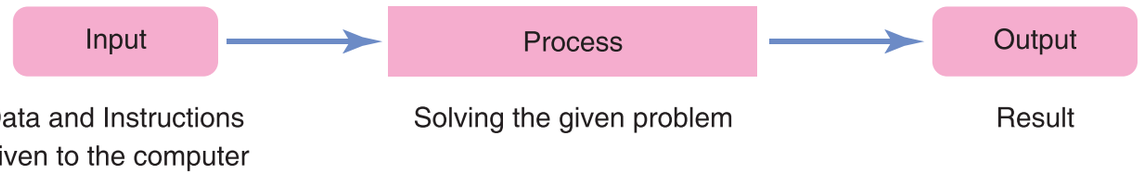
Dobo: Our brain helps us to think, decide, act and learn.

Dad: Correct! Whatever actions we take as a result of signals from our brain is called the **Output**. In the same way, computer does the work.

REMEMBER:

The **commands** given to the computer are called **Instructions**.

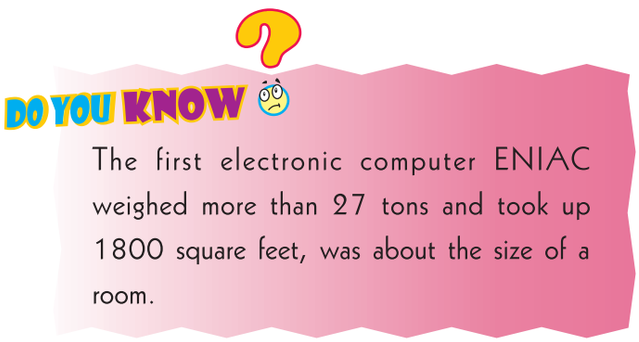
The ***values on which the commands are to be performed are called data***. Data can be **numbers or words**.



Dad: The **data and instructions given to the computer form the Input.**

Dobo: Then what is Processing?

Dad: In order to solve a problem, we think and decide, same way the **computer calculates, compares and then gives the result. The result given by the computer is the output.**



ACTIVITY :

1. Write the input, process and output for any three machines that you can find around you under the correct column

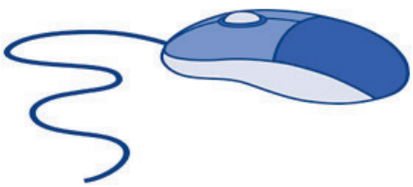
Name of Machine	Input	Process	Output

2. In order to perform the following task what will be the Input, Process and Output for the computer

Action	Input	Process	Output
Typing Numbers			
Arranging numbers in ascending order			
Print a picture			
Playing a song.			
Copying a drawing from pen drive to a computer.			

ACTIVITY :

Observe the following parts of computer. Classify them into input, process and output and write the name in the appropriate column. You can take help from help box given below.

Input Devices	Output Devices	Storage Devices

Speakers, Pen Drive, Joystick, Headphones, CD(Compact Disc), Printer, Mouse, Monitor, Hard Disk, Scanner, Keyboard, System Unit

From above activity we can understand that

Input Devices are the parts of the computer which help us tell the computer what to do. These devices are used to give instructions to the computer.

Let's learn more about them.

1. KEYBOARD

Keyboard is an essential part of the computer. **We need it to type words, numbers and instructions.** A standard keyboard has **104 keys**. There are different types of keys on the keyboard.

DO YOU KNOW

Keyboards can contain many germs. So you must keep your keyboard clean. Never eat food near the computer.

Located in the city of Yekaterinburg, Russia, is **THE KEYBOARD MONUMENT.** "Pamyatnik Klaviature" is made of stone, with grass growing between the keys. Local people make wishes by jumping from key to key. When they want to reset their lives, they jump **CTRL, ALT, DEL.**

ACTIVITY :

1. Write the name of the input device that you use with your smartphone.

   _____

2. Check your cellphone and find out the sequence of keys – Is it QWERTY?

   _____

QWERTY Layout

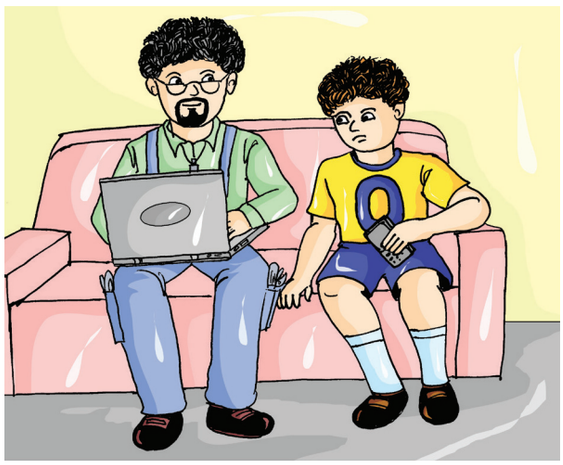
In this layout, alphabet keys are laid out in the sequence Q, W, E, R, T, Y.

Dobo: Dad I have a question, What will you do if the keyboard is not working.

