10. Information Communication Technology : The new direction of progress

- Important components of a computer
- Different types of software
- Importance of information communication in science and technology
- Opportunities in the field of computers

Can you tell?

Which devices do we use directly or indirectly for collecting, sharing, processing and communicating information?

The term Information Communication Technology (ICT) includes communication devices and the use of those devices as well as the services provided with their help. The store of information generated due to the advances in science and technology is increasing at a tremendous rate. If we ignore this explosion in information, the knowledge that we have will become outdated.

Think about it

How is information communication technology important for dealing with the explosion of information?

Devices used in information communication technology : Different devices are used for producing information, for communicating, classifying, saving/storing information, managing information etc. For example, the telephone is used for sharing information by conversing with someone.

Complete the table

The following table has names of some ICT devices. Complete the table based on the questions asked. Also, enter the names of any additional devices that you know of.

Name of the device	What is it used for?	Where is it used?	Benefits from its use
Computer / laptop			
Mobile			
Radio			
Television set			

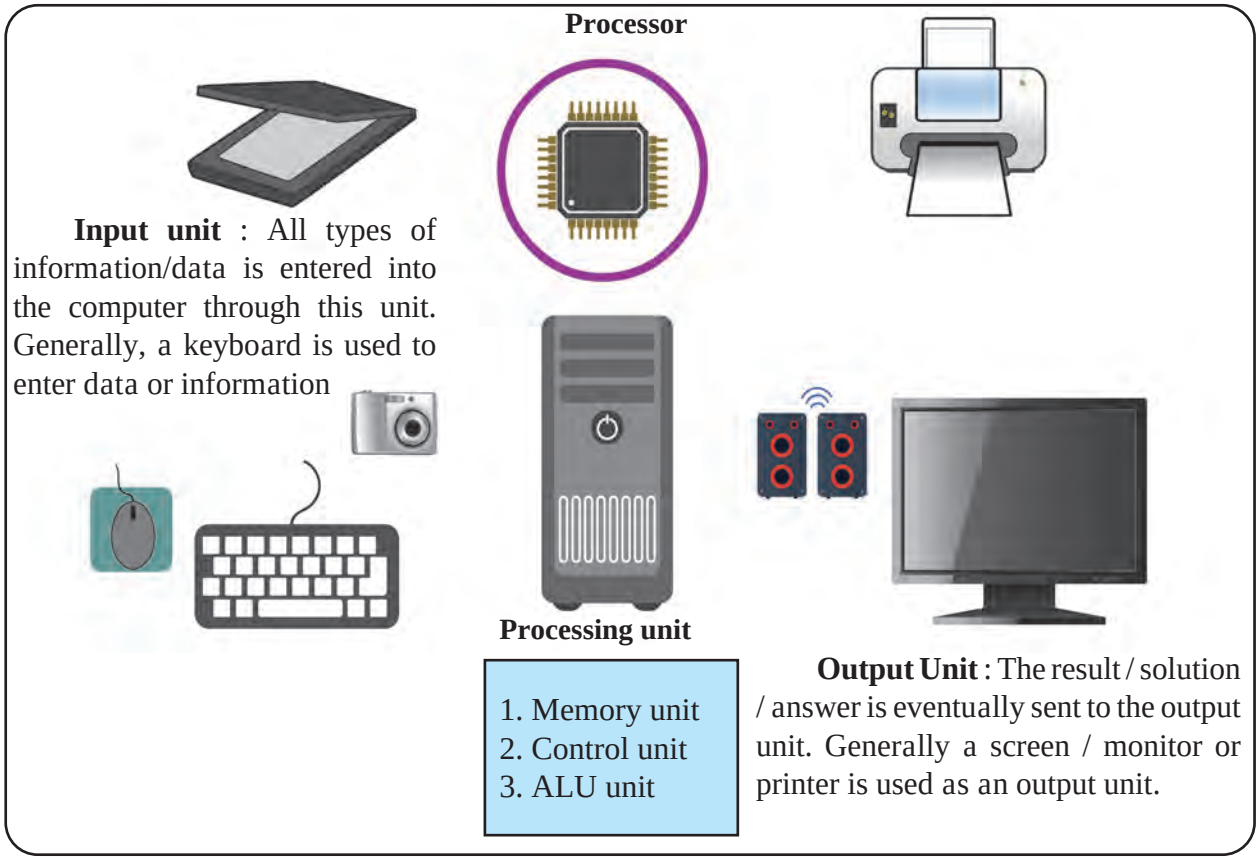
The computer, which is the most important device for information communication, is considered to have gone through five generations, since it was first created. The computers used during the period between 1946 and 1959 are said to be 'first generation computers.' The ENIAC computer was made in this period. Valves were used in its construction. These valves were large in size. They also consumed a lot of electricity. That generated heat and computers would shut down many times. Today's computers are 5th generation computers.

