



Based on
the Vision of
NEP 2020



Subject Code : 417

THINKING MACHINES

A Textbook of Artificial Intelligence



NAVNEET[®]



NAVNEET EDUCATION LIMITED

Mumbai : Bhavani Shankar Road, Dadar (West), Mumbai – 400 028. (Tel. 6662 6565)

Visit us at : www.navneet.com • e-mail : publications@navneet.com

Ahmadabad : Navneet House, Gurukul Road, Memnagar, Ahmadabad – 380 052. (Tel. 6630 5000)

Bengaluru : Sri Balaji's, No. 12, 2nd Floor, 3rd Cross, Malleswaram, Next to Hotel Halli Mane, Bengaluru – 560 003. (Tel. 2346 5740)

Bhavnagar : 5, Shivalik Building, Near Bank of India, Behind Joggers Park, Atabhai Chowk, Bhavnagar - 364 002.

Chennai : 10, C. P. Ramaswamy Road, Near REPCO Bank, Alwarpet, Chennai – 600 018. (Tel. 2467 1404)

Delhi : 2-E/23, Orion Plaza, 2nd Floor, Jhandewalan Extn., New Delhi – 110 055. (Tel. 2361 0170)

Hyderabad : Kalki Plaza, Plot No. 67, Door No. 6, Krishna Puri Colony, West Maredpalley, Secunderabad – 500 026. (Tel. 2780 0146)

Nagpur : 63, Opp. Shivaji Science College, Congress Nagar, Nagpur – 440 012. (Tel. 242 1522)

Nashik : Nirman Inspire, 2nd Floor, Kanhere Wadi, Opp. Old CBS, Nashik – 422 001. (Tel. 259 6950)

Navsari : 3/C, Arvind Nagar Society, Lunsikui Road, Navsari – 396 445. (Tel. 244 186)

Patna : 205, 2nd Floor, Jagdamba Tower, Sahdeo Mahto Marg, Srikrishnapuri, Patna – 800 001. (Tel. 254 0321)

Pune : Navneet Bhavan, 1302, Shukrawar Peth, Bajirao Road, Near Sanas Plaza, Pune – 411 002. (Tel. 2443 1007)

Rajkot : 20-21, Jagnath Corner, Behind Dhanrajani Building, Yagnik Road, Rajkot – 360 001.

Surat : 1/1136-1137, Kalapeshi Street, Behind Allahabad Bank, Nanpara, Surat – 395 001.

Vadodara : Near Hanuman Wadi, Sardar Bhuvan Khancho, Vadodara – 390 001.



NAVNEET DigiBook

Navneet DigiBook is the smart version of your favourite Navneet books. Navneet DigiBook will enhance your learning experience through interactive features resulting into better understanding of concepts and the syllabus.



Animations



Image Zoom



My Data



Pen/
Drawing
Tool



Sharing



Web Links



Text Input



MCQs &
Interactive
Exercises



Sticky
Notes



Audio

Use the below instructions:-

Step 1: Scan the QR Code given to Download the Navneet DigiBook App & Click on Register. (Registered Users can login directly.)

Step 2: Login using your credentials

Step 3: Click the Access Code button and Enter the Access Code mentioned.

Step 4: Explore Navneet DigiBook.



Access Code:

* Mobile Version Support Above Android 8 and Above iOS 12

* Access to this DigiBook is limited for this academic year only. Terms & Conditions apply.

* Digital features may vary from book to book



Scan to know more

Access Code:



THINKING MACHINES[®]

A Textbook of Artificial Intelligence

Subject Code: 417

Author

Swati Panchal

Teacher and Computer Science Consultant

Reviewer

Asha Menon

Teacher and AI Practitioner

Series Editor

Seema Jadaun

Computer Science Consultant

CONTENTS

Preface	3
Syllabus.....	7

PART A: EMPLOYABILITY SKILLS

CHAPTER 1: COMMUNICATION SKILLS	15
CHAPTER 2: SELF-MANAGEMENT SKILLS	40
CHAPTER 3: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SKILLS	49

CHAPTER 4: ENTREPRENEURIAL SKILLS	62
CHAPTER 5: GREEN SKILLS	74

PART B: SUBJECT SPECIFIC SKILLS [®]

CHAPTER 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE	87
● Intelligence.....	88
● Artificial Intelligence.....	90
● Types of Artificial Intelligence.....	91
● What Contributes to Artificial Intelligence?.....	93
● Artificial Intelligence Techniques.....	94
● Programming With or Without AI.....	96
● Relevance of AI in Our Lives.....	97
● Domains of Artificial Intelligence.....	98
● Smart Living: Smart Homes.....	99
● Smart Living: Smart Cities.....	101
● Sustainable Development Goals (SDGs).....	102
● Interlinking of the Social Issues Among SDGs.....	105
● Careers in the Field of AI.....	105
● Skill Sets Required for AI Jobs.....	106
● Some Leading AI Companies.....	108
● Ethics.....	110
● Artificial Intelligence Ethics.....	111
● Need for Artificial Intelligence Ethics.....	111

● Data Acquisition.....	141
● Data Exploration.....	148
● Modelling.....	151
● Evaluation.....	155

CHAPTER 3: NEURAL NETWORK	166
● Human Brain.....	167
● Neural Network.....	167
● Artificial Neural Network.....	168
● Future of Neural Network.....	172

CHAPTER 4: INTRODUCTION TO PYTHON	180
● Python.....	181
● Advantages of Python.....	182
● Installing Python.....	183
● Interacting with Python.....	183
● Working with Python.....	184
● Tokens in Python.....	186
● Basic Structure of a Python Program.....	191
● Data Types in Python.....	195
● Some Python Programs.....	201

CHAPTER 2: AI PROJECT CYCLE	135
● Challenges or Problems.....	136
● AI Project Cycle.....	136
● Problem Scoping.....	137

Worksheets 1, 2 and 3	217
Model Test Papers 1 and 2.....	220
Additional Projects.....	226
India in AI.....	229
Answers to ExerciseBot.....	231

PART A: **EMPLOYABILITY SKILLS**

- **Unit 1:**
Communication Skills-I
- **Unit 2:**
Self-management Skills-I
- **Unit 3:**
ICT Skills-I
- **Unit 4:**
Entrepreneurial Skills-I
- **Unit 5:**
Green Skills-I



CHAPTER 1

COMMUNICATION SKILLS

In this chapter

- What is Communication?
- Importance of Communication Skills
- Methods of Communication
- Process of Communication
- Perspectives in Communication
- Writing Skills Related to Communication

Communication is a basic function of any living thing. Birds chirp to communicate, bees dance, tigers and some other animals use scent to communicate. There are so many various ways to communicate. Humans are bestowed with the widest range in terms of the means to communicate, from voice to sign language, from acting to writing. It is very important to be able to communicate in a clear manner so that the recipient gets the intended message without any doubt. In the present world, communication is a primary skill for a successful career.

WHAT IS COMMUNICATION?

The act of exchanging information, idea, opinion, etc. between two or more people is called **communication**. The word 'communication' comes from the Latin word *commūnicāre*, meaning 'to share'. When two people share information or opinion, we say that both people are communicating.

Every communication involves (at least) one sender, a message and a recipient. The ability to communicate information accurately, clearly and as intended, is referred to as a **communication skill**. It is a vital life skill that one should start developing in one's life as early as possible.

IMPORTANCE OF COMMUNICATION SKILLS

Communication skill has great importance in our personal, professional and social life. It is a vital life skill and should not be overlooked. By developing communication skills, one can excel in all walks of his/her life. Let's learn about the importance of communication in different fields.

In Education: Communication plays a crucial role in education. Suppose a teacher explains a certain topic in the class but the students do not respond, whether they are getting the topic or not. How could the teacher know if the students have understood the topic properly or if they are facing difficulties at certain points?

Therefore, communication is very important in the teaching and learning process (Fig. S1.1). There should be communication between teachers and students consistently.



Fig. S1.1 Communication in teaching

In Professional Life: Good communication skills are one of the essential employability skills. Every employer wants an employee who can communicate properly and effectively within the organisation as well as with the clients or customers. Therefore, a person looking for a job or who wants a promotion should demonstrate good communication skills.



Professionals are supposed to have good communication skills, otherwise, they would not be able to communicate with their potential clients. If a lawyer is not able to convince the judge with his/her arguments, can he win any case?

In Personal Relationship: Communication skills also play a crucial role in maintaining personal relationships. In your personal life, you use communication skills to improve your relationships. It helps you to understand others and to be understood.

Many relationships do not last long just because of a lack of communication or a long gap in communication. We all know that most families in today's world are nuclear families and most of our relatives are far away from us. To be in contact with them, communication is the best way. We should develop our communication skills to maintain a healthy relationship with them. We should also communicate with the members of our immediate family. Remember, our words can make them happy or sad.

In Business: Communication is the basis of any business. Communication skills are required not only in big business establishments but also in small enterprises (Fig. S1.2). Even a street seller or a small shopkeeper cannot succeed in selling his/her items unless he/she possesses communication skills. Communication is very important for coordination among the staff as well as the clients and customers.



Fig. S1.2 Communication in business

METHODS OF COMMUNICATION

We can classify the methods of communication in the following three groups:

- Verbal Communication
- Non-verbal Communication
- Visual Communication

Verbal Communication

Verbal communication refers to the type of conversation in which words are used to convey messages. It can be written or spoken. It takes the form of talks, a public address, verbal discussions, telephonic talks, telecommunications and other artificial media, such as audio-visual aids speeches and orders, holdings of meetings and conferences, lectures, social get-togethers, training sessions, public address systems, museums, exhibitions, counseling, etc. There are two methods of verbal communication:

- Oral communication
- Written communication

Oral Communication

The exchange of words through speaking is called **oral communication**. Face-to-face conversation is the most common method of oral communication. It is the oldest form of



Fig. S1.3 Communication



Verbal communication includes only oral communication.