Dad: I will use the **Onscreen** or **Virtual Keyboard.**

Dobo: Why do we use the virtual keyboard?

Dad: Oh it's simple! We use the Virtual keyboard to protect our passwords from being stolen, specially during NetBanking.



DO YOU KNOW

Christopher Scholes is credited with keyboard layout that is used till date, called the QWERTY layout.

Hands On

Use the Virtual or onscreen keyboard and type your name using the same.

(Note for the teacher: In Windows 7, Onscreen Keyboard can be accessed by : Clicking Start Button → Accessories → Ease of Access → On screen Keyboard)

ACTIVITY :

Use your imagination and list the tasks, which you think you cannot do if there is no mouse attached to your desktop or if the mouse is not working?

2. MOUSE

It is a **pointing device**. With the help of mouse we can give instructions to the computer.

These days **wireless mouse** is also used. A red light at the bottom of the mouse indicates that the mouse is an **Optical Mouse.**

DO YOU KNOW

Few years back there used to be a ball under the mouse. This ball was used to track mouse movement.

First Computer Mouse

Douglas Engelbart invented the first mouse.

Image source: wikipedia.org

Dobo: Hey Tobo! This is my writing. How did you get my diary's copy in the computer?

Tobo: You must have seen a photocopy machine.

Dobo: Yes I have. With it, I get a replica on the paper.

Tobo: Similarly, with **a scanner, I get a replica on the computer** and can use it as many times as desired. Now-a-days some printers also have a scanner, so that the copy can be printed as well as stored in the computer memory. With the latest scanners, you can scan any 3D object.

Output Devices are those parts of computer through which we **display the result of processing**.

ACTIVITY :

1. Observe and find out which type of monitor is available in your computer lab.

2. Ask your parents about the type of monitor they have used when they were students.

3. Find out the other frequently used name for Monitor.

Dobo and Tobo are working on the computer.

Dobo: I wonder, how do the various parts of the computer work together?

Tobo: Oh, it's simple! The parts of a computer are connected to its brain(CPU) through wires.

Dobo: But, what is CPU?

Tobo: ***CPU Central Processing Unit is known as the brain of the computer because it is where <u>processing happens</u> It tells the other parts what to do***

REMEMBER:
The output that we get on the monitor is called soft copy. We can see it but can't touch it.

DO YOU KNOW

With 3D printers it is possible to create models of any kind of objects, toys and even organs too. View the video with the URL https://youtube/e0rYO5YI7kA

Using mouse or keyboard, data and instructions are given to the CPU and after processing, results are sent to the Monitor for display of the output.

System Unit

This is placed inside the System Unit

The CPU is placed here. It looks like this.

DO YOU KNOW

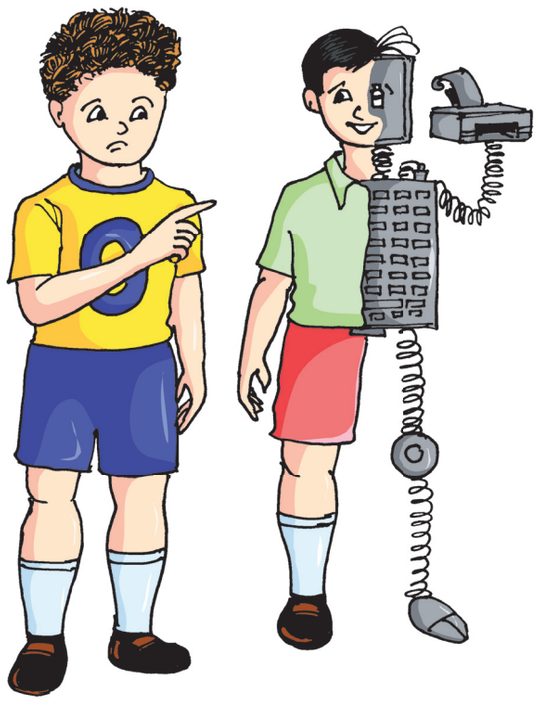
The desktop computer has a System Unit.

When we remove the System Unit cover, we can see a green circuit board on which rests a small square chip called the CPU.

Dobo: But, you have a wireless keyboard and mouse.

Tobo: Oh, Yes! The wireless keyboard or mouse, gets electricity from ***battery*** as in your TV remote. **A connector connects to the CPU which can receive signals from the wireless keyboard or mouse.**

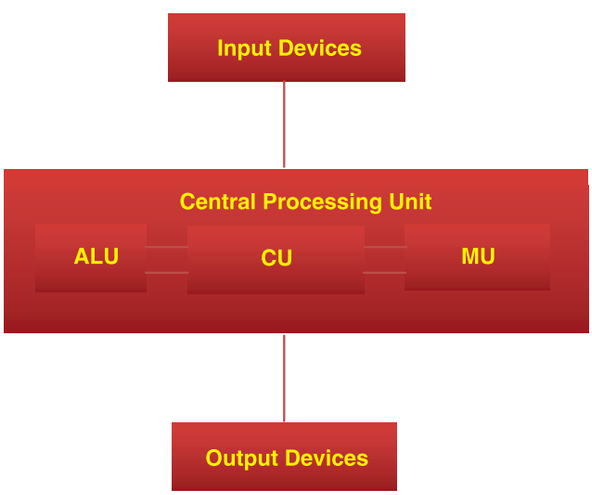
Connector



Dobo: What happens in the CPU?