Find out

Use the Internet to collect information about all the generations of computers and their types. Make a note of the differences in their characteristics.

The entry of computers in all fields in this age of technology has been possible only due to the increased speed of computers. In which fields of work do we see computers being used?

Can you tell? How does a computer work?



10.1 Working of a computer

Important components of a computer

Memory : Memory is the place for storing data obtained from the input and also the generated solution or answer by the computer. There are two types of memories in a computer.

1. Internal Memory 2. External Memory

The internal memory is of two types.

1. RAM (Random Access Memory): This is created from electronic components. Any electronic component can function only as long as it is supplied with electricity.

2. ROM (Read Only Memory): The information stored here can only be read. We cannot make changes to the information originally stored here.

Operating system : This is a program which provides a means of communication between the computer and the person working on it. It is called the DOS (Disk Operating System). We cannot use a computer without its operating system.

Program : A program is a group of commands to be given to a computer.

Data and information : Data is information in its raw (unprocessed) form.

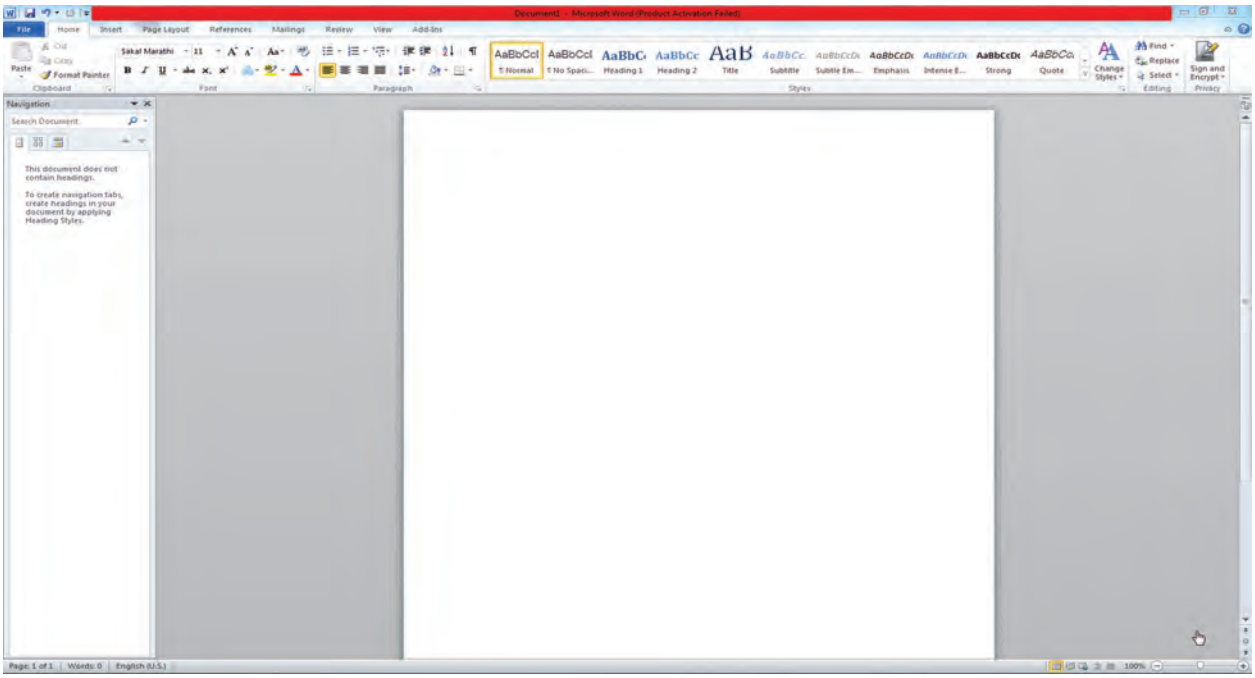
Two main components of computers

Hardware : Hardware consists of all the electronic and mechanical parts used in computers.

