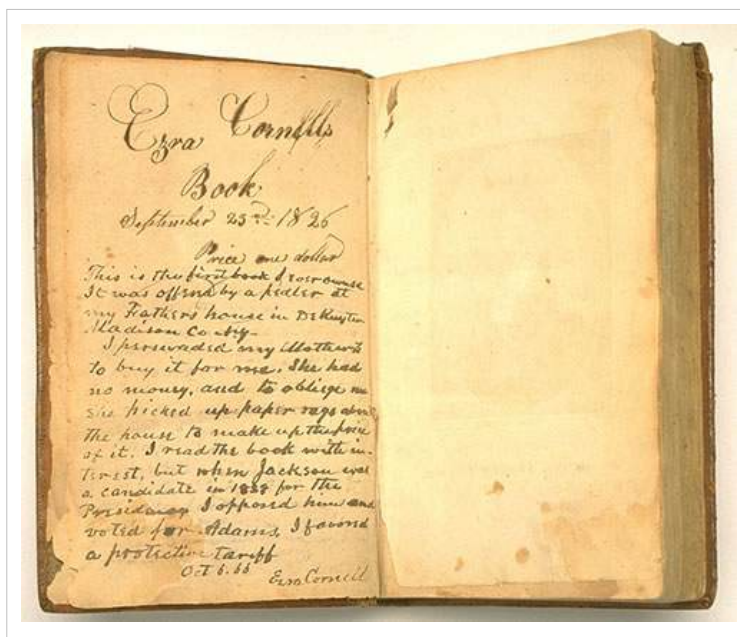


# ICT student textbook/Print version



## ICT student textbook

The current, editable version of this book is available at  
[https://teacher-network.in/OER/index.php/ICT\\_student\\_textbook](https://teacher-network.in/OER/index.php/ICT_student_textbook)

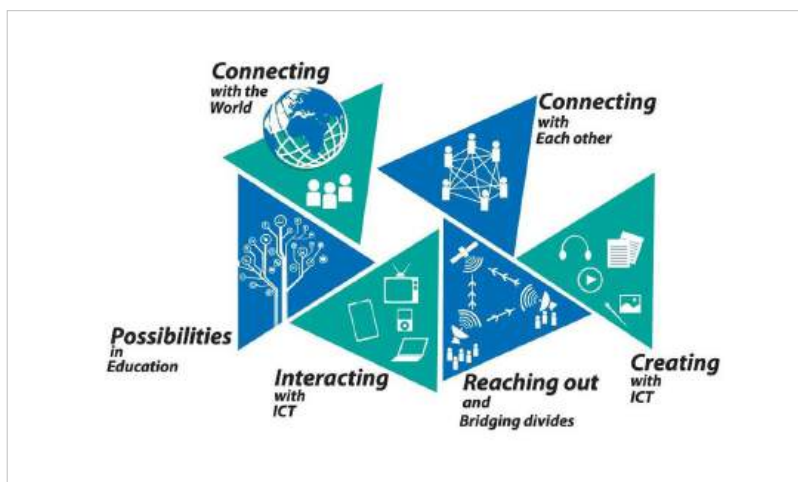
Permission is granted to copy, distribute, and/or modify this document under the terms of the Creative Commons Attribution-ShareAlike 4.0 International License.

### Table of contents

#### Preface

#### Overview

1. Introduction
2. What is the nature of ICT
  1. Science, Technology and Society
  2. Ethics of technology
3. Data representation and processing
4. Communication with graphics
5. Audio visual communication
6. Educational applications for learning your subjects



**Level 1**

1. What is the nature of ICT level 1
  1. How is a computer different from a fridge
  2. What all can a computer do
2. Data representation and processing level 1
  1. Data can tell stories
  2. How to make data meaningful
  3. A concept map of my data
  4. Making a text document
3. Communication with graphics level 1
  1. Photo and image essays
  2. Tell a story
4. Educational applications
  1. Help build your vocabulary with Kanagram
  2. Explore maths with Geogebra Level 1

**Level 2**

1. What is the nature of ICT level 2
    1. When did it all begin
    2. The human story behind the computer
  2. Data representation and processing level 2
    1. Columns and rows!
    2. Numbers and patterns
    3. Text document with data analysis
  3. Communication with graphics level 2
    1. Stories come alive with pictures
    2. Songs come alive with pictures
  4. Audio visual communication level 1
    1. Audio story telling
    2. Words and sounds to tell a story
    3. Make an audio book
    4. Make a read aloud audio visual book
  5. Educational applications
    1. Explore maths with Geogebra Level 2
    2. Your desktop atlas with KGeography
-

**Level 3**

1. What is the nature of ICT level 3
  1. The machine is using us
  2. The global digital library
  3. I have a new address
2. Data representation and processing level 3
  1. Spreadsheet for data analysis
  2. Multi page text document
3. Communication with graphics level 3
  1. Making comic strips
  2. Making posters
4. Audio visual communication level 2
  1. Make the pictures sing
  2. I am a movie maker
5. Educational applications
  1. Explore maths with Geogebra Level 3
  2. The globe on your table with Marble
6. Concluding remarks

**Preface**

Through the course of human history, there have been discoveries and inventions that have changed social processes and structures greatly. The agricultural revolution and industrial revolution created the agrarian and industrial societies respectively. We are now in another such age, brought on by Information Communication Technologies (ICT). With information creation, access, processing and sharing becoming quicker and simpler, society is now being shaped these processes, so much so that to be called the Information Society. Participating in this society requires the development of new skills as well as an understanding of how these processes are impacting justice and equity in society. It is the responsibility of the education system to respond to this by bringing into school education, an understanding of ICT, the impact of ICT and society, the possibilities for learning through ICT while at the same time building skills in students that will make them capable of functioning and responsive to a society shaped by ICT.

In this context, the Telangana Department of School Education is seeking to implement an ICT program in the state through an integrated approach that will focus on teacher capacity building, development of a comprehensive syllabus for ICT learning, development of content to support learning and provisioning of adequate infrastructure. The department is upgrading the school labs in 3,000 schools by building a digital lab and through equipping the classrooms with digital resources. The Telangana Department of School Education has decided to develop an ICT syllabus and text book which will be used by the school teachers transacting the ICT classes from Class 6-10. The Department of School Education has developed the state syllabus and the textbook based on the National ICT curriculum developed by NCERT, which seeks to bring to school education the possibilities of ICTs for connecting and learning and creating and learning, in collaboration with [HTTP://ITforChange.net IT for Change], with support from CEMCA <sup>[1]</sup>.

## Approach and intent of the state ICT syllabus

The state ICT syllabus has been based on the aspirations and guidelines set in the National ICT Policy which focuses on building the skills of computing, creating and collaborating through safe, ethical, legal means of using ICT.

The syllabus has emphasised the different possibilities of ICT in society, briefly discussed below.

1. **Connecting with the world:** Technology is providing new ways for us to access information and learn. Along with this, evaluating information and using it appropriately become skills to be developed. This theme will focus on accessing the internet, evaluating resources available and creating meaningful personal digital libraries for self learning. This will also include an introduction to
2. **Connecting with each other:** A related dimension of connecting through ICT is in possibilities for learning in communities from each other. The focus of this theme will be on how to interact and learn in peer learning settings and through online, virtual forums. Collaborating an learning is a key learning expectation from this curriculum.
3. **Interacting with ICT:** Building skills and aptitudes in a technology environment is an important expectation of this curriculum. The theme will focus on building a more proactive approach to engaging with technology, evaluating appropriate technology choices, maintaining ICT infrastructure and becoming critical users of technology, being aware of the social and economic implications of technology.
4. **Creating with ICT:** This is a theme that focuses on building computing and creating skills in students and teachers using various ICT applications. These include data analysis and processing, creating graphics, creating audio visual communications, working with mapping applications, creating resources with specific school subject related applications and programming.

Ability to handle ICT environment, creating original content, sharing and learning and focusing on educational and learning processes rather than on specific applications are the key principles of this syllabus design. The syllabus has been designed keeping in mind the various possibilities of creative expression possible through ICT applications and platforms available today and also seeks to build a mindset that will explore and such applications on an ongoing basis. Without taking a conventional approach to building digital literacy on specific applications the syllabus emphasizes a thematic, project based approach to ICT learning. Such an approach will also enable integration of ICT with multiple school subjects.

To facilitate such an approach to ICT learning, the technology environment in schools must be free and open. The syllabus has prescribed the use of free and open source technologies wherever available to facilitate such a free and open access. The educational content used in the schools will also be licensed as open content allowing teachers and students to modify and adapt the content to reflect their contexts.

## How is the textbook structured

The SCERT has anticipated the attainment of the competencies and objectives outlined in the National ICT curriculum and ICT Policy in two stages, covering classes 6-8 and classes 9-10 and has developed a syllabus for 5 years, taking into account the student curriculum set out in the National ICT curriculum. This will be covered through two books

1. Book 1 - which will have three levels to cater to the classes 6-8
2. Book 2 - which will have two levels to cater to the classes 9-10

The following sets of materials have been prepared to support this syllabus:

1. A textbook for students, that introduces ICT skills and applications in a project based way, integrated with the different school subjects. The core competencies and skills to be covered in the text book will be determined based on the National ICT curriculum and the Telangana state subject text books and academic standards. The text book will take a project based approach to the attainment of these learning competencies.

2. A handbook for teachers and teacher educators to help them implement the syllabus as well as support their own knowledge and learning of the ICT applications based on the NCERT ICT curriculum. This accompanying handbook will facilitate the transaction of the ICT syllabus and also provide meaningful linkages to curricular and co-curricular areas. The teacher handbook will also have a component for teachers to build their own competencies in using ICT.

Focusing on open content creation, teacher capacity building as well as integrating technology to develop new methods of learning, we hope, can demonstrate an effective model of technology integration in the school system across the country. We also believe such an approach will strengthen the government school system such that the vision of education of 'equitable quality' set out by the Indian Right to Education Act is realised.

*Keeping in line with the spirit of the National ICT Policy, the textbook is released under Creative Commons License CC BY SA NC, allowing teachers and other education departments to reuse, revise and modify, for non-commercial purposes and with attribution. The copyright is held by the Telangana Department of School Education.*

## Introduction

### What is ICT

Have you ever seen anyone in your school or community or home use a phone? Have you ever withdrawn money from an ATM (Automated Teller Machines, also known as 'Any time money'), or seen someone get money from an ATM? You may have seen or helped someone book a gas cylinder refill through a phone. You may perhaps have booked a train ticket or booked Tirumala darshan on-line. You may have seen a movie on your computer or chatted with a friend or recorded a video with your phone. Have you ever wondered how these things are done? There is one thing that is common across all these things - the use of Information Communication Technologies, ICT.

Before we understand what are ICT, look at the list below and identify all the words that you have heard of:

*(If you are using the printed book, please open the file "Have\_you\_heard\_of\_ICT\_terms.mm" using Freeplane).*

As students, you may have been introduced to some or many of these terms in your school, in your family or in your neighbourhood. The cell phone tower, your nearest ATM, your mother's mobile phone, games, whatsapp chats, email, the selfie, internet, videos and songs on your computer - all these are examples of a new kind of ICT. These technologies are called digital technologies <sup>[2]</sup> and they are changing the way we talk to each other, work with each other, and the way we do things. The computer is becoming like a television, the phone is becoming like a computer, you can use the computer to make voice calls, you can record a video with your phone, you can read your newspaper on the phone, and you can even paint with your computer! The technologies that make all these possible are collectively called ICT.

ICT refers to those set of technologies that help us create information, access information, analyze information and communicate with each other. Human beings have always accessed information and communicated, but what makes these present technologies special is their digital nature. You can read more about how ICT developed in the chapter on Science, Technology and Society.

## We live in an information society

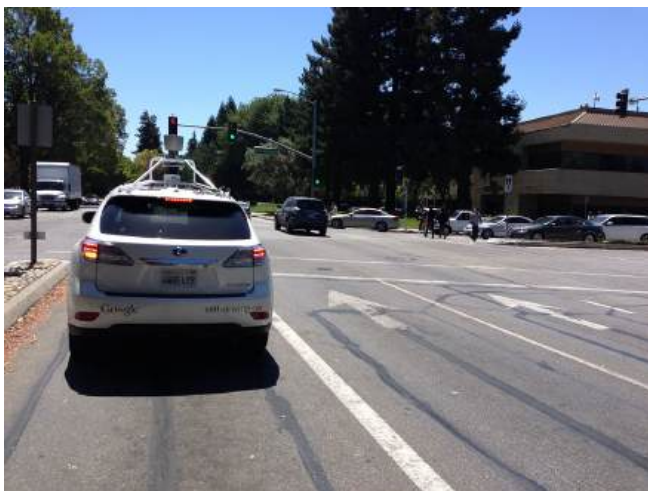
Look at the pictures below and discuss with your friends and teacher.



A Bonobo fishing for termites

What is this bonobo doing - can you guess? You are correct! It is "fishing" for termites from an ant hill.

Did you think only human beings can fish? When it was first discovered in the 1920s that chimpanzees can make tools, all over the scientific community, people were amazed. This was because human beings were defined as the species which makes tools for use. Dr Louis Leakey, a famous primatologist <sup>[3]</sup> said " We have to define what is a tool, or we have to define what is a human being or we have to accept that chimpanzees are human beings!".



Google self-driving car

What is special about this car? Did you guess? Yes, it has no driver.

When you drive, you gather information about the road, other vehicles, people, animals and weather and you operate the controls. Gathering information, processing, analyzing and acting, has been a defining characteristic of the human species. If a car can now do this, does it make the car a human being? What makes a human being special?

Today's society is called the information society. To see why, let us think of a small activity.

Let us say you are withdrawing money from a nearby ATM. Can you make a list of all the things you need to do for that? You need your account number, your PIN and you need to enter the amount of money. When you put your card in the machine, it verifies your PIN, collects information about your bank account, the bank and the balance amount. The ATM machine does all of this, connects with your bank and allows you to withdraw the money.

So many things we do now are based on information. Many devices - mobile phones, television, computers, tablets, cameras, scanners, collectively called ICTs, have made this possible. How we collect information, how we analyze it, how we communicate the information and how we use the information to make decisions are all very important. ICT and broadly digital technologies are changing the way we do things, thus making today's society an information society. You may be familiar with the computer but now ICT have moved far beyond the computer alone. As students you have to learn ICT to build your skills for functioning in the information society.