This is not true. Verbal communication includes both oral and written communication.



oral communication. Telephonic conversation and online audio chats are some other examples of oral communication. In oral communication, it is very important to listen and think carefully before speaking.

Oral communication plays a vital role in the teaching and learning process, interviews, motivation, maintaining social and personal relationships and so on. Nowadays, various electronic devices such as mobile phones, tape-recorders, loudspeakers and Internet-based audio chatting apps are being used for oral communication.

Advantages of Oral Communication

Following are the advantages of oral communication:

- **Spontaneity:** Oral communication is spontaneous. It means the members participating in the oral communication do not have to wait for getting replies or feedback. Both the sender and the receiver can, therefore, ask for clarification and elaboration on the spot. Thus, oral communication is very fast. Nowadays, there are facilities to send recorded voice messages that can be responded as per the wish of the receiver. In this case, oral communication loses its feature of spontaneity.
- **Time-saving:** Unlike other communication channels, oral communication is the quickest. It saves the time taken in writing the message and sending it through post or e-mail.
- **Personal Involvement:** In oral communication, the personal involvement of the sender and receiver of the message is obvious. It builds trust among the members involved in communication.
- **Confidentiality:** Oral communication is preferred for confidential discussion because it generally does not have any record. You just have to ensure that there is no one within the hearing or recording distance.
- **No or Low Cost:** You do not have to pay anything in oral communication especially when you are talking to someone face-to-face. Even if you are talking to someone over the phone or on the Internet, you have to pay a nominal charge.
- **Involvement of Body Language:** In oral communication, you can use your body language to make communication more effective. Besides, you can judge the personality or state of mind of the person you are talking to.
- **Group Communication:** Oral communication is quite effective in group communication. Classroom teaching cannot be possible without oral communication. In meetings, conferences, and social gatherings, oral communication is very effective.
- **Intonation:** In oral communication, one can use intonation to convey the idea and emotion better than simple words.

Disadvantages of Oral Communication

Oral communication also has some disadvantages which are mentioned below:

- **Dependency on Human Memory:** In oral communication, the messages exchanged are retained in the memory of the people participating in the communication. In human memory, messages cannot last long.
- **No Record:** Oral communication generally does not have any records. So, it cannot be used as legal evidence. Besides, due to a lack of records, the speaker cannot be held responsible for any mistakes in the speech.
- **No Time Frame:** Issues cannot be resolved in a given time duration because there is no time frame set in oral communication. But, in written communication, both the speaker and the recipient can keep an eye on the development going on in the discussion.

- **Chances of Misunderstanding:** There are chances of misunderstanding occurring in oral communication especially when the message is lengthy, distant and complicated. It may also be due to poor expressions or lack of attentiveness among the listeners.
- **Imprecise:** When someone writes a message, they usually use precise words to express themselves, effectively. It generally lacks in oral communication because people generally take less care while speaking than writing.

Tips for Improving Oral Communication

There are different ways to improve oral communication. Some are as follows:

- **Clarity in Speech:** The speaker should speak clearly and pronounce the words properly so that there is no chance of confusion or misunderstanding. Besides, the speaker should speak slowly.
- **Use of Right Words:** The speaker should use words according to the understanding level of the listeners. Besides, double meaning, offensive words and phrases should be avoided.
- **Precision:** The speaker should keep his/her message precise and concise because the use of too many words may affect the attention span of the listener and they may become inattentive.
- **Politeness:** Politeness is very important in oral communication. Both the speaker and the listener should be polite for healthy communication.
- **Active Listening:** In oral communication, listening is as important as speaking. To become an active listener, you should make eye contact with the speaker. You should avoid making distracting gestures. If you have any doubt, you should ask questions.
- **Constructive Feedback:** You know the importance of feedback in communication. The participants who are partaking in the oral communication should provide feedback instantly. The feedback should be impersonal and goal-oriented.

Written Communication

A form of communication in which messages are exchanged between two or more people using written or printed words is called **written communication**. After oral communication, written communication is the most common form of communication. It is generally in the form of instructions, orders, rules and regulations, policies, procedures, posters, memos, reports, information bulletins, etc.

Written communication is mostly used in office and business communication where records of communication are kept safe for further communication. Written communication is also used in legal proceedings. You cannot lodge any complaint anywhere, orally.

Tools used for written communication include letters, e-mail, SMS, fax, notice, poster, brochure, Internet-based chat apps (Fig. S1.4) and so on.



Fig. S1.4 Internet-based chat apps

Advantages of Written Communication

There are different advantages of written communication. Some are as follows:

- **Variety in Formats:** Written communication offers a variety of formats for different types of communication. The format helps us know what type of message it may contain.



- **Time for Revision:** In written communication, we have the advantage of revising our message before sending it to anyone. In this way, we can provide well-thought and well-planned details.
- **Record Preservation:** Written communication can be properly preserved for further reference. It can also be reviewed in the future for follow-up if required.
- **Time Saving:** No doubt, it takes some time to prepare a written message, but when the same message is to be sent to many people, it saves a lot of time. You can create as many copies of a letter as you want using a photocopier. Besides, you can send the same message to many people through e-mail.
- **Suitable Feedback:** Written communication offers an opportunity for the receiver to understand the message properly so that they can give suitable feedback.

Disadvantages of Written Communication

There are different disadvantages of written communication. Some are as follows:

- **Tough Job:** Writing and understanding a written message properly is difficult especially for people who are not well qualified.
- **No Instant Feedback:** Unlike oral communication, it is not possible to send feedback instantly in written communication. However, some technology-based written communication formats such as e-mail and WhatsApp can help you send and receive feedback instantly.
- **No Alteration:** Once you send a message to someone, you cannot make any kind of alteration to it later.
- **Lack of Expression:** In oral communication, you can express yourself using your facial expression or body language. It is not possible in written communication.
- **Lengthy Message:** In written communication, people need to add details that make the message lengthy and reading a lengthy message creates a lack of interest in the readers.



? THINKBOT

Nowadays, most of the written communication is done through e-mails. However, a large number of letters are still sent through post or courier. Can you think why?

Tips for Improving Written Communication

Let's discuss how to improve written communication.

- **Clear and Concise:** The written message should be clear and concise to avoid the chances of ambiguity. Remember, you will not be available at the place of the receiver to clarify. You should use the punctuation marks properly, otherwise, the meaning of the sentences may differ from what you want to convey.
- **Use of Appropriate Words:** Appropriate words help us express our thoughts clearly and properly. Besides, the words should be simple and according to the level of understanding of the receiver.
- **Use of Polite Words:** You should use polite words while writing a message or sending feedback. Never use any offensive language. Sometimes, the use of offensive language breaks the communication cycle.



- **Drafting the Message:** The message should be drafted before sending. It helps you know if your message contains all the points you are intended to convey to the receiver. You can make changes in the draft until you are fully satisfied. Once you are satisfied, you can now write the message neatly on fresh paper (not needed for electronic documents).
- **Timely and Constructive Feedback:** In written communication, people generally fail to give feedback in time which slows down the communication process to cause a communication gap. Therefore, the feedback should be given in time to show your interest in the matter of discussion. You should also give constructive feedback, i.e., your queries should be clear and concise. You should avoid personal comments even if you disagree on certain points.

Non-verbal Communication

Non-verbal communication is a wordless form of communication that involves some other means such as cues, body language, gestures, vocal characteristics, facial expressions, and spatial relationship between the sender and the receiver to convey a message. In other words, communication other than oral and written, such as gesture, body language, posture, pitch and tone of voice (paralanguage), or facial expressions, is called **non-verbal communication**. Non-verbal communication is also known as 'silent language'.

Non-verbal communication is a critical form of communication—a natural, unconscious language that helps us convey our true feelings and purposes in any given moment.

Types of Non-verbal Communication

There are different types of non-verbal communication. However, the most important types are as follows:

Facial Expressions: We can use the facial expressions to express a variety of emotions without saying a word (Fig. S1.5). Since the facial expression is the true expression of a human being, it is considered universal. It is, therefore, the facial expressions for happiness, sadness, anger, surprise, fear and hatred that are the same in all cultures across the world.



Fig. S1.5 Facial expressions

Body Movements and Postures: The way we walk, move, sit, stand up or hold something affects the people around us. A student sitting on the bench with his/her head down shows his inattentiveness to the lecture. Similarly, when someone droops his shoulders, it indicates that he/she is either sad or stressed. Standing up straight can help us feel positive and confident.

Gestures: Gesture refers to the movement of the hands, arms, head, etc. to express an idea or feeling. We use different types of gestures in our day-to-day life. Moving your head up and down during a conversation indicates that you are agreeable and interested. When a person nods while speaking to others indicates that he/she wants to convince others to agree with what he/she is saying. We should remember that the meaning of gestures may differ with different cultures and regions, so we should be very careful while using gestures.



Eye contact: Our eyes are the most important tools of non-verbal communication. The way we look at someone can communicate many things, including interest, affection, hostility¹ and attraction. Eye contact is also very important in maintaining the flow of conversation and gauging the other person's response. A steady gaze creates a mixed bag of emotions. If you say something looking into the eyes of the person you are talking to, it creates a feeling of trust. If you stare at someone, who is not known to you, may create a feeling of fear or threat.

