



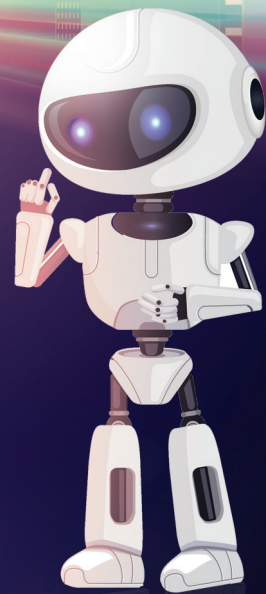
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NEP 2020



RISE Subject Code : 417

THINKING MACHINES

A Textbook of Artificial Intelligence





NAVNEET EDUCATION LIMITED

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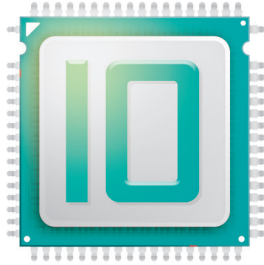
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THINKING MACHINES[®]

A Textbook of Artificial Intelligence

Subject Code: 417

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PREFACE

"AI is neither good nor evil. It's a tool. It's a technology for us to use."

– Oren Etzioni

Thinking Machines, a textbook of Artificial Intelligence, is a series of three books for classes 8 to 10 (Subject code: 417). This series is based on AI initiative launched by CBSE and the Department of Skill Education. Book 8 is based on the Inspire Module. Book 9 is based on the Inspire and Acquire Module. Book 10 is based on the Experience Module of the syllabus.

The Artificial Intelligence curriculum aims at developing the learner's mindset and skills for the digital world of the future. It is designed to be understood and applied with respect to everyday life and make the generation 'AI ready'. The important principle that Artificial Intelligence embraces is holistic, inclusive and progressive development in immersive ways by problem solving, creative thinking, and critically analysing data.

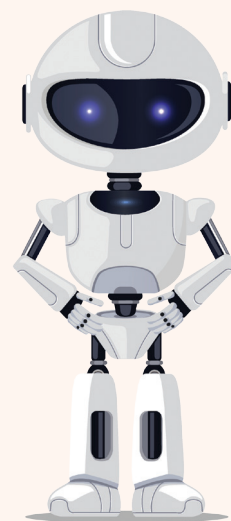
We have followed an activity-based and inquiry-based pedagogical approach, and have tried to encourage experiential learning by connecting learning to everyday situations. We have covered all the core AI concepts. The learning journey will take a course from simple to complex and known to unknown. The AI Learning Modules have been explained in age-appropriate manner with specific learning outcomes.

The approach followed in the series helps in developing ethics in learning Artificial Intelligence. This sharpens thinking skills, social skills and emotional skills. It also follows an interdisciplinary approach by integrating one subject to another. After completion of each unit, the students can be evaluated on the basis of conceptual skills, technical skills and life skills.

The aim is to strive together to make our students future ready and help them work on incorporating artificial intelligence to improve their learning experience.

Sincere efforts have been made in conceptualising and developing the content. We hope that it will be immensely useful for learning and applying the knowledge in various fields. We would like to thank various computer science teachers and resource people for their valuable contribution in shaping the series. Special care has been taken to make the books error-free. However, errors or suggestions, if any, for improvement, will be highly appreciated.

The Publisher



CLASSES 8-10 IN THE SERIES

THINKING MACHINES

A Textbook of Artificial Intelligence

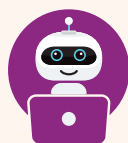
Artificial Intelligence curriculum aims at developing the learner's mindset and skills set towards Artificial Intelligence and how it is understood and applied. The important principle that Artificial Intelligence embraces is holistic, inclusive and progressive development in immersive ways by problem solving, creative thinking, and critically analysing data.

This series is based on the NCERT syllabus, following the 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.

CHAPTER OPENING PAGE

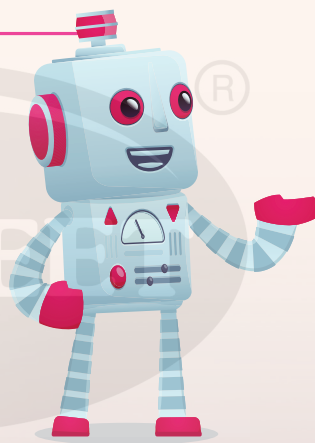
In this Chapter

Topics covered in each chapter



GET SET GO!

Warm-up activity for easy introduction or quick recapitulation of the topic



INSIDE THE CHAPTER

FACTBOT

Interesting snippets of information related to the concepts discussed



THINKBOT

Lateral thinking questions to promote out-of-the-box thinking



ACTIVITYBOT

Hands-on activities to promote skills to investigate and experiment



TALKBOT

Thought-provoking questions to initiate discussion in the class



CHECKBOT

Questions in-between the text for continuous evaluation



GET IT RIGHT

Highlights common errors and misconceptions

CHAPTER CLOSING ACTIVITIES



BLENDBOT

Activities that encourage cross-curricular integration



EXERCISEBOT

Elaborate exercise section with variety of questions (both objective and subjective), skill-based questions, lab activities and projects



CONCEPTBOT

Important points illustrated as concept map



AI CASE STUDIES REAL-LIFE CONNECT

Snippets of studies and advancements made in the field of Artificial Intelligence



AI GLOSSARY

New technical words used in the chapter with their meanings



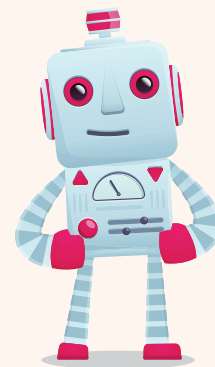
AI SUMMARY

Important points summarised for quick revision



AI LAB

Hands-on activities to be performed based on concepts taught



For Teachers

Suggestions for teachers that help to explain the concepts better

For Parents

Suggestions for parents to reinforce learning at home

ADD-ONS

- **COMIC STORY:** Interesting story to create awareness to be safe while using the Internet
- **WORKSHEETS:** Unit-wise questions for additional practice
- **MODEL TEST PAPERS:** Questions for half-yearly and annual assessments
- **ADDITIONAL PROJECTS:** Additional projects based on important concepts for practice
- **INDIA IN AI:** India's initiatives for developing the AI industry in various sectors to promote country's economic and social progress
- **ANSWERS:** Answers of ExerciseBot

ARTIFICIAL INTELLIGENCE (SUB. CODE 417) CLASS – X

• OBJECTIVES OF THE COURSE

The objective of this module/curriculum—which combines both Inspire and Acquire modules is to develop a readiness for understanding and appreciating Artificial Intelligence and its application in our lives. This module/curriculum focuses on:

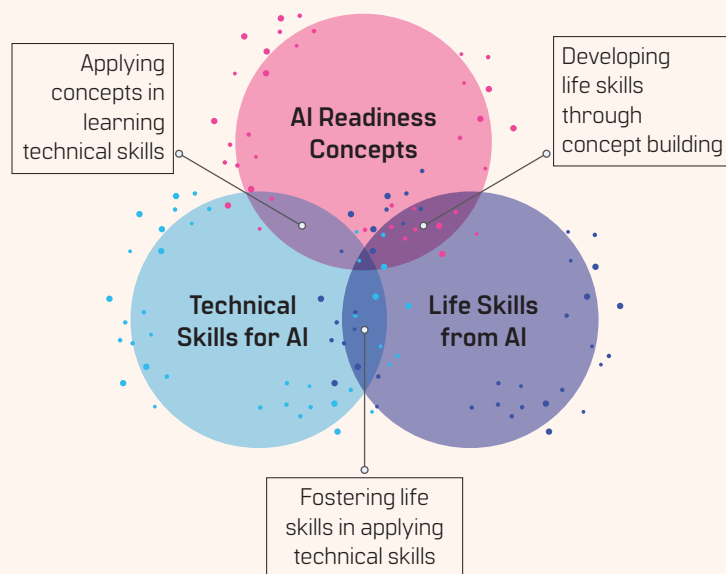
1. Helping learners understand the world of Artificial Intelligence and its applications through games, activities and multi-sensorial learning to become AI-Ready.
2. Introducing the learners to three domains of AI in an age appropriate manner.
3. Allowing the learners to construct meaning of AI through interactive participation and engaging hands-on activities.
4. Introducing the learners to AI Project Cycle.
5. Introducing the learners to programming skills - Basic python coding language.