Software : Software refers to the commands given to the computer, information supplied to it (input) and the results obtained from the computer after analysis (output).

Make a list and discuss

Make a list of the various hardware and software items of a computer and discuss their working in the class.

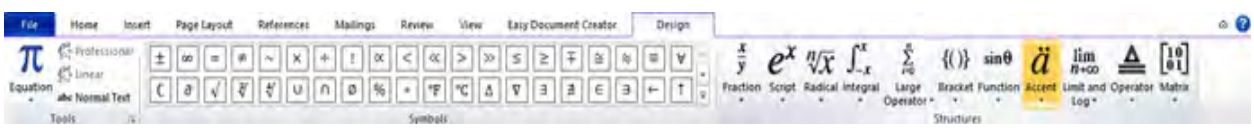


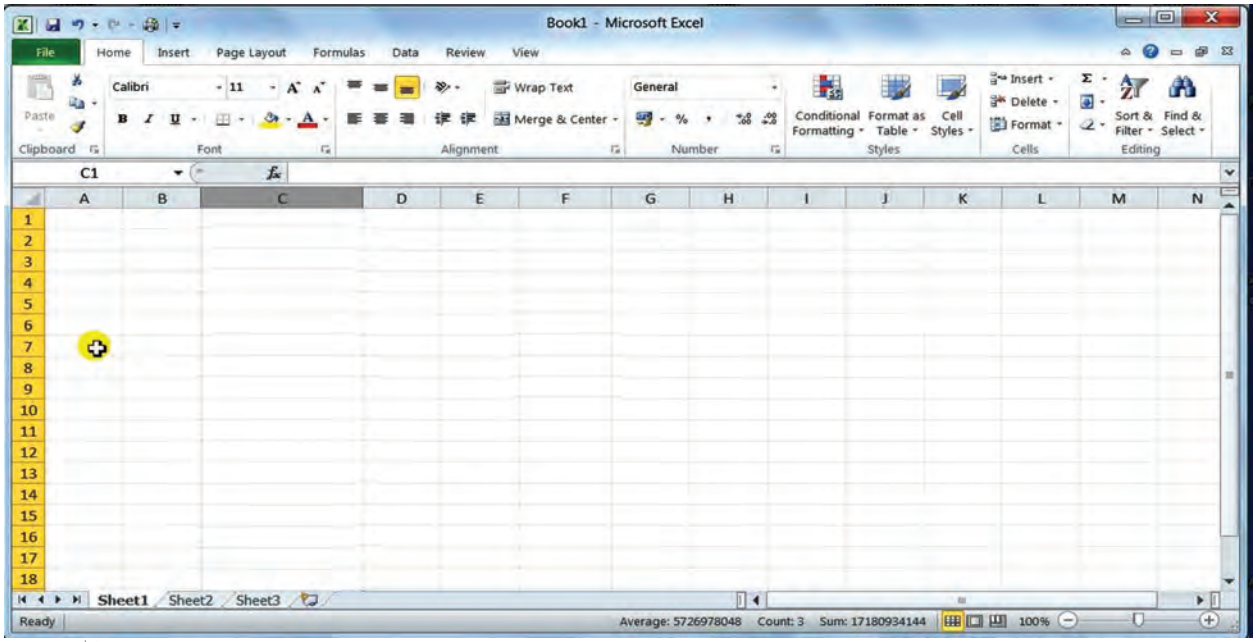
Try this **Using Microsoft Word to create a document and write equations.**

1. Click on the  icon on the desktop.

2. Select the 'New' option in the 'File' tab, and then select the 'Blank document' option.
3. Type your material on the blank page on the screen using the keyboard. Use the language, font size, bold, etc. options in the Home tab to make the typed material attractive.
4. To type equations in the text, select the 'Equation' option in the 'Insert' tab.

5. Select the proper equation and type it using mathematical symbols.





Try this **Using Microsoft Excel to draw graphs based on the obtained numerical information**

1. Click on the 

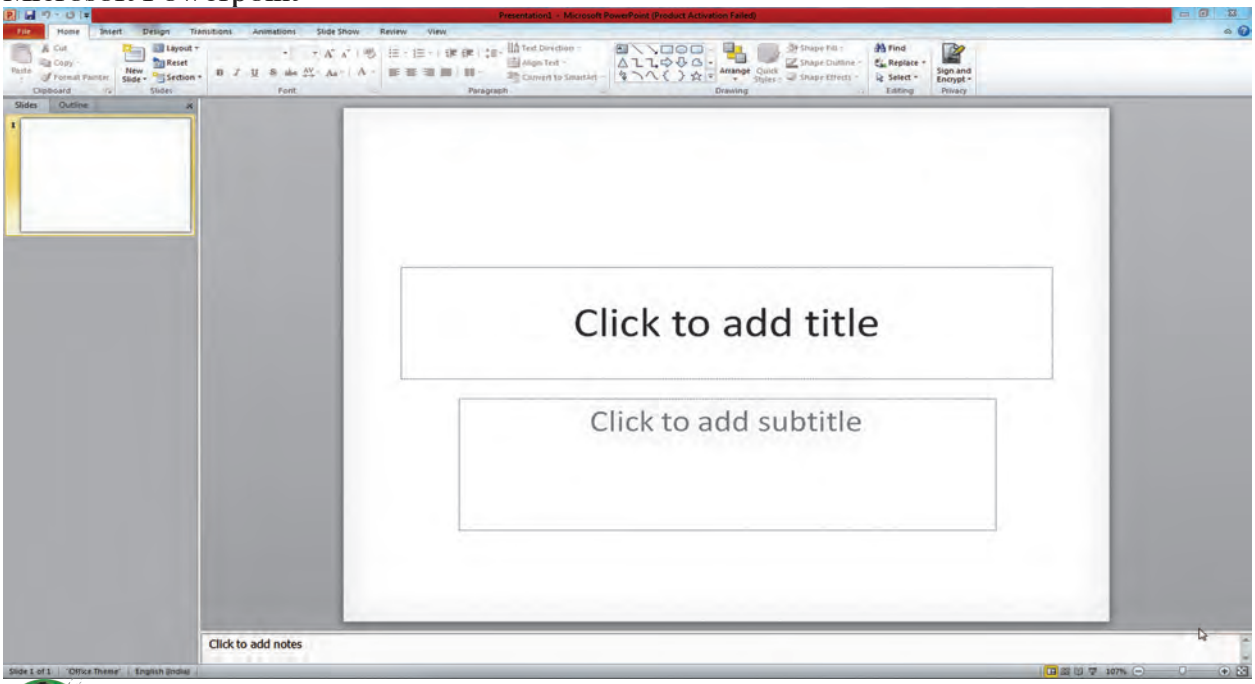
icon on desktop.
2. Select the 'New' and then 'Blank' option from the 'File' tab.
3. Type the information which is to be used to draw the graph, on the 'sheet' on the screen.
4. After you have finished typing,'Select' the information and click on the required graph in the 'Insert' tab.

5. Analyze the information using the graph.

What precautions will you take when entering data?

1. As far as possible, the data should be kept in tabular form. Different types of data should be entered in different cells. Data should be entered neatly and in one 'flow'. Unnecessary space and special characters should not be used.
2. Many times we 'drag and fill' data. At such times, the 'smart tag' can be used after 'drag data' to fill any data in any manner as required.
3. Once the data has been entered it can be formatted in different ways. Similarly, we can perform different types of calculations, using different formulae.
4. While using a formula, the '=' sign should be typed first. Similarly, no space should be inserted while typing any formula.

Microsoft Powerpoint



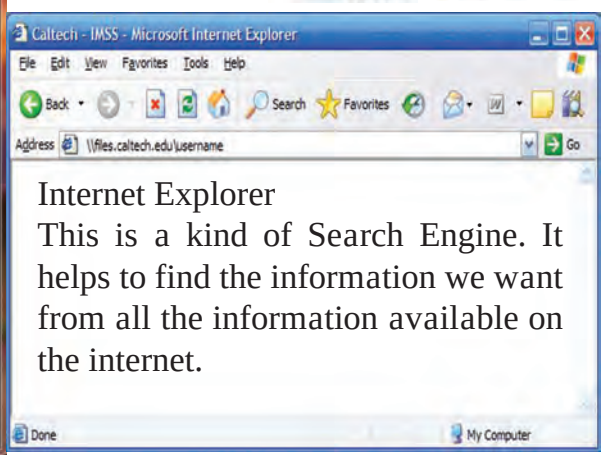
Try this

Using Microsoft Powerpoint to create a presentation

1. Click on the 

icon on the Desktop.
2. You must have with you the material and pictures related to the topic on which you wish to make the presentation.
3. Select the 'New' option under the 'File' tab and choose the 'Blank slide' option. (You can select the kind of slide you need according to your presentation.)
4. Type the information you need on the blank slide and insert pictures.
5. Use the 'Design' tab to design your slide.
6. Use the 'Animation' tab to animate the slide and make a slide show.

A PDF or Portable Document Format file can be used to view the file to print it or to handle files.



Internet Explorer
This is a kind of Search Engine. It helps to find the information we want from all the information available on the internet.

Note: While studying the subject of science and technology you have to actually make use of the information communication technology that you learnt in this lesson. Do take the help of your teachers as well as your parents and friends if you need it.

Some uses of information communication technology are given in the boxes below. What are its other uses?

Demonstration
Some experiments and concepts in science can be demonstrated easily and effectively by using simulation and animation e.g. functioning of the nervous system.

Prediction
Predictions can be made after compiling and processing information e.g. meteorology .

Collecting scientific information
Internet, emails, newsgroups, blogs, chat rooms, Wikipedia, video conferencing, etc.

Opportunities in the of computers field

1. Software field : This is an important field. Having accepted the challenge of creating software, many companies have entered this field. The opportunities in the software field can be classified as follows - application program development, software package development, operating systems and utility development, special purpose scientific applications.

2. Hardware field : Today, there are several companies in our country too, which make computers. They sell computers that they have themselves made. Others sell computers brought from outside as well as repair them and take maintenance contracts to keep computers in big companies working efficiently without a break. Plenty of jobs are available here. There are job opportunities in hardware designing, hardware production, hardware assembly and testing, hardware maintenance, servicing and repairs, etc.

3. Training : The training of new entrants for various jobs is a vast field. It is very important to have dedicated teachers who are competent in the field of computers.

4. Marketing : There are many establishments which make and sell computers and related accessories. They need good sales personnel who are experienced in the working of computers as well as skilled in marketing.

Institutes at work

C-DAC, the welknown Centre for Development of Advanced Computing, situated in Pune, is the leading institute in India which conducts research in the field of computers. The first Indian supercomputer was made with help from this institute. Valuable guidance for making this computer (the Param computer) was received from the senior scientist Vijay Bhatkar. Param means the supreme. This computer can perform one billion calculations per second. It is used in many fields like space research, movements in the interior of the earth, research in oil deposits, medicine, meteorology, engineering, military etc. C-DAC has also participated in developing the ISCII code for writing different language scripts. (Indian Script Code for Information Interchange)

Exercises

1. Fill in the blanks to complete the statements. Justify the statements.

a. While working with a computer we can read the information stored in its memory and perform other actions in …… memory.

b. While presenting pictures and videos about the works of scientists, we can use ……..

c. To draw graphs based on the quantitative information obtained in an experiment, one uses …..

d. The first generation computers used to shut down because of …….

e. A computer will not work unless …. is supplied to it.

2. Answer the following questions.

a. Explain the role and importance of information communication in science and technology.

b. Which application software in the computer system did you find useful while studying science, and how?

c. How does a computer work?

d. What precautions should be taken while using various types of software on the computer?

e. Which are the various devices used in information communication? How are they used in the context of science?

3. Using a spreadsheet, draw graphs between distance and time, using the information about the movements of Amar, Akbar and Anthony given in the table on page 4 , in the lesson on Laws of Motion. What precautions will you take while drawing the graph?

4. Explain the differences between the different generations of computers. How did science contribute to these developments?

5. What devices will you use to share with others the knowledge that you have?

6. Using information communication technology, prepare powerpoint presentations on at least three topics in your textbook.

Make a flowchart of the steps you used while making these presentations.

7. Which technical difficulties did you face while using the computer? What did you do to overcome them?

Project :

Taking help from your teachers, make a documentary about ISRO the institute mentioned in Chapter 18, using information comunication devices.

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