Touch: We can communicate a lot just by a simple touch. It can also reveal our intention. You become confident when your teachers or parents give a pat on your shoulder. When you are sad or stressed, a warm hug from your friend may relax you for a moment. Similarly, a firm handshake gives you a feeling of trust.

Space: In non-verbal communication, space refers to the distance between the communicator and the audience. Personal space refers to the immediate area around a person through which they feel ownership and safety. We don't like anybody to intrude into our personal space. How would you feel, when someone unknown to you, comes very close to you to convey something? Of course, you will not like it. However, space differs from person to person depending on the culture, the situation and the closeness of the relationship.

Paralanguage: Paralanguage refers to how one communicates with others. It includes the tone, speed and volume of our voice. When someone speaks fast we assume that he/she is happy or excited. On the other hand, speaking slowly indicates sadness. It's not just what you say, it's how you say it. Using paralanguage intentionally and appropriately can make our communication more effective. We can alter the tone and speed of our voice to change the meaning of what we orally say. By speaking loudly we can emphasise our message.

Advantages of Non-verbal Communication

According to an estimate, around 70 to 80 per cent of communication is non-verbal. Let's know about some advantages of non-verbal communication.

Complementary to Verbal Communication: Some non-verbal indications add meaning to a verbal message and make it more effective. For example, when you encourage someone and give a few pats on his/her back simultaneously, it has a great effect. Similarly, when you convince someone by holding his/her hand, it is going to be more effective. Thus, non-verbal communication is complementary to verbal communication.

- **Simple and Easy:** Non-verbal communication is simple and easy. Since non-verbal communication does not require words, anyone can use it.
- **Help to Differently-abled:** It is a great help to differently-abled people especially those who have difficulties in speaking or hearing. Such people can use non-verbal cues² for communication.
- **No Cost:** Non-verbal communication does not incur any cost as in the case of verbal communication.

¹ **Hostility:** Aggressive or unfriendly feelings or behaviour

² **Cues:** An action or event that is a signal for somebody to do something

- **Substitution to Verbal Communication:** Sometimes, the verbal message cannot reach the target audience due to noise, long distance or technical problems. In this case, non-verbal cues act as a substitution. For example, you can put your finger on your lips to ask other people to keep quiet if they are quite away from your place.
- **Reducing Wastage of Time:** Non-verbal communication is instant, i.e., takes almost no time to reach the receiver. Therefore, it helps us reduce the wastage of time in communication.

Disadvantages of Non-verbal Communication

You studied the advantages of non-verbal communication. But it has some disadvantages too. Let's know about some of its disadvantages.

- **Non-universal:** Gestures used in non-verbal communication are not universal. They differ from culture to culture and region to region. It means the meaning of a particular gesture used in one culture or region can be different in other cultures or regions.
- **Not Suitable for Crucial Matter:** Non-verbal communication is not suitable for crucial matters. It is difficult for a manager to discuss the planning and strategies of the company using non-verbal cues. Similarly, the heads of two different countries cannot discuss the crucial policies instead non-verbal communication.
- **Confusing:** Sometimes, there are some inconsistencies between the facial expression of the speaker and what he says. At this moment, it becomes difficult to understand the actual message. Since everything happens simultaneously, it may be confusing to try to keep up with everything.
- **Less Influential for Public Speaking:** Non-verbal communication is less influential in addressing a public gathering. In a public gathering, it is not possible for every person to notice the gestures of the communicator. So, it cannot create an impression on the listeners.
- **Lack of Rules:** There are no predefined rules or structures for non-verbal communication. In most cases, people unconsciously and habitually engaged in non-verbal communication by moving various parts of the body.

Tips for Improving Non-verbal Communication

Let's discuss how to improve non-verbal communication.

- Keep a simple smile on your face while talking to someone. It will make the listener feel more comfortable.
- While listening, you should nod to indicate that you are listening seriously.
- Maintain a good posture, stand straight with shoulders back, relaxed and feet shoulder width apart.
- Do not keep your arms crossed or keep your hands in your pocket. While standing, keep your hands by your sides.
- Use hand gestures to emphasise your words. Your gestures should match your words.
- Use positive gestures to sway³ your audience. Do not point your finger at anyone.

³ Sway: To move slowly from side to side



Visual Communication

You must have heard the old saying 'A picture is worth a thousand words'. It means something that can be expressed using just a picture, needs many words to express the similar meaning. Visual communication is a form of communication in which messages are interchanged only through pictures and symbols. Some other visual aids such as graphs, charts, maps, emotions, etc. are also used in visual communication. Visual communication does not use any language, so it is easy for everyone to use it. The tools used in visual communication are consistent across the world. Let's take examples.

The signs and symbols used on the roads for the smooth movement of traffic and pedestrians are examples of visual communication. These signs and symbols are consistent across the world. (Fig. S1.6). A driver can easily and quickly notice and understand their meaning while moving fast on the road.

Apart from traffic signs and symbols, there are several other signs and symbols used at different places. The signs used in shopping malls also say a lot. Look at the symbols given alongside (Fig. S1.7). These signs are used in shopping malls. The signs used in shopping malls are consistent all across the world to avoid confusion.



Fig. S1.6 Signs and symbols used for movement of traffic



Fig. S1.7 Signs used in shopping mall

Advantages of Visual Communication

Visual communication has many advantages. Let's discuss some of them.

- **Consistency in Symbols:** The signs and symbols used in visual communication are used in the same way across many places. Therefore, it removes the chances of any kind of ambiguity in use.
- **Immediate:** It means you can understand the information conveyed by a symbol immediately and respond quickly. For example, if a driver sees a symbol of a speed-breaker, he/she immediately slows down his/her vehicle.
- **Simple and Easy to Remember.** The information conveyed through visual communication is simple and easy to remember. Once you get to know the meaning of a symbol, you are unlikely to forget it.
- **Conserve Time:** Conveying something directly may take some time to understand. For example, a flowchart of instructions to make a recipe helps people understand the method quickly. But, if the instructions are given in writing, it will take some time to understand. Thus, visual communication can also help you conserve your time.
- **No Language Barrier.** Symbols can be understood by anyone, there is no language barrier.



Disadvantages of Visual Communication

Visual communication has some disadvantages too. Let's know about some of them.

- **Limited Use:** Visual communication can be used only for limited purposes, i.e., you cannot present a subject matter, plan or policy through visual communication.
- **Not Suitable for Detailed Information:** It is quite difficult to discuss something in detail through visual communication. For example, if you want to discuss a whole concept or idea, it will be difficult for you to use visual communication.
- **Need for Efficiency:** Complex drawings, charts, graphs and data presented through visual aids can be difficult for common people to understand. Thus, it requires some kind of efficiency to present and understand such information.
- **Distracting:** A lot of signs and symbols can be distracting for the viewers. For example, if you see many signs and symbols in one place, you may get distracted.
- **Costly:** To present information through visuals, you need some tools and articles such as graph paper, drawing sheets, colors, placards, charts, drawing boards, sketch pens, etc. which are costly.

FACTBOT

Visual communication is considered the **oldest** form of communication. Cave paintings found in different parts of the world are proof of this statement. Some of these paintings date back to roughly 40,000 years ago.



Write T for True or F for False.

1. Communication is always a two-way process.
2. In oral communication, the participating members do not have to wait for getting feedback.
3. The meaning of a gesture can be different in different cultures or regions.
4. Paralanguage includes the tone, speed and volume of our voice.
5. The signs and symbols used on the roads for the smooth movement of traffic and pedestrians are examples of visual communication.

PROCESS OF COMMUNICATION

The communication process refers to conveying and receiving messages between two or more individuals or entities in an easy-to-understand format. The communication process starts with the person who transmits the message through a channel or medium to the receiver. The receiver gives the feedback in the form of a message or appropriate signal in the given time frame to continue the communication (Fig. S1.8).

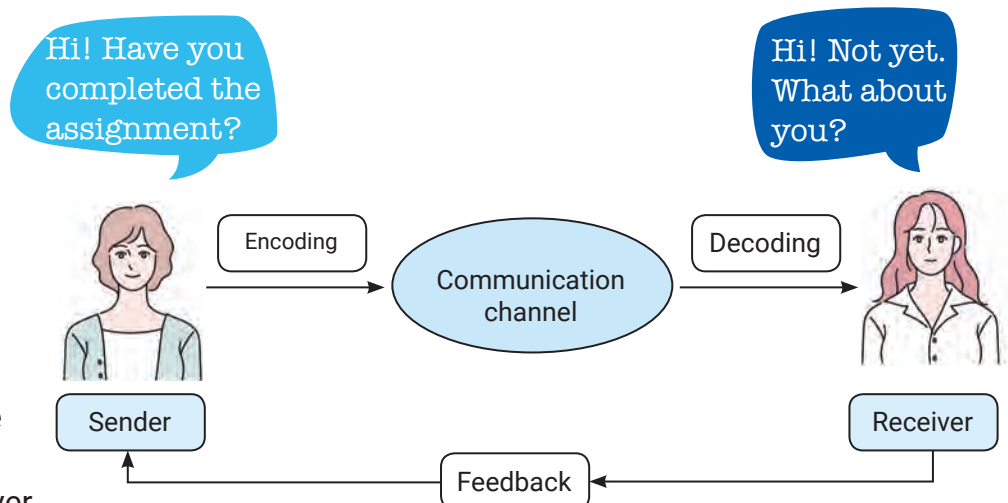


Fig. S1.8 Communication Process and Its Elements



Elements of Communication Process/Cycle

A communication process/cycle, be it face-to-face, written text, by telephone or by any other means, has some elements like sender, message, encoding, channel or medium, receiver, decoding and feedback. Let's learn about these elements, in detail.