Tobo: The **CPU has three parts**

1. **Arithmetic Logic Unit (ALU)** – Performs **calculations and comparisons on data.**
2. **Control Unit (CU)** - Controls the **flow of data and information.**
3. **Memory Unit (MU)** – Holds data and result of processing.



Hands On

Write the configuration of any desktop computer (or the computer allotted to you) in the computer lab.

(Note in order to find and check the configuration: Right Click on My Computer, Click Properties and note down the basic information as per heads given below about your computer.)

Processor:	
Installed Memory:	
System Type:	

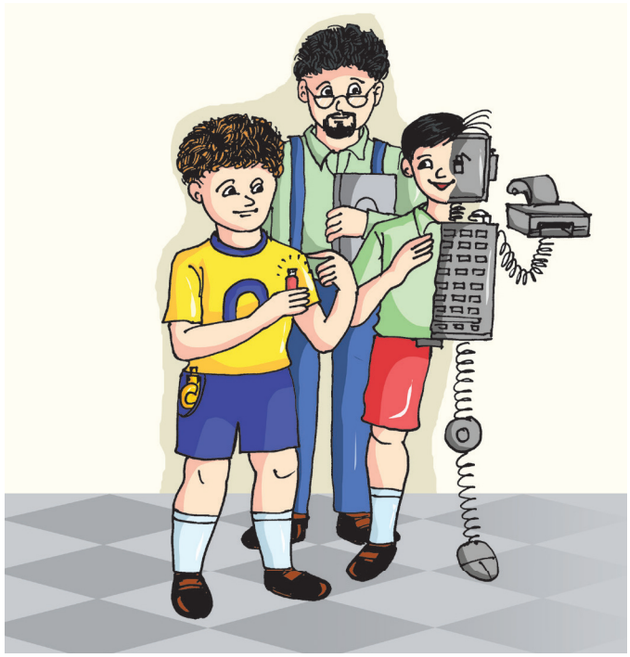
Dobo: I have lots of tasks to do and I am so confused which one to take first. Tobo, what do you do if you have to do a lot of things/tasks?

Tobo: I make a list. I refer to this list till all the tasks are over and keep on checking the checklist again and again to ensure that nothing is missed out.

Dad: This is exactly what the computer does.

Instructions and data given to it, are stored temporarily in the memory called **primary memory**. When the computer is turned off, **this memory loses data and becomes completely empty**. This memory can be compared to the list which can be used and erased as required. This memory can be seen inside the System Unit.

Tobo: Ummm...we know that the computer has a huge memory, it can store lots of files, music, movies, games etc.. which are not deleted till we delete it. Then how this memory loses data?



Dad: You are right, computer stores data in it whenever you tell it to save. Whatever you save, **goes in the secondary memory** of the computer. Can you name or provide example of secondary memory?

Tobo: **CD, PenDrive**

Secondary Memory is used to store large amount of data for a long period. Data is not lost until we delete it (even when the computer is turned off).

Dobo: Dad, What happens when we download pictures from the Internet?

Dad: The pictures are downloaded to the hard disk. **Hard Disk** is also an example of **secondary memory.**

Tobo: How much data can the hard disk store?

Dad: It can store **large amount of data.** Just as we can measure our height in metres and centimeters, we can also measure the amount of data that can be stored in any storage device. This is called as the **storage capacity** of that device.

ACTIVITY :

1. Find out the storage capacity of your parents smartphone. Do not forget to take their permission before checking the device.

Total	
Used	
Unused/Free	

2. Find out the storage capacity of your computer.

Total	
Used	
Unused/Free	

The first ever hard disk drive was made in **1979,** and could hold only **5MB of data.**

Tobo: What do MB, GB mean?

Dad: **Computer stores data in the form of 0 and 1. Each 0 or 1 is called a binary digit(bit).**

A **group of 8 bits is called a byte**, denoted by B.

Dad: **1 Kilobyte(KB) = 1024 B, 1 Megabyte (MB) = 1024 KB, 1 Gigabyte(GB) = 1024 MB**

REMEMBER:
Do not touch CDs on the rainbow side. It is here that the data is stored. Always hold the CD by the edges.

RESEARCH ACTIVITY :

1. Which memory will be used for the following? Write 'P' for Primary Memory and 'S' for Secondary Memory.

1.	Playing a game on a website	
2.	Tux Paint is stored in	
3.	When we type in Wordpad we use	
4.	Saving a drawing	

2. Explore how CD is different from a DVD? Write your findings in space provided.

3. Explore and write any three differences between Pen drive & Hard disk.

4. Collect information about the different storage capacity of Penderive and complete the table given below:

Pendrive	Storage Capacity

Hands On

1. In the computer lab observe and list the parts of computer which you can touch. Write the use of each such part under the correct column.