## What can you expect to learn

ICT can help you create music, write poetry, learn mathematics or make videos. ICT can also help you in communicating with each other and learning together. This textbook has been developed to introduce you to all these possibilities.

In this new subject called ICT, we can expect to learn about ICT and how to work with ICT; this will be covered over a 3 year period.

### Knowledge based

This subject will introduce you to:

1. What is ICT
2. How did ICT develop
3. Effect ICT has on family, neighbourhood, school and village
4. Use of ICT ethically, safely and responsibly

### Skill

In this subject, through different hands-on activities and projects you will learn to:

1. Use ICT to express your ideas, using available resources (using images, audio, text, videos)
2. Use ICT to learn school subjects and improve your general knowledge
3. Use ICT to talk to your friends, to work together and to play together
4. Use ICT to help in the development of the local community, socio cultural activities and development.

As students, you are encouraged to explore this new area and make connections to your own daily life, the impact these ICT have on your life, how you would like to work with this technology and how you can equip yourself to understand this new way of thinking, learning and communicating.

## How is this book organized

The textbook will have 5 units:

1. What is the nature of ICT
  2. Data representation and processing
  3. Communication with graphics
  4. Audio visual communication
  5. Learn your school subjects
- Each unit has a brief introduction followed by hands-on activities for each unit. Each of the units will have activities at three different levels, as you move from class 6-8. Different ICT devices, tools and applications will be used for the activities. Your teacher will show you how to use an ICT device or application. Instructions for learning an application are available here.
  - Your teacher will determine the appropriate level of activity. She will introduce a new unit or an activity with a demonstration. This will be followed by activities for you. These activities could include some projects and will involve individual or group work.
  - You can work individually or in groups or read the textbook and discuss in the classroom. Different groups in the class will work on different examples for a given theme and share your analysis, findings and creations. You will learn together and teach one another!

## What is the nature of ICT

### What is this unit about

We saw in the previous chapter about how ICT are part of many things we do; and how they have changed the way we are working, learning and even playing. What is it about ICT that allow such changes to happen?

Let us consider the following pictures:



Teachers in a video conference



Students learning how to shoot with a camera



Learning to read with a tablet



Students learning animation



Woman with a Cellphone

Image credits: Kerala IT@Schools project <sup>[4]</sup>, Government high school science class, Mysuru, IT for Change, <sup>[5]</sup> Wikimedia Commons <sup>[6]</sup>. All images are licensed under Creative Commons license which allows for free sharing with attribution.

Look at these pictures and make a list of words that come into your mind when you see the pictures. Also describe what you see in the setting. What did you come up with? Discuss these with your friends and teachers.

ICT can help you:

1. Create your own drawings
2. Talk to people - through audio or video
3. Make videos
4. Access information in different ways
5. Is there any more you can think of?

To do these things, you use ICT devices including a mobile phone, a computer, camera and many more. Ask your teacher or parent or other older members in your neighbourhood when was the first time they saw a computer or a phone or TV. People may tell you about how they communicated or did things in the days before the phone. It may be very hard for you to imagine but ICT (and all other technologies) were not always there - they got developed over time.



As you studied ICT, you may also have guessed one more thing - they need to be connected. Internet is a set of computers connected with one another. How these help in doing the various things we will see later on in this unit.

In this unit, you will learn about what is ICT, how ICT developed and how we need to work with ICT for all of us to benefit. You can read more about how ICT developed in the chapter on Science, Technology and Society.

## Objectives

### *Interacting with ICT*

1. Understanding the nature of ICT - how technology has developed in society, how ICT has developed and how it has changed the way society is organized today
2. Understanding about the ICT environment - various devices and applications
3. Understanding the safe use of ICT
4. Understanding the ethical and legal aspects of ICT

### *Communicating with ICT*

1. Understanding how to use technology for self learning
2. Understanding how to use technology for connecting with each other for learning

### *Creating with ICT*

1. Understanding that you can do various things with ICT (like writing, painting, mapping, singing)
2. Getting familiar with different applications for creating with ICT

## How is the unit organized

In this unit, there are three levels of activities. The activities will increase in difficulty - based on the ICT skills needed as well as subject knowledge that you will be building. As you work on the various activities for the different ICT areas in the each level, you will also get experienced with more ICT skills and this would help you with the subsequent level.

You can imagine this somewhat like a spiral staircase where you learn some topic at a basic level, you move along to the next class and you can come back to discuss the same topic at a more advanced level.

At each level you will be exploring new things about ICT; you will also be creating your outputs and building what is called a digital portfolio. This portfolio will include your outputs; they will be such that you will know what you have learnt and you will also know the method of learning. At the end of the year, your teacher will assess your portfolio.

You can also make your portfolio such that you can keep adding to it. How is that possible? When you make a model of clay or thermocol, you cannot change it after you make it. One of the special features of ICT is that you can change (edit) your creation. This means that, in Class 7 you can change what you completed in class 6 or in Class 8 you can change what you completed in class 7. This means you can keep adding to your knowledge and also improve the quality of your output. You will have a cumulative portfolio at the end of class 8.

## Science, Technology and Society

### Science and technology

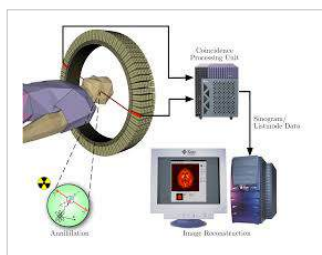
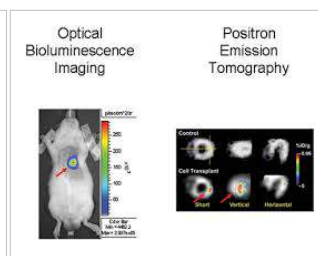
Many times you hear the word science and technology together. What is the connection between the two? Do you know? Study of science includes a method of observing things around us, thinking about why those events happen, explaining why the events happen, recording information about the events and also predicting what might happen. Often, scientists imagine what might be the solution and what might be the answer to the puzzles around us. The understanding of phenomena can lead to the development of tools – this is what we call technology. The technology

can provide us more methods of observing, experimenting and recording. And this in turn results in the advancement of science. Thus, science and technology share a symbiotic relationship.

A symbiotic relationship is when two phenomena work together and one affects the other. This term originated in biology and ecology to describe interactions between different organisms. Watch the attached video for examples of symbiotic relationship.

START\_WIDGETac369bed9a148aba-0END\_WIDGET

Can you think of examples of where technology has helped the growth of science? One area is that of cell biology. Until the microscope was invented by Robert Hooke and Anthony Leeuwenhoek, the study of cells was not possible. Now we study structure of cells, growth of cells, disease-affected cells, cell reproduction, gene sequencing and DNA [7] using many advanced microscopes, cameras; the data and images are analysed using computers.



As you can see the microscope started with simple magnification; now, the images captured by the microscope and camera can be input into the computer for further study and research. It has even become possible to scan parts of the body for diagnosing illnesses. Many complex problems in biology are being studied through the use of computers. Some of these areas include cancer research, study of how certain diseases develop and development of medicines.

Similarly, our understanding of astronomy [8] has been expanded after the invention of the telescope. But to make a telescope or microscope, we need to understand the properties of light. We must understand how a lens works, how light travels. Thus, science and technology are very closely connected.

Your teacher will discuss with you more examples of how technology has impacted the way we understand many natural phenomena.

### Information and communication technologies (ICTs)

Information is not new for human beings; communication has been known since the time human beings lived in caves. Thus ICT are as old as human beings themselves; human beings needed to communicate with one another, beginning with symbolic (non verbal) ways, before language was invented. The language we speak could be seen as first 'ICT', it enabled (oral) communication amongst human beings. Writing and script was the next technological advancement - around 5000 years ago - which enabled information could be created and communicated at different times and in a different place. Oral communication does not have this benefit, Writing also enabled easier recording of human history and thus the invention of script was a landmark in the history of ICTs. Next came printing which made it possible replicate writing. The invention of radio and television was the next advancement in ICT as it became possible for more and more people to access information.

Thus, the technology for information creation and communication has been changing, connected with the advancements in scientific knowledge. Changes happened in the way computing evolved and changes happened in the way communication technology evolved, each impacting the other to produce the ICT environment we are now in; and which is still changing rapidly.

	<p>Growth of ICT can be seen to be broadly in terms of 4 ages</p> <ol style="list-style-type: none"> <li>1. premechanical</li> <li>2. mechanical</li> <li>3. electromechanical and</li> <li>4. electronic</li> </ol> <p>While technology for information creation, storage and processing has been developing continuously, one important development which changed the course of technology is the development of digital technologies in the electronic area. Whereas during the electromechanical area, information was stored largely stored in analog formats. During the electronic age, information was stored in analog and digital formats.</p>
--	--

## Analog and digital technologies

### Impact on computing and development of computers

<p>During the mechanical and electric analog phases of technology, information was created by a series of physical changes converted into electrical impulses for storing and machine, and each analog information storage required a specialized equipment to decode and read the information. A cassette player or a gramophone disc is an example of such a device. Analog machines could be programmed for specific applications as well as for generalized computation. Representing information for computing using physical changes often meant that the results could not be accurate as the changes could not be replicated exactly.</p>	<p>See below how a difference engine, designed by Charles Babbage worked. START_WIDGETac369bed9a148aba-1END_WIDGET</p>
<p>An important breakthrough came when the binary system was invented. In the binary system information can in a series of "0"s and "1"s thus allowing information to be accessed through only a combination of "1"s and "0"s. This allowed information to be communicated in discrete bits which could be combined and recombined. Such a computer which uses "0"s and "1"s to perform computations a digital computer. What makes our society now different from ever before is the presence of digital technologies. Combined with the development of new methods of designing circuits like transistors and micro chips, it became possible to design computers which performed computations using digital methods. This improved the reliability and ease of computations significantly over the analog machines. The digital electronics changed operations in many applications including manufacturing, however the impact on ICT has been almost revolutionary. This has led to the growth of computers as we know it - from large clunky computers to the computer on your desktop to the laptop and now the smart phone.</p>	<p>slideshow - [9] See the slideshow here for a glimpse of how the digital technology revolutionized history of computing.</p>

### Impact on communication technologies

What is the word that comes to your mind when you say communication? The phone, precisely the cell phone. We will now look at how the communication technologies evolved.

#### Radio communication

The earliest electronic communication devices functioned using radio technology. Many communication devices we know today also function through radio waves. Radio waves are electromagnetic waves <sup>[10]</sup>. They carry energy through repeated propagation of electric and magnetic fields. Radio waves carry a certain amount of energy and can travel over large distances. When the wave reaches the destination, the receiver gets the amount of information. We

cannot see radio waves but we can detect them by building receivers that can detect them. These are called as antennae. They scan the environment for radio signals and respond when they find a signal. They detect the radio signal by the effect of the changing electrical and magnetic fields. Frequency gives a measure of how fast the radio wave is being produced and depends on the source from where the radio waves start. Different radio waves come at different frequencies and we need to build transmitters that detect them. Sound is a pressure wave – when we produce a sound it travels by disturbing the air particles. If there is no medium, sound cannot travel. What happens when we hear something on a radio? Originally sound is produced and then it converted into radio waves. These waves are sent and received through instruments called antennae. When your radio antennae receives this radio wave, this is converted back into sound and is played.

**Use of radio waves in astronomy** : Radio waves are also produced by many celestial objects <sup>[11]</sup>. By detecting the radio waves that travel through the atmosphere, it is possible to construct images of the astronomical objects <sup>[12]</sup>. Radio waves can pass through dust and gas unlike light. Radio astronomy along with optical observation is allowing us to understand the universe better.

### **Telephone**


Before the cell phone came, most of the long distance voice communication was through the regular telephone. This was based on the idea of travelling sound waves. They cause the mouthpiece to vibrate and this vibration is carried to the receiver at the other end. When a call came from one number, there will be an operator who sits at an office who will connect the call to another receiving number. Now this is different with automatic switches which connect the calls. The transmission of the signals has also become different now with voice being converted into electrical signals. All these transmissions used to happen through physical cables. These cables were either made of copper or optical fibres.

When you make a phone call, the voice signals from your phone get transmitted through these fibres to the nearest telephone exchange and through a series of switches sent to the receiver. Usually the first few numbers in our telephone number indicates the exchange information. In the earlier days, long distance calls (outside of the local exchange) could only be made by booking a trunk call. The users had to 'book' or rent the line through which the call can be made and this used to be done manually by the telephone operators in the exchange. Now-a-days, with automatic switches, long distance calls can be made directly to any number, even outside the country.

### **The cell phone**

The telephone and the radio came together - And we call that the cell phone! We saw how a telephone works. We also saw what radio waves are and we have some idea of what frequencies mean. There are many frequencies available for the users to talk on. Any geographic area is divided into small plots, and in each area a fixed number of frequencies is used. Each of these areas are called cells. The cell phone is called a cell phone because it functions by dividing a geographical area into small plots or cells through which the transmission takes place. It is possible to make and receive calls when there is a cell phone tower near your area for receiving and sending that frequency. Now do you understand what we mean when we say 'my cell phone has no coverage here'? It is because of this also that cell phones sometimes do not work inside buildings when the radio signals are disturbed. Just like an exchange for regular telephone calls, there is a mobile switching that allows you to make calls even when you move from one cell to another!

Can you make a list of all the things a cell phone does?

	<p>A cell phone functions like a phone, a camera and a computer. Yet, it does all of this using a few components. If you open up a cell phone, you will see the following parts:</p> <ol style="list-style-type: none"> <li>1. <b>A circuit board</b> : This is the brain of the cellphone and gives all the instructions to the phone. This contains a set of integrated circuits for giving instructions to the cell phone also. A computer has a similar circuit board also.</li> <li>2. <b>A keyboard</b> : This is also very similar to the computer keyboard and you use the key board to operate the cell phone.</li> <li>3. <b>Display</b> : This is similar to the computer monitor.</li> </ol> <p>Other parts include a microphone, antenna, speaker and a charger. One of the important parts of the cell phone is called the SIM card. The SIM card connects the phone to the network, your location. This helps the phone connect to a cell phone network and can also store phone numbers. It can be removed from one phone and put in any other cell phone.</p>
---	--

## What can ICT do

### ICT have changed the society

Look around you - can you make a list of things that have digital technologies involved in them? Yes, that is right. Starting from the computer in your school, television, movies, videos and other materials for subject learning mobile communication, Aadhar card, land records, bank accounts, pension accounts and so many more things, ICT have become integrated into society in many ways.