- **Sender:** The process of communication starts with the sender. The sender uses different types of means of communication to share his/her thoughts. Thus, the communication cycle begins as soon as the sender conveys his/her thoughts using a certain format.
- **Message:** A message refers to the information the sender wishes to convey to the receiver.
- **Encoding:** When the sender of the message becomes quite clear about what information or idea that he/she wants to convey to the receiver, then he/she begins to transmit the message. It is also known as **encoding**. The nature of the message can change depending on the medium you use and the receiver for which it is meant. For communication to be successful, the listener or the reader must understand the transmitted message.
- **Communication Channel:** Apart from face-to-face conversation, the media such as letter, e-mail, telephone, poster, notice, newsletter, chat, blog, newspaper, book, etc. that we use for communication are referred to as communication channels.

Before starting communication with someone, one should pay close attention to the communication channel. When the school administration wants to convey any message to the students, they stick a notice on the noticeboard. When the government wants to convey a message to the people, they publish the message in newspapers or broadcast it through radio or news channels. It is imperative to consider the medium used for information transmission while encoding the message, otherwise, it fails to reach the audience effectively. Besides, we should consider the following factors while choosing the right communication channel:

- Target audience
 - Costs
 - Kind/type of information
 - Urgency/priority
- **Receiver:** The process of communication cannot take place unless the message reaches the correct receiver. Whenever a sender writes or says or sings or expresses anything, it is meant to be read or understood. The message cannot be fruitful if the receiver fails to understand the purpose and intent of the message.
 - **Decoding:** When the receiver gets the message, the process of decoding begins. Decoding means reading the message the way it is meant. It does not matter how well the message is encoded, it will fail to make an impact if the receiver does not understand it.
 - **Feedback:** The receiver's response to the message is termed as **feedback**. Communication does not stop just after decoding the message. After a message is decoded, there is a need for the communication to keep moving. The communication process is continued through feedback.



Form a group of four students. Two of them will communicate each other. The third student will act as a communication channel; for example, they can write short notes on chits and the third student can collect and deliver the chits. The fourth student will write the different elements of the communication cycle.

After this activity is over, they will talk about the importance of each element of the communication cycle.



PERSPECTIVES IN COMMUNICATION

Perspectives are ideas, views or fixed ways of thinking. These sometimes affect our communication. For example, if you have a fixed idea that your teacher or father is strict, even when they are being friendly, you may think they are scolding you even though they are polite. In the same way, others may also have fixed ideas about you, which affects whatever you say to them.

A communication perspective focuses on the way in which our shared meanings and practices are constituted through language and symbol, the construction of messages and their dissemination⁴ through media, organisations and society. We all come to each communication exchange with our own 'filter' through which we see the world, the person we are communicating with and the situation or topic we are communicating about. These filters mean that we don't always start with the same perspective as the person we are communicating with.

Factors affecting Perspectives in Communication

Sometimes, we are not able to communicate clearly because of barriers that stop us from sharing and understanding messages. Some common factors that affect our perspective are as follows:

- **Visual Perception:** Visual perception is the ability to see and interpret (analyse and give meaning to) the visual information that surrounds us. The brain can make a sense of what we see through our eyes. For example, completing partially drawn pictures by visual perception whereas they can be something else. For example, in the figure given on right side, the line A seems smaller than line B whereas both are of equal size. Similarly, in the figure given on right side, some people will see two persons face-to-face, while some people will see a vase (Fig. S1.9).
- **Language:** The different perspectives we experience can be with language, as well. Some words used in one language may have different meanings in another language. Also, the regional dialect may affect the understanding at times. In case of the use of incorrect words, unfamiliar language and lack of detail, language can act as a barrier to communication that one wishes to convey. For example, language can act as a barrier when an Indian who only knows Hindi and a Chinese who knows Mandarin only, want to interact with each other.
- **Past Experience:** Letting our earlier experience stop us from understanding or communicating clearly. For example, 'The boy did not answer me last time, I should not ask him anything.' or 'The teacher was rebuking a student a while ago, he must be very angry, let's not ask him any doubt today.'
- **Prejudice:** Prejudices occur when we take an isolated experience with one 'type' of person and then act as if all encounters in the future with people of the same 'type' or with the same characteristics



Fig. S1.9 Figures with Visual Perception

⁴ Dissemination: The act of spreading information or knowledge so that it reaches many people



will result in the same experience. Fixed ideas, such as thinking, 'No one in my class likes me.' may stop a student from communicating openly in the class.

- **Feelings:** Our feelings and emotions, such as lack of interest or not trusting the other person, affects communication. For example, 'I am not feeling well, therefore, I don't want to talk.' There are two ways in which your feelings can influence your communication with another person. The first simply refers to the way that you feel on a given day; if you feel well, you'll communicate in one way and if you feel ill, you will communicate in another way. The second aspect related to feelings refers to how you feel about a specific person.
- **Environment:** The last area of influence on communication is your environment. All of us communicate differently in different environments. Do you speak to your teachers the same way that you do to your friends? Do you talk to strangers with more or less formality than people you know well? Noise or disturbance in the surroundings may make communication difficult. For example, speaking to a friend in a function where there is loud music being played by the orchestra.

WRITING SKILLS RELATED TO COMMUNICATION

Written communication plays a significant part in our lives. We write letters, e-mails, text messages, answers in exams, etc. Professionals write books, articles, journals, magazines, reports and so on. Thus, developing a good writing skill is a must for everyone. Let's learn about a few important aspects of writing skill.

Phrases

A sentence is a group of words that makes complete sense. It has a subject and at least one finite verb. A **phrase** is a group of words that make sense but not complete sense. It neither has a finite verb nor a subject.

Kinds of Phrases

According to their functions in a sentence, phrases are of the following three kinds:

- Adjective phrases
- Adverb phrases
- Noun phrases

Adjective Phrases

A phrase that acts as an adjective in a sentence is called an **adjective phrase**.

For example,

- She does not like **action** movies. (adjective)
She does not like movies **with lots of action**. (adjective phrase)
- **Wooden** furniture is beautiful. (adjective)
Furniture **made of wood** is beautiful. (adjective phrase)
- Dr A.P.J. Abdul Kalam was a **wise** man. (adjective)
Dr A.P.J. Abdul Kalam was a **man of wisdom**. (adjective phrase)



Adverb Phrases

A phrase that acts as an adverb in a sentence is called an adverb phrase.

For example,

- The children crossed the road **carefully**. (adverb)
The children crossed the road **with care**. (adverb phrase)
- After marriage, he settled **abroad**. (adverb)
After marriage, he settled **in a foreign land**. (adverb phrase)

Noun Phrases

A phrase that acts as a noun in a sentence is called a **noun phrase**.

For example,

- **The lively painting** she made was excellent.
- **Following the traffic rules** is a must to avoid accidents.

Kinds of Sentences

Based on the **sense** that sentences make, we can divide them into four types. These are as follows:

1. Declarative Sentences or Assertive Sentences
2. Interrogative Sentences
3. Imperative Sentences
4. Exclamatory Sentences

Declarative Sentences or Assertive Sentences

A sentence that makes just a statement is called a **declarative** or **assertive** sentence. A declarative sentence ends with a full stop. Look at the following examples:

1. India is the sixth-largest country in the world.
2. We have won the match.

A declarative sentence can be an affirmative sentence or a negative sentence.

Affirmative sentence: A declarative sentence that is positive in sense is called an **affirmative** sentence.

Negative sentence: A declarative sentence that is negative in sense is called a **negative** sentence.

A negative sentence contains the word 'not' or 'no'.

Look at the following examples of both the types:

1. Rose is a beautiful flower. (Affirmative sentence)
2. He is **not** a good player. (Negative sentence)

Interrogative Sentences

A sentence that enquires about something is called an **interrogative** sentence. It is followed by a mark of interrogation. Look at the following examples:



1. What is your name?
2. Are you a doctor?

Interrogative sentences can be grouped into 'wh-questions' and 'yes/no questions'.

Interrogative sentences that start with **what, who, when, why, which, whose, whom, where, how**, etc. are called 'wh-questions'.

Interrogative sentences that take the answer in yes/no are called 'yes/no questions'.

Look at the following examples:

1. When did they reach Mumbai? (wh-question)
2. Are they well now? (yes/no question)

FACTBOT

Rhetoric questions are not questions, they are forceful statements. They are used to convey a fact. They do not require any answer. Look at the following examples:

- What is more precious than health? (It means health is most important.)
- Who knows the future? (It means nobody knows the future.)



Imperative Sentences

Sentences which are used to express command, request or advice are called **imperative** sentences. Usually, 'you' acts as a subject in imperative sentences but it is not mentioned. Look at the following sentences:

1. Get out of my class. (Order)
2. Please, give me a glass of water. (Request)
3. Keep patience. (Advice)

Exclamatory Sentences

Sentences that are used to express a sudden feeling or emotion such as surprise, grief, anger, disgust, delight, etc. are called **exclamatory** sentences. An exclamatory sentence ends with an exclamation mark. Look at the following examples:

1. What a beautiful gift it is!
2. How boring it is!
3. How intelligently she played!

FACTBOT

Sentences that are used to express desires or wishes were earlier called **optative** sentences. But nowadays, these sentences are considered **exclamatory** sentences. Look at the following examples:

- May our country live long!
- Oh, I was a king!



Parts of a Sentence

A sentence has two parts: a **subject** and a **predicate**.