Part	Use

2. Observe and make a list of all the software(s) installed on any computer of the computer lab or the computer allotted to you in the lab and also write the purpose of these software.

Software	Purpose of software

Can you touch the software(s)? _____

Dobo: Why is it necessary to have software?

Tobo: A human body without thoughts (emotions) and intelligence is like a machine. It cannot feel and take action. Thoughts guide us how to do the desired work.

In the same way, ***computer have parts which we can see and touch, called hardware***. To control the working of these parts computer needs software. We cannot touch software.

Hands On

Let's peep inside the System Unit

View the movie by checking on the link (https://www.youtube.com/watch?v=yRmPTbGBqVI)

Make a list of the hardware components shown in the movie.

RESEARCH ACTIVITY :

Find out what happens to the computer or cellphone which is thrown/discarded by people?

_____

_____

_____

_____

Assessment Activity

1. Name the storage device to store:

1.	5 movies or game software	
2.	few songs and listening them in the car	
3.	to transfer your drawing from one computer to another	

Write the number of

1. (a) Alphabet keys on the keyboard _____
   (b) Function keys on the keyboard _____
   (c) Number keys on the keyboard _____
   (d) Combination keys _____
2. Key used to give space _____
3. Key with @ sign _____
4. Key used with alphabet keys to write uppercase letters and number keys to type special characters _____
5. Toggle key _____
6. Keys to restart your computer _____
7. Output that we get from printer is called _____

2 More on Tux Paint

Learning Objectives :

After the completion of this chapter learners will be able to:

- **develop the creative skills using Tux Paint,**
- **appreciate and use the various Tux Paint tools like lines, paint, etc.**

Dobo: Hey! Tobo, I wish to create few more drawings using Tux Paint. Could you please help me?

Tobo: Yes, of course! You made some lovely drawings using Tux Paint. However, there are some more options available in Tux Paint which can help you create excellent drawings.

Dobo: Please tell me more about Tux Paint.

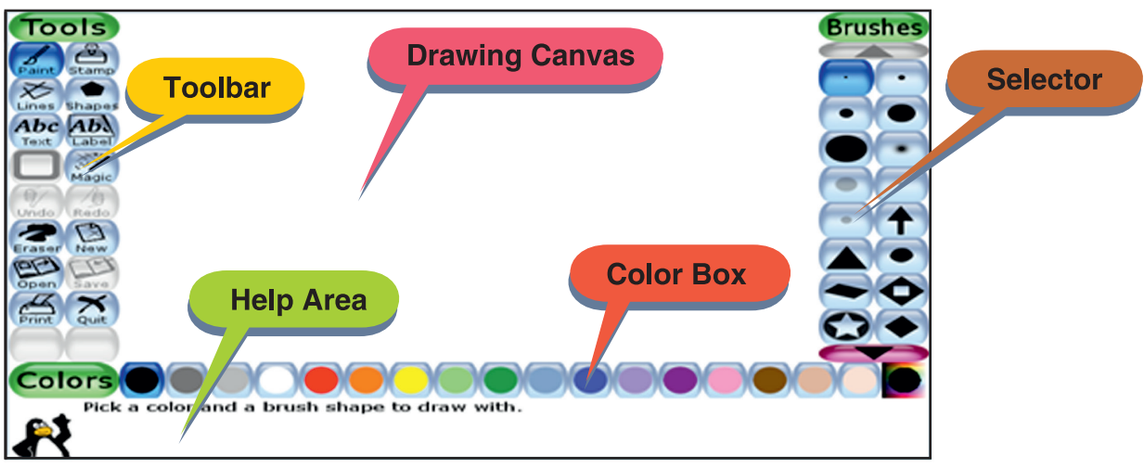
Tux Paint is an easy to use program which is used to create beautiful drawings.

Tobo: I am sure you are familiar with the components of main screen.

COMPONENTS OF MAIN SCREEN

The various components of main screen window of Tux Paint are:

1. Toolbar 2. Drawing Canvas 3. Selector 4. Color Box 5. Help Area



Dobo: Oh yes I am. What if I wish to draw a painting of a “garden”.

Tobo: It’s very easy you can draw this in many ways. One of them is using **“Paint Tool”**.

Dobo: I guess I have seen “Paint Tool” on tool bar but never used it.