• LEARNING OUTCOMES

Learners will be able to:

1. Identify and appreciate Artificial Intelligence and describe its applications in daily life.
2. Relate, apply and reflect on the Human-Machine Interactions to identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing and undergo assessment for analysing their progress towards acquired AI-Readiness skills.
3. Imagine, examine and reflect on the skills required for futuristic job opportunities.
4. Unleash their imagination towards smart homes and build an interactive story around it.
5. Understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
6. Research and develop awareness of skills required for jobs of the future.
7. Gain awareness about AI bias and AI access and describe the potential ethical considerations of AI.
8. Develop effective communication and collaborative work skills.
9. Get familiar and motivated towards Artificial Intelligence and Identify the AI Project Cycle framework.
10. Learn problem scoping and ways to set goals for an AI project and understand the iterative nature of problem scoping in the AI project cycle.
11. Brainstorm on the ethical issues involved around the problem selected.
12. Foresee the kind of data required and the kind of analysis to be done, identify data requirements and find reliable sources to obtain relevant data.
13. Use various types of graphs to visualise acquired data.
14. Understand, create and implement the concept of Decision Trees.
15. Understand and visualise computer's ability to identify alphabet and handwritings.
16. Understand and appreciate the concept of Neural Network through gamification and learn basic programming skills through gamified platforms.
17. Acquire introductory Python programming skills in a very user-friendly format.

• SKILLS TO BE DEVELOPED



SYLLABUS SCHEME OF UNITS

Total Marks: 100 (Theory-50 + Practical-50)

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class X opting for skill subject along with other subjects. The unit-wise distribution of hours and marks for class X is as follows:

| ARTIFICIAL INTELLIGENCE (417) Class X (Session 2020-21) | | |
|--|--|--|
| UNITS | NO. OF HOURS for Theory and Practical 200 | MAX. MARKS for Theory and Practical 100 |
| PART A | Employability Skills | |
| | Unit 1 : Communication Skills-II | 5 |
| | Unit 2 : Self-Management Skills-II | 5 |
| | Unit 3 : ICT Skills-II | 5 |
| | Unit 4 : Entrepreneurial Skills-II | 5 |
| | Unit 5 : Green Skills-II | 5 |
| | Total | 10 |
| PART B | Subject Specific Skills | |
| | Unit 1: Introduction to Artificial Intelligence (AI) | 10 |
| | Unit 2: AI Project Cycle | 10 |
| | Unit 3: Advance Python* [* To be assessed in Practicals only] | |
| | Unit 4: Data Science* [* To be assessed in Practicals only] | |
| | Unit 5: Computer Vision* [* To be assessed in Practicals only] | |
| | Unit 6: Natural Language Processing | 10 |
| | Unit 7: Evaluation | 10 |
| | Total | 40 |
| PART C | Practical Work: | |
| | Unit 3: Advance Python | 20 |
| | Unit 4: Data Science | |
| | Unit 5: Computer Vision | |
| | Practical Examination | 10 |
| | Viva Voce | 5 |
| | Total | 35 |
| PART D | Project Work/Field Visit/ Practical File/ Student Portfolio | 5 |
| | Viva Voce | 10 |
| | Total | 15 |
| | GRAND TOTAL | 200 |
| | | 100 |

DETAILED CURRICULUM/TOPICS FOR CLASS X:

Part-A: EMPLOYABILITY SKILLS

| S. No. | Units | Duration in Hours |
|--------|--|-------------------|
| 1. | Unit 1: Communication Skills-II | 10 |
| 2. | Unit 2: Self-management Skills-II | 10 |
| 3. | Unit 3: Basic Information and Communication Technology Skills-II | 10 |
| 4. | Unit 4: Entrepreneurial Skills-II | 15 |
| 5. | Unit 5: Green Skills-II | 05 |
| | TOTAL | 50 |

NOTE: For Detailed Curriculum/ Topics to be covered under Part A: Employability Skills can be downloaded from CBSE website.

Part-B – SUBJECT SPECIFIC SKILLS

- Unit 1: Introduction to Artificial Intelligence (AI)
- Unit 2: AI Project Cycle
- Unit 3: Advance Python (To be assessed through Practicals)
- Unit 4: Data Science (To be assessed through Practicals)
- Unit 5: Computer Vision (To be assessed through Practicals)
- Unit 6: Natural Language Processing
- Unit 7: Evaluation

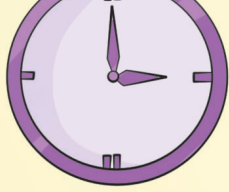
UNIT 1: INTRODUCTION TO AI

| UNIT | SUB-UNIT | SESSION / ACTIVITY / PRACTICAL |
|--|---------------------------------|---|
| 1. INTRODUCTION TO AI | Foundational concepts of AI | Session: What is Intelligence? |
| | | Session: Decision Making. • How do you make decisions? • Make your choices! |
| | Basics of AI: Let's Get Started | Session: What is Artificial Intelligence and what is not? |
| | | Session: Introduction to AI and related terminologies. • Introducing AI, ML & DL. • Introduction to AI Domains (Data, CV & NLP) |
| 2. AI PROJECT CYCLE | | Session: Applications of AI – A look at Real-life AI implementations |
| | | Session: AI Ethics |
| | Introduction | Session: Introduction to AI Project Cycle |
| | Problem Scoping | Session: Understanding Problem Scoping and Sustainable Development Goals |
| | Data Acquisition | Session: Simplifying Data Acquisition |
| | Data Exploration | Session: Visualising Data |
| 3. ADVANCE PYTHON (To be assessed through Practicals) | Modelling | Session: Introduction to modelling • Introduction to Rule Based and Learning Based AI Approaches • Introduction to Supervised, Unsupervised & Reinforcement Learning Models • Neural Networks |
| | | Session: Evaluating the idea! |
| | Evaluation | Session: Evaluating the idea! |
| | | Recap |
| 4. DATA SCIENCES (To be assessed through Practicals) | Introduction | Session: Introduction to Data Science |
| | | Session: Applications of Data Science |
| | | Session: Revisiting AI Project Cycle |
| | Concepts of Data Sciences | Session: Python for Data Sciences |
| | | Session: Statistical Learning and Data Visualisation |
| | K-nearest neighbour model | Activity: Personality Prediction |
| Session: Understanding K-nearest Neighbour Model | | |

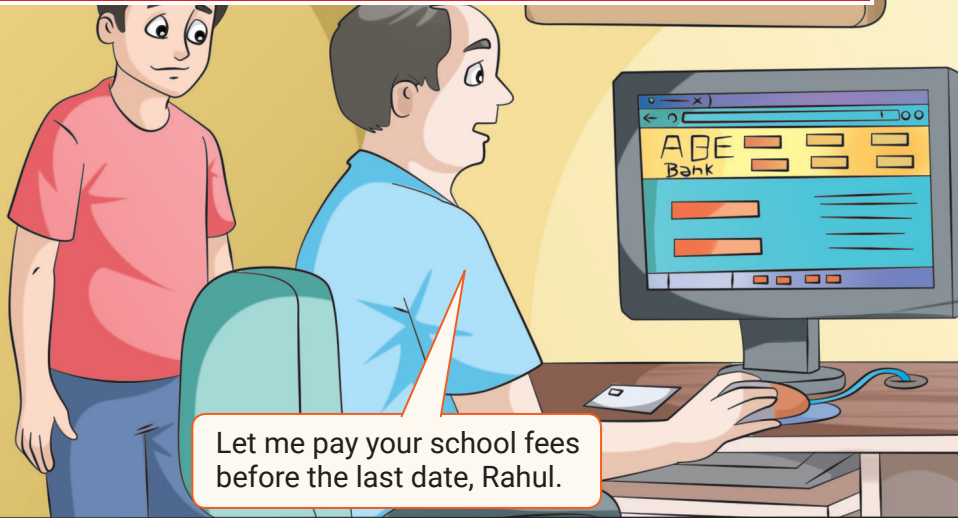
| UNIT | SUB-UNIT | SESSION / ACTIVITY / PRACTICAL |
|--|---|--|
| 5. COMPUTER VISION (To be assessed through Practicals) | Introduction | Session: Introduction to Computer Vision Session: Applications of CV |
| | Concepts of Computer Vision | Session & Activity: Understanding CV Concepts · Pixels · How do computers see images? · Image Features |
| | OpenCV | Session: Introduction to OpenCV Hands-on: Image Processing |
| | Convolution Operator | Session: Understanding Convolution operator Activity: Convolution Operator |
| | Convolution Neural Network | Session: Introduction to CNN Session: Understanding CNN · Kernel · Layers of CNN Activity: Testing CNN |
| 6. NATURAL LANGUAGE PROCESSING | Introduction | Session: Introduction to Natural Language Processing Session: NLP Applications Session: Revisiting AI Project Cycle |
| | Chatbots | Activity: Introduction to Chatbots |
| | Language Differences | Session: Human Language VS Computer Language |
| | Concepts of Natural Language Processing | Hands-on: Text processing · Data Processing · Bag of Words · TFIDF · NLTK |
| | | |
| 7. EVALUATION | Introduction | Session: Introduction to Model Evaluation |
| | Confusion Matrix | Session & Activity: Confusion Matrix |
| | Evaluation Score Calculation | Session: Understanding Accuracy, Precision, Recall & F1 Score Activity: Practice Evaluation |