The **subject** is the part of a sentence that tells us about what or whom the sentence is. The part of a sentence that tells something about the subject is called the **predicate**. Look at the following examples:

1. **Kavya** studies in a college.
2. **Lucknow** and **Prayagraj** are major cities of Uttar Pradesh.

In the above sentences, the colored parts are subjects and the rest are predicates.

Some important points regarding subject and predicate are as follows:

- A subject can be of one word or more than one word. For example,
 1. **Sheetal** is our teacher. (one word)
 2. **The woman in pink sari** is our Principal. (more than one word)
- Usually, a subject is placed at the beginning of a sentence. However, it can be placed after the verb in the sentence.
 1. **A fountain** is in the middle of the park.
 2. In the middle of the park is **a fountain**.
- A predicate can also be of one word or more than one word.
 1. Both the children **laughed**. (one word)
 2. They **were of the same class**. (more than one word)
- In an imperative sentence, the word (you) is usually hidden. In this case, 'you' is considered as the subject of the sentence.
 1. Kindly, **(you)** grant me two day's leave.
 2. **(You)** Learn to accept your mistakes.

Parts of Speech

As we have already learnt about sentences, let us take a look at parts of a sentence. A sentence consists of one word or more than one word. Each word used in a sentence has some meaning and purpose. These words are categorised into eight groups and we study these groups under the heading 'Parts of speech'. There are eight groups under the parts of speech (Fig. S1.10). Let's study these groups.

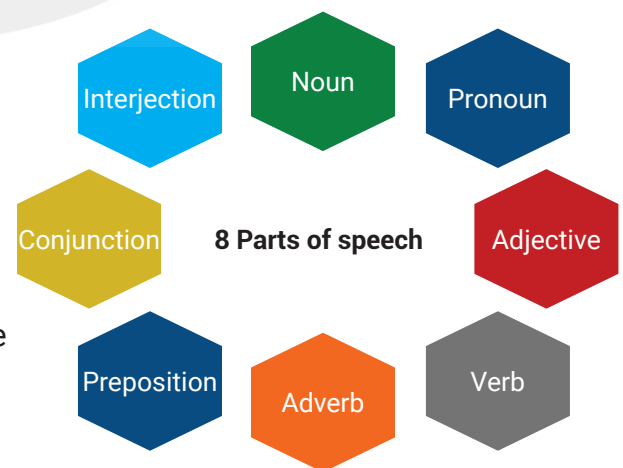


Fig. S1.10 Parts of speech

Noun

Noun is the name of a person, a place, an animal or a thing. Look at the following examples:

1. boy, Rohit, father, son, girl, mother names of persons
2. village, town, Jaipur, park, country names of places



3. cat, dog, alligator, parrot, fish, dolphin names of animals
4. bat, television, bread, car, skirt, desk names of things

All the colored words are nouns.

FACTBOT

The name of a particular person, place, animal or thing is called the **proper noun**. A proper noun always starts with a capital letter. In the above examples, the nouns Rohit and Jaipur are proper nouns.



Pronoun

A word that comes in place of a noun is called a **pronoun**. Look at the following examples:

1. **Aarav** is playing in the field. **He** is my best friend.
2. **A girl** is in the classroom. **She** is waiting for the teacher.
3. **Chandigarh** is a beautiful city. **It** is the capital of both Punjab and Haryana.
4. I ate **an apple**. **It** was so sweet.
5. **Aarushi** and **I** are in the same class. **We** like to study computers.
6. **Rohan** and **Ananya** are in the park. **They** are playing badminton.
7. Yes, come in **Aditi**. **You** are late today.



TALKBOT

What is the need for pronouns if we can repeat the noun in the next sentences? Discuss in a group and find out.

In the above examples,

He has come in place of **Aarav**.

She has come in place of **a girl**.

It has come in place of **Chandigarh**.

It has come in place of **an apple**.

We has come in place of **Aarushi** and **I**.

They has come in place of **Rohan** and **Ananya**.

You has come in place of **Aditi**. ('You' is used for a person or persons to whom we are talking.)

Thus, 'He', 'She', 'It', 'We', 'They' and 'You' are pronouns.

Adjective

A word that qualifies a noun or pronoun is called an **adjective**. Look at the following examples:



1. Sharat is an **intelligent** student.
2. She is **studious**.

In the given examples, the word 'intelligent' qualifies the noun 'student' and the word 'studious' qualifies the pronoun 'she'. Therefore, the words 'intelligent' and 'studious' are adjectives.

Some more examples of adjectives:

1. **Indian** vaccines are effective.
2. **Five** children entered the park.
3. **Every** girl gets an award.
4. I went there in **my** car.
5. **This** house is not good for me.

All the colored words used in the above sentences are adjectives.

Verb

A word used to denote an action or state of a noun or pronoun is called a **verb**. The verb is also used to show possession. Look at the following examples:

1. They **went** to the market.
2. She **is** happy.
3. He **has** a car.

In the first sentence, the word 'went' denotes an action. In the second sentence, the word 'is' denotes the state 'happy'. In the third sentence, the word 'has' denotes possession. Therefore, the words 'went', 'is' and 'has' are verbs.

Adverb

A word that qualifies a verb, an adjective or another adverb in a sentence is called an **adverb**. Look at the following examples:

1. Surbhi is running **slowly**.
2. Anisha is **very** beautiful.
3. Rohit is drawing the diagram **very** carefully.

In the first sentence, the word 'slowly' is qualifying the verb 'running'. In the second sentence, the word 'very' is qualifying the adjective 'beautiful'. In the third sentence, the word 'very' is qualifying the adverb 'carefully' therefore, the words 'slowly' and 'very' are adverbs.

Preposition

A word placed before a noun or pronoun to denote its relation with some other word in the sentence is called a **preposition**. Look at the following examples:

- The vase is **on** the table.



- She is going **to** the park.

In the first sentence, the word 'on' is denoting the relation of noun 'vase' with the other noun 'table'. In the second sentence, the word 'to' is denoting the relation of pronoun 'she' with the noun 'park'. Therefore, the words 'on' and 'to' are prepositions.

Conjunction

A word that connects words, phrases and sentences is called a **conjunction**. Conjunction is also called a **joining word**. Look at the following examples:

1. Kavya **and** Soumya are sisters.
2. It was partly a cloudy **but** warm day.
3. Amit ate a burger **that** I had brought.

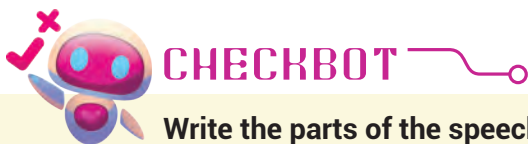
In the first sentence, the word 'and' connects two words 'Kavya' and 'Soumya'. In the second sentence, the word 'but' connects the two phrases 'a cloudy' and 'warm day'. In the third sentence, the word 'that' connects the two sentences 'Amit ate a burger' and 'I had brought'. Therefore, the words 'and', 'but' and 'that' are conjunctions.

Interjection

A word that denotes a sudden feeling is called an **interjection**. It is followed by an exclamation mark. Further, it is usually followed by a sentence that clears the meaning of the expression. Look at the following examples:

1. **Hurrah!** We have won the match.
2. **Ah!** My knee is aching.

In the first sentence, the word 'Hurrah!' denotes the feeling of joy. In the second sentence, the word 'Ah!' denotes the feeling of pain or grief. Therefore, the words 'Hurrah!' and 'Ah!' are interjections. Some other interjections are 'Oh', 'Alas', 'Bravo', etc.



Write the parts of the speech of the highlighted words.

1. **Shimla** is a beautiful city.
2. I ate a mango. **It** was so sweet.
3. Parth runs **very** fast.
4. We **went** to watch a movie.
5. The cat is **under** the table.
6. Both the mother **and** the child are healthy.



Use of Articles

In English, we use three words 'a', 'an' and 'the' to specify a noun. These words are called **articles**.

Articles are of two types:

- Indefinite articles
- Definite articles

Indefinite Articles

Articles 'a' and 'an' are called **indefinite articles**. They are used before a noun that is general or when its identity is not known. Look at the following examples:

- There is **a** temple on the hill.
- There is **an** apple in the basket.

Uses of 'a' and 'an'

The uses of indefinite article 'a' and 'an' are as follows:

- 'A' and 'an' are used before a singular noun.
- 'A' is used before a noun that begins with a consonant sound, for example, a boy, a dolphin, a house, a giraffe.
- 'An' is used before a noun that begins with a vowel sound, for example, an apple, an elephant, an inkpot, an orange, an umbrella.
- 'A' is also used before a noun that begins with a vowel but is pronounced as a consonant sound or 'Eu', for example, a European, a university, a US leader.
- 'An' is also used before a noun that begins with the letter 'h', but 'h' remains silent to make it a vowel sound, for example, an honest man, an hour, an heir, an hourly rate.
- 'An' is used before an abbreviation that begins with a consonant but sounds like a vowel, for example, an MLA, an M.Ed., an NCC cadet.

Definite Article

Article '**the**' is called **definite article**. It is used before a specific noun or a noun about which the reader is already aware.

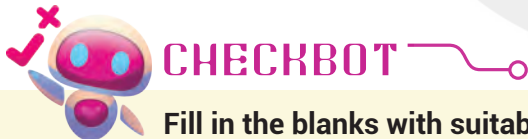
Uses of 'the' article

'The' is used:

- before nouns about which we have discussed earlier or whose identity is known to the reader, for example,
 - **The** pen you gave me is beautiful.
 - **The** film we saw yesterday was a thriller.
- before a singular noun to indicate the whole class, for example:
 - **The** tiger is a ferocious animal.
 - **The** man is mortal.



