

# COMMUNICATION

## What is Communication and how is it related to Business Knowledge and Processes?

Communication is how we give and receive information and convey our ideas and opinions. To communicate effectively, technicians need to develop verbal, written, and visual communication skills and active listening skills. They also need to be aware of the meaning conveyed by non-verbal communication cues. It is important to differentiate informal communication, which may be part of a one's social connections in the workplace, from formal communication. Formal communication requires consideration of the audience, the purpose, and attention to tone. This can help prevent miscommunication.

## Vocabulary

- **Verbal** – communication through spoken sounds, word choice, tone of voice
- **Non-verbal** – communication through facial expressions, body language, posture, position in the room, movement
- **Active listening** – process of paying careful attention while hearing information and focusing on all of the content before responding
- **Written** – information conveyed through emails, reports, text messages and other written media
- **Visual** – information presented through signs, symbols, and graphic representations
- **Tone** – manner of expression in speaking or writing when used to express an emotion

- **Informal** – unofficial and spontaneous communication between leaders, colleagues, and others in the workplace
- **Formal** – the official interchange of information between leaders, colleagues, and others in the workplace
- **Miscommunication** – failure to communicate adequately

## How will technicians use communication?

In her job as a manufacturing technician, Kate is part of wafer production team creating the very latest semiconductor chips to power PCs, tablets, smartphones, and wearable devices. To ensure a smooth transition between shifts, Kate verbally shares with the incoming technician a summary of what happened during her shift. There is a brief shift overlap which gives Kate plenty of time to talk about the typical daily production items. If there are any major problems that come up, however, Kate will need to provide documentation by writing a description of the problem, the root cause (if known), and whether it was resolved. She can do this through an email to her supervisor and the technician coming on board for the next shift. Kate includes a subject line stating the email is about a problem during her shift. She starts her emails with a formal salutation, using her colleague and supervisor's names. The body of the email is concise and to the point. Kate reviews her emails carefully before sending it out to ensure that it is free of errors and that she has used a professional tone.



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## Skills Needed for a High-Paying Career

- Communicating verbally (phone calls, personal communication, professional conversations, presentations, interviews)
- Listens actively, asks clarifying questions, and summarizes information to check for understanding
- Comprehends written material
- Conveys information professionally in writing (reports, memos, emails, faxes, forms, letters)
- Responds carefully to nonverbal communication
- Selects the appropriate media for presentations (presentation slides, photos, graphics, drawings, video, audio recordings)
- Combines written, verbal, and media communication effectively (data visualization, training, team troubleshooting)

## Education

Your local community college provides the classes you will need. Skills for speaking and writing well are most often taught within courses as part of presentation skills but may be offered within courses required for the general education component of the associate degree or one-year certification or within workforce preparation coursework. Communication skills are critically important across all technical fields, including agricultural, cybersecurity, biomedical, energy, environmental, engineering technologies, etc. Community college course schedules are designed to accommodate the needs of working students and often include online and hybrid delivery formats. [Find your nearest community college here.](#)

## Future Trends

The future will include using communications skills in:

- Remote and hybrid work environments
- Meetings with higher definition video conferencing
- Artificial Intelligence, Augmented Reality, and Virtual and Augmented Reality collaboration platforms
- Wearable Apps
- A global economy requiring intercultural communication skills



## Learn More

- [Communication Skills at Work: 4 Key Tips](#) (video)
- [How to Communicate Better with Coworkers](#)



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# COMMUNICATION

## What Is Communication?

Communication is the transfer of information to produce greater understanding. It can be done verbally (through words, vocal tone and pitch), nonverbally (through body language and gestures), visually (using graphs, charts, or maps), and through writing.