ICT can create information in so many different ways - maps, audio, video, text, numeric data. How we are able to generate information means more and more possibilities of knowledge creation and sharing. ICT have brought together people, made it possible to learn in different ways. How we learn and what is needed to be learnt have become different. For example, we no longer need to learn about a withdrawal slip, we need to know how to use the ATM. Your teacher can now take a video of a class in your school and share it. There is a great convergence of many technologies that is happening, a mobile is approaching the computer, the internet taking over.

If so many things are impacted by ICT, it is important to understand how these work, and how they should be used ethically and safely. Technology should be treated like a common resource where everyone can access it, interact with it, benefit from it and contribute to it. It should be used such that more and more people can get access in society should be treated like a public information good.

## What is the nature of ICT level 1

### Objectives

1. Understanding of computing - ICTs are computers and beyond
2. Understanding that data is of different kinds and can be edited, processed, combined in multiple formats which is what makes it possible to do many things with ICT - **Creating with ICT**
3. Understanding that there are different devices for reading, representing, communicating data - **Connecting with ICT**
4. Understanding of the computer as an ICT device which communicates with data and can connect with other computers

## Digital Skills

1. Introduction to a range of ICT devices, and specifically the computer
2. Handling ICT equipment safely
3. Getting familiar with using an operating system, data management and organizing (though files, folders)
4. Using input devices for entering data
5. Exploring multiple applications for understanding different things ICT can do
6. Introduction to the internet as a method of accessing information

## Your learning outputs

1. Mind maps representing your understanding of ICT (hand drawn and digitized)
2. Logs of lessons using applications for keyboard input (typed in a text editor document)
3. A simple text document using a text editor

## Activities

1. Activity 1 - How is a computer different from a fridge
2. Activity 2 - What all can you do with a computer

## Self-evaluation check-list

1. Do I understand what we mean by digital technologies?
2. Do I know the various kinds of ICT devices that are there today?
3. Do I know how to switch on a computer and connect different accessories?
4. Do I understand why software is important?
5. Am I familiar with using the keyboard and mouse?
6. Do I know how to create and manage my folders and files?
7. Have I created my first text document with my understanding of ICT?
8. Do I know that I can access the internet for information and to communicate?

## How is a computer different from a fridge

### How is a computer different from a fridge

### Objectives

1. Appreciating that a computer can do many things; unlike many other electronic appliances
2. Understanding the difference between hardware and software
3. Understanding that a computer works with data and can connect to other computers

### What prior skills are assumed

1. Academic levels as per class level; no specific ICT skills required
-

## Resources needed

### Hardware, software, Files

1. Computer installed with Ubuntu Operating System
2. Projection Equipment
3. Images to show of the computer
4. Basic digital literacy Handout
5. Freeplane Handout.

[13] Image [14]	[14] Image [14]
--------------------	--------------------

### Parts of the computer

```
#Scanner (nowadays this is in mobile itself, not very much used)
#CPU -This is the processing unit
#Main Memory: RAM: This determines how fast the computer works
#Expansion cards
#Power supply unit
#CD Drive -External storage device
#Hard disk: This determines how much storage capacity
#Motherboard: This is where all instructions are wired together and helps the computer work
#Speakers
#Monitor
#Operating System
#Application Software
#Keyboard
#Mouse
#External Hard Disk
#Printer
```

## Digital skills

1. Interacting with the ICT environment
2. Understanding the difference between operating system and application software

## Description of activity with detailed steps

### Teacher-led component

1. Students in small groups can make a of list all the items a fridge does and a list of all the things they think a computer can do.
2. In a group activity your teacher will compile all the group comments in a digital mind map using a concept mapping tool and encourage students to classify the various things the computer will do.
3. The teacher will discuss why an operating system needed is and how it works with different applications to ensure that data is communicated
4. With the help of a schematic the teacher will discuss the parts of a computer
5. In small groups the students can switch on a computer and identify the parts they know
6. The teacher will help you create a folder on your computer, for saving your work done in the class.

**Student activities**

1. With your friends, compare a mobile phone and the computer and list the things each does
2. Discuss with your friends if there is any difference
3. For any one mobile application, draw a flowchart to document all the steps in using the application. Click here for an example.
4. In groups, you can draw concept map for the following things (your teacher will discuss with you additional activities):
  1. Connecting a TV to a cable network
  2. Using phones to book cooking gas
  3. Using the farmer SMS service from MKisan portal
5. With the help of your teacher, take photographs of the charts and concept maps created, using a cell phone or a digital camera.

**Portfolio**

We saw earlier that you will keep adding to your digital outputs during this course. You will begin your portfolio collection with the digitized mind maps/ charts. Create a folder with your name and start saving your files.

**What all can a computer do****What all can a computer do****Objectives**

1. Understanding that there are different devices for reading, representing data
2. Understanding that data of different kinds and can be edited, processed, combined in multiple formats which is what makes it possible to do many things with ICT
3. Understanding that the computer communicates with data, and can connect to other devices
4. Understanding that data can be organized in files and folders
5. Getting familiar with input devices

**What prior skills are assumed**

1. Students have already been introduced to the basic functioning of the computer environment
2. An understanding of an operating system
3. Application software

**Resources needed**

1. Computer lab with projection equipment
  2. Internet availability to demonstrate a web page
  3. Videos, images to show
  4. Text documents
  5. Geogebra files, animations
  6. Mindmaps
  7. Handout for Ubuntu
  8. Handout for Tux Typing
  9. Handout for Tux Paint
  10. Handout for Text editor
-



## Digital skills

1. Getting familiar with the ICT environment; operating system, files and folders
2. Learning to work with input devices
3. Learning to work with multiple applications
4. Text input (English)

## Description of activity with detailed steps

### Teacher led activity

1. Watch the video shown by your teacher and see if any of the applications are familiar to you
2. Your teacher will demonstrate a file folder different kinds of files to you, which are opened by different applications. Some files are stored on your computer and some are not. With your friends, how your teacher opens any file. Your teacher will help you to tabulate this information as follows:
  1. What is the file name and file extension
  2. How the application was opened (from a menu or right click)
  3. What all did they see on the application
  4. What input had to be given (for example, opening a browser and typing an URL)
  5. What controls are available (increase in size, volume, etc)
3. Your teacher will also demonstrate the Applications Menu to demonstrate Tux Typing and Tux Paint.

### Student activities

**On your computers, open the files that have been saved in a folder.**

START\_WIDGETac369bed9a148aba-2END\_WIDGET



Mahbubnagar district farmer



India political map with Telangana



Warangal Fort pillars

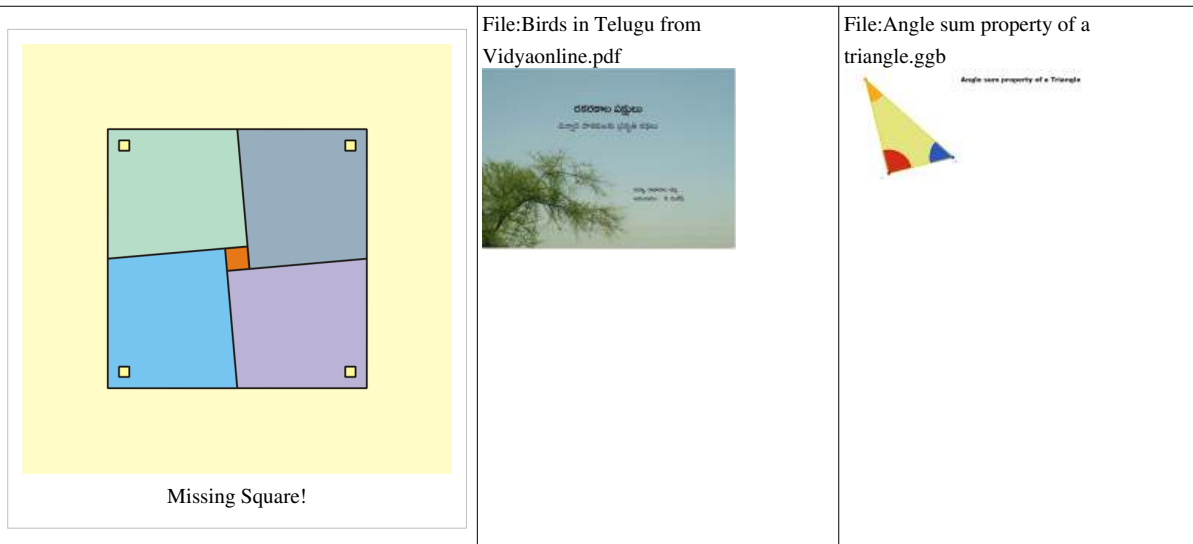


Image credits: YouTube, Geogebra file shared by teacher in Karnataka, Wikimedia Commons. All images are licensed under Creative Commons license which allows for free sharing with attribution. Telugu book from Vidyaonline <sup>[15]</sup> is free to use for non-commercial purposes.

1. As you opened each of the files, please make a note of how it opened, what was the file name, what it did. Your teacher will help you document it in a table. Did you get to open many different applications on the computer?
2. Now, you need to practice with the input devices of the computer so that you can interact with the computer faster and more easier.
3. Open the Application called Tux Typing and take turn with your friends in a group to practice
4. Open the Application called Tux Paint and take turn with your friends in a group to practice
5. Create your own work folders on the computer, if not done already
6. Open a text editor and make a list of 8-10 things you understood about ICT. This is the beginning of your portfolio.

## Portfolio

1. Lesson logs of Tux Typing. You can maintain this in your own notebook for this subject. Record the date, lesson learnt and time taken for each lesson. Over a period of time, try and complete all the lessons in Tux Typing. This will help you become familiar with the Keyboard, which is useful for using the computer efficiently.
2. Files created with Tux Paint. These files will be stored inside Tux Paint, you cannot access it externally.
3. Text file created with text editor. You should save the file with a proper file name, in a manner that the file contents can be understood by looking at the file name.

# Internet is the computer

## Internet is the computer

## Objectives

1. Understand that computers can connect to one another, a term called Networking
2. The internet is such a network

## What prior skills are assumed

1. Knowledge of what an operating system is and what an operating system is
2. Familiarity with keyboard and mouse input
3. Understanding folders and files
4. An understanding that computers work with data

## Resources needed

### Hardware, software, Files

1. Computer lab
2. Internet access

## Digital skills

1. Working with input devices
2. Working with a browser software to access the internet
3. Handout Firefox Web Browser
4. Handout Basic digital literacy

## Description of activity with detailed steps

### Teacher led activity

1. The teacher will open an application called Firefox and will try to access information. In your school lab, the computers may or may not be connected, but it is possible for computers to be connected.
2. The Internet is such a network of things. #[https://upload.wikimedia.org/wikipedia/commons/a/ab/Internet\\_of\\_Things.jpg](https://upload.wikimedia.org/wikipedia/commons/a/ab/Internet_of_Things.jpg)
- . The teacher will also demonstrate some websites which show how the internet is helping in communicating.

## Student activities

1. In small groups, make a list or a concept map of all the areas where you think computers are connected.
2. Practise with typing with the keyboard and mouse.

## Portfolio

1. The mind maps made by the groups can be collected and digitized.
2. Lesson logs of use in Tux Tping.

## What is the nature of ICT level 2

### Objectives

1. Understanding that technology and science is an evolving process
  1. Trace the history of technology and science
  2. Locating the history of ICT within this
2. Understanding that ICT has evolved/ evolving
3. Understanding technology safety and ethical use

### Digital Skills

1. Awareness about the social aspect of ICT
2. Understanding the distinction between digital and non-digital technologies
3. Understanding that ICT evolve and rapidly
4. Familiarity with the ICT environment and multiple applications

### Your learning outputs

1. Demonstrated familiarity with input devices through lesson logs
2. Concept maps to represent student conception of technology
3. Text document with iimages to demonstrate student understanding of the evolution of technology

### Activities

1. Activity 1 - When did it all begin
2. Activity 2 - The human story behind the computer

### Self-evaluation check-list

1. Do I understand the difference between digital and non digital technologies?
2. Am I able to understand the impact of ICT on society?

## When did it all begin

### When did it all begin

---

## Objectives

1. To develop a historical perspective on technology
2. To see technology as a human process

## What prior skills are assumed

1. Familiarity with different ICT terms
2. Ability to work with the ICT environment

## Resources needed

1. Computer lab with projection equipment
2. Pictures of timeline

## Digital skills

1. Understanding the development of technology
2. Understand the impact of technology on society

## Description of activity with detailed steps

### Teacher led activity

START\_WIDGETac369bed9a148aba-3END\_WIDGET

Your teacher will show the above pictures and discuss with you the different points of evolution of ICT. She will discuss how society shapes and can be shaped by technology.

### Student activities

1. Discuss with your friends and in small groups identify and one technology that you are aware of (ICT related technology)
2. With illustrations and text, develop a timeline of the technology.

## Portfolio

1. Your picture story of the development of technology (drawn and digitized)

## The human story behind the computer

### Title of Activity

---

## Objectives

1. To understand the role ICT play in society - the potential and the problem

## What prior skills are assumed

1. Familiarity with the ICT environment
2. Familiarity with multiple ICT applications

## Resources needed

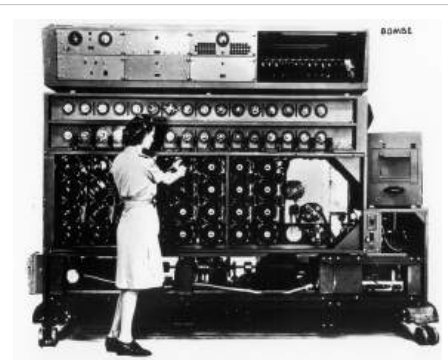
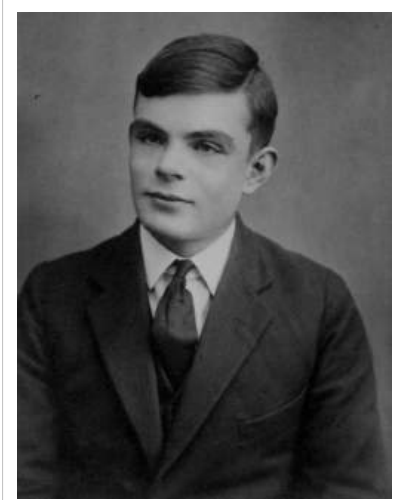
1. Computer with projection equipment
2. Access to the internet
3. Pictures and slide show
4. Handout for Firefox

## Digital skills

1. Understanding of how computers have impacted the society

## Description of activity with detailed steps

### Teacher led activity

 <p>How the computer looked during the World War II</p>	 <p>Alan Turing in College</p>	<p>Your teacher will play this Slide show of The story of Enigma <sup>[16]</sup>. She will discuss with you how this machine was developed during the second world war to decode the German messages. Alan Turing was called the code breaker. Though Britain and its allies broke the German code, they could not openly declare this because they did not want Germany to know. This meant that the team doing the computing had to take decisions on when to allow an attack to happen without defence. Can you imagine taking such decisions?</p>
--	--	---

## Student activities

1. Discuss with your friends and in small groups identify and one technology that you are aware of (ICT related technology)
2. With illustrations and text, develop a story of how the technology began, what need of society it addressed, what is available now, how the technology has changed the way we do things and what is the future of the technology
3. Are you aware of any technology that has disappeared?