- to indicate a particular person or thing, for example:
 - **The** man in a white shirt is a doctor.
 - **The** house of Mr Sindhu is very big.
- before a noun that is unique or extraordinary, for example: **the** Sun, **the** Earth, **the** Moon, **the** universe, **the** equator, etc.
- before the names of rivers, for example: **the** Ganga, **the** Thames, **the** Nile, **the** Amazon, etc.
- before the names of mountain ranges, for example: **the** Himalayas, **the** Alps, **the** Aravalis, **the** Vindhyas, etc.
- before the names of gulfs, canals, seas and oceans, for example: **the** Bay of Bengal, **the** Panama Canal, **the** Dead Sea, **the** Pacific Ocean, etc.
- before the names of well-known buildings, for example: **the** Taj Mahal, **the** India Gate, **the** Red Fort, **the** Jantar Mantar, etc.
- before the names of holy books, for example: **the** Gita, **the** Guru Granth Sahib, **the** Bible, **the** Quran, etc.
- before the names of newspapers, for example: **the** Times of India, **the** Mirror, **the** Telegraph, **the** Hindu, etc.
- before countries, if the name contains a common noun, for example: **the** United States, **the** United Kingdom, **the** United States of Emirates, etc.
- before the names of musical instruments, for example: **the** guitar, **the** tabla, **the** harmonium, etc.



Fill in the blanks with suitable articles.

1. There is apple in the fridge.
2. Have you ever seen lion?
3. Could you give me glass of water?
4. pen I had borrowed from you is lost.
5. What beautiful planet Saturn is?

Construction of a Paragraph

A **paragraph** is a collection of sentences that are ordered and make complete sense about a single topic.

A paragraph may have content such as:

- A variety of brief examples or a single long explanation of a general topic.



- A description of a place, character or process.
- The narration of a series of events.
- The contrast between two or more things or comparison.
- Cause and effects of an event.

Structure of a Paragraph

The structure of a paragraph mostly has three parts: introduction, body and conclusion. You will always see this pattern of structure despite the nature of content a paragraph may carry such as narrating, describing, comparing-contrasting or analysing. Let's learn about these parts.

Introduction: It is the introduction to the concerned topic, i.e., the first section of the paragraph.

Body: It further explains the concerned topic, briefly with ideas, facts, arguments, analysis, study, examples, experiment and other information.

Conclusion: It is the final section of a paragraph which concludes the topic indicating a connection between the body and the overall idea of the topic for further deliberation by the reader.



ACTIVITYBOT

Make groups of five students each. Each group will prepare a questionnaire based on the topics discussed in the chapter. Each group will then give a copy of the questionnaire to other groups to solve the questions. After each group solves the questions, the teacher will check the answers and allot marks. The group which gains maximum marks will win.



AI GLOSSARY

- **Communication:** The act of exchanging information, idea, opinion, etc. between two or more people
- **Encoding:** Converting a message into expression
- **Communication Channel:** Instruments or devices through which messages are sent
- **Decoding:** Reading and understanding the message
- **Feedback:** Response given by receiver to the sender of the message
- **Verbal Communication:** Communication in which words are used
- **Non-verbal Communication:** Communication in which gestures and body language are used instead of words
- **Visual Communication:** Communication in which images, signs and symbols are used
- **Sentence:** A set of words that makes complete sense
- **Declarative or assertive sentence:** A sentence that makes just a statement
- **Interrogative sentence:** A sentence that enquires about something
- **Imperative sentences:** Sentences which are used to express command, request or advice



- **Exclamatory sentences:** Sentences that are used to express a sudden feeling or emotion such as surprise, grief, anger, disgust, delight, etc.
- **Phrases:** A group of words that make sense together but not complete sentence
- **Articles:** The three words 'a', 'an' and 'the' to specify a noun



AI SUMMARY

- The word 'communication' comes from the Latin word *commūnicāre*, meaning 'to share'.
- Every communication involves (at least) one sender, a message and a recipient.
- The ability to communicate information accurately, clearly and as intended, is referred to as communication skill.
- Communication process refers to conveying and receiving of messages between two or more individuals or entities in an easy-to-understand format.
- Verbal communication is of two types: oral and written.
- Exchange of words through speaking is called oral communication.
- A form of communication in which messages are exchanged between two or more people using written or printed words is called written communication.
- Non-verbal communication is a wordless form of communication which involves some other means such as body language, gestures and so on.
- Paralanguage refers to the manner in which one communicates with others. It includes the tone, speed and volume of our voice.
- Visual communication is a form of communication in which messages are exchanged only through pictures and symbols.
- A communication process, be it face-to-face, written text, by telephone, or by any other means, it has some elements like sender, message, encoding, channel or medium, receiver, decoding and feedback.
- Based on the sense that sentences make, we can divide the sentences into four types. These are: Declarative Sentences or Assertive Sentences, Interrogative Sentences, Imperative Sentences and Exclamatory Sentences.
- A sentence that makes just a statement is called a declarative or assertive sentence.
- A sentence that enquires about something is called an interrogative sentence.
- Sentences which are used to express a sudden feeling or emotion are called exclamatory sentences.
- Sentences which are used to express command, request or advice are called imperative sentences.
- A sentence has two parts: a subject and a predicate.
- There are eight groups under the parts of speech, which are noun, pronoun, verb, adverb, adjective, preposition, conjunction and interjection.



- Articles 'a,' and 'an' are called indefinite articles.
- Article 'the' is called definite article. It is used before a specific noun.
- According to their functions in a sentence, phrases are of three kinds.
- A phrase that acts as an adjective in a sentence is called an adjective phrase.
- A phrase that acts as an adverb in a sentence is called an adverb phrase.
- A phrase that acts as a noun in a sentence is called a noun phrase.
- The structure of a paragraph mostly has three parts: introduction, body and conclusion.



EXERCISEBOT

A. Tick (✓) the correct option.

- Which language does the word 'communication' originates from?

a. Roman	<input type="radio"/>	b. Latin	<input type="radio"/>	c. Arabic	<input type="radio"/>	d. Greek	<input type="radio"/>
----------	-----------------------	----------	-----------------------	-----------	-----------------------	----------	-----------------------
- Which of the following is not an example of verbal communication?

a. Communication through e-mail	<input type="radio"/>
b. Communication over telephone	<input type="radio"/>
c. Communication through WhatsApp	<input type="radio"/>
d. Communication through body language and gestures	<input type="radio"/>
- In which type of communication images, signs and symbols are used in place of words?

a. Visual communication	<input type="radio"/>	b. Verbal communication	<input type="radio"/>
c. Non-verbal communication	<input type="radio"/>	d. All of these	<input type="radio"/>
- Which of the following refers to feedback in communication process?

a. Choosing a channel	<input type="radio"/>	b. Decoding a message	<input type="radio"/>
c. Receiver's response to the message	<input type="radio"/>	d. None of these	<input type="radio"/>
- Which of the following is not a sentence?

a. I am happy.	<input type="radio"/>	b. She	<input type="radio"/>
c. Is you are?	<input type="radio"/>	d. Are you sad?	<input type="radio"/>

B. Fill in the blanks.

- Every communication involves (at least) one sender, a and a recipient.
- Face-to-face conversation is the most common method of communication.
- Non-verbal communication is a form of communication which involves some other means such as body language, gestures and so on.
- A sentence has two parts: a subject and a
- Articles and are called indefinite articles.

C. Write T for True or F for False.

- An employer does not like an employee who can communicate properly within the organisation as well as with the clients or customers.



2. A message is worthless if the content of the message is not understood by the receiver, the way it is intended.
3. When the receiver gets the message, the process of decoding begins.
4. Visual perception is the ability to see and interpret (analyse and give meaning to) the visual information that surrounds us.
5. A declarative sentence that is negative in sense is called an affirmative sentence.

D. Short answer questions.

1. What do you mean by communication?
2. Name the different elements of a communication process.
3. What is feedback in a communication process?
4. How can you say that written communication saves time?
5. What do you mean by paralanguage?
6. The symbols used in visual communication are consistently used at many places. How is this feature advantageous?
7. What are the different parts of speech?
8. What do you mean by phrase?

E. Long answer questions.

1. Write the advantages of communication skills.
2. How does verbal communication differ from non-verbal communication?
3. Write the advantages of oral communication.
4. Describe any four tips to improve written communication.
5. Explain the role of gesture and body language in non-verbal communication.
6. Write a note on visual communication.
7. Write a note on parts of speech.
8. What are articles? Write a brief note on use of articles.
9. How do you construct a paragraph?
10. Write a note on the factors affecting perspectives in communication.





CHAPTER 2

SELF-MANAGEMENT SKILLS

In this chapter

- Introduction to Self-management
- Positive Results of Self-management
- Self-management Skills
- Factors that Help in Building Self-confidence
- Self-confidence Building Tips

INTRODUCTION TO SELF-MANAGEMENT

All humans do not feel the same way all the time. Sometimes they are happy, while may feel low or anxious at other times. It is absolutely okay to not feel okay sometimes. However, we should not be bogged down¹ by the low points. Self-management skills help us overcome our fear and anxieties and help us to manage our emotions and work.

Self-management is the ability to prioritise goals, decide what must be done and be accountable to complete the necessary actions. It is needed by everyone around us and it is needed at all stages and walks of life. A self-managed person is like a tree that is taking care of himself/herself and is also helping others to lead a comfortable life. It is also important for studies. Self-management includes goal setting, planning and managing your time. It involves understanding yourself, understanding what your interests and abilities are, having a positive attitude and grooming yourself in order to develop self-confidence. It is taking the responsibility for one's own behaviour and well-being. It also means managing with the people and resources around you.