## Communication Competencies

- Communicating verbally (phone calls, personal communication, professional conversations, presentations, interviews)
- Listens actively, asks clarifying questions, and summarizes information to check for understanding
- Comprehends written material
- Conveys information professionally in writing (reports, memos, emails, faxes, forms, letters)
- Responds carefully to nonverbal communication
- Selects the appropriate media for presentations (slides, photos, graphics, video, audio recordings)
- Combines written, verbal, and media communication effectively (data visualization, training, team troubleshooting)

## Cross-disciplinary Skills

- Selecting the appropriate methods to communicate with diverse audiences
- Using visualization tools effectively to present data
- Proficiency with digital communication technologies
- Following ethical principles in the digital world

## Information Security Scenario

Jayden is a Network Technician for an engineering consulting firm. Recently, the company had a cyber incident. One of the employees in the accounting department clicked on a link that she thought was from the IRS, but it wasn't. When she clicked on the link, she was asked to enter the company's login information, which gave cyber criminals access to their company's financial details. To prevent this type of incident from happening again, Jayden needed to communicate to all employees in a clear, concise manner about the danger of clicking on unsolicited email links and attachments and how to stay alert for warning signs of fraudulent emails. He did this by creating a one-page document with bullets that stated what not to do and why and the importance of contacting him if they receive suspicious emails. Jayden used 10 minutes of the company's weekly staff meeting to present the document and then followed up with an email and attached the document so everyone at the company would have access to both hard and electronic copies.

## Energy Technology Scenario

Ray recently began a position as a Nuclear Operations Technician soon after graduating with an associate degree from a nearby community college. Ray works in the control room for a nuclear power plant and is spending the next year training with a more experienced technician. Gaining the technical knowledge from college has provided an essential foundation to his work but asking key questions now that he's on the job has been equally important. Ray carries an iPad with him to take notes and to document questions and answers throughout the day. After asking a question, he types notes on what he hears and sends the summaries back to his supervisor for verification. If what he heard demonstrates misunderstandings, Ray corrects his notes, then summarizes again to make sure he is on target. This is a practice he uses when he meets with engineers and scientists at the plant as well. Not only does it help Ray, but others at the company have shared that it helps them build confidence in Ray's abilities as a new technician.

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## Activity

This activity asks students to explore how technicians use process writing. First, students watch a video of a process. They create a written set of processes on their own then consolidate and finalize the process document with a partner.

## Warm-Up

Review the types of communication. Explain that one type of communication technicians frequently use is written communication, such as emails, memos, lab reports or technical procedures for using equipment. Each of these types of writing requires a distinctive style based on purpose and audience. Discuss that procedural writing outlines process steps in the order they need to be completed. Well-written procedures are factual, precise, and provide the reader with adequate detail. It is important to write a draft or practice document before sharing it with others who will use the process. Ask students for examples of when they've used a procedural document such as a lab manual or Standard Operating Procedures (SOP) manual in the past and what made it effective or ineffective.

## Activity Steps

1. Explain to students that the activity is for them to watch a procedure and translate it into written directions. Ask what procedural documents they might need to write in their fields.
2. Review or provide brief background on cobots. A cobot is collaborative robot typically used in advanced manufacturing. The activity will have students first learn how to program a cobot

through watching a video and then write the procedure for programming a cobot.

3. Have students watch [The Cobot: A Tutorial](#) video all the way through.
4. Students watch the video again through 3:40, documenting the steps they are watching. They can stop the video and/or watch a few more times to write down all the process steps.
5. In pairs, students compare their steps. Together they should revise the procedure to ensure the documentation is clear, concise, free of errors, and could be submitted as a formal process write-up in the workplace.
6. Have pairs share their procedure steps with the class.
7. Questions to pose to close out the activity: (a) What were the similarities and differences in the procedure documents you and your partner created separately? (b) What are challenges or opportunities for doing this type of writing in your field of study?

## Read More

- [12 Tips to Effective Communication in the Workplace](#)
- [Working Stronger and Smarter: A Handbook on Theory and Techniques for Developing Employability Skills for Technicians](#)
- ["Communication," from the Employability Skills Resource Toolkit](#)



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## ABOUT THE PROJECT

Preparing Technicians for the Future of Work, funded by the National Science Foundation Advanced Technological Education program, recognizes that technicians need an expanded skill set to remain competitive. The project's Framework for a Cross-Disciplinary STEM Core outlines recommendations for incorporating knowledge and skills in Advanced Digital Literacy, Data Knowledge and Analysis, and Business Knowledge and Processes. Learn more about implementing the Framework at [preparingtechnicians.org](http://preparingtechnicians.org).