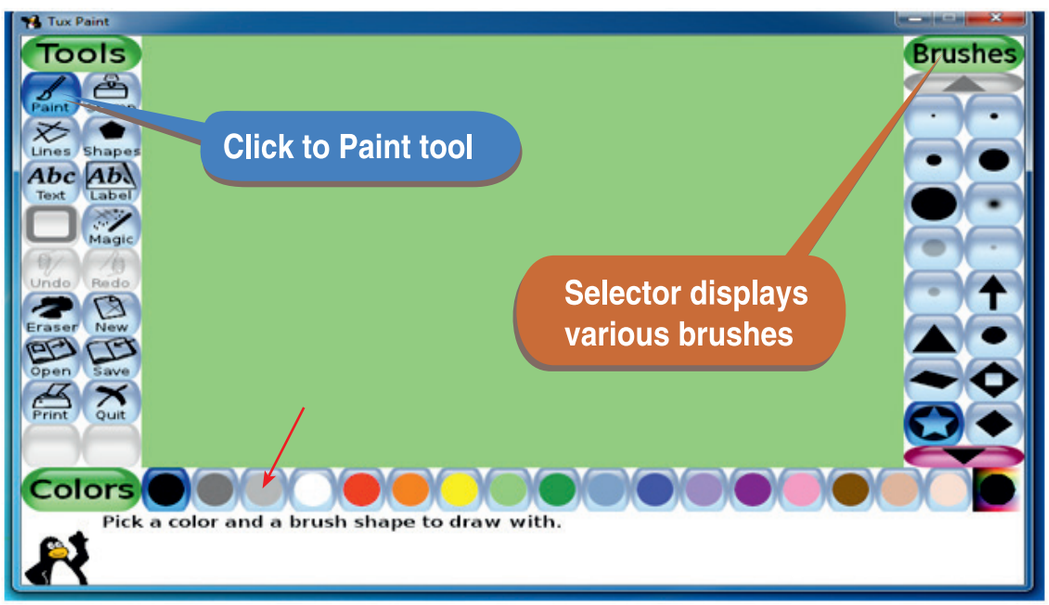
1. PAINT TOOL

The **Paint tool** is like a **pencil** or a **brush**. This tool can be used for **freehand drawing.** When paint tool is selected, the selector tool bar displays several brushes which can be used for free hand drawing.

Steps to use Paint Tool

Steps to be followed

1. Click on the **Paint** tool from the **Toolbar.**
2. Choose any **Brush** from the **Selector.**
3. Pick any **COLOR** from the color Box.
4. Put the cursor on **Drawing Canvas** and start drawing.



Hands On

1. Draw a picture as shown below.

2. Explore the paint tool bar and count the number of different types of brushes offered by selector. Also try to find out the difference between these brushes.

   The selector offers _____ different types of brushes.

   _____

   _____

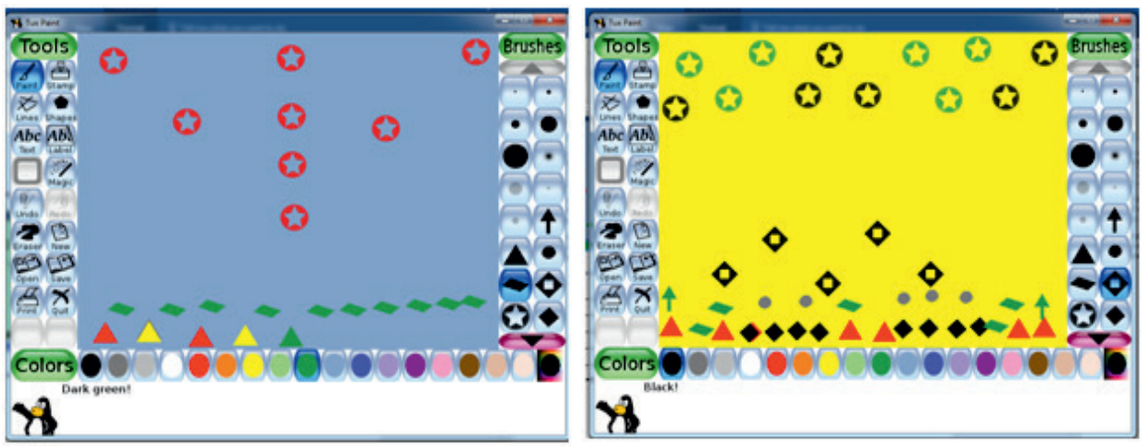
3. Using Paint tool draw a picture as shown below:

   How many different types of brushes were used to draw this picture?

   _____

ACTIVITY :

1. Spot the difference between the two pictures and write these differences in the space provided:

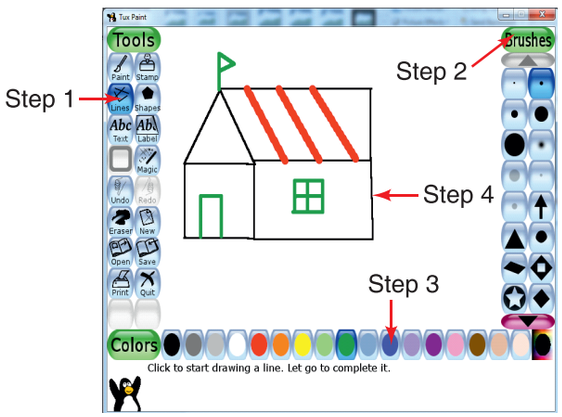


2. Find out the various types of brushes used by the art teacher and compare the brushes of Tux Paint with the brushes available in art room. Write your findings in space provided.