Fig. S2.1 Self-management

POSITIVE RESULTS OF SELF-MANAGEMENT

Self-management aims at conducting oneself for the greater good of the individual, family and society. A self-managed person not only manages himself well but also behaves responsibly towards people around. Self-management is needed by everyone around us and it is needed in all stages and walks of life.

Self-management can help us in:

- developing good habits
- overcoming bad habits
- achieving your goals
- overcoming challenges

SELF-MANAGEMENT SKILLS

There are various self-management skills to develop various aspects of human life. Let's discuss some of these.

¹ **Bogged down:** Not able to make any progress



Self-awareness

Self-awareness begins with knowing yourself. You must ask yourself who you are, what you like, what you do not like, what your beliefs are, what your opinions are, what your background is, what you can do well and what you cannot do well. Do you know your strengths and weaknesses? A strength and weakness analysis helps you in this process. Strength and weakness analysis begins by knowing and understanding oneself.

Strengths or abilities are the areas one excels at. Everybody has some strengths. For example, a person is good at solving math problems or plays cricket well, etc.

Weaknesses are the areas which need improvement. These are the areas wherein one faces difficulties. Everybody has some weaknesses too. For example, a person may not be able to wake up on time or is unable to cope with pressure, etc.

The difference between strength and weakness are as follows:

Strength	Weakness
<ul style="list-style-type: none">• People love to work on this and are enthusiastic about it	<ul style="list-style-type: none">• People tend to avoid it and dislike it when they have to do it
<ul style="list-style-type: none">• Always search for opportunities to perform this work	<ul style="list-style-type: none">• Always try to ensure that the task is not given to them
<ul style="list-style-type: none">• An atmosphere of positivity and constructiveness around them while performing	<ul style="list-style-type: none">• If tasked with, there's an atmosphere of disagreement and disinterest
<ul style="list-style-type: none">• Work is completed on time with disciplined behaviour	<ul style="list-style-type: none">• More than usual time is required and indisciplined behaviour
<ul style="list-style-type: none">• Perseverance, cheerful, agile and optimistic approach	<ul style="list-style-type: none">• Tendency to quit, sadness, unmotivated and pessimistic approach
<ul style="list-style-type: none">• Problems become miniscule and the focus is on trying to find solutions	<ul style="list-style-type: none">• Problems are exaggerated and attempts are made to evade it

By analysis of strengths and weaknesses, you can know better about yourself. You become much more than the usual understanding of identity such as name, qualification, and interpersonal relationships. By doing strength and weakness analysis, you become self-aware and understand who you are.



Think and note down your strengths and weaknesses.

Strengths	Weaknesses

Self-confidence

Self-confidence is an attitude about your skills and abilities. It means that you accept and trust yourself and have a sense of control in your life. If you are an intelligent, hardworking and talented person, but lack confidence and avoid taking initiative, then it may be difficult for others to recognise your talents. Self-confidence can be developed through changes in attitude and practice. It is a quality; we build it when we believe in our strengths to succeed in anything that we do in life. People who are confident believe that they can do anything given to them, in any situation.



Fig. S2.2 Self-confidence

The importance of self-confidence is as follows:

- **Openness to try new things:** When you believe in yourself or you have self-confidence, you will be more willing to try new things.
- **Better performance:** When you feel confident in yourself, you are able to devote your resources to the task at hand.
- **Better resilience:** Confidence or believing in yourself can enhance your resilience or ability to bounce back from any challenges or adversities you face in life.
- **Improved relationships:** Having healthy self-confidence can help keep your relationships happy and healthy.

Some qualities of self-confident people are as follows:

- **Self-belief:** In spite of struggling with repeated failures, self-confident people have resilience² and believe in oneself. The best example is of Sir Thomas Edison, who made thousands of prototypes³ of the incandescent light bulb before he could finally invent the bulb.
- **Hard work:** Self-confident people are able to work hard towards their goals. For example, Ms Dipa Karmakar was diagnosed with flat foot at the age of six. She worked hard to become the first Indian female gymnast ever to compete in the Olympics.
- **Positive attitude:** Self-confident people have a positive attitude and are always focusing on the positives even in the time of adversity. For example, the situation of losing a game can be perceived as losing something or as an opportunity to review the game strategies and improve to win in the future.
- **Commitment:** Self-confident people are more committed towards their goals. For example, Mahatma Gandhi, the leader of India's Independence Movement, was highly committed to the cause of making India free from the British Raj. He employed non-violent civil disobedience to achieve India's independence.

The steps for building self-confidence are as follows:

Step 1: Appreciate achievements and accept failures. For example, celebrate the achievements when the team wins a competition. Articulate the learnings when the team loses a competition.

Step 2: Have a goal and take steps towards it. For example, if you have won bronze at an event, set the goal to win gold medal next time and work towards it.

² **Resilience:** The ability of people or things to recover quickly after something unpleasant, such as shock, injury, etc.

³ **Prototypes:** The first design of something from which other forms are developed



Step 3: Always look at the good side and be happy. For example, if you have lost a match, celebrate the efforts of those team members who performed well. Talk to people who are confident and try to gain their outlook.

Positive Thinking

Positive thinking is one of the most important aspects that keeps you fit and also makes you a confident individual. Have you ever seen an ant that considers itself small and weak? An ant can lift weight up to 20 times its own body weight and works hard to get through each day. A positive attitude towards life can help us succeed like ants. Positive thinking requires a person to look at the good in things, observe, understand and patiently work towards improving them rather than worrying and/or looking for the bad in things.

Positive thinking leads to good results like:

- overcoming challenges,
- making you do well or making you an energetic individual,
- helping you get better at work, and
- making you and people around you happy.

To keep yourself positive, you need to **SMILE**.

- **Start your day in a positive way.** For example, exercising, reading or watching something motivating; talking to people who are positive and make you smile.
- **Manage time to relax.** For example, sit in a relaxed position and just feel how you are breathing. You can do Yoga and meditation or listen to music to relax and stay calm.
- **Imagine the best in any situation.** For example, do not keep thinking of things that are going badly, instead think of how you can make things better.
- **Learn to take feedback in a positive way.** For example, if someone gives you feedback, objectively think how it will help you to improve and start working on it.
- **Express gratitude.** For example, be thankful for all the good things you have, to people who have helped you or pat your back for the good things you have done.



ACTIVITYBOT

1. Make two groups of students. Play any game. The losing group will say positive phrases/ words to motivate themselves. Then, they will play again. Continue till they win, if possible.
2. Practise positive thinking on waking up and before going to bed.
3. Every day when you wake up, do these:
 - Look at the mirror and smile, think about your strengths.
 - Drink water, do light stretching exercise and meditate even if only for a few minutes.
 - Write your plan for the day.
4. Every day when you go to bed, do these:
 - Take a few minutes for writing what you are grateful for.
 - Write down anything you need to remember for the next day.
 - Read a warming book/listen to soft music/enjoy your favourite fragrance.



Self-motivation

Self-motivation is a force within you that drives you to do things. Self-motivation is what pushes you to achieve your goals, feel happy and improve your quality of life. There are two types of motivation:

- **External motivation:** This type of motivation is achieved as it gives you respect, recognition, opportunities to grow further, money or power.
- **Internal Motivation:** This motivation is achieved as it makes you happy, healthy, contented and feel good.



Fig. S2.3 Self-motivation

Self-motivation teaches us:

- to build strength to complete any task/work.
- not to give-up on your dreams even during difficult times.
- to stay focused and committed towards fulfilling your dreams or complete tasks/work.

Be self-motivated:

- Identify your likes and dislikes. Understand what makes you happy.
- Define the goals you want to achieve and focus all your energy on achieving your goal.
- Plan and set timelines to achieve your goals. Plan a list of activities that you will do to achieve each goal.
- Work towards achieving your goal, even when you are facing a difficult time.

Dressing and Grooming

Dressing is the process of putting on clothes whereas, grooming is the process of making yourself look neat, tidy and smart. The way you dress and groom yourself sends the message of confidence and smartness. In the first look, people can see the way we have dressed and groomed ourselves.

The advantages of dressing and grooming are:

- It helps us in looking neat and tidy.
- It makes us feel confident about ourselves.
- It helps in making a good impression of ourselves on others including customers, relatives and seniors.

Goal Setting

The process of goal setting in your life helps you decide on how to live your life, where you want to be, and how you want to be in the future. In life, we need to have a clear vision of what we will do and where we want to go. Goals are a set of dreams with a deadline to achieve them. Goal setting is all about finding and listing your goals and then planning how to achieve them.

The list can be prepared with the acronym **SMART**:

- **Specific** means something straightforward and clear. To set a goal, you must be specific. To be specific, you need to answer these six questions:



- Who is involved in the goal?
- What do I want to do?
- Where do I start?
- When do I start and finish?
- Which means do I use?
- Why am I doing this?



Fig. S2.4 Goal Setting

- **Measurable** means something that can be measured. The success you achieve can be measured. You need to answer these questions:
 - How much?
 - How many?
 - How do I know that I have achieved results?
- **Achievable** means something that can be completed. A goal must be achievable. Breaking down big goals into smaller sub-goals will make the goal achievable.
- **Realistic** means something that is real and is applicable in our lives. A realistic goal would be something that we want to achieve and can work towards it.
- **Time-bound** means the goal has to be completed within a certain period of time.

Time Management

Time management is the ability to plan and control how someone spends the hours in a day to effectively accomplish his/her goals. Time management is a thinking skill that helps you to:

- complete tasks on time.
- make a daily timetable.
- make a good estimate of how long it will take you to do something.
- submit homework and assignments before or on time.
- not waste time during the day.

Here are some tips for time management:

- Avoid delaying or postponing any planned activity.
- Organise your room and school desk.
- Develop a 'No Disturbance Zone' where you can sit and complete important tasks.
- Use waiting time productively.
- Prepare a 'to-do' list.
- Prioritise your tasks.
- Replace useless activities with productive activities.

The steps for time management are as follows:

- **Organise:**
 - Plan day-to-day activities.
 - Make a timetable that must be followed.
 - Keep your surroundings and study table clean and mess-free.
 - Put things back where they belong after using them.



- **Priorities**
 - Make a to-do list that has all the activities and rank them in the order of importance. For example, you may rank doing homework as the most important task.
 - Get the most important task done first and also track what is pending.
- **Control**
 - Control over your activities and time.
 - Avoid time-wasters like chatting on the phone, surfing gossip sites, etc. and focus on more important things.
- **Track**
 - Identify and note where you have spent your time.
 - Tracking helps you analyse if you have used your time effectively or not.
 - It also helps you in identifying time-wasting activities.



Fig. S2.5 To-do List

Factors that Help in Building Self-confidence

Realistic belief and trust in one's own judgement, capabilities and worthiness is self-confidence.

There are several factors that help in building self-confidence, which are as follows:

- **Social:** Interactions with family and social environment, like friends, relatives, teachers and media influences self-confidence of individuals. Development of confidence is a process which results from the experiences of individuals while interacting with others.
- **Cultural:** Cultural factors comprise of values, beliefs and customs. Indians give higher importance to family values, believe in the philosophy of '*Vasudhaiva Kutumbakam*' and follow custom of celebrating festivals. Conforming to cultural values, beliefs and customs enhances self-confidence.
- **Physical:** Physical self-efficacy⁴, physical activity and social physique anxiety are found to be influencing self-confidence of individuals. Physical activity is found to be directly related to self-confidence. Physical self-efficacy refers to physical potential to complete a given task. Social physique anxiety is a concern amongst individuals about perceived evaluation of one's physical self by the society.

SELF-CONFIDENCE BUILDING TIPS

Mind is like a fertile land, if you do not plant good thoughts there, weeds of negative thoughts are bound to grow.

Some tips to build self-confidence are as follows:

- **Getting rid of negative thoughts:** Going away from negative thoughts takes individuals closer to a peaceful positive mind. To travel away from negative thoughts, individuals need to involve themselves in an activity—take a walk, draw, sing, dance, chat, watch, read or talk.
- **Thinking positively:** Positive thinking brings brain to a peaceful stance⁵ and increases productivity

⁴ Self-efficacy: One's belief in one's ability to succeed in specific situations or accomplish a task



and performance. When individuals start thinking positively, they feel happy from within and their self-confidence is boosted.

- **Staying happy with small things:** An individual who is full of gratitude for every small blessing in his life feels content. Being thankful towards people and the world instils confidence in individuals.
- **Staying clean, hygienic and smart:** Personal hygiene is the first key to a confident person. Keeping hair, teeth, fingers, body and skin clean and well maintained is an easy and effective way to be at one's best.
- **Chatting with positive people:** Interacting with positive people brings forth a fresh and progressive perspective to life. People in similar stages of life go through similar issues. Some positively handle these situations, and interacting with them shall help boost confidence.



Do you know any of your friends who is struggling in life and is lacking in confidence? Talk to that person and try to understand his/her problem. Help them with self-management skills so that they can overcome/fight the situation with a positive attitude.



- **Self-management:** The management of or by oneself; taking the responsibility for one's own behaviour and well-being
- **Strengths:** The areas that one excels in
- **Weaknesses:** The areas which need improvement
- **Grooming:** The process of making yourself look neat, tidy and smart
- **Self-motivation:** A force within you that drives you to do things
- **Goals:** A set of targets with a deadline to achieve them
- **Goal setting:** Finding and listing your goals and then planning on how to achieve them



- A self-managed person is like a tree who is taking care of himself/herself and is also helping others to lead a comfortable life.
- Strength and weakness analysis begins by knowing and understanding oneself first.
- Self-motivation is the force within you that drives you to do things.
- Specific means something straightforward and clear. To set a goal, you must be specific.
- Measurable means something that can be measured. The success you achieve can be measured.
- Achievable means something that can be completed. A goal must be achievable. Breaking down big goals into smaller sub-goals will make the goal achievable.
- Realistic means something that is real and is applicable in our lives. A realistic goal would be something that we want to achieve and can work towards.

⁵ **Stance:** The opinions that somebody has about something and expresses publicly

- Time-bound means the goal has to be completed within a certain duration/period of time.
- Time management is the ability to plan and control how someone spends the hours in a day to effectively accomplish their goals.



EXERCISEBOT

A. Tick (✓) the correct option.

- Self-management can help us in:
 - developing good habits
 - overcoming bad habits
 - reaching our goals
 - All of these
- is the area that one does well and is good at.
 - Strength
 - Weakness
 - Discipline
 - Fear
- Which of the following means you accept and trust yourself and have a sense of control in your life?
 - Self-confidence
 - Self-motivation
 - Self-regard
 - Self-resolution
- The force within you that drives you to do things is:
 - self-confidence
 - self-motivation
 - self-regard
 - self-resolution
- Which of the following is the correct word for 'M' in SMART goals?
 - Major
 - Measurable
 - Meaningful
 - Mindful

B. Fill in the blanks.

- means something straightforward and clear with reference to SMART goals.
- is the ability to plan and control how someone spends the hours in a day to effectively accomplish their goals.
- means the process of making yourself look neat, tidy and smart.
- 'T' in SMART goals stands for
- To-do list is a tool.

C. Write T for True or F for False.

- Make a timetable that must be followed on a daily basis.
- Positive thinking makes you lazy at work.
- Achievable means something that can be achieved.
- SMART goals must not have time limit.
- To-do list is a self-confidence boosting tool.

D. Short answer questions.

- What is self-management?
- List any two benefits of self-management.
- Define strength and weakness analysis.
- List the importance of self-confidence.
- What do you mean by positive thinking?

E. Long answer questions.

- Explain the role of self-management in our lives.
- Describe the SMILE technique.
- Describe the two types of motivation.
- Write any four self-confidence building tips.
- Explain SMART goals.





Our products for the CBSE and ICSE curricula

Aligned to the guiding principles of the National Curriculum Framework

Based on the Vision of NEP 2020

New Titles

अनंत | Grades 1-8

A Series on **Creative and Functional Grammar**

The Pole Star Readers | Grades 1-8

A **Skill Building** Series

EXPLORE AND LEARN SCIENCE | Grades 3-8
Hands-on **STEAM** Activity Books

EXPLORE AND LEARN MATHEMATICS | Grades 6-10
Laboratory Manuals

MIND BODY AND YOU | Grades 6-10

Health and Physical Education Handbooks

THINKING MACHINES | Grades 8-10

A Textbook of **Artificial Intelligence**

LEARNING TO LOCATE | Grades 3-10

A **Map Skills and Activity** Series for ICSE curriculum

YOUNG NAVIGATORS | Grades 3-10

A **Map Skills and Activity** Series for CBSE curriculum

OUR BESTSELLERS

STENCIL English Language and Literature Coursebook Grades 1-8

GRAMMAR CIRCLE English Grammar Grades 1-8

NUMERICS Mathematics Grades 1-8

SCIWISE Science Grades 1-8

ANAND Hindi Language and Literature Coursebook Praveshika A & B, Grades 1-8

ELEMENTS Social Studies Grades 1-8

SAPLING Environmental Studies Grades 1-5

REFRESH and SCROLL Computer Science Grades 1-8

QUEST General Knowledge Series Grades 1-8

THINKING MACHINES

A Textbook of **Artificial Intelligence**,
is a set of three books from classes 8 to 10.

This series is based on NCERT syllabus following NCF guidelines. This course has been designed for schools teaching a basic course in Artificial Intelligence at middle and secondary levels, and provides various tools for learning, assessment and evaluation.

Artificial Intelligence Curriculum aims at developing the learner's mindset and skill set towards Artificial Intelligence and how it is understood and applied.

Students can be assessed and evaluated on the basis of following skills:

CONCEPTUAL SKILLS

Conceptual understanding of AI
AI applications and the three domains of AI
Knowledge enhancements in three AI domains: Data, Computer Vision and Natural Language Processing
Mind Mapping
Problem Identification
Data Acquisition
Data Exploration
Graphical Representation
Neural Network

TECHNICAL SKILLS

Ability to use AI Powered Tools
Troubleshooting Skills
Basic Programming Skills
Basic Python



LIFE SKILLS

Thinking Skills
Problem Solving
Creative Thinking
Critical Thinking
Decision-making Skills
Social Skills: Teamwork
Team-building Skills
Leadership
Self-awareness
Empathy
Effective Communication Skills
Oral and Written Presentation

Features of the series:

- Based on AI initiative launched by CBSE and the Department of Skill Education
- Based on proposed modules by CBSE with specific learning outcomes
- Simple and lucid language
- Focus on concept building and experiential learning
- Follows inquiry-based, discovery-based, discussion-based and critical thinking approaches
- Well-graded exercise section that assesses conceptual skills, technical skills and life skills
- Follows interdisciplinary approach across subjects based on a selected theme



NAVNEET EDUCATION LIMITED