## Portfolio

1. Your picture story discussing the human being - technology connection


## What is the nature of ICT level 3

### Objectives

1. Understanding that the Internet is changing the way we live; and is becoming prominent in our society
2. Appreciating that connecting is an important aspect of ICT and how peer learning is possible with ICT
3. Understanding that Internet is a place for self learning and exploring
4. Understanding the safe and ethical use of Internet

### What is the internet

<p><b>Key Layers of the Internet</b></p> <p>1941-Konrad Zuse COMPUTERS</p> <p>1956-George Valley NETWORKS</p> <p>1969-J.C.R. Licklider INTERNET</p> <p>1990-Tim Berners-Lee WORLD WIDE WEB</p> <p>1993-Marc Andreessen BROWSERS</p> <p>1998-Google SEARCH ENGINE</p> <p>1987-HyperCard CONTENT</p> <p><b>Key layers of the internet</b></p>	<p>If you want information about some book available in your library, you can connect to the library's computer from home and get the information that you want. There are many such computers in different organisations giving us different types of information. These computers are connected to one another, their network is called the Internet. The Internet is a physical network of millions of computers across the world, each of which has a unique identifier. Some of these computers act as 'servers', they store data which can be accessed by other computers. The millions of computers which are part of the Internet, is like a huge library with information on almost any issue. Initially the internet was a set of computers connected by one another and information requests were sent and received through networks.</p>
<p><b>World Wide Web</b></p>	<p>But this was difficult. In 1989 Sir Timothy Berner Lee developed a system by which the computers can transfer information through a method called "Hyper Text Mark-up Language".</p> <p>This application is called the "World Wide Web - www". Yes, the "www" is an application on the internet to access the Internet in the form of a web page, using an application called the Web Browser. There are millions of pages of shared information on the computers in the network, created by many people and organizations, in the form of 'web pages' accessed using a software application called a 'web browser'.</p> <p>This makes connection between computers more accessible to all and it allows different kinds of content to be shared across the internet. This was a significant shift in the way the internet developed.</p>

 <p style="text-align: center;">Internet of things</p>	<p>Now can you think of all the places the internet is being used:</p> <ul style="list-style-type: none"> <li>- Reading information</li> <li>- News</li> <li>- Radio</li> <li>- TV programmes</li> <li>- Webcast instead of telecast</li> <li>- Booking movie tickets</li> <li>- Shopping</li> <li>....and so many more</li> </ul>
---	--

### Digital skills

1. Accessing the internet and browsing the web (understanding the difference between the two)
2. Downloading information and organizing
3. Identifying license information and using downloaded information appropriately
4. Using safety tips while browsing
5. Using emails to communicate

### Your learning outputs

1. You will develop a concept map on what you intend to research on the internet
2. Your concept map will lead to a text document with links to useful websites accessed alongwith a summary of the information on the site
3. A short reflection on the role of technology and society and how students should interact with it - this can be in the form of a presentation or a text document with graphics
4. Print to file copies of email conversations with your friends

### Activities

1. Activity 1 - The machine is using us
2. Activity 2 - The global digital library
3. Activity 3 - I have a new address

### Self learning check-list

1. Am I aware that the internet is a place that I can access information from
2. Do I understand how the internet is changing our world?
3. Do I know how to communicate using email?
4. Am I aware of safety precautions I must take while using the internet?



# The machine is using us

## The machine is using us

### Objectives

1. Developing an understanding of the role the Internet is playing in the society
2. Understanding of the internet and the web
3. Using the browser and accessing different web sites

### What prior skills are assumed

1. Skills of creating using multiple applications
2. Familiarity with creating with different applications
3. Familiarity with the ICT environment

### Resources needed

1. Computer lab with projection
2. Access to Internet
3. Pictures and videos
4. Handout for Firefox

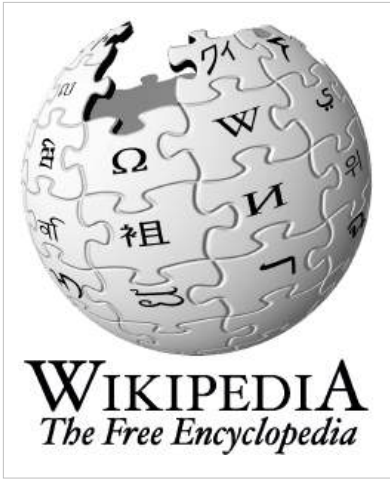
### Digital skills

1. Understanding of the physical infrastructure needed to connect to the internet
2. An understanding of what is the internet
3. Browsing the web
4. Using the search engine

### Description of activity with detailed steps

#### Teacher led activity

START_WIDGETac369bed9a148aba-4END_WIDGET	<p>Your teacher will show you this video in class. Discuss with her the following:</p> <p>How is the text you write different from the text you type?</p> <p>How is the image you draw different when you do with digital art?</p> <p>We have seen earlier that you can use what is called the internet to access information not on your computer.</p> <p>How is this done? What is the internet and what is the web?</p> <p>What are the various kinds of information you can access on the internet?</p>
--	---

	<p>Using a search engine, your teacher will open wikipedia. She will explain how the search engine works and she will demonstrate different kinds of websites on the internet.</p>
---	--

### Student activities

1. Your teacher demonstrated different kinds of websites above. In groups, look for websites in the different categories. In each group search and make a list of 3-5 websites. Enter these addresses in a text document and add to your folder.
2. Make an infographic of the internet and what it means for you.

### Portfolio

1. You should have a text document with a list of websites that you would have accessed
2. Your infographic digitized.

## The global digital library

The global digital library

## Preparation

## Resources needed

Hardware, software, Files

## Digital skills

1. Link to tool page as needed
2. Link to tool page as needed

## Description of activity with detailed steps

## How to use the template

1. {{subst:ICT-Project}}
2. After the template is inserted go to the side box syntax and add the corresponding chapter link from the teacher handbook


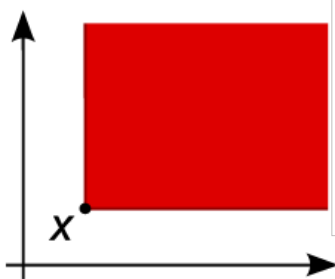
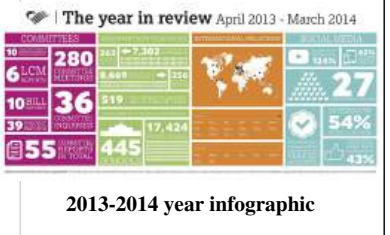
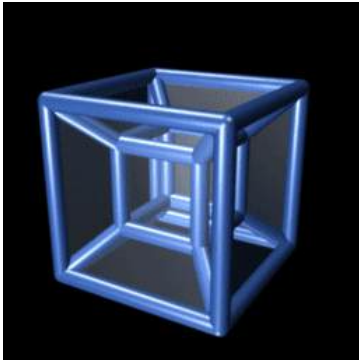
Add a link to the Teacher Handbook

## Data representation and processing

### What is this unit about



If someone asks you where is data, what would your answer be? When we see, we are gathering data. When we eat, our tongue gather data. When you cook you gather data. Gathering data from the environment, analyzing and understanding and decision making are important for survival. Imagine human beings hunting and roaming in the forests - if they encounter a wolf, they should process the data and quickly run for cover. So, gathering data and using for decision making is not new. Throughout history, people have observed that animals also gather data - there have been anecdotes <sup>[17]</sup> of animals behaving differently <sup>[18]</sup> before an earthquake.

Gathering data, analyzing and making decisions is not new to human beings. Can you guess what may be different about this unit? Yes - you are correct! Digital technologies have changed the way we are gathering data and representing data. Discuss with your friends, in groups, all the word that come to your mind when you say data. Now look at the following and classify whether the following are data or not.

 <p>Double rainbow, Graz, Austria</p>	 <p>Ordered space illustration</p>	 <p>2013-2014 year infographic</p>
 <p>A 3D projection animation</p>	<p>Not like this ... but like this: New York, Tokyo, Budapest, ...</p> <p>Text</p>	<p>0123456789</p> <p>Numbers</p>

Are you surprised? All the above are data. We saw how computers work by converting everything into data. Whether we see a picture, or listen to a song or perform calculations, we are working with data. In today's world data is becoming more and more important and we should develop skills of understanding data to make decisions.

Look at the following and discuss with your teacher:

Image of a pottery	Photo of potter	
		<p>The potter was gathering data about the mud, the water, the texture and he was making the pot. Now you have a photo of the pottery making and it is possible to know about the pot by looking a picture and reading about it. Is there any difference between what you know and what the potter knows?</p>

In this unit, you will be learning about how to read and represent data in different formats.

## Objectives

1. Understanding how to read data in various formats and representations and analyze
2. Understanding methods of data organizing, analysis and representation
3. Processing and representing data in textual, image and numeric formats with different tools
4. Understanding the power of data visualization

## How is this unit organized

As in the previous unit, there are three levels of activities, to match roughly to classes 6-8. This is the first unit in which you will be interacting with different ICT applications and will be getting introduced to basic digital literacy. An important skill you will be introduced to in this unit is local language typing.

1. At the first level, the focus will be on reading data in different formats, organizing data, analysing and making meaning. You will be introduced to concept mapping and text editing as a method of documenting your analysis.
2. At the second level, you will learn to use spreadsheet for data collection, organizing and analysis.
3. At the third level, which will be in the third year, you will be introduced to making multi-page communication documents.

At each level you will be exploring new things about ICT; you will also be creating your outputs and building your digital portfolio. This portfolio will include your outputs; they will be such that you will know what you have learnt and you will also know the method of learning. At the end of the year, your teacher will assess your portfolio.

The examples will be drawn from your textbook and will be related to different topics you have studied.

# Data representation and processing level 1

## Objectives

1. Understanding data is around us, in the various things we see
2. Understanding that data can be represented as numbers, text, pictures
3. Reading pictures, graphs and plots to make meaning
4. Representing findings through concept maps and text documents

## Digital skills

1. Working with an operating system and interacting with the ICT environment – various devices, applications
2. Reading data through images, pictures, photos, maps
3. Introduction to text editor and local language typing
4. Working with concept mapping application
5. Working with text processing application

## Your learning outputs

1. Mind maps representing your understanding of information and various formats using a concept mapping
2. Text documents with your analysis of data
3. Logs of lessons using applications for keyboard input
4. A simple text document using a text editor

## Activities

1. Activity 1 - Data can tell stories
2. Activity 2 - Organizing data to make meaning
3. Activity 3 – A concept map of data
4. Activity 4 – Making a text document

## Self-evaluation check-list

1. Do I know how to read a map, chart or a graph?
  2. Do I understand the difference between different kinds of data representation?
  3. Do I know how to access the computer, enter input, create and save files?
  4. Do I know how to organize my files into folders?
  5. Do I know the difference between a text editor and text processor?
  6. Am I familiar with Telugu typing?
  7. Do I know how to create a text file?
  8. Do I know how to create a concept map?
-

# Data can tell stories

## Data can tell stories

### Objectives

1. Understand that data can be in different formats
2. Reading different kinds of data to make meaning
3. Analyzing data and expressing

### What prior skills are assumed

1. Creating folders and saving files
2. Opening a given file with the correct application
3. Familiarity with using a key board

### Resources needed


1. Computer lab with projection
2. Access to internet
3. Data in the form of bar graphs, pictographs, maps (images)
4. Handout for Ubuntu
5. Handout for Tux Typing
6. Handout for LibreOffice Writer
7. Handout for Freeplane

### Digital skills

1. Navigating a folder
2. Opening multiple files with multiple applications
3. Text entry (local languages)

### Description of activity with detailed steps

#### Teacher led activity

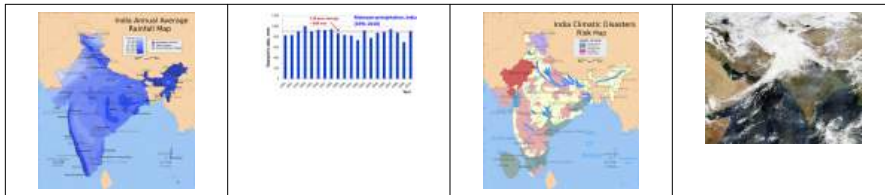
[19]		<ol style="list-style-type: none"><li>1. Look at these examples of data representation in the form of a graph with your teacher.</li><li>2. In small groups, discuss what are the various kinds of analysis you can make from this graph.</li><li>3. Your teacher will summarize this analysis using a concept map or text document.</li></ol>
------	---	--

### Student activities

1. On each of the computers, you will find folders with different data sets.
2. Each group of students will get one data set to work with - this will comprise maps, satellite images, pictographs and bar graphs. Your teacher will also give you a set of questions for each data set.
  1. Make a concept map of what you understand with the data
  2. You can also add your findings in a text document.

*In the workshop, teachers are requested to identify more data sets along similar lines which can be added as additional student activities*

### Rainfall



### Pictographs-one per group



### India's forests



### Portfolio

1. Make a concept map, as shown by your teacher, to share your findings:
  1. What is the data about
  2. What forms of representation did you study?
  3. What are the advantages of each representation?
  4. What did you conclude from the data?
  5. Have you studied about this before?
  6. What more do you want to know
2. Text document with your understanding of the data

# How to make data meaningful

## Title of Activity

## Objectives

1. Data can be organized for meaning making
2. Identifying data elements to capture for organizing data
3. Identifying method of organizing that will allow you to answer the questions (building a table for data)
4. Understanding the importance of representing data in pictures

## What prior skills are assumed

1. Understanding of different types of data
2. Creating folders and saving files
3. Opening a given file with the correct application
4. Familiarity with using a key board and text input (Telugu)

## Resources needed



1. Data in the form of bar graphs, pictographs, maps (images)
2. Learn Firefox Access to internet
3. Handout for Ubuntu
4. Handout for LibreOffice Writer
5. Handout for Tux Typing

## Digital skills

1. Working with different files and applications
2. Creating and editing a text document
3. Organizing files and folders

## Description of activity with detailed steps

### Teacher led activity

		<ol style="list-style-type: none"> <li>1. Your teacher will use these data sets to discuss how data elements can be identified for any set of data</li> <li>2. Each data element will have a value associated with it and the data can be organized along those values</li> <li>3. It is also possibly to pictorially represent the data once it is organized</li> </ol>
---	---	--



### Student activities

**Data collection and organizing** Now you will create your own data sets based on things around you. You will work in groups with your friends. In this section we will focus on creating data sets in the class. The following activities can be taken up by different sets of students. For all these data sets, make pictographs when possible and also represent in a table form.

1. **Data is about us:** Data is of us, around us. To see how, collect the following information about your class:
  1. Make a list of the kinds of foods eaten in the class over a week - these should be in some categories like sambar, rice, baingan etc. And tabulate this as pictograph and with numbers. Also list the food groups covered in the diet in each day.
  2. Find out the favorite movie song of all students in the class and tabulate. Think about how you will ask the collection, how you will collect it and how you will organize it.
  3. Find out the favorite subject of the class and favorite teacher in the school
2. **Know your neighbourhood:** Go around your school or home neighbourhood for a survey. Find out the following: the types of houses, the number of household members, the number of houses with school going students, the number of houses with students in college, the number of houses with cooking gas connection.
3. **Material around us:** You collect data on what fabrics things around us are made of. You can also classify and tabulate fabrics by properties.

Classifying different kinds of fabrics based on properties.

1. **Organizing our ICT resources:** Revisit the data sets created in the school lab computers for the activity What all can a computer do. Organize the resources in terms of features like size of the file, type of the file, application needed to open it and how this file could be used.
2. **Studying the flags of the world:** #With a collection of flags of various countries, try to organize them based on various parameters like colour, shapes contained, symbols contained and so on. This data can be tabulated for analysis.
3. Analyse kitchen ingredients as acid or base (your teacher will help you with identifying an acid or base)
4. **Profile of the newspaper :** Pick 3-4 newspapers from your library. Collect the following data for each newspaper.
  1. Date of the newspaper.
  2. Day
  3. Total number of pages in it.
  4. Price of the newspaper.
  5. Name of the editor.
  6. Number of comic strips/ games/ puzzles/ crossword.
  7. Number of Letters to editor.
  8. Number of advertisements.

### Making an infographic

1. Draw a route map from school to your house
2. In groups, make an infographic (sketch) of the following - your school, the local park or playground, your community
3. In groups talk about how symbols for infographics get developed.

## Portfolio

1. Your collected data in raw format (it can be photos of your data collection)
2. Your data tabulated (this can be non digital and can be digitized in subsequent activities)
3. Your own notes on how you organized the data and what you learnt
4. Infographic created and digitized

## A concept map of my data

### Title of Activity

### Objectives

1. Understanding concept mapping as a method of expression
2. Using a concept map to explain the connections within data, further explorations, etc

### What prior skills are assumed

1. An understanding that data is of different kinds
2. Familiarity with reading multiple kinds of data
3. Organizing data and creating data sets
4. Working with folders and files
5. Keyboard input

### Resources needed

1. Computer lab with projection equipment
2. Handout for Ubuntu
3. Handout for Tux Typing
4. Handout for Freeplane

### Digital skills

1. Introduction to working with a concept mapping tool
2. There are different formats in which data can be captured
3. One data format can be converted to another and multiple formats can be combined

### Description of activity with detailed steps

#### Teacher led activity

1. Your teacher will take you through a process of explaining data organization and method. For this she will use a concept mapping tool.
2. We will use an existing data set to work on this. (We will use the languages of India map used in the previous activity)
3. Your teacher will discuss with you how the mind map can be used to organize a process as well as be used as an output format. The mind map can be used as a live mind map or as an image.
4. The mind map (dynamic) and image (static) are both given below.



**Student activities**

1. You worked on different data collection and organizing activities in the previous section. For each data set that you collected, make a concept map representing the various data elements, the methods of organizing and possible ways of representing
2. You can create a mind map as an introduction to the data analysis and store it in your folder.

**Portfolio**

1. Your data sets - raw data, tabulated by hand and digitized
2. Your concept map files with your explorations of the organized data

**Making a text document**

ICT student textbook/Representing data analysis with text

**Data representation and processing level 2****Objectives**

1. Understanding number patterns
2. Using spreadsheet to organize data, analyse data and represent
3. Using concept maps and text documents to output data analysis
4. Understanding how visualization allows us to see how data behaves, what conclusions can be drawn

**Digital skills**

1. Using a spreadsheet to collect data and organize
2. Using a spreadsheet for simple data analysis and making charts
3. Studying graphs
4. Presentation for output with concept map, text document

**Your learning outputs**

1. Your data sets captured using spreadsheet
2. Using a text document to summarize data analysis with charts and tables
3. Using a concept map with links between concepts

**Activities**

1. Activity 1 - Numbers and patterns
  2. Activity 2 - Columns and rows
  3. Activity 3 - Inferences from graphs
  4. Activity 4 - Presenting with a concept map
  5. Activity 5 - Text document with charts and tables
-

### **Self-evaluation check-list**

1. Do I know how to enter and organize data in a spreadsheet?
2. Do I know how to play around with data in a spreadsheet?
3. Do I understand why data organized in tables and fields is useful?
4. Can I make a concept map with links between ideas and with additional notes
5. Can I make a text document with charts, data tables inserted?

## **Numbers and patterns**

ICT student textbook/Playing with number patterns

### **Columns and rows!**

ICT student textbook/Data analysis with spreadsheet

## **Inferences from plots and graphs**

ICT student textbook/Plots and graphs

## **Presenting data analysis with a concept map**

ICT student textbook/Concept map to present data analysis

## **Text document with data analysis**

ICT student textbook/Text document to present data analysis

## **Data representation and processing level 3**

### **Objectives**

1. Understanding that you can ask different questions of data
2. Ability to read, collect, organize, analyse and present data using numbers, text and graphs

### **Digital skills**

1. Using spreadsheet for advanced data analysis – using (if,then) conditions, formulas for analysis, etc
2. Working with a text editor to produce a multi page document with numbers, text and graphs

### **Your learning outputs**

1. Your data sets captured using spreadsheet
  2. Your data analysis with spreadsheet
  3. Your formatted text document
-

## Activities

1. Activity 1 - Spreadsheet for data analysis
2. Activity 2 - Multi page text document

## Self-evaluation check-list

1. Am I able to organize my spreadsheet for data analysis?
2. Have learnt how to use conditions and formulas for analysis?
3. Can I make a formatted text document with charts, data tables inserted?

## Multi page text document

ICT student textbook/Text document with advanced formatting

## Communication with graphics

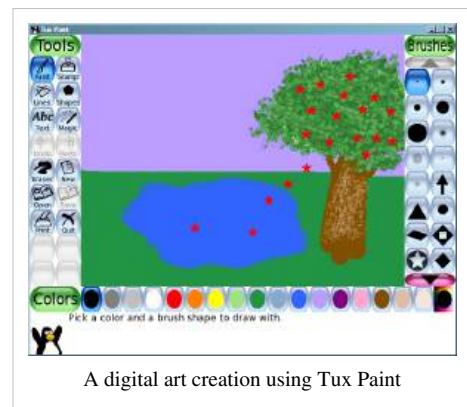
### What is this unit about?

A picture tells a thousand stories, they say! Have you ever wondered about how a picture can tell a story? When we hear a story, when we read a story, our mind forms an image of what is being described. They make us connect to the story. Similarly, when we see a picture, our mind tries to build the story from the picture. No wonder that picture story books have been favourite reading books for children and adults.

In this unit, we will learn how we can use pictures as a method of story telling. Story telling is a traditional method of transmitting information from one person to another; one generation to another. Story telling can also be used to create awareness about social issues and challenges - talk to your teacher about how Burra Katha emerged as an art form in Telangana. Drawing pictures is also not new - human beings have been using pictures to tell stories, describe things throughout our history - from cave paintings to Deccani paintings to the comic strip or to the movie poster.

Can you guess what is new about this unit? Yes, it is the use of new, digital methods to create pictures and combining them with text. This field of ICT involves the creation of visual (pictures and text) stories is called graphics and is developing fast as a method of developing communication. In the earlier unit on data processing, you saw how data is represented in multiple formats - through text, numbers, and maps, photos and pictures.





In this unit, we will focus on how we can use digital methods to create such graphic representations. You will be creating with ICT, interacting with various ICT applications and devices and developing messages for communication.



*The beginning of photography!*

START\_WIDGETac369bed9a148aba-5END\_WIDGET Your teacher will show you the following video to give you an idea of how photography began. Watch the times shown, how people lived and worked. In your home or local neighbourhood, find out if there are any old photographs.

*Telling stories with pictures - 1*

 <p><b>Picture for discussion - 1</b></p>	 <p><b>Picture for discussion - 2</b></p>	 <p><b>Picture for discussion - 3</b></p>	 <p><b>Picture for discussion - 4</b></p>
---	--	---	--

What ideas come into your mind when you see the pictures? Discuss with your friends what ideas came into their mind. You may have come to the understanding that pictures can tell stories in many ways:

1. Show how we feel
2. Describe events
3. They can sometimes express ideas beyond words
4. A picture can be a substitute for an experience - you can understand the event even if you have not seen or heard it directly
5. Combined with words

*Telling stories with pictures - 2*

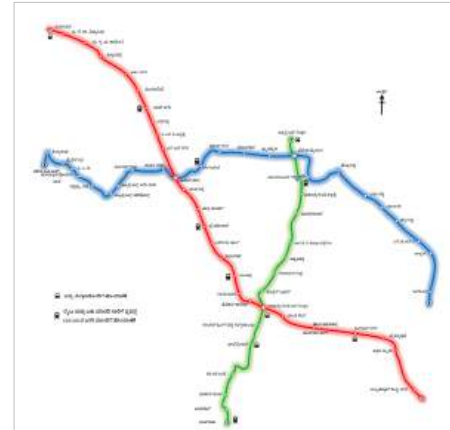
 <p><b>Metro Rail Progress Picture 1</b></p>	 <p><b>Metro Rail Progress Picture 2</b></p>	 <p><b>Metro Rail Progress 3</b></p>
---	--	---



Metro Rail Progress Picture 4



Metro Rail Progress Picture 5



Metro Rail Progress Picture 6

Look at these pictures and discuss with your friends:

1. What do these pictures represent?
2. Are they in any order? Should they be re-ordered?
3. If someone were to tell you, tell about Hyderabad Metro Rail in photos, would you use these pictures or would you want to take some more pictures? What would you have to do before you start collecting the pictures?

## Objectives

1. Understanding the power of story telling as a method of communication and that pictures can tell stories
2. Understanding how to tell a story – developing a story board and determining how/ when to introduce different elements – text, images, designs
3. Creating digital art
4. Accessing images and pictures from the internet
5. Creating a graphic communication - combining images and text

## How is the unit organized

In this unit, similar to the previous units, you will work on activities at three levels. Broadly the levels are divided in terms of the following skills:

1. At level one, you will focus on reading and compiling pictures to tell a story
  2. At the second level, you will create pictures with digital tools and learn to illustrate stories and songs
  3. At the third level, you will develop a story sequence, look for suitable images or create suitable images and combine with text to create your own posters, comic strips and story books
- The examples will be drawn from your textbook and will be related to different topics you have studied. You have already learnt to type in Telugu and make a concept map. You also know how to make simple documents with a text processor. All these skills you have learnt in the unit on data representation and processing will help you develop your graphic communication.
  - You will continue to add to your portfolio. You must look at your portfolio as a library for your learning for various subjects.

# Communication with graphics level 1

## Objectives

1. Understanding story telling as communication
2. Developing the ability to read pictures and tell a story
3. Understanding that there is a process of story development and text and images can be combined
4. Ability to access images, combining to make them into image essays

## Digital Skills

1. Using different devices/ applications to capture an image using multiple methods – screen capture , camera, mobile, snapshot from video, scan, etc – and organizing these on a computer in a folder
2. Creating image slide shows
3. Combining text and images

## Your learning outputs

1. Folder with images and pictures
2. Image slideshows
3. Text documents with images inserted and text added

## Activities

1. Activity 1 - Photo and image essays
2. Activity 2 - Tell a story

## Self-evaluation check-list

1. Do I know how to create images using multiple devices and applications?
2. Can I organize my images in a folder?
3. Have I enjoyed telling a story with my pictures?
4. Do I know how to add good description for each of my images?
5. Do I know how to develop a story board - with a sequence, with sets of images, with suitable text - and develop an output?
6. Can I make my own graphics communication for myself, my school or my village?

# Photo and image essays

## Creating photo and image essays

## Objectives

1. Capturing an image so as to tell a story, communicate
  2. Understanding that a collection of images can be created as an essay
  3. Getting familiar with different methods of image capture
  4. Ability to tell a story
-



## What prior skills are assumed

1. Ability to handle ICT equipment safely, including mobiles, camera, etc (If this is not the case, a short introductory session can be done by the teacher)
2. Familiarity with the ICT environment and managing files and folders
3. Text typing in local languages - through concept mapping or text editing

## Resources needed

1. Computer lab with projection equipment
2. Camera, mobile, connectors
3. Images, photos
4. Handout for Ubuntu
5. Handout for LibreOffice Writer
6. Handout for Freeplane
7. Handout for Tux Paint

## Digital skills

1. Accessing and creating images - drawing and taking a photo, using the camera to capture and image, using screenshot to capture an image
2. Organizing them in folders
3. Viewing images
4. Combining different formats together - text and image

## Description of activity with detailed steps

### Teacher led activity

Your teacher will demonstrate how to create image using multiple devices:

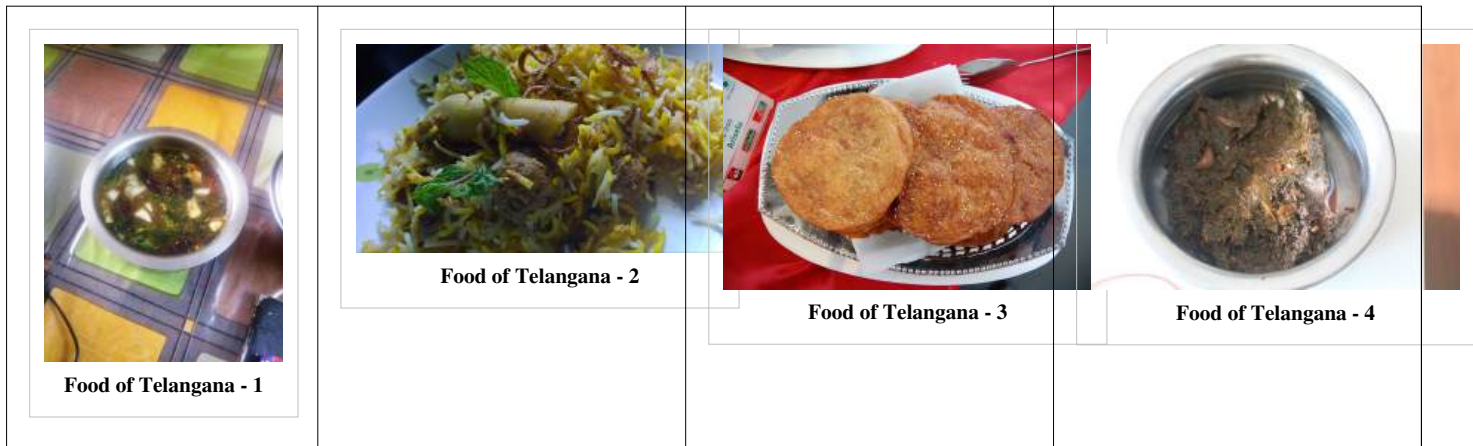
1. A photograph with a camera (or a mobile)
2. Digitizing a hand-drawn illustration
3. A screenshot or a snapshot from a video playing
4. These images can be copied to your computer for story telling.

### Single image essays



A cow and her calf

1. Your teacher will show you an image for you to tell a story about.
2. This will involve looking at all the data elements in the image and making connections.
3. She will demonstrate how there can be different stories.
4. Discuss with your teacher what are the elements of story telling that are involved - listing the important events, put them in order, determine the medium and format of communication.
5. For the image shown, discuss as a class how you will tell the story and the teacher will document this story either as a mind map or a text document
6. You have already seen different kinds of images like timelines or infographics that can also be used to tell stories. Discuss with your teacher how to capture a timeline of an activity

**Multiple image essays**

1. Your teacher will discuss with you how to use this set of images to talk about how food habits of the state of Telangana. Some ideas that you can discuss with your teacher are:
  1. How does the weather and local vegetation shape our food and recipes?
  2. How does caste impact food habits?
  3. How does the economic condition impact food habits?
2. Using these pictures you can also trace how food habits change in a community or culture
3. Your teacher will demonstrate how to make an image slideshow for using multiple pictures

**Student activities**

1. Make an image essay of any local festival or fair. You can get a collection of 3-5 images (you can either draw them or photograph them) and show them as a slideshow. These images are your story! You use your imagination to tell the story you want.
2. You have studied about natural fibres in your science class. In your community, identify local craftsmen/ occupations/ industry/ shop that makes or sells products using various natural fibres. Examples can include thatching, basket weaving, fabric weaving, dyeing. Find out how these activities are done and develop a picture story.
3. Create a picture time line of the following in groups and discuss your creations:
  1. Day in the school
  2. Preparing for Dussehra
  3. A timeline of the Samakka Saralamma Jatra

**Portfolio**

1. Your collection of images
2. Image albums
3. You would have imagined the story line and developed some ideas for telling a story. Capture these in text document or concept map. You can also write it by hand and digitize it.

**Tell a story****Telling a story from pictures**

## Objectives

1. Adding narratives to a picture essay
2. Building language communication skills - including in multiple languages
3. Building skills of creative interpretation and expression

## What prior skills are assumed

1. Capturing images from different devices (Mobiles, Cameras, videos)
2. Importing images from the devices (Pen drives, Memory Cards, CD's and DVD's)
3. Organizing images on the computer
4. Familiarity with text editor - basic text entry, inserting images into a document
5. Local language typing

## Resources needed

1. Computer lab with projection equipment
2. Camera or mobile for image capture
3. Collection of image files
4. Handout for Ubuntu
5. Handout for LibreOffice Writer

## Digital skills

1. Local language text typing
2. Combining images and text
3. Simple formatting and layout

## Description of activity with detailed steps

### Teacher led activity

### *Open ended story*

Your teacher will demonstrate how to tell a story with a set of images. In your lab computers, you will find the following images of a railway station (Warangal railway station). You must work on this in groups and make your stories. Compare your stories at the end of the class.



**Given story line**

Tell a story

1. Your teacher will show you this image in class and will discuss with you how to develop a story
2. You will notice that in this case your story has been given; you need to add a text narrative to the story

Discuss with your teacher the difference between the two story telling exercises.

**Student activities**

1. Go back to your photo and images from the previous activity. For each one of the image essays, add a text description to describe your image. After making a slideshow, insert the images in a document and type a phrase describing the picture. These images are your story! You use your imagination to tell the story you want.
2. In your local habitats - lake, pond, field, dry land -find out the animals that live there and develop a food chain infographic. You can either illustrate the images for the infographic or photograph them.
3. Capture photographs of food wastage in functions and hotels and tell a story
4. Take photographs/ collect photographs of local leaders and make a biographic. The biographic should have 5 images of which atleast 1 should be an illustration (draw and take a photo).
5. On your computer, you will find images of the water cycle (Venkat Reddy Sir to give images). Look at the images and add your story. Add your own illustrations (draw and take a photo)

**Portfolio**

1. Your collection of images (from camera, or drawn and digitized)
2. Image albums organized into a slide show
3. Your picture stories of images created
4. Infographics of local habitat and water cycle

**Communication with graphics level 2****Objectives**

1. Understanding story telling as communication and ability to develop a story line and identifying ideas for insertion of images
2. Understanding that images are formats of data that can be edited and combined with other formats
3. Understanding that text and images can be combined
4. Using digital art creations to tell a story

## Digital Skills

1. Using a mind map to develop a story line
2. Capturing images
3. Creating digital images
4. Combining text and images
5. Text input in multiple languages
6. Image editing tools

## Your learning outputs

1. Text document with your story and song
2. Folder with images and pictures
3. Image slideshows
4. Illustrated document of stories and songs

## Activities

1. Activity 1 - Stories come alive with pictures
2. Activity 2 - Songs come alive with pictures

## Self-evaluation check-list

1. Have I learnt how to create digital images using digital art applications?
2. Do I know how to develop a story line and identify areas for combining images?
3. Can I organize my images in a folder for a given text?
4. Have I enjoyed illustrating my story with my pictures?
5. Can I make my own graphics communication for myself, my school or my village?

## Stories come alive with pictures

ICT student textbook/Making a picture book

## Songs come alive with pictures

ICT student textbook/Illustrating local songs

## Communication with graphics level 3

### Objectives

1. Understanding how to communicate about processes and events
2. Ability to build a story board and narrative
3. Making communication outputs of different kinds
  1. Comic strips
  2. Posters
  3. Dialogues and story boards
4. Critical perspective on communication for building community

## Digital Skills

1. Combining text and images
2. Creating digital images
  1. Digital art creation tool
3. Creating a formatted, communication piece

## Your learning outputs

1. Folder with images and pictures
2. Document with picture stories (text and images)
3. Digital art creations
4. Posters, Brochures

## Activities

1. Activity 1 - Making a comic strip
2. Activity 2 - Making posters

## Self-evaluation check-list

1. Can I develop a story board with correct choice of text, images?
2. Do I feel that I can create digital art?
3. Do I have the skill to develop communication pieces for fun, community issues and for expressing myself?
4. Can I appreciate the importance of a graphic, visual communication for messages for community?

## Making comic strips

### Making comic strips

### Digital skills

1. Conversation bubbles
2. Link to tool page as needed
3. Link to tool page as needed

## Description of activity with detailed steps

### Student activities

1. Express the science behind the story "Rabbit and tortoise"
  2. Humorous stories from Tenali Raman for making comic strips. Ramesh sir will provide the stories for this activity (stories from English text books for making comic strips)
-

## How to use the template

1. {{subst:ICT-Project}}
2. After the template is inserted go to the side box syntax and add the corresponding chapter link from the teacher handbook

Add a link to the Teacher Handbook

## Making posters

Making posters

## Resources needed

Hardware, software, Files

## Digital skills

1. Link to tool page as needed
2. Link to tool page as needed

## Description of activity with detailed steps

### How to use the template

1. {{subst:ICT-Project}}
2. After the template is inserted go to the side box syntax and add the corresponding chapter link from the teacher handbook

Add a link to the Teacher Handbook

## Audio visual communication

### What is this unit about

One of the most exciting things about ICT is videos - and this unit is about that. While human beings have been writing text and drawing pictures videos are a relatively recent development. See below for the first video that was developed!

START\_WIDGETac369bed9a148aba-6END\_WIDGET

Can you make out how this was developed? Discuss with your friends and teachers.

See the following video - can you identify the elements in the video?

START\_WIDGETac369bed9a148aba-7END\_WIDGET

Yes, the video has the following elements:

1. Picture
2. Sound
3. Movement

We have already seen that all of this is data. ICT have made it possible to create data in the form of pictures, numbers, text, voice, sound and combine this to form a video. By itself, a picture can tell a story, text can tell a story,

a voice can tell a story. Combining these is also a story telling exercise and is called audio visual communication. In this unit, we will look at how to create an audio visual communication.

### **Objectives**

1. Audio is a form of communication
2. Audio can be verbal and non verbal
3. Audio can be combined with images
4. Video can be a combination of images and audio
5. Audio visual communication can be combined with text
6. Ability to narrate a story, developing a story board

### **How is this unit organized**

Like in the previous units, you will be working on this in multiple levels.

## **Audio visual communication level 2**

### **Objectives**

1. Ability to narrate a story, developing a story board
2. Making an audio visual communication

## **Audio story telling**

### **Title of Activity**

### **Objectives**

1. Using multiple devices to record a sound
2. Organizing recordings on folders and playing
3. Ability to create an audio communication

### **What prior skills are assumed**

1. Handling ICT equipment
2. Managing files and folders

### **Resources needed**

1. Computer lab with projection equipment
2. Speakers

### **Digital skills**

1. Using multiple recording devices to record
  2. Organizing recordings on folders
  3. Using players to listen to the audio
-



## **Description of activity with detailed steps**

### **Teacher led activity**

1. Your teacher will play the following sounds for you and discuss with you how to tell a story

### **Student activities**

1. You can go around a kitchen (yours and your friends) and record the sounds of preparing food. Tell yummy stories around the food that is cooking.
2. You can talk to your elders and record what people used to eat

### **Portfolio**

1. Your audio clips of sounds and narration

## **Words and sounds to tell a story**

### **Title of Activity**

### **Objectives**

1. Combining words and sounds to tell a story
2. Organizing recordings on folders
3. Ability to create an audio communication

### **What prior skills are assumed**

1. Handling ICT equipment
2. Managing files and folders
3. Using multiple recording devices to record

### **Resources needed**

1. Computer lab with projection equipment
2. Speakers
3. Recording devices and players
4. Handout for [[Learn

### **Digital skills**

1. Using multiple recording devices to record
  2. Organizing recordings on folders
-

## **Description of activity with detailed steps**

### **Teacher led activity**

1. Your teacher will play the following sounds for you and discuss with you how to tell a story  
As she plays

### **Student activities**

1. You can go around a kitchen (yours and your friends) and record the sounds of preparing food. Tell yummy stories around the food that is cooking.
2. You can talk to your elders and record what people used to eat

### **Portfolio**

1. Your audio clips of sounds and narration

## **Audio\_visual\_communication\_level\_3**

ICT student textbook/Audio visual communication level 3

## **Make the pictures sing**

ICT student textbook/Adding audio to song illustrations

## **I am a movie maker**

ICT student textbook/Adding audio to a video

## **Educational applications for learning your subjects**

### **What is this unit about**

We have so far learnt the different dimensions in which ICT can help create knowledge - whether graphics or audio visual communication or spreadsheets. You may be having a question how do these things help me in my subject learning? Can a graphic creation help me learn social science or help me with Telugu language or can an animation help me with doing a science experiment? You are correct!! The power of ICT to make content in different ways has led to the development of new applications that cater to specific subjects. These applications can either help you build the skills needed for learning a subject or help you understand the concept better by adding audio visual or graphic content. Some of your classes will even become very different when the teacher starts using these resources. In this unit, you will learn about some educational applications.

## Objectives

In this unit, you will be learning the following:

1. An understanding of the different features of a tool
2. Being able to use different similar applications
3. Use the features of the tool to make create resources that are relevant to your subjects
4. Enhance your conceptual understanding by playing with the tool and extending the knowledge of your subjects

## How is this unit organized

1. Explore maths with Geogebra Level 1
2. Help build your vocabulary with Kanagram
3. Explore maths with Geogebra Level 2
4. Your desktop atlas with KGeography
5. Explore maths with Geogebra level 3
6. The globe on your\_table\_with\_Marble

## Help build your vocabulary with Kanagram

### Objectives

1. Familiarise yourself with the interface of Kanagram
2. Playing with the word lists to test yourself and your friends
3. Build new vocabularies with the tool

### Activities

1. You can work with Kanagram to check your vocabulary for a given item collection
2. You can build a vocabulary list for water
3. You can build a vocabulary list for the poem *In the Bazaars of Hyderabad*.
4. You can build a vocabulary list for the poem (Telugu)
5. You can learn the software application on this link [Learn to use Kanagram](#)

## Objectives

1. Understanding how the interactive environment of Geogebra
2. Playing with the features to construct, explore and evaluate
3. Explore math concepts with Geogebra

## Activities

### Draw the given figure

1. With dot grid make shapes
2. Free shapes
3. Defined shapes

START\_WIDGETac369bed9a148aba-8END\_WIDGET

## Tessellate and tile

1. Translation
2. Rotation
3. Symmetry

## Construct given shape

1. Lines and Angles become important
2. Draw and measure
3. Draw a given measure
4. Properties of lines and angles
5. Complementary and supplementary

## Your desktop atlas with KGeography

### Objectives

Becoming familiar with digital maps of different political regions in the Earth, such as continents, countries, states.

### Activities

1. Identifying states in India and the capital of each state. You can set this up as a quiz also
2. K Geography has a set of quiz questions, to test your knowledge of places. Select the 'Place district in the map' quiz. You should place the district map within the state map. You can do this for undivided Andhra Pradesh.
3. You can try to play all the quizzes - locating the district in the map, identifying capital for each district, district for each capital etc.

You can Learn KGeography application to work with the maps better.

## The globe on your table with Marble

Marble is a digital atlas. It provides the physical geography of the Earth. It does not provide the political geography (with political borders dividing the continents into countries etc).

### Objectives

1. Understanding how the interactive environment of Marble, as a digital atlas
2. Playing with the features to explore and learn
3. Explore Geography concepts with Geogebra

### Activities

#### Playing with the globe

1. You can see the Earth as a 3-D model and explore different maps provided. You can open the "Atlas" map to see the different continents and oceans. You can rotate the Earth to see the entire globe. You can simulate the rotation of the earth by moving the Globe from left (west) to right (east). You can use the mouse to increase the zoom to see a place in more detail. You can move the Atlas to see India and increase the zoom to see the cities and towns in Telangana. Pick up any country of your choice. Try to move the Atlas to locate that region (though you will not see the country name, you can locate the cities and towns, rivers and mountains of that region).

2. Chapter 2 of your class 6 text book is 'Globe - a model of the Earth'. Can you relate the activities in that chapter to the Marble globe?
  1. Identify the land masses and water masses. Are they equal? Are they equally distributed in the northern and southern hemispheres?

### Map analyses

1. Try to see the maps provided in Chapter 1 of your class 8 Social Studies text book. You can see the world maps at different points of history in Marble.

### Latitudes and Longitudes

1. Increase the scale by moving the 'navigation slider' to increase the map size. See that latitudes are 'parallel' to one another.
2. Move the earth from west to east to simulate the rotation of the earth. Move the Earth 'top down' and 'bottom up' also upside down to show Arctic Circle in the bottom. Are 'north' and 'south' only conventions or are they 'up' and 'down'.
3. Are Latitudes lines? Are they parallel lines?
4. Are Longitudes lines? Are they parallel lines? By increasing the scale by moving the 'navigation slider', you can increase the map size and see that longitudes are not 'parallel' to one another, but meet at the poles.
5. Why are latitudes full circles while longitudes are semi-circles?
6. How many time zones does India have? How many does USA have? why is there a difference?
7. If the earth was not rotating on its axis, would there be any need for time zones and longitudes?
8. If the earth was not revolving around the sun, would there be any need for time zones and longitudes?
9. List as many differences between latitude and longitude as possible. Explain these differences

### Precipitation (rainfall), weather and climate

1. You can see the 'Precipitation (July) map. Is there any pattern in the rain heavy zones? Does it depend on the Latitudes?
  1. (tip - Is there more rain in the northern hemisphere than southern hemisphere? Within the northern hemisphere, is it heavier in some parts, are these related to the latitude of that place?)
  2. Why is the rain heavy in the south west coastal part of India (including coastal Karnataka)? Why is there a vertical strip where there is very less rain?
  3. While North India around tropic of cancer has good rainfall, why is the same tropic of cancer region in Africa without any rain at all? Tip - This is the Sahara desert region. Is the lack of rain the effect of it being a desert or is it vice versa?)
2. See the 'Temperature (July) map.
  1. Where is the weather hotter - northern or southern hemisphere?
  2. In the northern hemisphere, where is it the hottest? Why?
  3. Why is it hotter around tropic of cancer in Africa and West Asia, compared to the same latitude in India?
3. See the 'Temperature (December) map.
  1. Where is the weather hotter - northern or southern hemisphere?
  2. Why is the southern hemisphere not as hot in December as the northern hemisphere is in July?
  3. In December, the northern hemisphere has larger areas which are colder, compared to Southern hemisphere during July. (or the range of temperatures in northern hemisphere is much more than the southern hemisphere). Why?
4. Connect the ideas relating to weather and climate in Chapter 2 of your Class 8 Social Studies text book, on 'The temperature of Atmosphere'

### **Recording the latitude and longitude of your own school and publishing it**

1. Mobile phones have software application to record the latitude and longitude information of a place. The "OSM Tracker" app on a Android phone can record the 'latitude longitude' information about a place, and even record a track, such as a road. Try recording using this on a cell phone. You can also upload this information on a digital map on the Internet such as the OpenStreetMap<sup>[21]</sup>

Basically try and identify and discuss with your classmates and your teacher, what are the various factor that affect weather/climate of a place. Which of these factors - latitude, vegetation/forest area, coastal region v/s hinterland (distance from sea/water body), altitude, land mass vs water body affect weather and climate of a region?

Discuss the weather and climate in your own location / region. What are the causes for the weather / climate patterns?

You can Learn Marble and study the other maps provided and try and understand other geography concepts.

## **In summary**

We hope you have found this journey with technology enjoyable. As you would have experienced, this is an area of knowledge, where rapid changes are taking place. Not only are ICT changing how we learning, they are also defining what learning is to be had. Occupations and vocations are no longer limited to the traditional ones of teaching, engineering or medicine. ICT also have an enormous potential for allowing greater access and opportunities for more people to express and create knowledge, in multiple ways. When the possibilities for knowledge creation change, more knowledge will be produced from areas which would have earlier been left unexplored. However, for this vision to be realised, we need to approach ICT as if it is a public resource - of all, by all and for all. The power of ICT must be guided by the spirit of participation and democracy.

We will explore more areas of technology learning in Book 2 of this subject, in classes 9 and 10.

We hope you have enjoyed this journey and do share your feedback below.

## **Feedback**

Feedback is very important in many topics, especially when writing a book like this. We would like to learn from your experience using this book.

1. How did the book help you in technology learning?
  2. How did the book help you in subject learning?
  3. What did you like the most about the book? Why?
  4. What did you like the least about the book? Why?
  5. Which topics did you have problem understanding?
  6. Wish three things that should be included in the book!
-

## References

- [1] <http://cemca.org.in>
- [2] <http://www.dictionary.com/browse/digital-technology>
- [3] <https://en.wikipedia.org/wiki/Primateology>
- [4] <http://itschool.gov.in>
- [5] <http://ITforChange.net>
- [6] <http://commons.wikimedia.org>
- [7] <https://en.wikipedia.org/wiki/DNA>
- [8] <https://en.wikipedia.org/wiki/Astronomy>
- [9] <http://www.computerhistory.org/timeline/computers/>
- [10] [https://en.wikipedia.org/wiki/Electromagnetic\\_radiation](https://en.wikipedia.org/wiki/Electromagnetic_radiation)
- [11] <https://en.wikipedia.org/wiki/Celestial>
- [12] [https://en.wikipedia.org/wiki/Astronomical\\_object](https://en.wikipedia.org/wiki/Astronomical_object)
- [13] [https://upload.wikimedia.org/wikipedia/commons/thumb/8/87/Operating\\_system\\_placement\\_%28software%29.svg/2000px-Operating\\_system\\_placement\\_%28software%29.svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/8/87/Operating_system_placement_%28software%29.svg/2000px-Operating_system_placement_%28software%29.svg.png)
- [14] [https://upload.wikimedia.org/wikipedia/commons/thumb/4/4e/Personal\\_computer\\_exploded\\_6.svg/2000px-Personal\\_computer\\_exploded\\_6.svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/4/4e/Personal_computer_exploded_6.svg/2000px-Personal_computer_exploded_6.svg.png)
- [15] <http://vidyaonline.net>
- [16] <http://www.bbc.co.uk/timelines/z8bgr82>
- [17] <https://en.wikipedia.org/wiki/Anecdote>
- [18] <http://www.bbc.co.uk/nature/15945014>
- [19] [https://upload.wikimedia.org/wikipedia/commons/7/72/Sachin\\_Tendulkar\\_cricket\\_centuries\\_against\\_countries.JPG](https://upload.wikimedia.org/wikipedia/commons/7/72/Sachin_Tendulkar_cricket_centuries_against_countries.JPG)
- [20] <https://upload.wikimedia.org/wikipedia/en/b/bb/TSforestcover.png>
- [21] <http://openstreetmap.org>

# Article Sources and Contributors

ICT student textbook/Print version *Source:* <https://teacher-network.in/OER/index.php?oldid=2550> *Contributors:* Yogi

## Image Sources, Licenses and Contributors

**Image:Book.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Book.jpg> *License:* unknown *Contributors:* -

**File:ict curricula.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:ict\\_curricula.jpg](https://teacher-network.in/OER/index.php?title=File:ict_curricula.jpg) *License:* unknown *Contributors:* Ranjani

**File:A Bonobo at the San Diego Zoo "fishing" for termites.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:A\\_Bonobo\\_at\\_the\\_San\\_Diego\\_Zoo\\_\"fishing\"\\_for\\_termites.jpg](https://teacher-network.in/OER/index.php?title=File:A_Bonobo_at_the_San_Diego_Zoo_\) *License:* Creative Commons Attribution-ShareAlike 3.0 Unported *Contributors:* User:Mike R

**File:Google self-driving Lexus SUV rear view.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Google\\_self-driving\\_Lexus\\_SUV\\_rear\\_view.jpg](https://teacher-network.in/OER/index.php?title=File:Google_self-driving_Lexus_SUV_rear_view.jpg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:Runner1928

**File:Video conference class for english teachers DSCN0123.JPG** *Source:* [https://teacher-network.in/OER/index.php?title=File:Video\\_conference\\_class\\_for\\_english\\_teachers\\_DSCN0123.JPG](https://teacher-network.in/OER/index.php?title=File:Video_conference_class_for_english_teachers_DSCN0123.JPG) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* Fotokannan

**File:It@schoolDSCN2395.JPG** *Source:* <https://teacher-network.in/OER/index.php?title=File:It@schoolDSCN2395.JPG> *License:* Creative Commons Attribution 3.0 *Contributors:* Kannanshanmugam,shannmugamstudio,Kollam

**File:Learning to read with a tablet.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Learning\\_to\\_read\\_with\\_a\\_tablet.jpg](https://teacher-network.in/OER/index.php?title=File:Learning_to_read_with_a_tablet.jpg) *License:* unknown *Contributors:* Ranjani

**File:Animation training of itschool1.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Animation\\_training\\_of\\_itschool1.jpg](https://teacher-network.in/OER/index.php?title=File:Animation_training_of_itschool1.jpg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:Fotokannan

**File:Bangalore Woman on Cellphone top November 2011 -23.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Bangalore\\_Woman\\_on\\_Cellphone\\_top\\_November\\_2011\\_-23.jpg](https://teacher-network.in/OER/index.php?title=File:Bangalore_Woman_on_Cellphone_top_November_2011_-23.jpg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:Victorgrigas

**File:1Old-microscopes.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:1Old-microscopes.jpg> *License:* unknown *Contributors:* Sriranjani

**File:Leeuwenhoek\_Microscope.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Leeuwenhoek\\_Microscope.png](https://teacher-network.in/OER/index.php?title=File:Leeuwenhoek_Microscope.png) *License:* unknown *Contributors:* Guru, Ranjani

**File:Microscope\_And\_Digital\_Cameralowres.JPG** *Source:* [https://teacher-network.in/OER/index.php?title=File:Microscope\\_And\\_Digital\\_Cameralowres.JPG](https://teacher-network.in/OER/index.php?title=File:Microscope_And_Digital_Cameralowres.JPG) *License:* unknown *Contributors:* Ranjani

**File:imaging.jpeg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Imaging.jpeg> *License:* unknown *Contributors:* Ranjani

**File:petscan.jpeg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Petscan.jpeg> *License:* unknown *Contributors:* Ranjani

**File:Long\_Waves\_of\_Social\_Evolution.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Long\\_Waves\\_of\\_Social\\_Evolution.jpg](https://teacher-network.in/OER/index.php?title=File:Long_Waves_of_Social_Evolution.jpg) *License:* unknown *Contributors:* Ranjani

**File:mindmapofcellphone.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Mindmapofcellphone.jpg> *License:* unknown *Contributors:* Ranjani

**File:Mahabubnagar District farmer.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Mahabubnagar\\_District\\_farmer.jpg](https://teacher-network.in/OER/index.php?title=File:Mahabubnagar_District_farmer.jpg) *License:* Public domain *Contributors:* Adityamadhav83, File Upload Bot (Magnus Manske), MGA73bot2, OgreBot 2

**File:India - administrative map.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:India\\_-\\_administrative\\_map.png](https://teacher-network.in/OER/index.php?title=File:India_-_administrative_map.png) *License:* Creative Commons Attribution-Sharelike 2.5 *Contributors:* Maximilian Dörbbecker (Chumwa)

**File:Warangal fort pillars 01.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Warangal\\_fort\\_pillars\\_01.jpg](https://teacher-network.in/OER/index.php?title=File:Warangal_fort_pillars_01.jpg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:Peejaey

**File:Missing square edit.gif** *Source:* [https://teacher-network.in/OER/index.php?title=File:Missing\\_square\\_edit.gif](https://teacher-network.in/OER/index.php?title=File:Missing_square_edit.gif) *License:* Creative Commons Attribution 2.5 *Contributors:* Joaquim Alves Gaspar

**File:Coverfortelugubook.png** *Source:* <https://teacher-network.in/OER/index.php?title=File:Coverfortelugubook.png> *License:* unknown *Contributors:* Ranjani

**File:screenshot\_of\_geogebra.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Screenshot\\_of\\_geogebra.png](https://teacher-network.in/OER/index.php?title=File:Screenshot_of_geogebra.png) *License:* unknown *Contributors:* Ranjani

**File:'bombe'.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:'bombe'.jpg> *License:* Public Domain *Contributors:* National Security Agency

**File:Alan Turing Aged 16.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Alan\\_Turing\\_Aged\\_16.jpg](https://teacher-network.in/OER/index.php?title=File:Alan_Turing_Aged_16.jpg) *License:* Public Domain *Contributors:* DaB., DieSwartzPunkt, Florn88, Hedwig in Washington, Jarekt, Lx 121, Sefer azeri, Stas1995, Stormobile, Tambo, Upp75, Vlsergey, Yann, 5 anonymous edits

**File:Internet Key Layers.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Internet\\_Key\\_Layers.png](https://teacher-network.in/OER/index.php?title=File:Internet_Key_Layers.png) *License:* unknown *Contributors:* User:Concord hioz

**File:Herramientas web 2.0.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Herramientas\\_web\\_2.0.jpg](https://teacher-network.in/OER/index.php?title=File:Herramientas_web_2.0.jpg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:NorReyes

**File:Internet of Things.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Internet\\_of\\_Things.jpg](https://teacher-network.in/OER/index.php?title=File:Internet_of_Things.jpg) *License:* Creative Commons Attribution 2.0 *Contributors:* Wilgengebroed on Flickr

**File:Wikipedia-logo-en-big.png** *Source:* <https://teacher-network.in/OER/index.php?title=File:Wikipedia-logo-en-big.png> *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* BotMultichill, Chininazu12, CrowzRSM, Dbenbenn, Eloquence, Evil saltine, FSII, Feliciomendes, Guillom, Jean-Frédéric, Jossifresco, LivingGodGroup, Michczu, Quibik, Str4nd, WAVegetarian, Waldir, 10 anonymous edits

**File:Double rainbow, Graz, Austria, 2010-05-30.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Double\\_rainbow,\\_Graz,\\_Austria,\\_2010-05-30.jpg](https://teacher-network.in/OER/index.php?title=File:Double_rainbow,_Graz,_Austria,_2010-05-30.jpg) *License:* unknown *Contributors:* User:Dnalor01

**File:Ordered space illustration.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Ordered\\_space\\_illustration.svg](https://teacher-network.in/OER/index.php?title=File:Ordered_space_illustration.svg) *License:* Public Domain *Contributors:* User:Oleg Alexandrov

**File:2014-Infographic-English (14696784703).jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:2014-Infographic-English\\_\(14696784703\).jpg](https://teacher-network.in/OER/index.php?title=File:2014-Infographic-English_(14696784703).jpg) *License:* Creative Commons Attribution 2.0 *Contributors:* National Assembly for Wales from Wales

**File:8-cell-simple.gif** *Source:* <https://teacher-network.in/OER/index.php?title=File:8-cell-simple.gif> *License:* Public domain *Contributors:* Acc12345acc, Amada44, ArishG, BartekChom, Benh, BotMultichill, Docu, Jaybear, Jim2k-commonswiki, Julia W, Kilom691, Ladsgroup, MichaelMaggs, Miya, Mirmariokartguy, Nevit, OgreBot 2, Pbroks13, Roberta F., Rocket000, Sarregouset, SharkD, The High Fin Sperm Whale, Themightyquill, Tobias "ToMar" Maier, Túrelio, Watchduck, WriterNews, Xario, Zzyzx11, संवीव कुमार, 12 anonymous edits

**File:Latex example text dots.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Latex\\_example\\_text\\_dots.png](https://teacher-network.in/OER/index.php?title=File:Latex_example_text_dots.png) *License:* GNU Free Documentation License *Contributors:* Tobias Oetiker

**File:Arabic Numerals.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Arabic\\_Numerals.svg](https://teacher-network.in/OER/index.php?title=File:Arabic_Numerals.svg) *License:* Public Domain *Contributors:* User:Partymetroid

**File:Potter working, Bangalore India.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Potter\\_working,\\_Bangalore\\_India.jpg](https://teacher-network.in/OER/index.php?title=File:Potter_working,_Bangalore_India.jpg) *License:* unknown *Contributors:* A.Savin, Bulat, Cathy Richards, Moheen Reeyad, Muhammad Mahdi Karim, Thierry Caro, Yann

**File:Potter and his work, Jaura, India.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Potter\\_and\\_his\\_work,\\_Jaura,\\_India.jpg](https://teacher-network.in/OER/index.php?title=File:Potter_and_his_work,_Jaura,_India.jpg) *License:* Creative Commons Attribution-Share Alike *Contributors:* Yann (talk)

**File:Solar\_Resource\_Map\_of\_India.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Solar\\_Resource\\_Map\\_of\\_India.png](https://teacher-network.in/OER/index.php?title=File:Solar_Resource_Map_of_India.png) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* Graphium, Roland zh, SolarSoft, Surajt88, W!B., 1 anonymous edits

**File:India annual rainfall map en.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:India\\_annual\\_rainfall\\_map\\_en.svg](https://teacher-network.in/OER/index.php?title=File:India_annual_rainfall_map_en.svg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* Aschroet, Auntof6, Cpt.a.haddock, Planemad, Taivo, 1 anonymous edits

**File:1991 to 2010 rainfall totals during monsoon India.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:1991\\_to\\_2010\\_rainfall\\_totals\\_during\\_monsoon\\_India.png](https://teacher-network.in/OER/index.php?title=File:1991_to_2010_rainfall_totals_during_monsoon_India.png) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* User:AmyNorth

**File:India climatic disaster risk map en.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:India\\_climatic\\_disaster\\_risk\\_map\\_en.svg](https://teacher-network.in/OER/index.php?title=File:India_climatic_disaster_risk_map_en.svg) *License:* Creative Commons Attribution-Sharelike 3.0 *Contributors:* Aschroet, Mdd, Roland zh, Sarang, Saravask



**File:Western\_Disturbance\_-\_3\_February\_2013.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Western\\_Disturbance\\_-\\_3\\_February\\_2013.jpg](https://teacher-network.in/OER/index.php?title=File:Western_Disturbance_-_3_February_2013.jpg) *License:* Public Domain *Contributors:* Pierre cb, Roland zh, Tatrāju.rishabh

**File:National\_Park\_Service\_sample\_pictographs.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:National\\_Park\\_Service\\_sample\\_pictographs.svg](https://teacher-network.in/OER/index.php?title=File:National_Park_Service_sample_pictographs.svg) *License:* Public Domain *Contributors:* Tkgd2007

**File:NEWSPAPER\_ROCK\_IS\_A\_LARGE\_CLIFF\_MURAL\_OF\_ANCIENT\_INDIAN\_PETROGLYPHS\_AND\_PICTOGRAPHS\_REMARKABLE\_FOR\_THE\_CLARITY\_OF\_...\_-\_NARA\_-\_545671.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:NEWSPAPER\\_ROCK\\_IS\\_A\\_LARGE\\_CLIFF\\_MURAL\\_OF\\_ANCIENT\\_INDIAN\\_PETROGLYPHS\\_AND\\_PICTOGRAPHS\\_REMARKABLE\\_FOR\\_THE\\_CLARITY\\_OF\\_...\\_-\\_NARA\\_-\\_545671.jpg](https://teacher-network.in/OER/index.php?title=File:NEWSPAPER_ROCK_IS_A_LARGE_CLIFF_MURAL_OF_ANCIENT_INDIAN_PETROGLYPHS_AND_PICTOGRAPHS_REMARKABLE_FOR_THE_CLARITY_OF_..._-_NARA_-_545671.jpg) *License:* Public Domain *Contributors:* SunOfErat

**File:Delhi\_metro\_rail\_network.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Delhi\\_metro\\_rail\\_network.svg](https://teacher-network.in/OER/index.php?title=File:Delhi_metro_rail_network.svg) *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Arbalete, Chumwa, Co9man, Jpatokal, MGA73bot2, Mittal.fdk, OGREBot 2, Planemad, RaviC, Roland zh, SBC-YPR, 1 anonymous edits

**File:Timeline\_evolution\_of\_life.svg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Timeline\\_evolution\\_of\\_life.svg](https://teacher-network.in/OER/index.php?title=File:Timeline_evolution_of_life.svg) *License:* Creative Commons Zero *Contributors:* User:LadyofHats

**File:Andhra\_Pradesh\_and\_Telangana\_Physical.jpeg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Andhra\\_Pradesh\\_and\\_Telangana\\_Physical.jpeg](https://teacher-network.in/OER/index.php?title=File:Andhra_Pradesh_and_Telangana_Physical.jpeg) *License:* unknown *Contributors:* User:Arjunaraoc

**File:Indian\_Forest\_Cover.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Indian\\_Forest\\_Cover.png](https://teacher-network.in/OER/index.php?title=File:Indian_Forest_Cover.png) *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Csyogi

**File:AreaUnderWildlifeSanctuariesIndia2006.png** *Source:* <https://teacher-network.in/OER/index.php?title=File:AreaUnderWildlifeSanctuariesIndia2006.png> *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:Veryhuman

**File:Indian\_Spices.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Indian\\_Spices.jpg](https://teacher-network.in/OER/index.php?title=File:Indian_Spices.jpg) *License:* unknown *Contributors:* User:Joe mon bkk

**File:Indian-languages-map.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Indian-languages-map.jpg> *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* Alan Liefing, Koromandia

**File:Languages spoken in India.jpeg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Languages\\_spoken\\_in\\_India.jpeg](https://teacher-network.in/OER/index.php?title=File:Languages_spoken_in_India.jpeg) *License:* unknown *Contributors:* Ranjani

**File:Tuxpaint-drawing.png** *Source:* <https://teacher-network.in/OER/index.php?title=File:Tuxpaint-drawing.png> *License:* Public domain *Contributors:* Bill Kendrick (w:user:BillkendrickBillkendrick)

**File:Animals in action; studies and stories of beasts, birds and reptiles; their habits, their homes and their peculiarities (1901) (14568810978).jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Animals\\_in\\_action;\\_studies\\_and\\_stories\\_of\\_beasts,\\_birds\\_and\\_reptiles;\\_their\\_habits,\\_their\\_homes\\_and\\_their\\_peculiarities\\_\(1901\)\\_14568810978.jpg](https://teacher-network.in/OER/index.php?title=File:Animals_in_action;_studies_and_stories_of_beasts,_birds_and_reptiles;_their_habits,_their_homes_and_their_peculiarities_(1901)_14568810978.jpg) *License:* unknown *Contributors:* FlickreviewR 2, Fae, Kilom691

**File:Smiles of innocence.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Smiles\\_of\\_innocence.jpg](https://teacher-network.in/OER/index.php?title=File:Smiles_of_innocence.jpg) *License:* Creative Commons Attribution 2.0 *Contributors:* Pranav Yaddanapudi from Hyderabad, India

**File:Street.hawker.in.rome.arp.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Street.hawker.in.rome.arp.jpg> *License:* Public Domain *Contributors:* User:Arpingstone

**File:The\_How\_and\_Why\_Library\_002.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:The\\_How\\_and\\_Why\\_Library\\_002.jpg](https://teacher-network.in/OER/index.php?title=File:The_How_and_Why_Library_002.jpg) *License:* Public Domain *Contributors:* Eleanor Stackhouse Atkinson

**File:Lnt-metrorail-hyderabad-girder.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Lnt-metrorail-hyderabad-girder.jpg> *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:Sunilraj.raj

**File:Hyderabad Metro Rail Project - Progress.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Hyderabad\\_Metro\\_Rail\\_Project\\_-\\_Progress.jpg](https://teacher-network.in/OER/index.php?title=File:Hyderabad_Metro_Rail_Project_-_Progress.jpg) *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:Sunilraj.raj

**File:HYD Metro near SC.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:HYD\\_Metro\\_near\\_SC.jpg](https://teacher-network.in/OER/index.php?title=File:HYD_Metro_near_SC.jpg) *License:* unknown *Contributors:* User:Rizwanmahai

**File:Station model of Hyderabad Metro at Nampally Exhibition.JPG** *Source:* [https://teacher-network.in/OER/index.php?title=File:Station\\_model\\_of\\_Hyderabad\\_Metro\\_at\\_Nampally\\_Exhibition.JPG](https://teacher-network.in/OER/index.php?title=File:Station_model_of_Hyderabad_Metro_at_Nampally_Exhibition.JPG) *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:Strike Eagle

**File:Hyderabad Metro Engine.JPG** *Source:* [https://teacher-network.in/OER/index.php?title=File:Hyderabad\\_Metro\\_Engine.JPG](https://teacher-network.in/OER/index.php?title=File:Hyderabad_Metro_Engine.JPG) *License:* Creative Commons Attribution 3.0 *Contributors:* Kishorechan

**File:Hyderabad Metro Rail.png** *Source:* [https://teacher-network.in/OER/index.php?title=File:Hyderabad\\_Metro\\_Rail.png](https://teacher-network.in/OER/index.php?title=File:Hyderabad_Metro_Rail.png) *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:Kishorechan

**File:Mother's Love Cow & Calf.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Mother's\\_Love\\_Cow\\_&\\_Calf.jpg](https://teacher-network.in/OER/index.php?title=File:Mother's_Love_Cow_&_Calf.jpg) *License:* unknown *Contributors:* User:Anivesh.agrawal

**File:Pachi Charu@Telangana.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Pachi\\_Charu@Telangana.jpg](https://teacher-network.in/OER/index.php?title=File:Pachi_Charu@Telangana.jpg) *License:* unknown *Contributors:* User:Sandeep Rangu

**File:Telangana Biryani.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Telangana\\_Biryani.jpg](https://teacher-network.in/OER/index.php?title=File:Telangana_Biryani.jpg) *License:* unknown *Contributors:* User:Vanamala.vardhan

**File:Sweety Arishalu.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Sweety\\_Arishalu.jpg](https://teacher-network.in/OER/index.php?title=File:Sweety_Arishalu.jpg) *License:* unknown *Contributors:* User:Anilphotojournalist

**File:Gongura Chutney.JPG** *Source:* [https://teacher-network.in/OER/index.php?title=File:Gongura\\_Chutney.JPG](https://teacher-network.in/OER/index.php?title=File:Gongura_Chutney.JPG) *License:* unknown *Contributors:* User:Coolcheetahbangalore

**File:Warangal\_railway\_station.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Warangal\\_railway\\_station.jpg](https://teacher-network.in/OER/index.php?title=File:Warangal_railway_station.jpg) *License:* unknown *Contributors:* User:Nikhilb239

**File:Konarkexpresskzpt.jpg** *Source:* <https://teacher-network.in/OER/index.php?title=File:Konarkexpresskzpt.jpg> *License:* Creative Commons Attribution-Sharealike 3.0 *Contributors:* User:JohnnyBlaze007

**File:Warangal\_rly\_station\_overview.jpg** *Source:* [https://teacher-network.in/OER/index.php?title=File:Warangal\\_rly\\_station\\_overview.jpg](https://teacher-network.in/OER/index.php?title=File:Warangal_rly_station_overview.jpg) *License:* unknown *Contributors:* User:Nikhilb239

**File:Write a story based on the picture.gif** *Source:* [https://teacher-network.in/OER/index.php?title=File:Write\\_a\\_story\\_based\\_on\\_the\\_picture.gif](https://teacher-network.in/OER/index.php?title=File:Write_a_story_based_on_the_picture.gif) *License:* unknown *Contributors:* Nyidhyaa

## License

Creative Commons Attribution-ShareAlike  
<https://creativecommons.org/licenses/by-sa/4.0/>