NOTE: Unit 3, 4 & 5 should be assessed through Practicals only and should not be assessed with the Theory Exam.

Mr Anuj faces online banking fraud



1



Let me pay your school fees before the last date, Rahul.

Nowadays most people pay electricity bills, school fees, gas bills, etc., online. Today, Rahul's father, Mr Anuj has to pay school fees. He logs in to his ABC bank account.

2

Mr Anuj tries three times to log in to his account but failed to access his account. Soon he gets a call.

Thank you, Mr Anuj. Please try logging in after 10 minutes.

Is this Anuj Sharma? You have been trying to log in to your account. I can help you with that. Can you give me the username and your password?

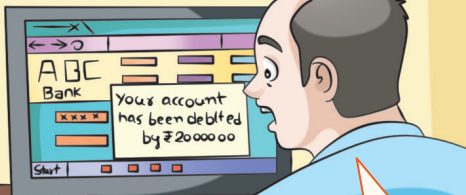


Sure! Note it down. It is 6345 8176 4356 7890 and the password is XYZ123.

Mr Anuj tries logging in after 10 minutes and this time he is successful. But to his shock, he finds out that there has been a deduction of 20,000 rupees.

Papa, why don't you call customer care?

3



Hell! My account has been debited by ₹20,000. But I never made any such transaction. What do I do now?

Mr Anuj immediately calls customer care.

4

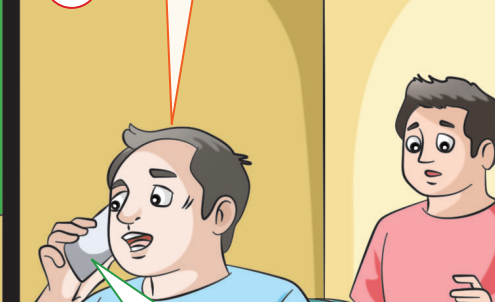
Hello! Is this ABC bank? My account has just been debited by ₹20,000. I never made that transaction.



Sir, but here in our record it says, you logged in to your account and purchased ₹20,000, 15 minutes ago.

I was not able to log into my account. But I got a call from your bank who asked me for my account details. I gave it to him. Was the call not from your bank?

5



Sir, our bank never asks for any username or password. And we have customer care numbers on our bank website.

Sir, we will investigate this matter. Please lodge a formal complaint with the bank and block the card or the account immediately.

6



Yes, I will do so right away. I will also lodge an FIR with local police station. Such cases are then forwarded by the police stations to the Cyber Cell, a friend told once.

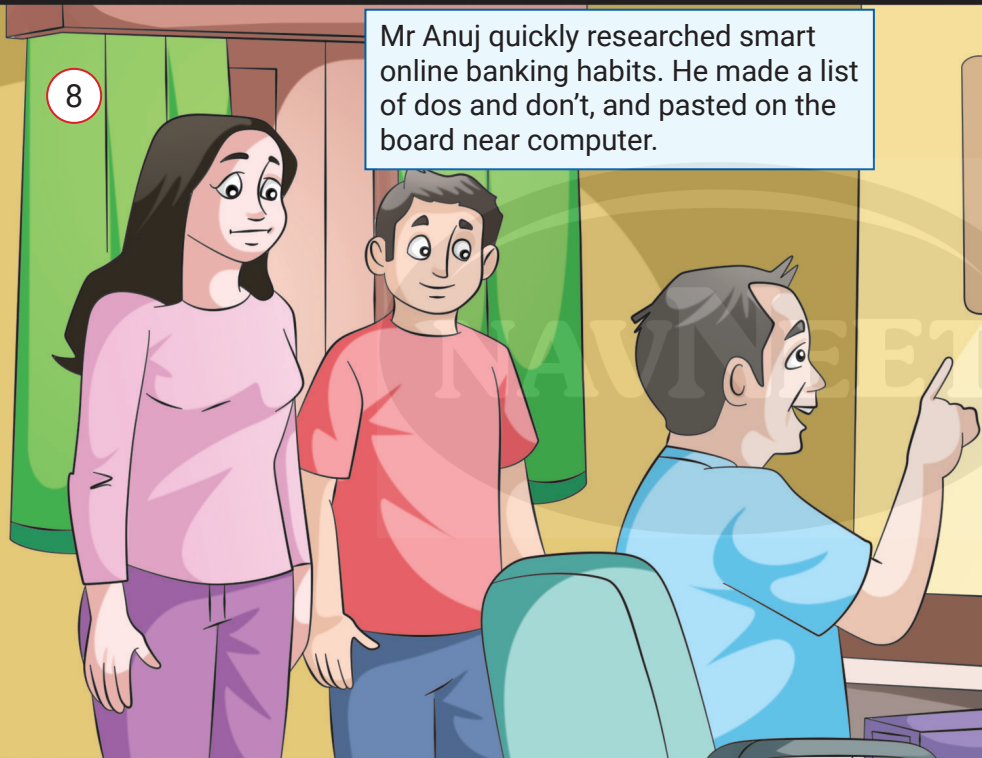
Oh no! My father lost a lot of money due to online fraud. Online banking is a great service but we should also be aware of its cons.

7



8

Mr Anuj quickly researched smart online banking habits. He made a list of dos and don'ts, and pasted on the board near computer.



REMEMBER

1. Do not share your account details like username and password with anyone who calls you for it.
2. Call on the customer care number given on the bank website and immediately block the card or account.
3. Do not note down your username and password at the same place like in a diary or on your phone. If any of these get stolen, anyone will access your online username and password.
4. Before making any online transaction, make sure you have entered the correct details of the receiver.

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PART A: EMPLOYABILITY SKILLS

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Communication Skills-II**
- **Unit 2:
Self-management Skills-II**
- **Unit 3:
Information and Communication
Technology Skills-II**
- **Unit 4:
Entrepreneurial Skills-II**
- **Unit 5:
Green Skills-II**





CHAPTER 1

COMMUNICATION IN OUR LIFE

In this Chapter

- Importance of Communication Skills
- Methods of Communication
- Communication Cycle and Feedback
- Effective Communication

The act of exchanging information, idea, opinion, etc. between two or among 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 they 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**.

IMPORTANCE OF COMMUNICATION SKILLS

Communication skill has great importance in our personal, professional and social life. It is a vital life skill that one should start developing in one's life as early as possible and should not be overlooked. By developing effective 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. Imagine a teacher explains a certain topic in the class. How will the teacher know if the students have understood the topic properly or not if they do not respond?

Therefore, communication is very important in the teaching and learning process (Fig. S1.1). There should be regular communication between teachers and students for them to teach and learn.



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 in any field are required 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 his/her clients, then how will his/her client hire him/her?

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 better.



Many relationships do not last long only due to a lack of communication or a long gap in communication. We all know that most families today are nuclear families and most of our relatives live 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 shopkeeper cannot succeed in selling his/her goods unless he/she possesses effective communication skills. Communication is very important for coordination among staff as well as the clients and customers.