2. LINE TOOL

This Tool allows you to **draw straight lines** using various brushes and colours. Selector offers many options for line tool which can be used after selecting this tool.

Steps to use Line Tool



1. Click on the **Line** tool from the **Toolbar.**
2. Select the desired brush from **Selector.**
3. Choose any Color from Color box.
4. Put the cursor on **Drawing Canvas,** press the left mouse button, drag the mouse and draw the desired drawing.

Hands On

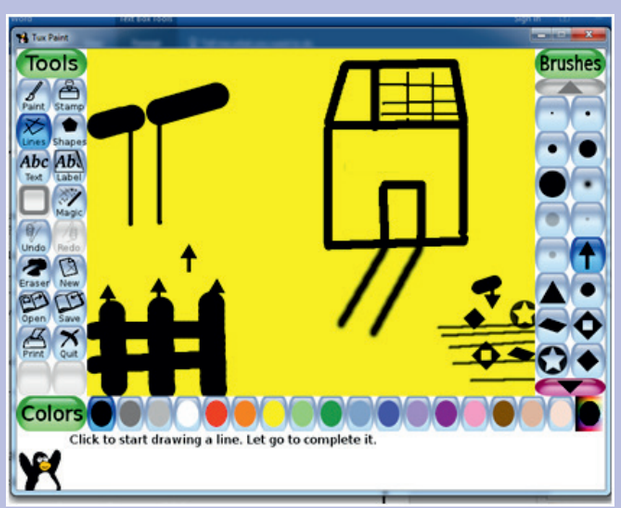
1. Explore the Line Tool and count the number of different types of brushes offered by selector. What is the difference in these brushes?

   The selector offers _____ different types of brushes.

   _____

   _____

2. Draw a picture as shown below:



   Write the number of brushes used in making this drawing.

   _____

Hands On

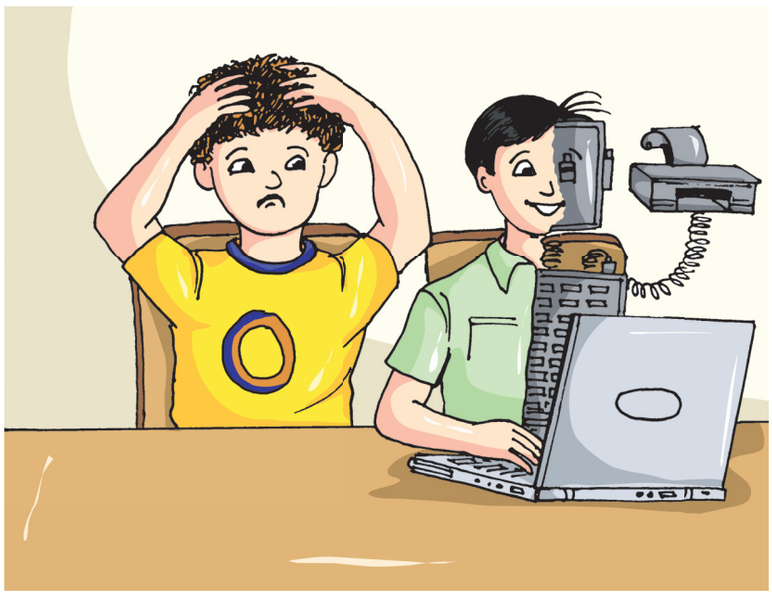
1. With the help of your partner compare the brushes offered by selector in case of Line and Paint tool.
2. Draw the national flag by using **Line** tool.
3. Explore if a circle can be drawn using **Line** tool? Which tool can be used for drawing a circle?

_____

Dobo: Oops! I have drawn something wrong. Is there a way to remove this?

Tobo: Oh yes! We can erase any portion of the drawing by using the eraser. Eraser in Tux Paint works in similar way as the eraser used on note books.

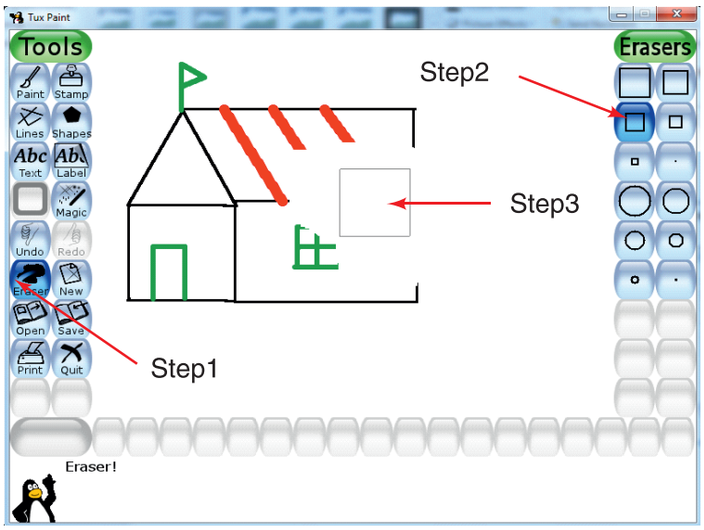
Dobo: Wow! That's Great. In that case, I can erase any part of my drawing and correct it.