Fig. S1.2 Communication in business

METHODS OF COMMUNICATION

We can classify the methods of communication into 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 take place in the form of private talks, a public address, verbal discussions in a meeting, telephonic talks and so on. Audio-visual aids, speeches and orders, holdings of meetings and conferences, lectures, social get-togethers, training sessions, exhibitions, counselling, etc. also involve verbal communication. 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 and the oldest method of oral communication. It is the oldest form of oral communication. Telephonic conversation and online audio chat 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, taking and giving interviews, motivating others, 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.



Fig. S1.3 Communication



Verbal communication includes only oral communication.

This is not true. Verbal communication includes both oral and written 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 method of communication. 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 to write and send messages 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, the cost involved is 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 is not possible without oral communication. In meetings, conferences and social gatherings, oral communication is very effective.

Disadvantages of Oral Communication

Oral communication also has some disadvantages as mentioned here:

- **Dependency on Human Memory:** In oral communication, the messages conveyed or exchanged are retained only in the memory of the people participating in the communication. In human memory, messages do not 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 the participants misunderstanding each other 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. That level of preciseness lacks in oral communication because people are generally less careful while speaking than writing.

Tips for 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 the words according to the understanding level of the audience. 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 cause the listeners to lose interest and they may become inattentive.
- **Politeness:** Politeness is very important in oral communication. Both the speaker and the listener should be polite towards each other 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 of 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 and information bulletins.

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. It has to be in the form of a written communication.

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



Fig. S1.4 Internet-based chatting apps

Advantages of Written Communication

These are some advantages of written communication:

- **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 later 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 at once.

- **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

These are some disadvantages of written communication:

- **Tough Job:** Writing and understanding a written message properly is difficult especially for people who are not well qualified. Therefore, written communication is not possible for certain sections of the society.
- **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 to do so in written communication.
- **Lengthy Message:** In written communication, people need to add details that make the message lengthy and reading a lengthy message makes it uninteresting for the readers.

? THINKBOT



Nowadays, most of the written communication takes place through e-mails. However, a large number of letters are still sent through post or courier. Why?

Tips for Written Communication

Let's discuss how to improve written communication skills.

- **Clear and Concise:** The written message should be clear and concise to avoid any chances of ambiguity. Remember, you will not be there with the receiver to clarify. You should use the punctuation marks properly, otherwise, the meaning of the sentences will differ from what you want to convey.
- **Use of Appropriate Words:** Appropriate words help us express our thoughts clearly and properly. Besides, the words used should be simple and suitable 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 intend 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.
- **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 cues¹, body language, gestures, vocal characteristics, facial expressions and spatial relationship between the sender and the receiver to convey a message and so on. 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 at 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 facial expressions to express a variety of emotions without saying a word (Fig. S1.5). Since facial expression is the true expression of a human being, it is considered universal. It is, therefore, that the facial expressions for happiness, sadness, anger, surprise, fear and hatred are the same in all cultures across the world.



Fig. S1.5 Facial expressions

Body Movements and Posture

The way we walk, move, sit, stand 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 straight shows that we are positive and confident.

Gestures

Gesture refers to the movement of the hands, arms, head, etc. to express an idea or feeling (Fig. S1.6). 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 in agreement with and interested in what is being said. 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.

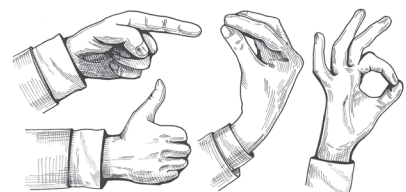


Fig. S1.6 Hand gestures

¹ Cues: An action or event that is a signal for somebody to do something



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, hostility² 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 you 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 in which they feel ownership and safety. We do not like anybody intruding 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 say orally. By speaking loudly, we can emphasise our message.



Fig. S1.7 Paralanguage

Advantages of Non-verbal Communication

According to an estimate, around 70 to 80 per cent of communication is non-verbal. Let's learn 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 to hold

² Hostility: Aggressive or unfriendly feelings or behaviour



his/her hand, it is going to be 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 cues for communication.
- **No Cost:** Non-verbal communication does not incur any cost as in the case of verbal communication.
- **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 far away from where you are.
- **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

Non-verbal communication has some disadvantages too. Let's learn 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 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 through 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 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 upon his/her audience or listeners.
- **Lack of Rules:** There are no predefined rules or structures for non-verbal communication. In most cases, people unconsciously and habitually engage in non-verbal communication by moving the various parts of their body.

Tips for Non-verbal Communication

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

- 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 a 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.

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, in detail. Visual communication is a form of communication in which messages are exchanged only through pictures and symbols. Some other visual aids such as graphs, charts, maps, emoticons, 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 see some 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 many places (Fig. S1.8). 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 in different places. The signs and symbols used on maps also say a lot. Look at the symbols given alongside (Fig. S1.9). These symbols are used in maps. The symbols are consistent across the world to avoid confusion.

Advantages of Visual Communication

Visual communication has many advantages. Let's learn about 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.
- **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.



Fig. S1.8 Signs and symbols used for movement of traffic

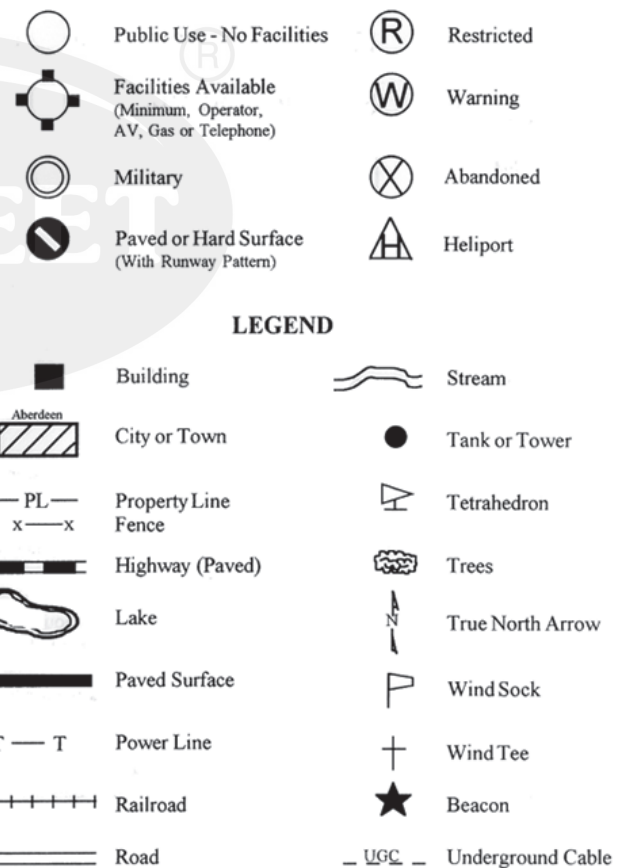


Fig. S1.9 Signs and symbols used on a map

³ Sway: To control, influence or convince another person



- **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, if the instructions of a recipe are given in writing, it will take some time to understand. But, a flowchart of instructions to make a recipe helps people understand the method quickly and easily. Thus, visual communication can also help you save your time.

Disadvantages of Visual Communication

Visual communication has some disadvantages too. Let's learn 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 might add to the cost.

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 14,000 and 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 members participating do not have to wait long for getting feedback.
3. The meaning of a gesture used in one culture or region can be different in other 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.

COMMUNICATION CYCLE AND FEEDBACK

The communication cycle expresses how the system of conveying and understanding messages operates. In case of inter-personal communication, only sending of message by the sender to the receiver is not enough.



He/She must be eager to know the reaction or to get return information. The message sent by the receiver back to the source is called **feedback**. It is the response by the recipient. When the receiver receives the message and sends a feedback, he/she becomes the **sender** and the actual sender becomes the **receiver**. In this way, a cycle of communication is formed, which is called **communication cycle** (Fig S1.10).

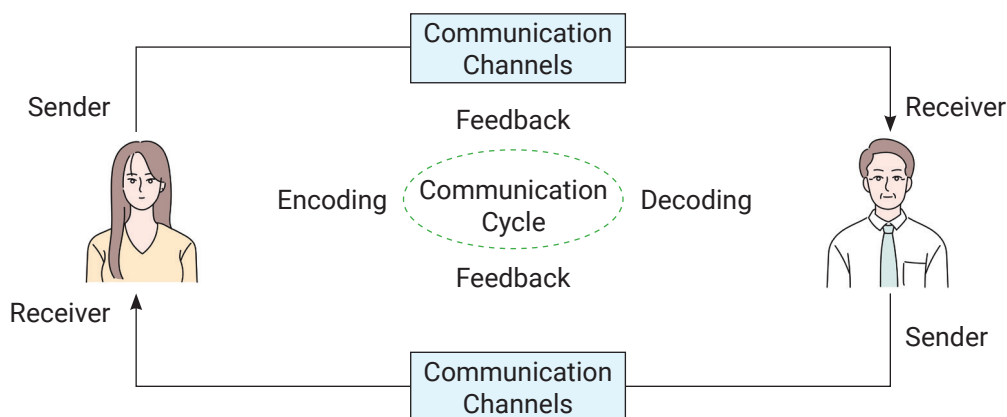


Fig. S1.10 Communication Cycle

Let's understand the role and importance of feedback in a communication cycle. Actually, communication is a two-way process:

- Sending the message, and
- Receiving the response or feedback

After sending the message, the sender wants to know whether the recipient has understood the message as well as what his/her reaction is regarding the message. Besides, the sender also wants to know whether the recipient has understood the message in the same way as intended by the sender. If there is any lapse in it, further communication becomes obvious.

In face-to-face communication, feedback is not a problem, because the speaker and the listener both are present and can ask and clarify the message instantly if there is any ambiguity. One can ask the other to repeat what has been missed. They can also observe the gestures and facial expressions in oral communication. But in the case of written communication, the feedback is not instant. It requires some time.

Feedback is the key to the success of communication. The objective of communication cannot be fulfilled unless the process of communication is complete with feedback.

Let's take an example. A teacher is teaching the topic photosynthesis. In this case, the teacher is the sender; the students in the class are the receivers; the lesson on photosynthesis is the message. The teacher might use tools (communication aids) like the white/blackboard or LCD projector to transmit the message/lesson more effectively.

If at the end of the class, the teacher asks a question and the students are able to answer correctly, the students are providing immediate positive feedback, indicating that they have understood the lesson. However, if the students refuse to acknowledge the question and remain silent, they are refusing to give immediate feedback.

Now, if the teacher sets a question on photosynthesis in the semester exam question paper and if most of the students write the correct answer and score full marks, the class is providing delayed positive feedback.

Types of Feedback

Feedback is mostly of two types: positive feedback and negative feedback. Let's learn about them.

Positive Feedback

It is a kind of feedback that is more or less acceptable or satisfactory to the sender. It means that the recipient of the message has responded in the way intended by the sender and taken the intended course of action. It signifies that everything is correct and no corrective measure regarding this communication is necessary.

Negative Feedback

It is a form of feedback in which the feedback says that someone is doing poorly and telling the sender of the message how to change it. It can also involve telling a person that the attitude he/she is displaying is inappropriate or that certain behaviours and habits are causing problems.

Feedback can also be categorised into specific feedback and non-specific feedback.

Specific Feedback

If detailed information is provided about some particular work or performance, it is called **specific feedback**. It can be written or oral, but it is quite beneficial for the receiver. If your science teacher explains your performance in the subject, it is called specific feedback. Specific feedback helps people to focus and take suitable action for improvement.

Further, we can classify specific feedback as descriptive feedback and prescriptive feedback.

- **Descriptive feedback:** If specific feedback contains detailed information about how well you have performed in a particular task, it is called **descriptive feedback**. It can be in the form of written comments or verbal conversations that help the learner understand what he/she needs to do to improve. The report-card you get after an examination is a kind of descriptive feedback.
- **Prescriptive feedback:** If the specific feedback contains precise correction statements and helps you know how to improve in those areas is called **prescriptive feedback**.

Non-specific Feedback

Unlike specific feedback, non-specific feedback is general, i.e., just a response to the received message. It may not be of much help, as it does not guide the receiver properly to achieve the desired goal. It gives the impression that the sender has not given a thoughtful response.



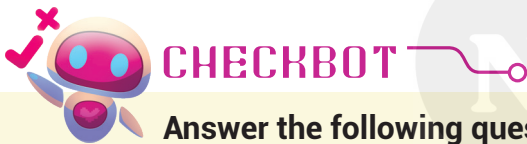
Fig. S1.11 Positive and Negative Feedback



Importance of Feedback

You know how important feedback is in a communication cycle. However, let's understand its importance categorically.

- **Basis of problem-solving:** Feedback is very important in every method or channel of communication. Unless or until the sender does not get any feedback, he/she will not be able to know if the receiver has got the message, the way it is intended or if there is an issue with understanding the message. The sender can resolve the issue only after he/she gets a feedback.
- **Equal approach:** In some way, feedback ensures equality among the members participating in communication. Every member has the right to express their views. Suppose a senior passes an order to his/her subordinate and the subordinate finds some issues in executing the order. In this case, it is the feedback through which he/she can know the opinion of his/her senior on the issue.
- **Effective communication:** A communication cannot be effective if there is no scope of feedback. There is no sense in communication without the scope of feedback.
- **Opportunity for improvement:** Constructive feedback highlights the areas that need improvement. In this way, the sender or the receiver becomes aware of any such areas and takes steps for improvement.
- **Effective coordination:** Feedback enables effective coordination among the members of an organisation. A better coordination can be productive for the organisation. Feedback also ensures better coordination between different departments of an organisation.



Answer the following questions orally.

1. Name the elements of a communication cycle.
2. What is the need for feedback in communication?
3. In oral communication, feedback is not a problem. Why?
4. What is specific feedback?
5. What is the importance of descriptive feedback?



TALKBOT

The aim and objective of communication cannot be fulfilled without feedback. Discuss with your partner.

EFFECTIVE COMMUNICATION

You studied communication and its different prospects. But do you know what effective communication is? Communication is referred to as effective communication when the purpose and intention of exchanging the messages, ideas, information or knowledge are fulfilled. Following certain principles while communicating ensure effective communication and everyone should follow them. These principles are popularly referred to as the 7 Cs of communication.

The 7 Cs of Communication

The **7 Cs of communication** is a list of principles for written and spoken communications to ensure that they are effective. The 7 Cs are: clear, correct, complete, concrete, concise, coherent and courteous (Fig. S1.12). Let's learn about them.



- **Clear:** Clarity is the foremost requirement for a message to be understood properly. The sender of the message should be clear about his/her intention and purpose that he/she wants to convey through the message. Unless the message is clear, you cannot expect the receiver to understand it and respond accordingly. The recipient should be made aware of why they are receiving the message and what you are trying to achieve by delivering it. Therefore, you should be clear about your intention and purpose before drafting the message. Besides, you should use simple and easy language and focus on the core points of the message.

- **Correct:** Correctness of the factual information along with language and grammar is also very important. The spelling of the words should also be correct. If there are factual, grammatical or spelling errors in your message, your credibility will be greatly reduced. Moreover, this will reduce the effectiveness of your communication.

- **Complete:** An incomplete message is of no use as it cannot fulfill the purpose of communication. Before completing your message, you should ensure that you have mentioned all the required information so that the recipient can take further course of action properly. If you are assigned to draft a message on behalf of your school to inform the students about the cultural event to be held, you should mention each detail such as date, time, place, a chronology of events, chief guest, etc.

- **Concrete:** To ensure that your message is concrete, you should use the exact words and facts. You should not replace words already used in previous conversations with words of your own. Besides, you must ensure that you are specific and use solid facts and opinions from credible sources.

- **Concise:** You should keep your message as concise as possible. You should not elaborate the message, unnecessarily. You should stick to the point and keep your message short and simple. In other words, if a message is to be in 50 words, you should not use a hundred words for the same. Moreover, nobody is interested in reading a lengthy message.

- **Coherent:** Coherence means systematically or logically connected. The information given in your message should be systematically or logically connected. If your communications are not coherent, they will not be effective. To make sure your communications are coherent, you should have a logical flow and your style, tone and language should be consistent throughout.

- **Courteous:** Courteous language adds effectiveness to your communication. Your message should be friendly, professional, considerate, respectful, open and honest. You should always use polite words while communicating with others. It not only makes your communication effective but also enhances your personality.

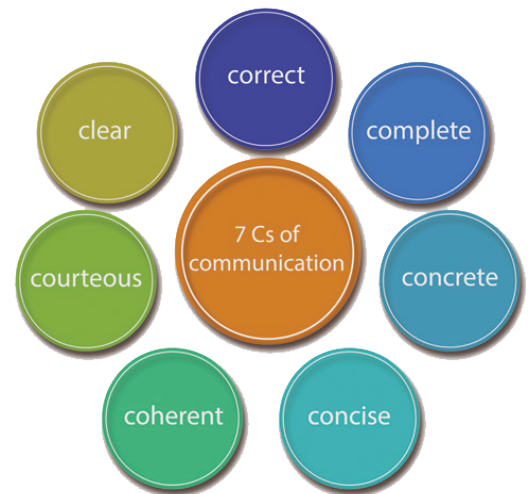


Fig. S1.12 7 Cs of Communication

FACTBOT

The '7 Cs of Communication' was first discussed by professor Scott M. Cutlip and Allen H. Center in the book, *Effective Public Relations* published in 1952.



Barriers to Effective Communication

Effective communication is very important but you should be aware that there are certain barriers to effective communication. These communication barriers may disturb or discontinue the communication cycle. Let's learn about these barriers.

- **Linguistic Barriers:** Linguistic barriers refer to the barriers caused by the difference in languages and dialects. It is one of the main barriers that often limit effective communication. You know that thousands of different languages are spoken worldwide. In India, almost every state has a different language. Even dialects in the same language change within a range of few kilometres. Imagine you are visiting Kerala or Assam and you do not know the language spoken in these states. In this case, you will not be able to communicate properly with the people of these states. Similarly, if an organisation has employees from different regions, languages may likely become an issue in communication.
- **Physical Barriers:** Barriers to communication that are caused due to unfavourable environmental or natural conditions are called **physical barriers** to communication. These barriers create problems in sending a message to the recipients. These barriers include noise and distance. If there is a lot of noise, the message cannot reach the receivers. Similarly, if the audience is quite far from the communicator, it is difficult for the communicator to impress them through their gestures and body language. The same happens when one talks to someone else over telephone because it is not possible to use gestures and body language to make the communication more effective.
- **Cultural Barriers:** The advancement in communication system has turned the world into a global village where people can talk to anyone residing in any part of the world. Therefore, apart from linguistic barriers, we need to focus on overcoming the cultural barriers. People in different parts of the land follow different cultures and traditions. We should be aware of the culture and tradition of people to whom we are talking so that we do not offend their feelings, unknowingly. Many multinational companies offer special courses to their employees to know about other cultures so that the communication is effective and not offensive.
- **Organisational Barriers:** Every organisation follows a hierarchical structure, i.e., the order of job responsibilities and authority according to post and position of the employees. Besides, they have their own rules, regulations, policies and behavioural norms, etc. The methods of communication also differ from organisation to organisation. All these things sometimes create obstacles in free flow of communication. Lack of transparency is also a factor that affects communication.
- **Technological Barriers:** Technological barriers are another important factor creates obstacles in effective communication. Rapid advancement in technology is one of the reasons. Due to heavy cost in shifting from one technology to the newer one, it is not possible for all people and organisation to make the required changes. Sometimes, old and faulty equipment also create problems in free flow of communication.
- **Interpersonal Barriers:** If the message sent to the recipient is not understood the way it was intended to, it is called **interpersonal barriers**. It is called so because this barrier occurs due to personal understanding and behaviour of people involved in the communication. Interpersonal barriers can discontinue the communication process if not sorted out in time. If the sender clarifies



each and every point clearly so that the receiver can understand the intended meaning of the message or if the receiver asks for clarification, such problems can be avoided.

Ways to Overcome the Barriers to Effective Communication

Now that you know about the different barriers to effective communication. Let's learn some methods to overcome these barriers.

- **Make a Plan for Communication:** Anything done without prior planning is unlikely to be successful and the same is true with communication. For a fruitful communication, you must plan your communication well before the scheduled communication. For this, you need to gather all the relevant data and information, study them thoroughly. Besides, you should be well aware of the subject matter.
- **Make a Schedule:** You should make a schedule of the communication by having a discussion with the people, you want to communicate with. It will help you and other people to spare the required time for the communication. Your communication cannot be fruitful if it is done in a hurry.
- **Be Aware of Language and Tone:** You should be aware of the language and tone you use to converse with someone. You should frame the message in simple and convenient language. The tone of communication should not hurt the feelings of the receiver. Your message should be brief and excessive use of technical words should be avoided or minimised at the least.
- **Avoid False Assumption:** You should not make any false assumption at any stage of communication unless you have sufficient feedback for doing so. Suppose you send a message to someone and assume that the receiver has understood the intent and purpose of the message, it could go wrong.
- **Be an Active Listener:** It is the essence of communication that both the sender and the receiver must be good listeners. Both should listen to each other's point of view with attention, patience and positive attitude. A sender can collect useful information by being a good listener.
- **Consistency of Message:** The sender should ensure that the information mentioned in message is not self-contradictory. The information mentioned in the message should not change with time. It means when a new message has to be sent in place of the old one, it should always make a mention of the change otherwise it is bound to create some doubts.
- **Ensure Proper Feedback:** The sender of the message should mention certain questions in the message to encourage the receiver to give constructive feedback. Similarly, the receiver should send a constructive feedback to the sender.
- **Never be Judgemental:** The receiver or the sender should not be judgemental. Sometimes, being judgemental breaks the communication cycle. If you do not like any expression in the message, you should politely raise the issue and try to sort it out, at the earliest.



Work in groups of four. Each student in the group will send a letter to one another. Thus, each one will get three letters. Each of them will mark and mention the mistakes. Also, share some advice as to how they can improve their letter-writing skills.





AI GLOSSARY

- **Communication:** The act of exchanging information, idea, opinion, etc., between two or more people
- **Encoding:** Writing a message
- **Communication Channel:** Instruments or devices through which messages are sent
- **Decoding:** Reading and understanding the message
- **Feedback:** Response given by the 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
- **Communication Cycle:** A cyclic process in which a message is conveyed by the sender and understood and interpreted by the receiver who in turn responds by providing feedback



AI SUMMARY

- The word 'communication' comes from the Latin word 'communicare', 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, pitch and volume of our voice.
- Visual communication is a form of communication in which messages are exchanged only through pictures and symbols.
- Positive feedback is a kind of feedback which is more or less acceptable or satisfactory to the sender.
- Negative feedback is a form of feedback in which the sender of the feedback points out that someone is doing poorly and telling the sender of the message how to change it.

- If detailed information is provided about some particular work or performance, it is called specific feedback.
- Non-specific feedback is general in nature, i.e. just a response to the received message.
- If specific feedback contains detailed information about how well you have performed in a particular task, it is called descriptive feedback.
- If the specific feedback contains the precise correction statements and helps you know how to improve in those areas, it is called prescriptive feedback.
- The 7 Cs of communication is a list of principles for written and spoken communications to ensure that they are effective. The 7 Cs are: clear, correct, complete, concrete, concise, coherent and courteous.



EXERCISEBOT

A. Tick (✓) the correct option.

- Which language does the word 'communication' originally belong to?

| | | | | | | | |
|----------|-----------------------|----------|-----------------------|-----------|----------------------------------|----------|-----------------------|
| a. Roman | <input type="radio"/> | b. Latin | <input type="radio"/> | c. Arabic | <input checked="" 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 is not an advantage of written communication?

| | | | |
|-----------------------|-----------------------|------------------------|-----------------------|
| a. Variety in formats | <input type="radio"/> | b. Time for revision | <input type="radio"/> |
| c. No alteration | <input type="radio"/> | d. Record preservation | <input type="radio"/> |
- Which of the following is not a principle of 7 C's of effective communication?

| | | | | | | | |
|-------------|-----------------------|------------|-----------------------|---------------|-----------------------|--------------|-----------------------|
| a. Complete | <input type="radio"/> | b. Concise | <input type="radio"/> | c. Classified | <input type="radio"/> | d. Courteous | <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.
- In non-verbal communication, refers to the distance between the communicator and the audience.



5. If the message sent to the recipient is not understood, the way it was intended to, it is called barrier.

C. Write T for True or F for False.

1. An employer does not like an employee who can communicate properly within the organisation as well as with 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 to.
3. The members participating in a written communication do not have to wait for getting replies or feedback.
4. When a person nods while speaking to others, it indicates that he/she wants to convince others to go along with what he/she is saying.
5. Feedback is very important for a better coordination between different departments of an organisation.

D. Short answer questions.

1. What do you mean by communication?
2. What is feedback in a communication cycle?
3. How can you say that written communication saves time?
4. What do you mean by paralanguage?
5. What do you mean by space?
6. The symbols used in visual communication are consistently used at many places. How is this feature advantageous?
7. What do you understand by communication cycle?
8. What is a descriptive feedback in a communication process?
9. What are the 7 Cs of communication?
10. What do you mean by cultural barriers?

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 the importance of feedback in communication process.
8. What are the principles listed under the 7 Cs of communication? Describe any four.
9. What are the barriers to effective communication? Describe each one briefly.
10. Write any five ways to overcome the barriers of effective communication.





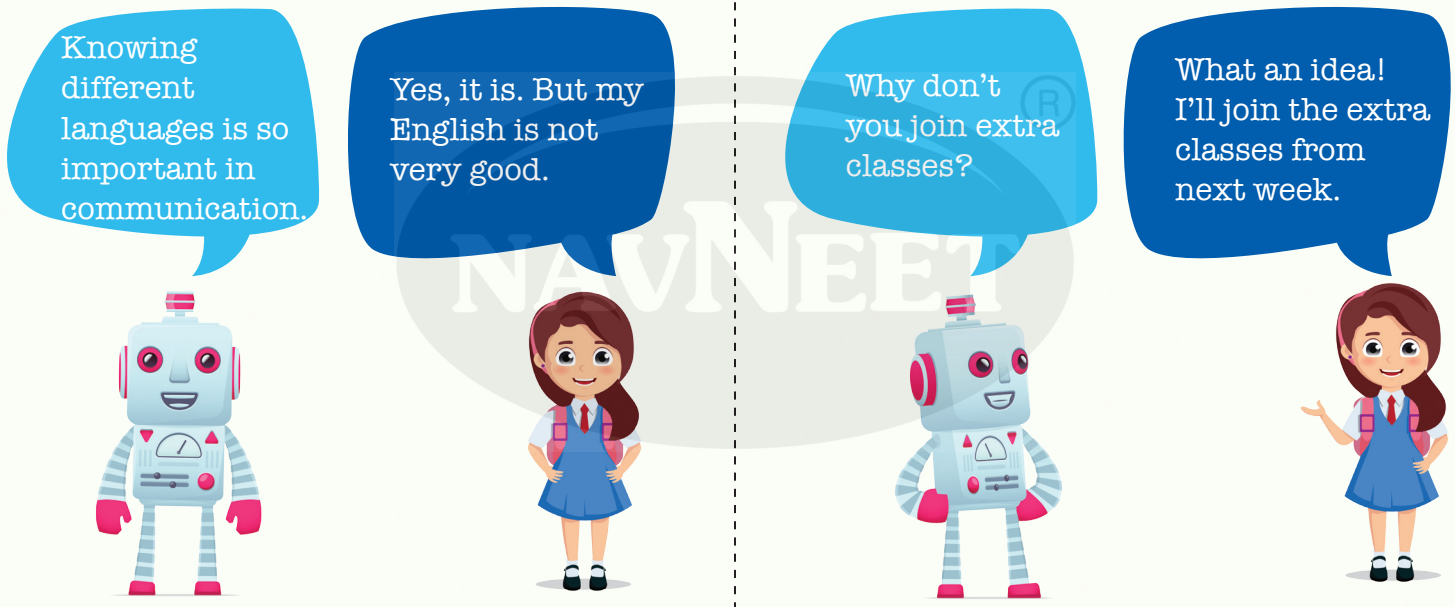
CHAPTER 2

BASIC WRITING SKILLS

In this Chapter

- The Sentence
- Parts of a Sentence
- Parts of Speech
- Articles
- Phrases
- Clauses
- Paragraph Writing

Read this conversation taking place between Sofia and Roboto. Notice the types of sentences they are using in their conversation. Are these sentences of the same type or different? Also, notice the punctuation mark used at the end of each sentence.



Yes, they are using different types of sentences. Let's examine a few of these sentences. Let's take the first sentence, 'Knowing different languages is so important in communication.' It is a simple statement. Roboto is just stating a fact. The sentence is followed by a full stop. Let's take another one, 'Why don't you join extra classes in English?' In this sentence, Roboto is asking a question to Sofia. Therefore, the sentence ends with a note of interrogation. The sentence, 'What an idea!', expresses a sudden feeling of joy. And therefore, it ends with a mark of exclamation. Thus, there is basic differences in these sentences. Let's learn about the sentences, in detail.

THE SENTENCE

Letters of the alphabet of a language are the **smallest unit** of the language. Letters are used to form words. The English alphabet consists of 26 letters from 'A' or 'a' to 'Z' or 'z'. A **word** is a single distinct meaningful entity of the language. We use a group of words in a certain order to express something.



A **sentence** is a set of words that makes complete sense. It starts with a capital letter and ends with a full stop (.), the mark of interrogation (?) or mark of exclamation (!). Let's study the different types of sentences.

Types 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

Based on the **structure** of sentences, we can divide them into three types. These are as follows:

1. Simple sentences
2. Compound sentences
3. Complex sentences

Let's first study types of sentences, based on the **sense**.

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. Let's look at some examples.

1. India is the seventh-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.

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**' or '**yes/no questions**'.



Interrogative sentences that start with **what, who, whom, whose, when, where, why, which, 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 the most important.)
- Who knows the future? (It means nobody knows the future.)



Imperative Sentences

Sentences that 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 examples:

1. Get out of my class. (Order)
2. Please, give me a glass of water. (Request)
3. Have a little more 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 these days, these sentences are considered **exclamatory** sentences. Look at the following examples:

1. May our country live long!
2. Oh, I was a king!



Based on the **structure** of sentences, they can be grouped into simple sentences, compound sentences and complex sentences. Let's learn about these sentences.

Simple Sentence

A sentence that has only one finite verb is called a **simple** sentence.

For example,

- Aditi **organised** a party for her birthday.

In the above sentence, there is only one finite verb, **organised**. Therefore, this sentence is a simple sentence.

Compound Sentence

A **compound** sentence is made up of two or more independent clauses of equal rank.

For example,

- **The teacher entered the classroom and started the class.**

In the above sentence, there are two independent clauses. Each of them can stand alone to clear in its meaning.

Complex Sentence

A sentence made up of one principal or main clause and one or more subordinate clauses is called a **complex** sentence.

For example,

- **She left for school** when the rain stopped.

In the above sentence, "**She left for school**" is the main clause because it does not depend on the second clause to make complete sense. But, the second clause, "**when the rain stopped**" is a coordinate clause because it depends on the first clause to make complete sense.

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. **Mrs 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. For example,
 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 from 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.



CHECKBOT

Read the following sentences and write their types. Also, circle the subject in each sentence.

1. Ananya has broken the vase. _____
2. Alia, Ritwik and Sohail are of the same age. _____
3. Why did he not join the extra class? _____
4. Up the hill was a beautiful temple. _____
5. How cute the baby is! _____
6. Please, shut the door. _____
7. How can he blame me for this mistake? _____
8. Under the bed was lying a cobra. _____

PARTS OF SPEECH

Now, you know what a sentence is. A sentence consists of one or more words. 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' (Fig. S2.1). Let's learn more about these groups.

Noun

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

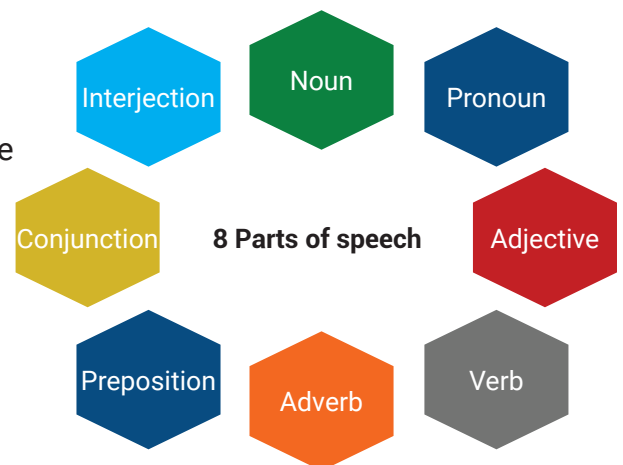


Fig. S2.1 Parts of speech



- | | |
|---|------------------|
| 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 |

FACTBOT

The name of a particular person, place, animal or thing is called a **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.

In the above examples,

He is used in place of **Aarav**.

She is used in place of **a girl**.

It is used in place of **Chandigarh**.

It is used in place of **an apple**.

We is used in place of **Aarushi** and **I**.

They is used in place of **Rohan** and **Ananya**.

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

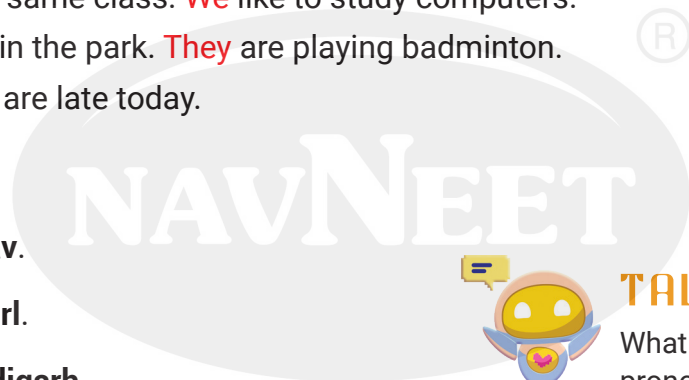
Thus, 'He', 'She', 'It', 'We', 'They' and 'You' are pronouns.

Adjective

A word that qualifies or describes 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 above examples, the word 'intelligent' qualifies the noun 'student' and the word 'studious' qualifies the pronoun 'she'. Therefore, the words 'intelligent' and 'studious' are adjectives.



TALKBOT

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



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**. A 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 the 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.

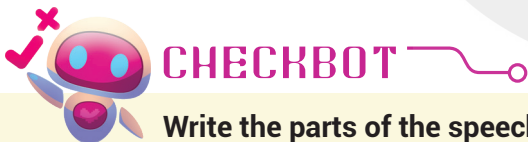
In the first sentence, the word 'and' connects two nouns 'Kavya' and 'Soumya'. In the second sentence, the word 'but' connects the two phrases 'a cloudy' and 'warm day'. In the third sentence, the word 'that' connects the two sentences 'Amit ate a burger' and 'I had brought'. Therefore, the words 'and',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

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, 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, for example, a European, a one-rupee note, a university, a US leader.
- 'An' is also used before a noun that begins with the letter 'h', where 'h' remains silent, 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 a singular or plural noun. For example,
 - **The** tree swayed from side to side.
 - **The** children ate the sandwiches.
- 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, **the** Dead Sea, **the** Pacific, 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** Koran, 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** table, **the** harmonium, etc.



CHECKBOT

NAVNEET

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 is Saturn?

PHRASES

A sentence is a group of words that makes complete sense. It has a subject and at least a 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**.

Look at the following examples:

- 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**.

Look at the following examples:

- 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**.

Look at the following examples:

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

CLAUSES

A **clause** is a group of words that has a subject and a finite verb. A clause makes some sense but not complete sense.

Kinds of Clauses

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

- Adjective Clauses
- Adverb Clauses
- Noun Clauses



Adjective Clauses

An **adjective clause** acts as an adjective in a sentence.

Look at the following examples:

- The woman **who is in a black saree** looks charming.

In the above sentence, **who is in a black saree** is a clause that is describing the **woman**. So, it is an adjective clause.

- The watch **which you gifted me** is quite expensive.

In the above sentence, **which you gifted me** is an adjective clause because it is describing the noun **watch**.

Adverb Clauses

An **adverb clause** acts as an adverb in a sentence.

Look at the following examples:

- All of us stood up **when the national anthem was sung**.

In the above sentence, **when the national anthem was sung** is an adverb clause because it is describing the verb **stood up**.

- The police rushed to the spot **where the crime had taken place**.

In the above sentence, **where the crime had taken place** is an adverb clause because it is describing the verb **rush**.

Noun Clauses

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

Look at the following examples:

- It seems **that they have drowned in the river**.

In the above sentence, **that they have drowned in the river** is a noun clause. It is acting as the object of the verb **seems**.

- It is expected **that he would win the final**.

In the above sentences, **that he would win the final** is a noun clause. Here, it is acting as the object of the verb **expected**.

PARAGRAPH WRITING

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.



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 that scores the maximum marks will win.



- **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 sentence:** A sentence that is used to express command, request or advice
- **Exclamatory sentence:** A sentence that is used to express a sudden feeling or emotion such as surprise, grief, anger, disgust, delight, etc.
- **Simple Sentence:** A sentence that has only one finite verb
- **Compound Sentence:** A sentence made up of two or more independent clauses of equal rank
- **Complex Sentence:** A sentence made up of one principal or main clause and one or more subordinate clauses
- **Articles:** The three words 'a', 'an' and 'the' to specify a noun
- **Phrases:** A group of words that make sense but not complete sense
- **Clauses:** A group of words that makes some sense but not complete sense





AI SUMMARY

- Based on the sense that sentences make, we can classify the sentences into four types. They are: Declarative Sentences or Assertive Sentences, Interrogative Sentences, Imperative Sentences and Exclamatory Sentences.
- Based on the structure of sentences, we can classify the sentences into three types. They are: Simple sentences, Compound sentences and Complex sentences.
- A sentence that makes just a statement is called a declarative or an assertive sentence.
- A sentence that enquires about something is called an interrogative sentence.
- A sentence that is used to express a sudden feeling or emotion is called exclamatory sentences.
- A sentence that is used to express command, request or advice is called an imperative sentences.
- A sentence has two parts: a subject and a predicate.
- There are eight groups under the parts of speech. They 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 sentence is called an adverb phrase.
- A phrase that acts as a noun in a sentence is called a noun phrase.
- An adjective that acts as an adjective in a sentence is called adjective clause.
- An adverb that acts as an adverb in a sentence is called adverb clause.
- A clause that acts as a noun in a sentence is called a noun clause.
- The structure of a paragraph mostly has three parts: introduction, body and conclusion.



EXERCISEBOT

A. Tick (✓) the correct option.

1. Which of the following is not a sentence?
a. I am happy. b. She goes. c. Is you are? d. Are you sad?
2. Which of the following is not an adverb?
a. carefully b. fastly c. gradually d. loudly
3. Which of the following is a conjunction?
a. into b. although c. very d. common



4. Which of the following sentences is incorrect?

a. She gave me an egg.

b. Give me the pen you have.

c. She studies in an university.

d. All of these

5. Which of the following is a complex sentence?

a. They have contacted the merchant.

b. I returned home after it started raining.

c. Kavya went to her friend and told her the problem.

d. She is a good girl.

B. Fill in the blanks with suitable articles.

1. The kid is eating orange.

2. There has been emergency evacuation at the apartment.

3. Tomorrow, we are going to library.

4. umbrella we bought is pretty.

5. man who stole car has been caught.

C. Identify the following as phrases or clauses and write their types.

1. Mahatma Gandhi was a man with a heart full of kindness.

2. The woman handled the vase with care.

3. I did not like the taste of the food.

4. The car which is black belongs to me.

5. She jumped in excitement when her brother arrived.

6. It is expected that we will lose the match.

D. Write whether the following sentences are simple, compound, or complex.

1. I will play cricket today.

2. I went to the cinema and watched a movie.

3. I played at home because it rained outside.

4. I will study when the tutor arrives.

5. The cat jumped over the wall flawlessly.

E. Write a paragraph on any two of the following topics.

1. Impact of COVID-19 on human life

2. Effects of global warming

3. Advantages and disadvantages of online shopping

4. Monuments of India

5. India before independence



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.

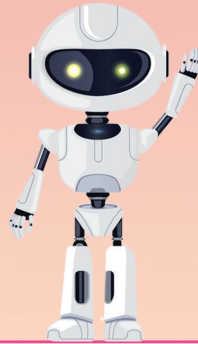
Students can be assessed and evaluated on the basis of following skills:

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



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