3. ERASER TOOL

This tool can be used to erase anything on the drawing canvas. Wherever it is clicked it gets activated. After selecting desired size and shape of eraser from the (selectors) erasers, it can be dragged on the picture to erase the complete picture or part of it.

Steps to Use Eraser Tool



1. Click on the **Eraser** tool from the **Toolbar.**
2. Select the size and shape of the eraser from the **(selector)** erasers.
3. Put the cursor on **Drawing Canvas,** press the left mouse button and drag the mouse to erase the required drawing or part of it.

As we move the mouse around, after activating the eraser, a square or a round outline follows the eraser or pointer, erasing the part or whole of the picture.

Hands On

Observe and use all the erasers (round and square erasers) available in the selector, and find the difference between them.

_____

Dobo: Hey! Tobo, I want to give a heading for my scenery. How can I do that on computer? Can you help me, please?

Tobo: Oh! It's so simple, we can write anything on a drawing by using the text tool.

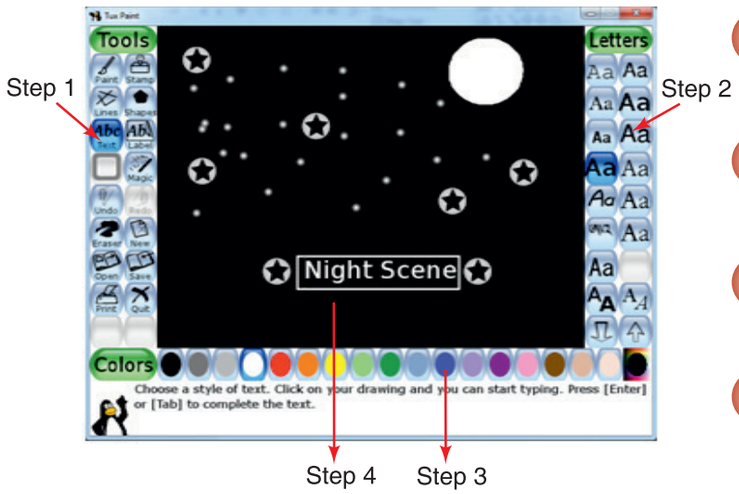
Shortcuts:

★ Open	=	ctrl + O
★ New	=	ctrl + N
★ Save	=	ctrl + S

4. TEXT TOOL

Text tool is used to type (or write) a statement or to give a heading to a scenery.

Steps to Use Text Tool



1. Click on the **Text** tool from the **Toolbar.**
2. Select the **size and style** of the Letter from the **selector** (Letters).
3. Choose any colour from the Colour Pallet.
4. Click on drawing canvas, you will find a blinking cursor, type the text.

Hands On

Click on Text tool to activate the tool, check all the fonts available under the letters column by typing the different words using different fonts available. Also, ensure that each new word is typed using a new font.

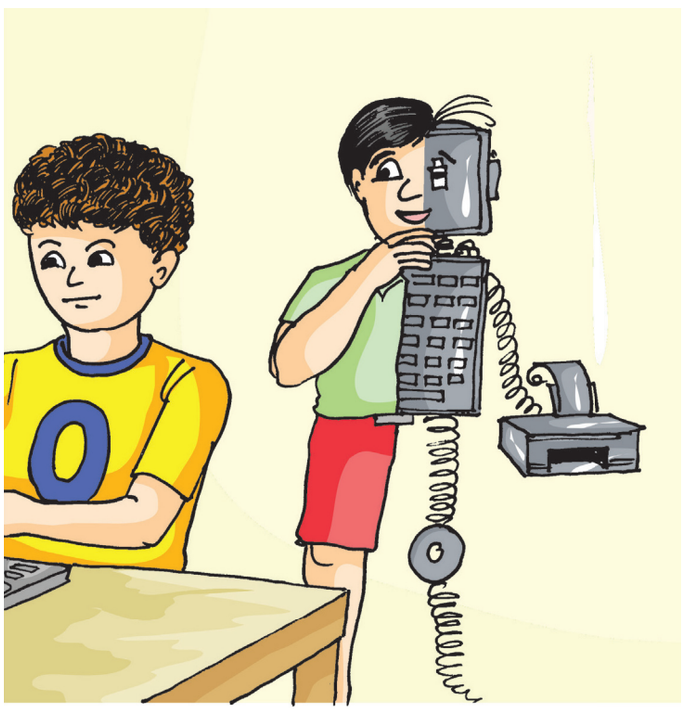
Dobo: Umm... while drawing my painting I erased a portion of it by mistake. It was so lovely. I wanted to show it to my father. Now I have to redraw it.

Tobo: No need, I can get your erased portion back.

Dobo: How is that possible? Do you know magic?

Tobo: No, I don't know magic but I know a command which can help you get your eased work back. These two commands are **undo** and **redo** options.

Dobo: Great!!! Means, whatever I erased by mistake, I will get that back.

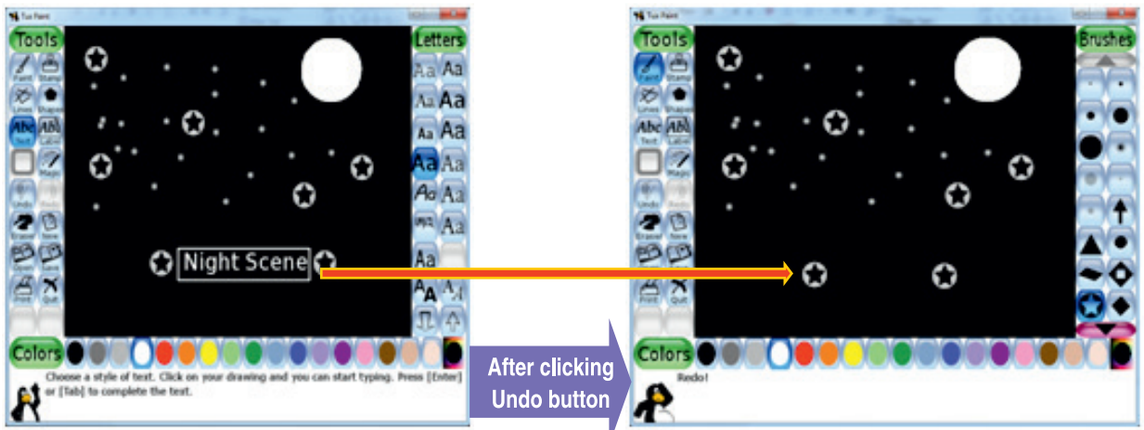


5. UNDO BUTTON

The thumbs down button on the toolbar is Undo button.

Clicking this tool will cancel the last action performed. You can even undo more than once.

Observe the two pictures carefully. In the first picture the text was added in the end by the person who was drawing this scenery. On clicking UNDO the text got deleted as shown in the second picture.

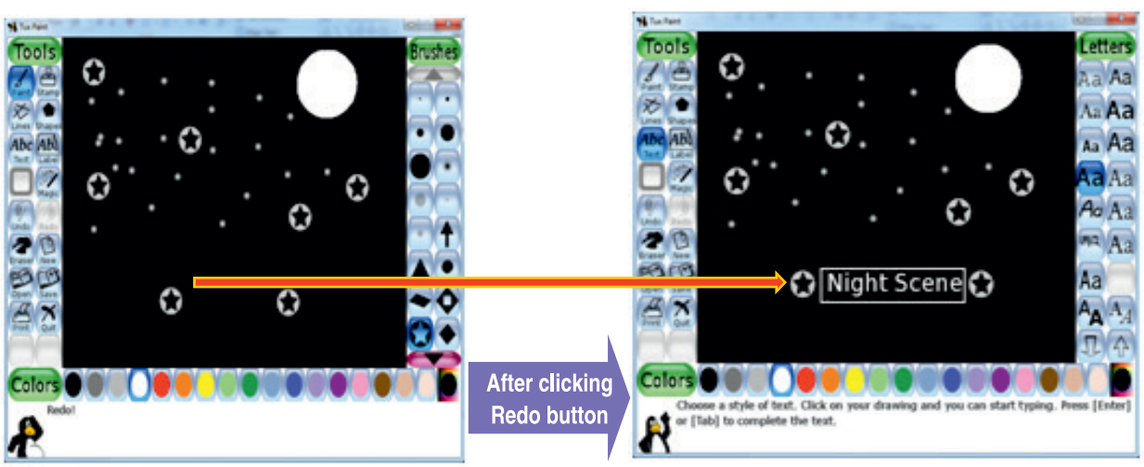


Picture 1 Picture 2

6. REDO BUTTON

The thumbs up button on the toolbar is Redo button.

Function of this button is to **cancel the last Undo action.** Clicking this tool will repeat the drawing action you just "rolled back" with the 'Undo' button.



Picture 1 Picture 2

Shortcuts:

★ You can also press **[Control]+[Z]** on the keyboard to undo.

★ You can also press **[Control]+[R]** on the keyboard to redo.

DO YOU KNOW

★ **Bill Kendrick** is the lead developer and designer of Tux Paint.

★ The software can be downloaded from http//tuxpaint.org/download/

★ Tux Paint is translated in more than **85 languages.**

ACTIVITY :

Art competition

Form groups of four students each. Select any one topic from the topics listed below:

(a) Rainy season

(b) Garden with swings

(c) Hut in a garden

(d) Joker

(e) Night Sky

(f) Solar System

Based on the topic selected, draw a scenery which should be evaluated by the art teacher. All the paintings should be printed and displayed in art exhibition which may be organized in class itself.

Assessment Activity

Using line, paint and text tool draw a picture as shown below: