

LOW PRICE EDITION



Basic Communication Skills for Technology

Second Edition

Andrea J. Rutherford

This edition is manufactured in India and is authorized for sale only in India, Bangladesh, Bhutan, Pakistan, Nepal, Sri Lanka and the Maldives. Circulation of this edition outside of these territories is UNAUTHORIZED.

BASIC COMMUNICATION SKILLS FOR TECHNOLOGY

2nd Edition

Andrea J. Rutherford, Ph.D.
*formerly of DeVry Institute of Technology
Atlanta, Georgia*

**SAMPLE COPY
NOT FOR SALE**



**TEACHER'S SAMPLE
NOT FOR SALE**

This one



ZSC5-46J-LKUZ

Copyrighted material

**Copyright © 2001 by Pearson Education, Inc.
This edition is published by arrangement with Pearson Education, Inc. and Dorling Kindersley Publishing Inc.**

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, resold, hired out, or otherwise circulated without the publisher's prior written consent in any form of binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser and without limiting the rights under copyright reserved above, no part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), without the prior written permission of both the copyright owner and the above-mentioned publisher of this book.

ISBN 81-7758-407-3

First Impression, 2006

Second Impression, 2007

This edition is manufactured in India and is authorized for sale only in India, Bangladesh, Bhutan, Pakistan, Nepal, Sri Lanka and the Maldives. Circulation of this edition outside of these territories is UNAUTHORIZED.

Published by Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.

Head Office: 482, F.I.E., Pataparganj, Delhi 110 092, India.

Registered Office: 14 Local Shopping Centre, Panchsheel Park, New Delhi 110 017, India.

Printed in India by Saurabh Printers Pvt. Ltd.

Contents

<u>Preface to the Student</u>	x
<u>Acknowledgments</u>	xiii
<u>Messages from Industry</u>	xiv
<hr/>	
Part I: Foundations	1
<hr/>	
Chapter 1:	
<u>Audience</u>	<u>3</u>
READING: Technical Communication	3
WRITING: Analyzing Your Audience	9
SPELLING: Using the Spelling Check	13
VOCABULARY: Prefixes <i>pseudo</i> and <i>quasi</i>	14
WORD WATCH: <i>its</i> and <i>it's</i>	15
<hr/>	
Chapter 2:	
<u>Language and Style</u>	<u>17</u>
READING: Strong Writing Skills Essential for Success, Even in Information Technology	17
WRITING: Language and Style	19
SPELLING: Doubling the Final Consonant	26
VOCABULARY: Negative Prefixes	28
WORD WATCH: <i>a</i>, <i>an</i>, & <i>and</i>	29
<hr/>	
Chapter 3:	
<u>Organization</u>	<u>31</u>
READING: Taking the Noise Out of Technical Writing	31
WRITING: Organization	36
SPELLING: Suffixes <i>ise</i>, <i>ize</i>, and <i>yze</i>	45
VOCABULARY: Number Prefixes <i>bi</i>, <i>mono</i>, <i>poly</i>, and <i>semi</i>	47
WORD WATCH: <i>a lot</i> and <i>allot</i>	48

Part II: Writing Elements**49**

Chapter 4:**Technical Definitions 51**

<u>READING: You Are Not Alone: Beware of What You Say on the Internet</u>	51
<u>WRITING: Technical Definitions</u>	55
<u>SPELLING: Plurals</u>	60
<u>VOCABULARY: Latin Number Roots</u>	62
<u>WORD WATCH: <i>to, too, and two</i></u>	63

Chapter 5:**Technical Descriptions 65**

<u>READING: Writing Science Articles Without a Ph.D.</u>	65
<u>WRITING: Technical Descriptions</u>	68
<u>SPELLING: Using Numbers</u>	73
<u>VOCABULARY: Greek Number Roots</u>	76
<u>WORD WATCH: <i>wear, we're, were, and where</i></u>	77

Chapter 6:**Summaries 78**

<u>READING: Hubble Expands the Universe</u>	78
<u>WRITING: Summaries</u>	83
<u>SPELLING: Double Trouble</u>	85
<u>VOCABULARY: <i>tele, phono, photo, graph, and gram</i></u>	86
<u>WORD WATCH: <i>lose, lost, loss, loose, and loosen</i></u>	87

Chapter 7:**Graphics 89**

<u>READING: Is There Safety in Numbers?</u>	89
<u>WRITING: Preparing Graphics</u>	93
<u>SPELLING: <i>ie</i> and <i>ei</i></u>	106
<u>VOCABULARY: Roots <i>spec</i> and <i>son</i></u>	107
<u>WORD WATCH: <i>they're, their, and there</i></u>	108

Chapter 8:**Instructions 110**

<u>READING: Easy as 1-2-3</u>	110
<u>WRITING: Instructions</u>	114
<u>SPELLING: Adding <i>ly</i> and <i>ally</i></u>	120
<u>VOCABULARY: <i>macro</i> and <i>micro</i></u>	121
<u>WORD WATCH: <i>advice</i> and <i>advise</i></u>	122

Chapter 9:**Comparison and Contrast 123**

<u>READING: Your PC is Listening</u>	123
--------------------------------------	------------

<u>WRITING: Comparison and Contrast</u>	127
<u>SPELLING: Tough words</u>	129
<u>VOCABULARY: <i>retro</i>, <i>circum</i>, <i>intro</i>, <i>intra</i>, and <i>inter</i></u>	131
<u>WORD WATCH: <i>effect</i> and <i>affect</i></u>	132
<hr/>	
<u>Part III: Forms of Technical Communication</u>	133
<hr/>	
<u>Chapter 10:</u>	
<u>Technical Reports</u>	135
<u>READING: Implementing ISO 9000: Three Perspectives</u>	135
<u>WRITING: Technical Reports</u>	144
<u>SPELLING: Suffixes <i>ance</i> and <i>ence</i></u>	155
<u>VOCABULARY: Prefixes <i>proto</i>, <i>trans</i>, and <i>neo</i></u>	156
<u>WORD WATCH: <i>accept</i> and <i>except</i></u>	157
<hr/>	
<u>Chapter 11:</u>	
<u>Forms, Memos, and E-mail</u>	158
<u>READING: E-mail etiquette: When and How to Communicate Electronically</u>	
<u>WRITING: Forms, Memos, and E-mail</u>	161
<u>SPELLING/VOCABULARY: Roots <i>sede</i>, <i>cede</i>, and <i>ceed</i></u>	174
<u>WORD WATCH: <i>past</i> and <i>passed</i></u>	178
<hr/>	
<u>Chapter 12:</u>	
<u>Business Letters</u>	179
<u>READING: Turning Confrontation into Communication</u>	179
<u>WRITING: Business Letters</u>	182
<u>SPELLING: Suffixes <i>ible</i> and <i>able</i></u>	198
<u>VOCABULARY: Roots <i>grad</i> and <i>gress</i></u>	200
<u>WORD WATCH: <i>stationary</i> and <i>stationery</i></u>	201
<hr/>	
<u>Chapter 13:</u>	
<u>Presentations</u>	203
<u>READING: John F. Kennedy's Address on the Space Effort</u>	203
<u>WRITING: Presentations</u>	207
<u>SPELLING: Dropping the Final e</u>	213
<u>VOCABULARY: Prefixes <i>sub</i> and <i>super</i></u>	215
<u>WORD WATCH: <i>used</i> and <i>supposed</i></u>	215
<hr/>	
<u>Chapter 14:</u>	
<u>The Job Search: Résumés and Letters</u>	217
<u>READING: Web Spurs Change in Style of Résumé</u>	217

<u>WRITING: The Job Search</u>	<u>219</u>
<u>SPELLING: Technical Terms in Résumés</u>	<u>231</u>
<u>VOCABULARY: Prefixes <i>mega</i> and <i>meta</i></u>	<u>232</u>
<u>WORD WATCH: <i>infer</i> and <i>imply</i></u>	<u>232</u>

<u>Part IV: Grammar Units</u>	<u>235</u>
-------------------------------	------------

<u>Grammar Unit 1: Subjects and Verbs</u>	<u>237</u>
---	------------

<u>Grammar Unit 2: Subjects/Verbs Agreement</u>	<u>245</u>
---	------------

<u>Grammar Unit 3: Prepositional Phrases</u>	<u>251</u>
--	------------

<u>Grammar Unit 4: Pronouns</u>	<u>256</u>
-------------------------------------	------------

<u>Grammar Unit 5: Pronoun References</u>	<u>261</u>
---	------------

<u>Grammar Unit 6: Avoiding Shifts</u>	<u>263</u>
--	------------

<u>Grammar Unit 7: Avoiding Sexism</u>	<u>266</u>
--	------------

<u>Grammar Unit 8: Modifiers</u>	<u>268</u>
--------------------------------------	------------

<u>Grammar Unit 9: The Clause and Simple Sentences</u>	<u>276</u>
--	------------

<u>Grammar Unit 10: Compound Sentences</u>	<u>277</u>
--	------------

<u>Grammar Unit 11: Complex and Compound-Complex Sentences</u>	<u>281</u>
--	------------

<u>Grammar Unit 12: Fragments, Run-Ons, and Comma Splices</u>	<u>289</u>
---	------------

<u>Grammar Unit 13: Transition Words</u>	<u>295</u>
--	------------

<u>Grammar Unit 14: Parallelism</u>	<u>297</u>
---	------------

<u>Part V: Mechanics Units</u>	<u>303</u>
<u>Mechanics Unit 1:</u> Capital Letters	305
<u>Mechanics Unit 2:</u> <u>Abbreviations and Acronyms</u>	<u>309</u>
<u>Mechanics Unit 3:</u> End Punctuation	311
<u>Mechanics Unit 4:</u> Commas	314
<u>Mechanics Unit 5:</u> Colons and Semicolons	322
<u>Mechanics Unit 6:</u> Parentheses, Dashes, Brackets, Ellipses, Slashes, and Hyphens	324
<u>Mechanics Unit 7:</u> Apostrophes	328
<u>Mechanics Unit 8:</u> Quotations	332
<u>Part VI: Appendices</u>	<u>337</u>
<u>Appendix 1:</u> Common Symbols and Abbreviations	339
<u>Appendix 2:</u> Tips for Word Processing	344
<u>Appendix 3:</u> Sample Reports	349
<u>Appendix 4:</u> Spelling and Misused Words	390
<u>Appendix 5:</u> Irregular Verbs	393
<u>Appendix 6:</u> Job Application	396
<u>INDEX</u>	<u>401</u>

Preface to the Student

Your technical skills will be an important factor in your career. However, if the technical skills of two candidates are equal, the decision for hiring (or promoting) is usually based on the ability to communicate. For some positions, communications skills are so vital that poor writers or speakers are passed over, no matter what level of expertise they have in technical skills. To confirm the importance of communication skills in technology, read "Messages from Industry". Leaders of major corporations state their beliefs in the value of good communication.

This book presents the types of writing skills you need to have for a career in technology. Much of the information is based on my career as an educator and professional technical writer. During the course of my career, particularly in the business world, I have witnessed the growing demands and increased expectations for written and spoken communication that employees at every level face on a daily basis.

A few years ago, employees could rely on a department secretary or administrative assistant for help with writing, editing, and distribution. Today, all employees, except those in the highest levels of upper management, are personally responsible for their communication tasks. And the results depend as much on their ability to master a computer and software as on their ability to write effectively.

Companies still hire or contract professional technical writers to produce critical documents, such as proposals, user's guides, and online help. But the majority of employees must write their own e-mail, letters, reports, and presentation aids, sometimes without time for internal review. This can be an intimidating challenge to someone who is unfamiliar with basic writing skills. For those who take the time to practice and experiment, it can be an opportunity to shine.

The tools for communication continue to become more powerful and sophisticated. Most businesses expect workers to operate desktop computers, laptops, personal digital assistants (PDAs), and other equipment for word processing and messaging, as well as peripheral devices such as high-quality printers, scanners, and digital cameras to enhance the quality and detail of documents and graphics.

Writing software has become more powerful, too, ranging from easy-to-use word processors, database programs, and graphic tools, to ever-more-powerful desktop-publishing programs and presentation systems, capable of producing manuals, documents, online help, and presentations in any language and any format, and available on all types of computer platforms. Many companies have adopted strategies such as telecommuting, teleconferencing, and even telework as alternatives to expansion, making it even more important for employees to maintain and manage their own equipment

and software. This was driven home to me recently when a service technician came to my home to provide an estimate for a repair. During the process of testing my air conditioning ducts, he also set up his laptop computer, external zip drive, and portable printer. His entire office was now operational on my kitchen table, and he was able to complete the diagnostic pricing and contract, authorize it, and print it in his portable office. This scenario is sometimes called telework. The technician doesn't have an office at his employer's site; instead, he brings his office with him to each customer site.

And of course, no business can afford to overlook the value of e-business, e-commerce, and e-recruiting: conducting all types of transactions using the Internet. Progressive companies know that technology provides the most effective way to communicate with customers, employees and potential employees, business partners, and customers. It also provides immediate access to information, products, and services. Employees often use the Internet as their primary source of company information, research and development, training, and communication.

All of these trends should impress upon you the value of learning more about information technology and how to use the computer as your basic communication tool. Your entire work environment might one day be contained within the casing of your computer and a few peripheral devices.

Many exercises in this text require the use of a word processor. Some require the use of the Internet to research specific topics.

Before you get started, I want to tell you how to use this book. I wrote it using a systems approach to communication. A system is an arrangement of related, individual elements that, together, form a unity. Language has several individual elements, as demonstrated in each chapter of this book. Each chapter has five sections. The first section is an article to READ, followed by WRITING, SPELLING, VOCABULARY, and WORD WATCH sections.

The READING articles for each chapter either discuss or demonstrate the topic of the chapter and consist of facts and ideas presented in an interesting way. If you encounter new words, underline the words and keep reading. Sometimes you will figure out new words by their context—the words around them. Look up the words that you have not figured out after you have finished reading, then reread the sentence. Finally, answer the comprehension questions at the end of the article. They will help you interpret, organize, and respond to what you have read.

The WRITING sections present the skills most useful to technical people and deal with one primary writing skill at a time. Part 1 presents the foundations of technical writing: audience, language and style, and organization. Part 2 presents chapters on specific writing tasks, such as writing a technical definition, technical description, summary, graphics, comparison and contrast, and instructions. Part 3 presents chapters on longer or more complicated tasks, including reports, presentations, and searching for a job.

The SPELLING sections review some spelling patterns that are reliable. They will also give you a helpful aid to remember correct spellings of tricky words. Poor spelling is unprofessional. Spelling checks find and correct some errors, but not all. Since writing takes time, thought, and effort, it seems senseless to degrade our own work with misspellings—it's almost like wearing an expensive shirt inside-out.

The VOCABULARY sections attempt to bring some order to the haphazard collection of foreign roots, prefixes, and suffixes that form technical words. Latin and Greek, particularly, form the roots for most of the difficult words that we encounter in technology. These sections will help you analyze words to determine their meanings.

Finally, the WORD WATCH sections review groups of easily confused and misused words. Sometimes the placement of one letter completely changes the meaning of a word, as in *tough* and *though*. Other times, two related words, such as *affect* and *effect*, have completely different meanings and uses.

Following the chapters, two sections review the fundamental rules of composing clear and correct sentences: The Grammar and Mechanics Units. The Grammar Units

deal with the components of language: individual words, groups of words, and sentence structure and their functions in communication. Just as science is guided by a limited set of theories and principles, English is guided by a limited set of rules. *Limited* does not mean a small number, just a learnable number. The Grammar Units provide a review of these rules.

The Mechanics Units deal with the tools of our language: symbols, abbreviations, numbers, and punctuation. The longest unit reviews the comma, often the most troublesome punctuation mark for writers. The Mechanics Units provide a review of the rules surrounding punctuation, numbers, and symbols.

At the very end of the book, six appendices include information that supplements other chapters. Look through them to see what is offered. Learning the techniques of effective writing requires thought and practice. Whatever effort you put in, however, will pay off—in this course and in your career. Consider this book as a ladder to career advancement. Good luck!

Andrea J. Rutherford

ACKNOWLEDGMENTS

The second edition is the result of many years of learning from instructors, colleagues, students, and more recently, from my workteams, co-workers, managers, and business associates. I would like to thank them all collectively for their individual contributions, large and small.

I would also like to acknowledge the people who shared their professional experiences with business communication. They each supplied examples and suggestions for applying general writing practices to specific careers. They include Tony Cook and Wayne Wofford, Gwinnett Area Institute of Technology; Sonny Cox, Sonny's Service Center; Earl Friedell and Shirley McCree, DeKalb Technical Institute; David Homback, Southern College of Technology; David Hurst, State Farm Corporation; Jean Burns and Shelley Fischer-Wylie, human resources; Jim Brown and Patrick Williams, Colder Products Company; and Steve Hookstra, paramedic. My family also provided many experiences from their careers—formally and informally. Thank you to Dick Ottum, Duane Ottum, Lara Nichols, Chris Sorlie, and Vermont Rutherford.

I also want to thank the faculty and staff at DeVry Institute of Technology (Atlanta) for their insights into electronics and computer science. For this edition, I particularly want to thank Kyle Jones and Jack Griffin.

Despite my many resources, however, any technical inaccuracies are solely my own.

My Prentice Hall editor, Steve Helba, and his assistant, Nancy Kesterson, provided many of the tools and the encouragement I needed to get this into production.

Many thanks to my reviewers for helping to improve the text: Nancy M. Staub, Lamar University; Deborah L. Lamm, Lenior Community College; Kent Harrelson, Dalton State College; Robin Newcomer, Olympic College; and F. C. Campbell, Ph.D., Devry-Chicago.

And of course, I want to express appreciation to my family for letting me spend my weekends at the library or computer, miss a few holidays, continue to type while we talked on the phone, and put off many events (except becoming a grandmother) for a few months. And Tom, my husband, learned how to fend for himself, again, as I disappeared into the office for days on end. Without their patience and understanding, I could not have continued. I dedicate this book to my family: Tom, Chris, Vermont, Lara and Joel, and baby Sintra Autumn.

Messages from Industry

Tomorrow's problem will not be the communication of data but more importantly, 'information.' Data abounds. Useful information is still unfortunately sparse.

Matthew A. Kenny, President, Racal-Milgo, Inc., Sunrise, Florida

The best ideas in the world are useless unless they can be communicated to others. By the word 'communication' I mean that there's not only reception, but understanding of the information conveyed. Miscommunication of information not only destroys many great ideas, but causes untold waste in daily business activities.

Richard W. Oliver, Assistant Vice-President, Northern Telecom Limited, Nashville, Tennessee

The ability to speak and write clearly is not only important to the communication of technical concepts, it is an essential part of the innovation process itself. Translating an idea into the written word is one of the better ways of validating the soundness of one's thinking.

Ian M. Ross, President, AT&T Bell Laboratories, Holmdel, New Jersey

Your knowledge is only as valuable as your ability to communicate it to someone else.

Gerald E. Schultz, President, Bell & Howell Company, Skokie, Illinois

... Communications skills are the second most important [skill] that any technical person can learn, and the first is learning to learn. Without communication skills, however, doing the most important is much more difficult than it needs to be. Someone who has already attained communication skills is ready to move ahead more quickly, for he must learn them to move ahead at all.

Court Skinner, Manager, Advanced Technology, National Semiconductor, Santa Clara, California

One is not evaluated on technical skills alone, but also on the image one presents while communicating.

Keith R. Welker, Personnel Administrator, Hughes Aircraft Company, El Segundo, California

PART I

Foundations

Chapter 1: Technical Communication

Chapter 2: Language and Style

Chapter 3: Organization

Technical Communication

- Identify the factors to consider in technical communication.
- Analyze the "audience."
- Rewrite passages for a different audience.
- Spell plurals correctly.
- Use *pseudo* and *quasi* correctly.
- Use *its* and *it's* correctly.

READING: Technical Communication

The way we communicate reveals many things about us: our emotions, our view of the world, our interests, and our experience with the different methods of communication.

Technical communication differs from other forms of communication in several ways, including audience, purpose, and style. The chapters of this book introduce many of the concepts that make technical communication distinctive and effective for writers, readers, speakers, and listeners in the workplace. Most of the concepts apply primarily to written communication, but you can apply them equally to spoken communication.

The audience for this book is the student who is preparing for a technical career in which communication will be part (but not all) of the job.

What Is Technical Communication?

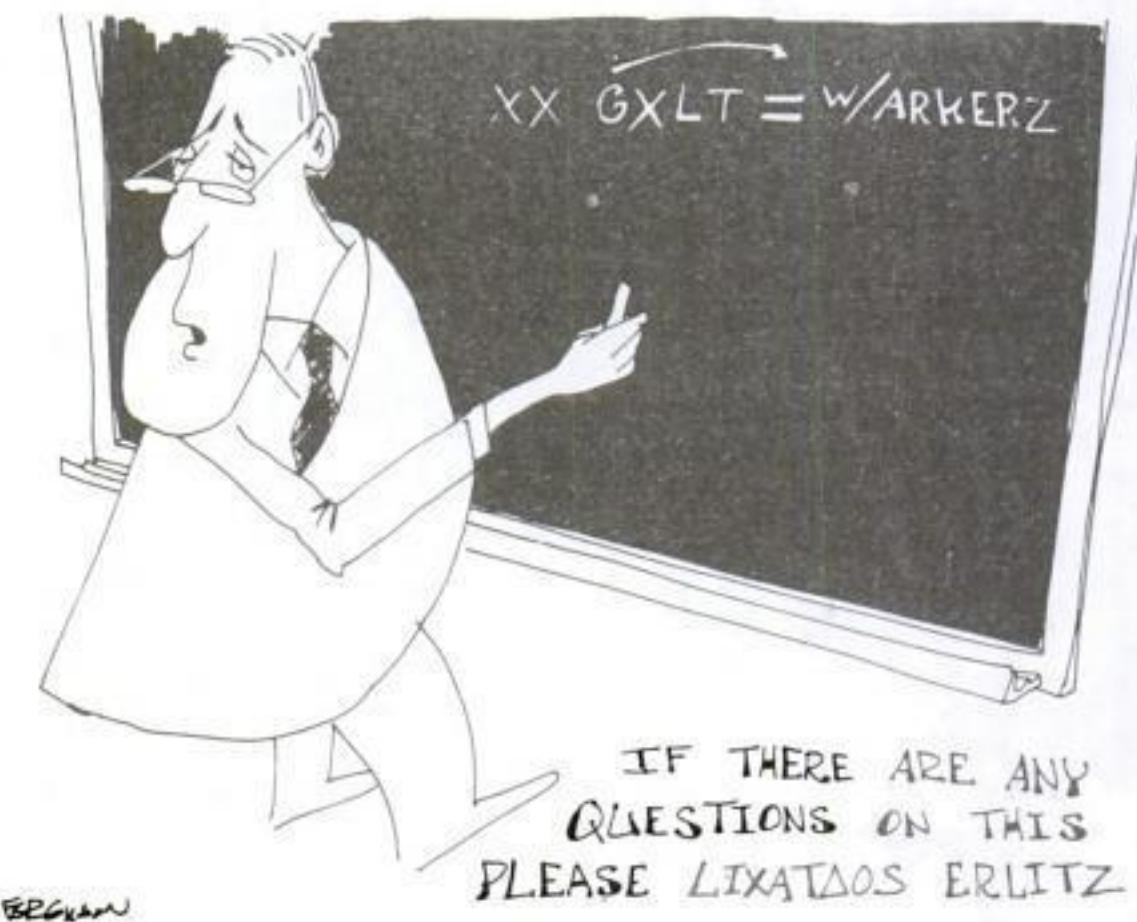
Technical communication is the process of transmitting facts and information to a defined audience for a specific purpose. More simply, technical communication is writing for understanding. Technical writers present information in science, electronics, or other technical areas on a professional level, backed up by data and facts, so that the information is complete and accurate.

Most companies expect employees to communicate regularly on a business level through e-mails, letters, and memos. Some positions, usually higher-level, require reports, proposals, instructions, and presentations. Employees who can produce focused, clear documents often have a competitive edge over others who are less skilled with written communication.

The History of Technical Communication

Technical writing dates back to the earliest recorded language. Ancient civilizations drew pictographs on cave walls to describe how they hunted and where they journeyed. In more recent centuries, leaders in science and mathematics developed a language and style to record their theories, inventions, and discoveries by documenting their procedures and proofs for others to understand or replicate.

For the western origins of technical writing, we need to go back only to the 17th century, when the Royal Society in London produced the first written attempts to describe and categorize the physical world systematically. Today, in the 21st century, scientists use a time-honored methodology for conducting and reporting discoveries



and technical developments. As a professional in a technical field, your peers will expect you to conform to the writing conventions in your industry.

We have available to us today a wide variety of equipment and computer software to make our writing, research, and distribution efficient. We use word processors, desktop publishers, graphics programs, and multimedia presentation software, rich with features and versatility. We have innovative equipment such as modems, digital cameras, and scanners that transmit or process information into usable forms. The Internet offers millions of Web sites on which we can shop, research, and communicate with others. We have entire encyclopedias on the Internet, and multiple Internet search engines to research topics and locate data from thousands of sources online. We have laptop and hand-held computers, portable digital assistants (PDAs), and portable digital notepads (PDNs) to take with us from place to place. We even have computer software that types what we dictate (called speech-recognition software) and reads our computer documents and e-

mails out loud using a computer-generated voice (called text-to-speech software). In recent years, the variety, power, and speed of communication tools have given us access to a staggering amount of data that we must then convert into information.

We are surrounded by technical information. As an example, look at the back of a common frozen-food carton. It is a marvel of verbal efficiency and visual layout, containing everything you need to know about the product. It contains preparation instructions, an ingredients list, nutrition facts, and pictures showing the prepared product. In addition, packages include serving suggestions, marketing information, a bar code for grocery store scanners, safety warnings, and recycling information, all carefully worded and laid out so they are succinct, accurate, visible, and understandable. This example might seem like a simple writing project, but in fact, it is a challenge undertaken only by teams of experienced technical writers, designers, and marketers. Every carton design has probably gone through extensive reviews, edits, redesigns, marketing

feedback, and usability testing. We'll leave that kind of assignment to the pros.

Factors to Consider in Technical Communication

For most of us, the ability to write a meaningful report or a hard-hitting memo develops slowly. As with any skill, practice and experience are essential. To get started, look at the factors technical writers must consider before beginning any type of technical communication. These are audience, purpose, format, and style.

Audience

The audience could consist of managers, coworkers, customers and clients, the general public, or any combination. They will have different levels of understanding and different information needs that require specific formats and styles of communication.

Purpose

The purpose of a technical document could be to inform, explain, describe, persuade, or record your actions. Some documents have multiple purposes, and some purposes overlap, such as a request for equipment (to persuade) that includes a technical description of the equipment (to describe).

Format

Technical communication can be written in the following formats:

- Reports or documents, such as proposals, lab reports, product specifications, or quality-test results.
- Record-keeping forms, such as service reports, travel and expense forms, or troubleshooting logs.
- Instructions, such as user guides, online help, and training manuals.
- Correspondence, such as letters, memos, and e-mails.

- Presentations, such as interviews, marketing calls, or training seminars.

Some types of communication employ a combination of formats, such as a letter or e-mail that includes a message and a backup report as an attachment.

Style

Writers base the style (language, organization, and layout) of the document on the audience, purpose, and format. The language can include many technical terms, called *jargon*, or it can include general terms and definitions of technical terms. The document might need a visible structure of headings and subheadings or even chapters to identify the flow of information, such as a product specification or manual. Or the document might not need visible clues for structure, such as a casual e-mail or memo focused on only one topic, comprised of only a few paragraphs.

The layout can consist of condensed paragraphs that fill the pages of the document, or it can provide lots of white space, with examples, charts, or graphics to illustrate points and bulleted or numbered lists to highlight main points. These types of visual aids allow for a quick or scanned reading.

Preferences of Technical Readers

Generally people who read technical information prefer sentences that get straight to the point. They prefer words that are functional, exact, and clear. They prefer paragraphs that are short, with each paragraph focused on only one idea. And they prefer a visible organization with headings, bulleted lists, and numbered steps, and graphics and examples that illustrate the details of the subject.

Style Guides

A style guide is a reference book for writers. It offers guidelines on the finer points of word usage, punctuation, and

mechanics for standard communication, beyond the basic rules of grammar and punctuation. The differences between style guides might appear to be slight, but they provide for consistency in such things as formatting headings, citations, and quotations.

Some style guides develop within an industry. For example, English departments in colleges and universities often prefer the *MLA Handbook for Writers of Research Papers*, written by Joseph Gibaldi and published by the Modern Language Association. The MLA style guide uses the following format for citing a book in a bibliography:

Paynter, Robert T. *Introductory Electronic Devices and Circuits*. Upper Saddle River, NJ: Prentice Hall, 1991.

Newspapers and book publishers often prefer *The Chicago Manual of Style*, published by the University of Chicago Press. It uses the following format for citing the same book:

Paynter, Robert T. 1991. *Introductory Electronic Devices and Circuits*. Upper Saddle River, NJ: Prentice Hall.

Companies usually adopt a style guide, which the writers in the company follow. In addition, some companies develop their own conventions and styles for certain documents. If your company makes such recommendations, familiarize yourself with the approved style and adjust your writing accordingly.

Getting Started: Focus on the Audience

Does this overview make technical writing sound overwhelming? It is a challenging task to most people, even those who have been writing professionally for many years. So where do you start?

Focus On the Audience

The first step in writing technical communication is to focus on the audience. While you are in school, you know that your audience is your professor or possibly your classmates, and you have a good idea of your audience's technical background and expectations. In the workplace, however, you must analyze your audience more carefully by asking the three questions that introduce the following sections.

1. What does the audience already know about the subject?

In communication, the "audience" is the person or group of people whom you expect to read your information. Even though writers do not know exactly who will read their documents, they can usually define an intended audience as either technical, semi-technical, or nontechnical.

Technical Audience

The technical audience includes practitioners in your field: those with technical experience and training, such as technicians and engineers. A technical audience understands fundamental concepts and jargon without definitions or background information. Readers expect the writer to use technical language efficiently and appropriately. For this audience, writers use technical terms and precise data to convey information. The following example is a paramedic's report written for a technical audience: the medical staff at an emergency room.

If you do not have medical training, the example above probably made little sense

REPORT FOR A TECHNICAL AUDIENCE

Subjective: Patient C/O of SOB secondary to MVA.

Objective: —40 y.o. W/M found conscious, sitting behind bent steering wheel of passenger car with extensive front-end damage.

HEAD: ARWY patent; **EYES:** attntv; **PERL:** SKIN: W&D; c some cyanosis present. **NECK:** No pain upon palp. No J.V.D., resp., retract., or trach. dev. present. **CHEST:** Chest movement asym. Flail segment @ right chest, ribs 3-7. **NEURO:** Patient CAO X 3. GCS = 15. *And so on . . .*

Assessment: Flail chest.

Plan: P/E, C-spine immob. (KED), Vx, SaO₂, O₂, IV (L.R., 14GA., ® a.c., #16541), EKG. Patient removed from vehicle to LSB. Telemetry: A.L.S. transport to Chicago Hope, #1236 attending.

to you. It includes many abbreviations common to emergency medical services (EMS), and it communicates a patient's condition efficiently to others in EMS.

Semi-technical Audience

This type of audience has some technical training or works in the industry, but not directly in the field, such as those working in related departments or those with training in related technical areas. This might even include personnel in marketing, finance, or administration of a technical company. The semi-technical audience needs some explanation of concepts, abbreviations, and jargon. Writers use technical terms only if they are common in the company or industry. For this audience, you might provide an orientation to the subject and explain or interpret the terms and information. The following example is a version of the first example revised for students in an emergency medical technician program or a first-aid class:

REPORT FOR A SEMI-TECHNICAL AUDIENCE

Subjective: Patient complains of shortness of breath, secondary to motor vehicle accident.

Objective: —40-year-old, white male found conscious, sitting behind bent steering wheel

of passenger car with extensive front-end damage. **HEAD:** airway patent (breathing freely). **EYES:** attentive, pupils equally reactive to light. **SKIN:** warm and dry with some cyanosis present. **NECK:** No pain upon palpation. No jugular venous distention, respiratory retraction, or tracheal deviation present. **CHEST:** Chest movement asymmetrical. Inspection revealed flail segment on right chest at ribs 3 through 7. **NEURO:** Patient cooperative, alert, and oriented and able to respond to questions about his name, date, and location correctly. Glasgow coma scale of 15 (normal). *And so on . . .*

Assessment: Flail chest.

Plan: Administer physical exam, stabilize flail segment (chest wrap), immobilize C-spine using a KED (Kendrick Extrication Device), monitor vital signs, monitor percentage of oxygen in blood using a pulse oximeter, administer oxygen and IV line (lactated ringers, 14-gauge, right antecubital, by paramedic #16541), monitor with electrocardiogram. Remove patient from vehicle to long spine board. Telemetry: radio consult while transporting to Chicago Hope, paramedic #1236 attending.

Did you understand more of the report this time? Without all the abbreviations and acronyms, a wider audience can understand the report. But, without at least some training, you still will not have a clear picture of the extent of the patient's injuries or his condition.

Nontechnical Audience

The last type of audience is the general public, an unknown audience, or any combination of technical, semi-, and nontechnical readers, including customers, clients, and patients. It might also include upper management—a group that is uninvolved with technical activities, but that must have enough information to make decisions for the company. This audience expects a clear organization that progresses from the background to the new information, with examples or illustrations to explain points that may be confusing.

For this audience, writers provide the most comprehensive treatment of the subject, such as common terminology, simple language free of jargon and technical data, a full background and orientation to the subject, and a complete discussion of the main points. To simplify difficult concepts, writers often compare technical processes to more familiar ones through analogies and metaphors. The following revision of the prior examples is addressed to a family member of the victim.

REPORT FOR A NONTECHNICAL AUDIENCE

Your husband was involved in a car accident. He's alert, cooperative, and oriented. We're treating him for five broken ribs on his right side, which are each broken in several places, called flail chest. This can cause breathing difficulties and even lung damage. When Emergency Medical Services arrived, he complained only of shortness of breath and seemed a little blue from oxygen deprivation. They removed him from the car, placed him on a spine board, gave him additional support for his chest, and gave him supplemental oxygen and saline. His initial examination revealed the broken ribs, but no other neurological or respiratory problems. He is presently receiving oxygen and saline, and we'll continue to monitor his heart and other vital signs.

2. What does the audience want to know?

The audience, whether technical or general, might want only the highlights of the information. For example, a manager might want bottom-line information, such as total cost, time frame, or budget impact.

Or the audience might want detailed information, including all the background, procedures used, visual aids, data tables, and your conclusions. For example, customers will want estimates and explanations for repairs, especially if

it's bad news, or troubleshooting information to solve or prevent a problem. Or coworkers might want you to provide exact procedures for a process.

3. What does the audience intend to do with the information?

This is the critical question. People read technical information for a purpose. Sometimes that purpose is simply for general interest. If so, you can make the subject more interesting for this audience by providing graphics, examples, and colorful details. Journalists and science writers address this audience, as you will see in a few of the reading articles in this book.

Other times, the audience wants to follow a procedure, solve a problem, or make a decision. Writers must anticipate questions and provide the organization and details this audience needs. For example, a manager might want the information needed to complete a projected budget for next year. A colleague might want to replicate a lab procedure. A customer might pay a bill (or refuse to pay it) based on an explanation of your service.

4. False assumptions about audiences

Unfortunately, writers sometimes make false assumptions about their audiences.

Assumption: My audience speaks and reads English.

Fact: About 10% of the people living in the United States were born in another country. Avoid those prize-winning vocabulary words—stick to the simplest appropriate terms you can find. And avoid words without a precise meaning, such as *really*, *very*, and *nice*.

Assumption: My audience will read the complete report or manual.

Fact: People normally don't read long documents or manuals from cover to cover. When's the last time you read an entire user manual? Include an executive summary, table of contents, and headings and subheadings to help your readers locate specific information when they might not have time to read the entire report.

Assumption: My audience will remember what I tell them.

Fact: Studies show that people forget up to 50% of what they hear within 10 minutes, and memory declines even more after that. They tend to remember more of what they read, and even more if they take notes or apply what they learn right away. For presentations or customer calls, experienced marketers provide something for the audience to read and take notes on. They use repetition and visual aids to help the audience remember. For example, they might create transparencies to project during the presentation and provide an introduction, such as a

bulleted list of main points that will be covered, and a summary with a conclusion that reviews the main points.

Assumption: When listeners or readers don't understand, they will ask questions.

Fact: Formulating a question requires some degree of understanding. If the subject is too difficult or too new, the listener or reader might not be able to put a question into words. You can help by anticipating typical questions or trouble spots. Also, ask for feedback. Ask one person in your audience to recap the message in his or her own terms. Sometimes you can clear up misunderstandings or clarify points by listening to others paraphrase you.

Reading Comprehension Questions

1. What is the purpose of technical communication? _____
 2. Define “audience” as it applies to technical communication. _____
 3. What are the three questions you can use to analyze your audience? _____
 4. Describe the types of technical communication you have written so far in your training or work experience, and the type of audience for whom they were written (technical, semi-technical, or nontechnical). _____
 5. What types of technical writing do you expect to do in your career field? For what type of audience? _____
 6. Describe one of the false assumptions about audiences and what you can do to prevent misunderstandings. _____
-
-

WRITING: Analyzing Your Audience

Writing is composed of many skills: thinking, researching, organizing, choosing words, and editing for spelling and grammar. It is easy to see why many people avoid writing altogether—it can seem overwhelming. However, as a technical student, you already have an advantage over other students: you are accustomed to learning individual

skills that you can apply as needed to complex situations. Similarly, writing can be broken down into individual skills that you apply as needed for different assignments and purposes.

The writing sections of this text present individual skills used in technical writing, accompanied by examples and exercises to help you develop those skills. In Part I, you will practice many fundamental skills of writers: analyzing the audience, adjusting language and style, and organizing information. In Part II, you will practice many short types of writing, called the elements of technical writing, such as technical definitions and descriptions. Finally, in Part III, you will apply these elements to produce reports, business communications, presentations, and job-search materials. Skills are organized from simple to complex, with guided practice in writing, as well as in related skills such as spelling, vocabulary, grammar, and mechanics.

TIPS Technical communication begins with analyzing the intended readers, called the audience. Technical writers answer the following questions to analyze their audience before they begin writing:

1. *What does the audience already know about the subject?*
2. *What does the audience want to know?*
3. *What does the audience intend to do with the information?*

This section provides practice in identifying how writers edit their passages for different audiences.

Exercise 1.1 *The following examples demonstrate how information changes for different audiences. Read the examples, keeping the intended audience in mind.*

The first passage was written for people who are familiar with fly-fishing. The author uses several terms and concepts that are unfamiliar to readers who do not fish. Although it is efficient and clear to fishing enthusiasts (a technical audience), it might be difficult for a nontechnical audience. Underline the words or phrases that seem to be specialized for the subject of fly-fishing.

PASSAGE 1

I sat on the bank studying the riseforms for several minutes. They were taking something too small to see. Finally, I selected a size 16 Griffith's Gnat and attached it to my tippet. It looked like the Trico hatch was on, and I wanted to get in on the action!

Passage 2 is revised for a general audience, such as people who enjoy regular fishing or the outdoors. The author explains each term or uses simpler terms than those in the first passage. And each fact is stated individually, with a logical progression of information. Underline the added information.

PASSAGE 2

I sat on the bank studying the surface of the water for several minutes. The trout were feeding on something too small to see, leaving spreading dimples (riseforms) as they slurped the invisible insects floating on the surface of the stream. Judging from the time of day, the season, and the minuteness of the insects, I reasoned they were feeding on Tricos, a small mayfly of the family *Tricorythodes*. I took out my flybox and selected the smallest artificial fly that I had with me, a black Griffith's Gnat. Though larger than the natural Tricos, the Griffith's Gnat will often fool trout when Tricos are abundant. I tied it onto the end of the fly line and said a short prayer.

Passage 3 was written for people learning about rigging a sailboat. The author uses several terms and concepts that are unfamiliar to nonsailors. While it is efficient and clear to professionals or even to advanced sailing students (a technical audience), it is too difficult for a nontechnical audience. Underline the words or phrases in Passage 3 that are specialized for sailing.

PASSAGE 3

Rigging is broken down into two major categories: running rigging and standing rigging. Running rigging consists of all the lines on a boat that are easily adjusted, including halyards and sheets. Standing rigging consists of the wires that hold up the masts of a sailboat, including stays and shrouds.

Passage 4 is revised for a general audience, such as people who enjoy watching sailboats or those wanting to become sailors. The author explains each term or uses simpler terms than those in the original passage. And each fact is stated individually, with a logical progression of information. Sailors will find it slow, but a more general audience needs the extra details. Underline the words or phrases that the author added to make the fourth passage appropriate for a general audience.

PASSAGE 4

Sailboat rigging consists of all the wire and lines (ropes are called "lines" on a sailboat) that are attached to the mast and sails. It is broken down into two major categories: running rigging and standing rigging.

Running rigging consists of the lines that are easily adjusted, including halyards and sheets. Halyards are the lines that raise and lower the sails, and sheets are lines that adjust them in and out laterally. The running rigging controls the sails and keeps the sailboat running (moving) with the wind.

Standing rigging consists of the wires that hold up the masts of a sailboat, including stays and shrouds. Stays are the wires that keep the mast from falling over the bow (front) or stern (back) of the sailboat. Shrouds keep the mast from falling athwartship (over either side of the boat). The standing rigging keeps the mast standing upright.

Exercise 1.2 *Read the following passage, which was written for a general audience interested in rock climbing. Then complete the exercises that follow.*

PASSAGE 5

All beginning climbers will have the protection of a belay—a top rope to check their falls—secured by the climbing leader. The first task of all students is to learn to tie the bowline (pronounced "bo'-lynn"), the knot used in belaying. Climbers are also customarily taught a set of verbal signals, or words and phrases that communicate important safeguards. The climb leader ascends the first leg of the route and finds a ledge from which to begin the belay. The first climber watches until the leader stops climbing. The climber secures the belay rope around her waist and calls, "On belay?" The belayer (climb leader) assumes brace stance above the climber, and calls back, "Belay on." The climber then calls, "Climbing." The belayer responds with "Climb" and begins to pull up any slack in the rope as the climber slowly ascends.

During the climb, the climber might yell "Slack!" which tells the belayer to pay out more rope for the climber to maneuver before resuming pulling up the slack rope. The "Rock!" signal, yelled downward loudly, is obligatory because it signals loose, falling rock (or equipment) to climbers below. When the climber reaches the belayer's position, the belayer yells "Belay off!" which informs the next climber to prepare to climb.

1. Underline the technical terms defined in the article.
2. Rewrite the passage for a technical audience composed of experienced rock climbers in training to become climbing leaders. Delete the information that the professionals will not need.

Exercise 1.3 *Read the following passage, which was written for a general audience attending a first-aid class on caring for an accident victim suffering from shock. Then complete the exercises that follow.*

PASSAGE 6

Shock is the result of hypoperfusion (inadequate or low perfusion) of the body's cells and tissues caused by insufficient blood flow through the capillaries. Before treating any patient, put on protective gloves. The next step of shock management is to maintain an open airway using the standard method of tilting the head. Administer a high concentration of oxygen using a nonrebreather mask, a device that fits over the patient's mouth and nose for a controlled flow of oxygen.

Check the patient's heartbeat, and perform cardiopulmonary resuscitation (CPR), if necessary. Check the patient for external bleeding, and if any exists, control it using pressure bandages. If the patient has no serious injury, raise the victim's feet 8–12 inches, called the Trendelenberg position. Cover the patient with a blanket to stop heat loss. Transport the patient to an emergency room immediately, and treat any secondary injuries, such as broken bones or joints, along the way.

1. Underline the technical terms defined in the article.
2. Rewrite the article for an audience of paramedics and ambulance workers, who need just a quick reminder of the steps to follow. Rewrite the passage into *no more than* ten brief steps.

Step 1: _____

Step 2: _____

Step 3: _____

Step 4: _____

Step 5: _____

Step 6: _____

Step 7: _____

Step 8: _____

Step 9: _____

Step 10: _____

Exercise 1.4 Copy a passage from a textbook or magazine, similar in length to those in the examples, that uses technical terms and jargon in your career field. Then rewrite the passage for a general audience. Define technical terms, and add the background necessary to understand at least one concept in the passage.

SPELLING: Using the Spelling Check

Each chapter in this text contains a spelling unit that focuses on one spelling pattern. Appendix 4 contains a longer list of frequently misspelled words.

Correct spelling is a key ingredient in effective written communication. If you misspell common—or even uncommon—words in your technical writing, others perceive you as either careless or unprofessional. Spelling can be compared to hygiene: people notice bad hygiene, but they usually don't notice good hygiene. The same is true of spelling. When you read “good” spelling—words spelled correctly—you are probably not aware of spelling. But when you spot a misspelled word, you stop reading, stare at the misspelled word, lose your train of thought, and possibly start to lose faith in what you are reading.

You might ask why spelling is included in this text, especially since word processing programs provide handy spelling-check tools that highlight misspelled words. Indeed, spelling checks are wonderful aids for writers. Most spelling checks in word processing programs operate the same way. They have a standard dictionary of 50,000 or more common words. As you type, or when you start the spelling check, the program matches each word in your document with the words in its dictionary. If it doesn't find your word in its dictionary, the program highlights it and searches for possible alternative words. When used regularly, spelling checks can catch and correct simple mistakes, saving us time and embarrassment. However, you cannot rely on spelling checks to do the entire job for several reasons.

1. Automatic spelling checks are not always available, such as when writing on eraser boards, forms, and even some e-mail programs.
2. The spelling tool cannot identify misused words. It blindly matches words with its dictionary, not recognizing how the word is used. Consider the following sentence:

I was *two* hungry *too* sleep.

The sentence above contains the homonyms *too* and *two*, which are spelled correctly, but used incorrectly. The spelling check will not highlight them. Only careful proofreading will find the misused words. (The **Word Watch** sections of each chapter will alert you to sets of misused words.)

3. Spelling check dictionaries do not include the most recent technical language. Spelling checks will highlight not only the latest technical words, but also specialized words, acronyms, names, and foreign words in your documents, even though you spelled them correctly. One solution for this is to create your own customized dictionary in your word processor. Then you can add technical words so that your spelling check will be faster.
4. Even when the spelling check highlights a word, you still have to either select or type the correct spelling—a risky task. Sometimes words are misspelled so badly that the program cannot come up with alternatives, or at least none that resemble your intended word.
5. Riskier still, some word processors let you “add” words to the dictionary. When you choose to add a word, be extra careful of the spelling. If you are in a hurry and accidentally tell the program to add a misspelled word to the dictionary, the program

will always accept that misspelled word in your documents. Most spelling checks have no way to remove words once you add them to the dictionary. If available, choose an option that allows the word to remain, such as “Ignore,” “Skip,” or “Allow in document,” until you confirm the spelling.

Exercise 1.5 *Open your word processor, and describe the options available to you when the spelling check highlights a word.*

Exercise 1.6 *Use the online help or manual to find how to add a customized dictionary for technical words, and once added, how to open or close the dictionary.*

Exercise 1.7 *Use the online help or manual to find information on the “Autocorrect” feature, if available in your word processor. Describe how to add and remove words that are replaced using “Autocorrect.”*

VOCABULARY: Prefixes *pseudo* and *quasi*

The more words we know, the more precisely we can understand the subtle differences in words and articulate our ideas when writing and speaking. For this reason, each chapter in this text contains a section to help build your vocabulary. Instead of your memorizing a list of words (which is usually ineffective anyway), the sections introduce sets of prefixes, suffixes, or root words that are the foundation of our language. The first set of prefixes is *pseudo* and *quasi*.

Pseudo is a prefix that means “false” or a “fake.”

pseudo-intellectual: pretending to be a thinker or educated

pseudonym: false name used by artists or authors

Quasi is a prefix that means “approximately” or “in some sense or degree.”

quasi-intellectual: some degree of education

quasi-official: partially official

Exercise 1.8 Write the technical meaning of each word. Relate the meaning to the prefix.

1. quasi + judicial _____
2. quasi + public _____
3. quasi + binding contract _____
4. quasi + serious _____
5. quasi + legitimate _____
6. pseudo + athletic _____
7. pseudo + classic _____
8. pseudo + sophisticated _____
9. pseudo + symptoms _____
10. pseudo + psychology _____

Exercise 1.9 Describe the difference in expertise between persons labeled as the following:

pseudotechnical _____
quasitechnical _____

WORD WATCH: *its* and *it's*

Each chapter of this text contains a Word Watch section that examines sets of commonly misused words—words that are similar in spelling or pronunciation, but different in meaning and usage. These words are especially troublesome because spelling checks ignore the context surrounding words, which is what determines correct word usage. Appendix 4 contains a longer list. The first set of misused words is *its* and *it's*.

Unlike some pronouns, the possessive form of *it* does not have an apostrophe:

The document and *its* conclusion were the subject of the memo.
The writer studied the group and analyzed *its* information needs.

Use the apostrophe when forming the contraction of *it is*, spelled *it's*.

It's not easy to anticipate the audience's questions.
I looked at the document, and *it's* clear that the writer knew the audience.

Hint: If you can substitute *it is*, add the apostrophe for the contraction. If not, leave it out.

Exercise 1.10 Complete the sentences with the correct form of *its/it's*.

1. I analyzed the audience and _____ needs on the subject.
2. _____ not clear whether upper management is included in the audience.
3. We decided to include the term and _____ meaning.
4. _____ unwise to categorize the marketing department and manager as a "technical" audience.

5. While the marketers know who purchases the device, they are not familiar with _____ components.
6. When you describe a component, include _____ location in the device.
7. Everyone involved agreed that _____ time to distribute the document for review.
8. After the document was reviewed, I decided to change _____ title.
9. My first reviewer thinks that _____ not necessary to add graphics.
10. My second reviewer suggested that I add a graphic and make sure _____ the latest model.

Language and Style

- Write sentences using the active and passive voice.
- Adjust sentence length.
- Eliminate single and double negatives.
- Write using a neutral tone.
- Double the final consonant correctly when adding a suffix.
- Use negative prefixes correctly.
- Use *a/an/and* correctly.

READING: Strong Writing Skills Essential for Success, Even in Information Technology

by Paula Jacobs

Hot Job

Electronics Foreman: FT, top salary, growth potential, good benefits. AS degree preferred. Minimum 5-yr's experience with broad background in electrical repairs. Strong computer and communication skills a plus. Writing ability required. Proficiency in Word/Excel required.

No matter how good your technical skills are, you probably won't move up the Information Technology (IT) career ladder unless your writing measures up. "One of the most surprising features of the information revolution is that the momentum has turned back to the written word," says Hoyt Hudson, vice president of IS at InterAccess, an Internet service provider in Chicago. "Someone who can come up with precise communication has a real advantage in today's environment." Whether you are pitching a business case or justifying a budget, the quality of your writing can determine success or failure.

Writing ability is especially important in customer communication. Business proposals, status reports, customer documentation, technical support, and even e-mail replies all depend on clear, written communication.

Alan Cunningham, a manager at Computer Sciences Corp. who is working on a project at NASA's Marshall Space Flight Center, in Huntsville, Ala., says many failed partnerships between business personnel and their IT counterparts can be directly attributed to lack of communication between the parties.

"Without good communication skills, IT professionals are little good to business people because there is no common platform," Cunningham says. "Just like all IT

How good writing can help you advance

- Increases customer satisfaction
- Saves time
- Improves communication across the organization
- Enhances your professional image
- contributes to business success
- Raises your professional status

professionals should have to take some elementary finance and accounting courses to better understand business processes and methods, every IT professional should be able to write cogently and explain technical elements in readable English."

"Knowledge may be power, but communication skills are the primary raw materials of good client relationships," Cunningham adds. Every job description for a new position on his staff includes the following line (which would include other languages if the business were international): "Required: effective organization and mastery of the English language in written and oral forms." Clear communication can enhance your reputation as an IT professional, says Kevin Jetton, executive vice president of the Association of Information Technology Professionals (AITP) and president of GeniSys Consulting Services, in San Antonio. It is especially important to communicate in plain English and not technical jargon when you are talking to a non-IT business executive.

"You can have the greatest technical skills in the world, but without solid communication skills, who will know and can understand?" Jetton says.

Even if you have limited customer contact, writing skills are essential. Larry McConnell, deputy registrar for information services at the Massachusetts Registry of Motor Vehicles, in Boston, says that unless you can communicate, your career will level off.

Your job efficiency may depend on how well others communicate, as well. Joe Thompson, product support lead at Kesmai, an online games developer in Charlottesville, VA, says his daily work often depends on somebody's writing skills. Whether he's communicating with the test department or with a customer, Thompson sees writing as the key to effective two-way communication.

Even if writing is not your forte, you can improve your skills. Many companies offer on-site writing courses or send their staff to business writing workshops such as those offered by the American Management Association (<http://www.amanet.org>) and other training organizations.

Pete McGarahan, executive director of the Help Desk Institute, in San Francisco, says one of the best investments of his career was hiring a trainer to teach business writing for IT professionals.

Check out writing courses at colleges and community education programs, as well. "College-level courses in English composition and creative writing help broaden skills beyond the technical 'myopia' common to many IT professionals, enabling them to establish rapport and truly communicate with their clients," Cunningham says.

Good writing requires practice. AITP's Jetton suggests becoming involved in community volunteer opportunities or professional societies, where you can work on newsletters or write committee reports. "Communication skills are an ever-evolving skill set," Jetton says. "You never have enough practice."

Reading Comprehension Questions

1. What does Mr. Hudson say is the biggest surprise of the information revolution?

2. In the sentence, "Even if writing is not your forte, you can improve your skills," explain the meaning of the word *forte*. Write the phonetic pronunciation.

3. According to the contributors, what are some of the things that happen when an employee does not have good communication skills? _____

4. List three suggestions made by contributors to improve your writing ability.

5. Suppose, as you get close to graduation, you see a job description that states: "Required: effective organization and mastery of the English language in written and oral forms." Discuss potential ways that you can demonstrate these skills to a prospective employer. _____

WRITING: Language and Style

The language and style writers use for technical communication depends on the audience—the background, need, and purpose of the people who will read the information. Writers choose the most effective terms, writing style, and organization to make the subject understandable to their audience. This section focuses on four factors: voice, sentence length, negatives, and tone.

Active and Passive Voice

In speaking, you can vary your voice and tone to communicate a message more effectively. For example, speaking slowly and clearly with a strong voice adds authority to a message. Speaking in a lively voice with changes in pitch and inflection can make the message more interesting. Good speakers learn how to use their voices to inform, persuade, and entertain an audience.

In writing, we also have different voices. The most common are called active and passive voice.

The **active** voice emphasizes the fact that the subject of the sentence does something. It directs attention to the subject:

The architect placed the blueprint on the table.

The emphasis is on the architect and what she did. There is no confusion about who put the blueprint on the table. Most technical writers today write predominantly in the



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

5. No heat is transferred by ceramic.
6. The car is started by turning the key.
7. Chassis systems have not been neglected by manufacturers.
8. More power is needed by small engines.
9. Present innovation has been dominated by advancements in digital control.
10. The economy has benefited from the new innovations.

Exercise 2.3 *In the reading passage, identify examples of active and passive voice and determine the predominant style.*

Sentence Length

Technical communication can be full of ideas and facts. Shorter sentences are usually easier to understand than long, complicated sentences. Critics agree that sentences over 25 words are too long for most readers to understand. However, use this as a guideline, not a rule. A message consisting only of short sentences will sound choppy and artificial; sometimes the relationship between ideas gets lost when sentences are too short. Compare the following sentences:

The bird flew into the yard. The cat was waiting. The cat was in the shadow.
The tree had the shadow.

These sentences are too short and too much alike.

When the bird flew into the yard, the cat was waiting in the tree's shadow.

In this sentence, the logic is simplified by combining ideas and using a signal word (*when*) to relate the ideas.

A document with sentences that are similar in length and structure sounds dull. Variety in sentence length and construction makes the message more interesting; however, sentences can quickly become complex and dense. Technical writers must pay close attention to sentence length for understandability and interest.

Examples

Too Long: As the brain cells grow, connections called synapses form between the billions of brain cells, or neurons, that process information and allow excitations to pass from one neuron to another.

This problem sentence can be revised by breaking it into two sentences:

Better: As the brain cells grow, connections called synapses form between the billions of brain cells, or neurons. Synapses allow excitations to pass from one neuron to another.

Too Long: The technique involves infecting some neurons in a slice of brain with a benign virus that causes cells to produce internally a fluorescent dye that can be scanned by an infrared laser.

This problem sentence can be revised by breaking it into two sentences:

Better: The technique involves infecting some neurons in a slice of brain with a benign virus. This process causes cells to produce internally a fluorescent dye that can be scanned by an infrared laser.

Too Choppy: The laser has energy. The energy was too weak. The laser did not excite the neurons.

These problem sentences can be revised by merging them into one sentence:

Better: The laser's energy was too weak to excite the neurons.

Exercise 2.4 Rewrite the following paraphrased sentences from the reading passage into appropriate sentence lengths.

1. College-level courses in English composition and creative writing help broaden skills beyond the technical 'myopia' common to many IT professionals, enabling them to establish rapport and truly communicate with their clients.
2. You could have limited customer contact. Writing skills are still essential. You must have communication skills. Without them, your career will level off.
3. Knowledge may be power, but communication skills are the primary raw materials of good client relationships, and every job description for a new position on the staff includes the following line (which would include other languages if the business were international): "Required: effective organization and mastery of the English language in written and oral forms."
4. Your job efficiency may depend on how well others communicate, as well, because your daily work often depends on somebody's writing skills to communicate with the test department or with a customer.
5. Writing ability is especially important. It is important in customer communication. Business proposals, status reports, and customer documentation all depend on clear, written communication.

Negatives

Understanding negative sentences is difficult. People often misread or fail to see the negative word, such as *not*, or a negative prefix, such as *non* or *un*. Understanding a negative sentence is especially difficult when the sentence contains two (or more) negative terms.

Consider this quotation from author Ernest Hemingway:

"Never think that war, no matter how necessary nor how justified, is not a crime."

It takes some re-reading to determine that his opinion of war is that all war *is* a crime. Mentally, the reader must shift the negative to a positive to understand the author's opinion of war. In the quotation, the sentence contains the two negative terms: *never* and *not*. As in mathematics, the two negatives "cancel" each other, and we can remove both negatives and reword it into an active, positive form. However, this takes time and effort, and it is risky. Fast readers might miss one of the negatives and arrive at the opposite conclusion from what the author intended.

Consider another example:

It is not unlike Jim to wash his car on Saturday.

This passive sentence with two negatives (*not* and *unlike*) leaves the reader wondering whether Jim washes his car on Saturday or not. The reader must mentally reword the sentence to get the correct meaning:

Jim usually washes his car on Saturday.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

- Flowery words set an insincere tone. (Business people consider this gushy.)
“We thank you very much for your exceptionally enthusiastic interest in our opening.”
- Sarcastic or angry words set a negative tone. (Business people consider this unproductive or mean.)
“We need a writer, and with some recycling, you might fit.”
- Neutral words set a businesslike tone, free of emotion or manipulation. (This is the preferred tone in business writing.)
“We have an opening in our technical writing department. Would you like to hear about it?”

Read the following pairs of synonyms, and determine which column has a more positive tone, and which a more negative tone.

Synonyms with different tones:

suggest	insinuate
rumor	gossip
assertive	aggressive
pause	hesitate
eager	brash
enthusiastic	fanatical
knowledgeable	know-it-all

The words in the first column are considered complimentary. The words in the second column, although they have the same general meaning, are considered more negative in tone.

Some words or phrases are considered “loaded,” which means they have strong emotional meanings. Examples of loaded words are listed below.

Loaded words:

red-neck	hippie	yuppie
hot-head	sexy	leading edge
kook	excellent	state-of-the-art
lean and mean	macho	feminist

Other words with loaded meanings include nicknames for ethnic, religious, or political groups; political sayings; and sexual terms. If a loaded word or phrase is insulting, it is not appropriate in any type of professional writing. Some loaded words are harmless or possibly useful. For example, a “lean and mean” department currently implies a small, highly trained staff capable of working intensively on projects. However, some expressions have become overused and have lost a clear meaning, such as “a nominal fee.” Overused or trite expressions should be avoided.

Some words and expressions are considered formal, neutral, or slang. In the following list, compare the synonyms that set a formal, neutral, or slang tone.

Formal Words	Neutral	Slang
fortuitous	fortunate	lucky
contemplate	consider	chew on
copious	many	gobs
reiterate	repeat	ditto
elucidate	explain	draw you a picture
dialogue	conversation	rap
recalcitrant	stubborn	muleheaded
disconcerting	upsetting	a downer



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

3. I won't tolerate any shilly-shallying on this undertaking. Vacillation will only retard the resolution.

4. We would like to hang out while you put on the feedbag and deliberate our druthers.

5. What do you envision as our game plan? Let's get the prerequisite go-aheads, like yesterday.

Review of Preferred Language and Style for Technical Writing

TIPS Follow these guidelines for technical writing:

- Use active voice, which emphasizes that the subject does an action.
- Keep sentences shorter than 25 words in length.
- Write statements in the positive form. Avoid negatives (single or double).
- Use a neutral, businesslike tone.

SPELLING: Doubling the Final Consonant

The problem of doubling or not doubling the final consonant when adding an ending, or suffix, is one of the easiest and most consistent spelling rules. The doubling rule is used only if the suffix, or new ending, begins with a vowel (ING, ED, ANCE).

First, remember that the five **vowels** are A, E, I, O, and U (we do not consider Y for this rule). All the rest of the letters in the alphabet are called **consonants**. Now, let's look at **one-syllable** words.

Rule: If the last two letters in a word are a single vowel followed by a single consonant, double the final consonant before adding the ending.

We'll call this the **one and one rule**. Notice that each of the following words ends in one single vowel followed by one single consonant.

Examples: r un + ing = running
h op + ed = hopped
pl od + ing = plodding

Notice that the following words do not follow the *one and one* rule.

Example: seat + ed = seated
test + ing = testing

Note: Certain letters are never doubled, even if they follow the rule. They are W, X, and Y.

Example: draw + ing = drawing
 say + ing = saying
 box + ed = boxed

Exercise 2.8 Add the following endings to the words.

- | | |
|--------------|----------------|
| 1. jam + ed | 2. band + ing |
| 3. hum + ing | 4. link + age |
| 5. trim + er | 6. drop + ed |
| 7. fix + ed | 8. loop + ing |
| 9. trip + ed | 10. ring + ing |

There is one more part to this rule. It concerns words with **more than one syllable**. When a word has more than one syllable, one of them will be **stressed**—pronounced louder or with more emphasis than the others. Dictionaries have an accent mark after the stressed syllable (in the phonetic spelling).

Rule: Double the final consonant of a word with two or more syllables if it follows the previous rule (one and one), and if the stress is on the last syllable.

The following words conform to the rule above, called **one and one and last rule**.

Example: refer + al = referral
 submit + ing = submitting

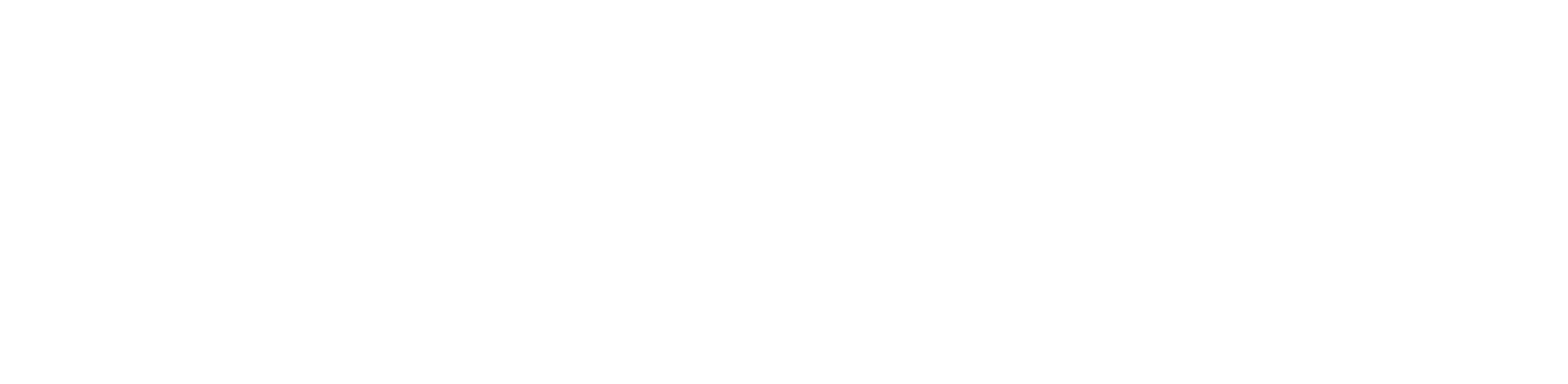
The following words do not conform to the *one and one and last rule*.

Example: resist + or = resistor
 system + atic = systematic
 relax + ing = relaxing

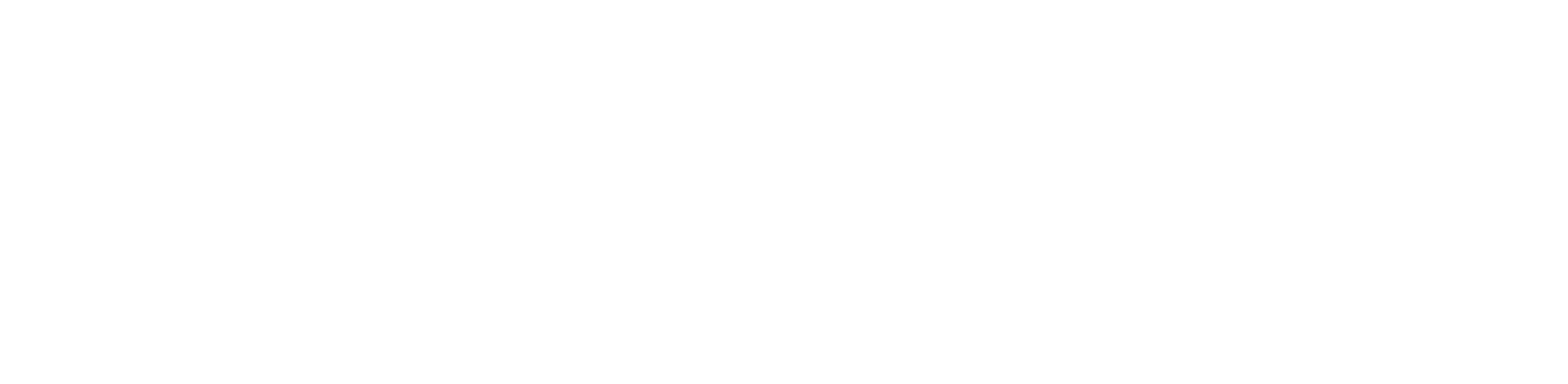
Exercise 2.9 Add the following endings to the words.

- | | |
|--------------------|------------------|
| 1. transfer + ence | 2. decay + ed |
| 3. fit + ing | 4. travel + ing |
| 5. display + ed | 6. control + ed |
| 7. occur + ence | 8. transmit + er |
| 9. gather + ed | 10. admit + ance |

Exercise 2.10 Now check your memory by writing the rule for doubling the final consonant.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 2.12 *Fill in each blank with a, an, or and.*

Time management is _____ skill that students must learn if they hope to handle all their responsibilities. Reducing traveling time saves _____ hour here _____ there. Bringing _____ bag lunch means being able to eat without hunting for _____ inexpensive cafe. These things are necessary for people trying to go to school, keep _____ part-time job, study, _____ most importantly, find some time to relax. Many students find _____ hobby that is inexpensive _____ active. Jogging, calisthenics, _____ dancing are _____ few activities that provide _____ healthy outlet for stress that builds from keeping _____ demanding schedule. With good pacing and planning, students can make the most efficient use of their time _____ keep _____ enthusiastic, energetic attitude.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

try. Rarer still is a draft manuscript that goes from writer to editor to printer without retracing part of its path for correction or improvement.

The act of creating any written piece starts a process that resembles the oscillation of a vibrating spring; this concept enables us to follow the path of a manuscript on successive trips between author and editor (see Figure 3-1). Imagine that the initial displacement from the solution axis is proportional to the degree of uncertainty, and that the restoring force of a spring represents the process of evaluation and generalization. At the maximum amplitude of each oscillation we apply a "damping" factor that consists of the act of defining and refining, and thus limit the next oscillation. Successive definitions at peak amplitudes, as the draft goes from author to editor and back again, contribute to decreases in the degree of ignorance. The envelope formed by decreasing displacements of these quantities is the convergence of understanding. It approaches, at infinity, the truth.

At the Los Alamos Scientific Laboratory, we construe editorial modulation to mean editing for consistency, organization, and language correction, with the specific intent of retaining the author's style and the accuracy of technical content. Some writers complain that an editor's efforts have changed the intended meaning. When that occurs, the writer was probably not clear in the first place. A writer who is concerned

lest editorial modulation violate his "style" can best preserve it by

- Writing clearly and directly.
- Making sure of his facts and marshaling them in logical sequence—with the "news" of his findings or a statement of the problem first, followed by details and supporting arguments.
- Imparting the significance of his work to readers outside his field.
- Providing enough details of method and equipment so that others can repeat his work.

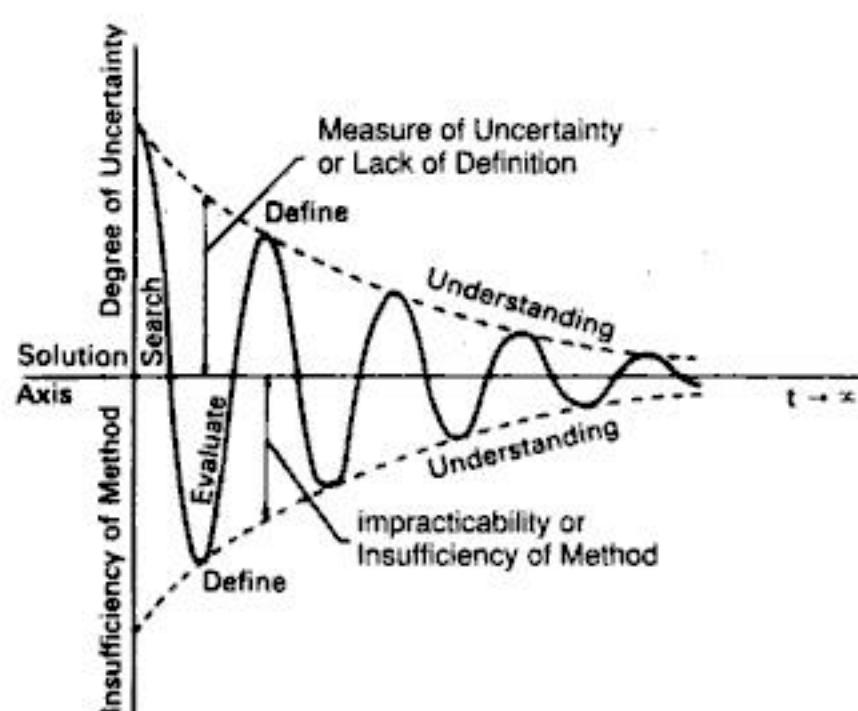
He should apply a noise filter at the source by avoiding overspecialized jargon and acronyms, by using the active voice in preference to the passive, and by using personal pronouns (I, we) where appropriate. "The present author" went out with "gentle reader," so say "I" naturally and honestly when it fits. "We," unless the work is reported by more than one author, is used only by royalty, editors, and people with a tapeworm. Finally, it is no sin to occasionally split an infinitive or to use a preposition to end a sentence with.

Noise Abatement in the Report

Noise filters applied to the reproduction of a report are easier to use and control than the human factors of source and receiver. We can, by consistent and conscious effort, filter out printing errors, faulty re-

FIGURE 3-1

The creative process as a damped oscillation.





You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 3.1 Rearrange the following words into categories (four words per category) and label each category.

antifreeze	gasoline	oil	sphere
cone	horizontal	parallel	vertical
cube	manometer	perpendicular	voltmeter
cylinder	multimeter	speedometer	water

Categories: _____

- | | | | |
|----|----|----|----|
| 1. | 1. | 1. | 1. |
| 2. | 2. | 2. | 2. |
| 3. | 3. | 3. | 3. |
| 4. | 4. | 4. | 4. |

A paragraph, or a whole report, will usually have one main idea, such as a *category*, and several supporting details, such as the items within a category. Sometimes an author will state the category and list the details within the category, as in the following sentences.

Kirchhoff's law is used in branch current analysis, mesh current analysis, and node voltage analysis.

There are three methods of analysis that use Kirchhoff's law: branch current analysis, mesh current analysis, and node voltage analysis.

Writing Lists

A list at the beginning of a paragraph, section, or report is an effective way of telling the reader how you have organized your ideas. The second sentence in the example above states the list in an obvious way by using a **colon** (:) before the items. Although either way of stating the list is correct, the colon is a visual cue and thus is more direct.

The colon is a punctuation mark that means "as follows." It is a signal to the reader that a list is being given. Other signals for lists are words and phrases such as the following:

There are three kinds: . . . can be divided into three areas:

types:	classified
groups:	grouped
classes:	classed
categories:	categorized

Example: Resistors can be divided into two groups: fixed and variable.
There are two types of current: alternating and direct.

A colon is usually not used following a verb. After a verb, simply write the list.

Example: The two main categories of resistors are fixed and variable.

The two types of current are alternating and direct.

If your list includes more than two items, put a comma between the items.

Example: The company has three regions: the northeast, southeast, and west.

If commas are needed within items, separate the items with a **semicolon** (;).

Example

The article can be divided into two sections: the specialized and multipurpose information utilities; and the requirements of the hardware, computer-communications network, and software.

For typing rules about these punctuation marks, see Appendix 2: Tips for Word Processing.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

One of the simplest steps to resolve the uncertainty is to write a quick outline of the ideas you want to convey. Writing an outline forces you to consider all the information you should include for your audience.

Outlines also save time. Once you have the main ideas or topics written down, you can then focus on one topic at a time and develop it fully. You can devote your concentration and research to each topic in any order. Each main topic becomes a main heading in your document.

Topics can require subtopics. If a topic gets long and complex, write a list of ideas just for that topic, and you have your list of subheadings.

Formal outlines can become elaborate, with Roman numerals, letters, and Arabic numbers, all indented to show a parallel structure.

The following outline represents the organization of the article in the reading section:

Thesis statement: Technical writers must take care to eliminate "noise" from their documents.

I. Introduction

- A. Lead-in with examples of excessive noise in everyday life.
- B. Thesis: "All communication takes place in the presence of noise."
- C. Organizational preview: "Before we talk about how to reduce noise, let's discuss what noise is, and how it gets into the communication system."

II. Sources of Noise (how noise gets into the communication system)

- A. From the source (writer or speaker)
- B. From the message (subject)
- C. From the channel (report)
- D. From the receiver (reader or listener)
- E. Feedback (speaker modifies message by reducing noise)

III. Noise Abatement at the Source (how the writer removes noise)

- A. Write an outline to improve organization
- B. Prevent carelessness
 - 1. Choose words carefully
 - 2. Eliminate mangled metaphors
 - 3. Eliminate redundancy and deadwood
- C. Check spelling
- D. Proofread

IV. Editorial Modulation (continual revisions of drafts)

- A. Reduce uncertainty (confusion or ignorance)
- B. Evaluate continually (edit for consistency, organization, language, style, and technical accuracy)
- C. Preserve own style
 - 1. Write clearly and directly
 - 2. Verify facts
 - 3. Convey significance of report
 - 4. Provide details so others can repeat the work.
- D. Use good technical style (avoid unnecessary jargon and acronyms, use active voice and personal pronouns)

V. Noise Abatement in the Report (filter out printing errors)



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Rule 1: Use a final *yz*e for only a few technical words:

analyze paralyze electrolyze

Rule 2: Use a final *ise* when it is part of a word, such as *wise*, *vise*, *rise*, and *guise*:

likewise advise sunrise guise
otherwise supervise arise disguise

Rule 3: Use a final *ise* for words ending in *-mise*, *-prise* and some words ending in *-cise*:

surmise surprise exercise
compromise comprise incise

Rule 4: Use a final *ize* for nearly all other words.

apologize minimize organize
alphabetize mechanize symbolize
emphasize memorize visualize

In most cases, when you add suffixes to the verb form of one of these spellings, just drop the final *e*, keep the *yz*, *is*, or *iz*, and add the suffix.

ANALYZE	ADVISE	ORGANIZE
*analysis	adviser	organizer
analyzing	advise	organization
analyst	advisory	organizational
*analytical	advisable	organizing

*These words vary slightly from the rule.

Warning: Some writers attempt to sound formal or technical by adding *-ize* to form words that are not normally verbs. Although these words often indicate an action, try not to overdo them. Overusing *ize* can make the writer sound like a robot—artificial and distant. Notice the difference in tone in the following two sentences.

Mechanical: In an effort to minimize errors, we prioritized and analyzed our objectives and organized our procedures.

Human: To reduce errors, we first established our objectives and procedures.

The same overkill can happen when writers add *-wise* to a noun and use the new word as an adverb, as in *timewise* and *costwise*.

Mechanical: The procedure was more efficient timewise and costwise.

Human: The procedure's efficiency saved time and money.

Writing that sounds human is easier to read than mechanical-sounding writing.

Exercise 3.8 Using *yz*e, *ise*, and *ize*, add the correct ending to each word.

1. Turn the dial clockw_____.
2. Use the oscilloscope to visual_____ the waveforms.
3. To anal_____ the results, correct measurements have to be taken.
4. It helped to priorit_____ the needs.
5. The manager took the situation under adv_____ment.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Technical Definitions

- Write formal technical definitions.
- Write an expanded definition.
- Spell plurals correctly.
- Use Latin roots correctly
- Use *to, too, and two* correctly.

READING: You Are Not Alone: Beware of What You Say on the Internet

by Rochelle Kaplan

Messages or information transmitted through e-mail over the Internet are not private, and this should be considered before one sends any type of message. People should not copy information from the Internet and claim it as their own.

Are there any legal restrictions on what I can say in e-mail or how I can use information I find on the Internet?

The Internet is fast becoming the communication tool of choice, even eclipsing the telephone. However, there is confusion over just what the Internet is and who owns the information on it. Is the Internet a mega-size warehouse where people deposit and gather information, or is it a giant electronic publication where we are all authors and publishers and must guard what we write or be careful of what we copy? Or is it a little of both?

Consider the following situations.

- A former university student was indicted for hate crimes after he emailed threatening messages to minority students.
- A person was sued for defamation after he posted a message to a discussion group regarding the business conduct of a brokerage firm.

- A company asked a court to stop a private individual from using the company's logo on his WWW home page.
 - An Internet provider was sued by a computer game manufacturer for copyright violation. A customer of the provider copied computer games and forwarded them to a chat group offered by the Internet provider.
- Other, similar situations are likely to occur.

Before You Send That Message . . .

There are several things a computer user should consider when sending an e-mail message to another person or to a group, or when gathering information, pictures, and graphics from sites on the WWW. Questions to consider are:

- Would you send the same message on paper, knowing that it might be seen by



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

7. What two rules does the author say apply to sending or copying information on the Internet? _____
-

WRITING: Technical Definitions

The reading passage included definitions of terms essential for understanding the topic. Without a precise definition of *defamation* and *harassment*, we might not understand the legal issues surrounding the use (and misuse) of e-mail on the Internet.

Definitions

Definitions of terms are the foundation of technical writing. A precise set of terms is used in technology, and only with a common understanding of those terms can information be communicated accurately.

Some terms used in technology have meanings entirely different from those with which you are familiar in everyday life. Examples of such words are *power*, *force*, and *communication*. For example, the term *communication* used in casual conversation can include speaking, listening, reading, writing, and body language. But to an electronics technician, if the message wasn't transferred electronically, it wasn't communicated at all. In fact, the study of communications systems begins with Samuel Morse's invention of the telegraph in 1837, even though we all know that throughout history, people have been sending verbal and nonverbal messages to anyone who would pay attention.

Some terms are used with more precision in technology than in everyday life. Words such as the following have precise meanings in technology and must be used carefully:

absolute	current	fundamental
critical	force	ground
intensity	power	specific
inversely	rate	static
potential	relative	uniform

Some terms are frequently confused. Can you state the difference between *force* and *power*? These are words that are used interchangeably in everyday language, but in technology the meanings are different. There are many such terms in technical writing.

Sometimes students are in such a hurry to do problems and assignments that they skip to the end of the chapter, referring to the chapter only as a last resort. These students are missing the "verbal" part of their field—how the concepts are explained in words. Don't be this kind of reader. Eventually, you will have to communicate what you know in words, either spoken or written. You won't be able to communicate entirely in numbers. Get used to how the experts, the authors, describe the principles of your technology. Learn the terms and how to use them correctly. Several examples of short and long, and formal and informal definitions are presented in this chapter to give you practice in this skill.

Informal Definitions

You can probably remember learning your first definition in your field. In electronics, it was probably

Resistance: opposition to current flow.

This is an informal definition. A definition placed between commas or parentheses is usually an informal definition.

A *potentiometer* (variable resistor) is used for volume controls.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

3. _____

4. _____

5. _____

Extended Definitions

Some objects or concepts require more than a one-sentence definition. An extended definition might require a paragraph or even several pages to fully define a complex concept or object. An extended definition includes the standard definition sentence, but also provides more details that describe the object. It can contain related definitions and examples that illustrate the term.

The following paragraph defines *harassment* by providing not only a definition, but also two differing situations under which harassment can occur and the legal consequences of each one.

Harassment is words or actions that are designed to threaten, intimidate, and/or make a person's workplace or educational environment unbearable and intolerable. E-mail can be harassing. If harassment occurs in the workplace and is directed toward employees of a certain race, ethnic group, age, disability, religion, or gender, then it is a violation of state and local EEO laws. If harassment is in an educational setting and is directed at students, then civil rights laws prohibiting discrimination in educational and/or public institutions are violated.

More commonly, extended definitions include examples that illustrate and clarify the term or idea. For example, the author clarifies the definition of an e-mail discussion group by comparing it to an electronic roundtable:

An e-mail discussion group (newsgroup, listserv, chat room, etc.) is nothing more than an electronic roundtable. As with any roundtable, the participants share information about a particular topic. A subscriber to the group may ask other group members for a reference about a product or person, e.g., "Has anyone used (fill in name of product or service)?" or "Has anyone worked with (fill in name of person or organization)?" Sometimes a subscriber "warns" or "advises" other subscribers about a product or vendor.

Exercise 4.4 Choose one term from Exercise 4.2, and write an extended definition in a paragraph. Write the definition sentence as your topic sentence. Include the details or examples that give meaning to the term.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 4.8 Use the Latin number roots to complete the words.

1. A number system in base 8 is called an _____ al system.
2. A _____ al-purpose machine can perform two functions.
3. An exam given every three weeks is called a _____ -weekly exam.
4. The number system in base 10 is called the _____ imal system.
5. One-thousandth of an ampere is called a _____ iamperie.

Exercise 4.9 Write an informal definition for each of the following Latin-based words. Use complete sentences.**Example**

Century: A century is a 100-year period.

1. Duodecimal _____
2. Decathlon _____
3. Trilateral _____
4. Octogenarian _____
5. Quadrant _____
6. Unilateral _____
7. Sexennial _____
8. Million _____
9. Quintuplicate _____
10. Centimeter _____

WORD WATCH: *to*, *too*, and *two*

Two is the number (2) and is rarely confused with *too* or *to*.

There were only *two* hours left.
There could be *two* interviews.

Too is a modifier and can have *two* meanings. It can mean “more than enough” when it is in front of another modifier:

The gray jacket was *too* expensive.
The blue tie was *too* long.

Too can also mean “also.” When used this way, *too* usually has commas around it:

I’ll interview with that company, *too*.
They, *too*, have positions available.

To is used in all other cases, usually as a direction (preposition) or in front of a verb.

I selected the suit *to* wear *to* the interview.
I planned *to* arrive early.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

You want to know: Is this research onto something? Is this hypothesis at least credible? Is it new, or the best evidence yet for an idea that's been around a while? How strong is the evidence here? Are there other ways to explain these results? How credible are the conclusions? Does this work run counter to what scientists have thought before? In fact, is this new evidence clearly outweighed by a mound of previous work to the contrary?

If you get major criticism of the research, ask your original source for a reply. The details of the debate might be too technical for your readers, but you can decide how far to wade in.

One other thing: Find out who paid for the researcher's work. It may be a company or organization with a financial interest in the results. The scientist may also stand to make money from a patent, or be a consultant to an interested party, or hold shares of stock in a company that could benefit from the study results. Tell your readers about ties like this, and give the researcher a chance to deny that the ties made any difference.

How Do I Write This Stuff Clearly?

Remember all those analogies and examples you pressed your sources to supply? Now you can put them to work. They are your best friends in making scientific topics understandable to your readers.

A while ago, I wrote that an experimental vaccine "made multiple sclerosis patients build up a police squad of blood cells to stop vandalism in their nervous systems." As the story explained, it made them pump out more of one kind of T cell that

prevented another kind of T cell from attacking the protective sheath around nerves in the brain and spinal cord. Diagnosis: complex idea. Prescription: metaphor.

Even a familiar concept can be introduced with an example. Researchers recently found evidence that a particular nerve helps the brain store emotionally charged events in long-term memory. My lead: "Why do you remember prom night so well when you don't have a clue what you did two nights later? In part, a study says, you can thank a nerve that runs to your brain from deep in your innards."

Use statistics sparingly, focusing on those that most clearly make the point. And if you can't explain something without lots of background, tell the reader it's time to fall back: "To understand why Smith's findings are so important, it helps to know a thing or two about objects called active galactic nuclei."

Finally, show your copy to a friend to see if it makes sense.

What Did You Learn From That Doc?

1. *Arm* is one of those words with a hidden technical meaning. In drug experiments, it means a group of participants. The patients getting drug A would be in one arm of the study, and those getting B would be in the other arm.
2. A scientist can think he communicated an idea, and you can think you got it, and you can both be wrong.
3. If something a source says doesn't quite add up, ask about it. Don't be embarrassed.

After all, it's better to look dumb in conversation than in print.

Reading Comprehension Questions

1. What is the fundamental way a science writer finds story ideas? _____
 2. According to the author, what makes a good story? _____
 3. Before the author describes a research study, what does he do to prepare? _____
-



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Clichés

Some speakers and writers overuse comparisons to add color to their words. Overused comparisons are called **clichés** (pronounced *klee-shays*), and they should be avoided in technical writing. The following exercise will give you a chance to recognize common clichés.

Exercise 5.4 *Complete the phrases with common expressions.*

1. As quick as _____
2. As fast as _____
3. As smart as _____
4. As slow as _____
5. As sharp as _____

Physical Descriptions

The technical description of an object generally starts with the general information, and proceeds to specific information.

The following example describes the sound system on a music stage.

Once the stage is erected, the two main speaker towers are positioned on scaffolds 54 feet high. Ultimately, the Springsteen tour will present 3200 sq. ft. of loudspeakers to a single crowd. Each of the 160 speaker cabinets contains two 18-inch, low-frequency drivers; four 10-inch, lower/midrange assemblies; and two each of upper/midrange and high-frequency drivers. (Eskow, "The Heart of Rock 'n' Roll," *Popular Mechanics*, March 1986)

You were probably struck by the number of measurements included in the description, which left you with an impression of ear-shattering sound capability and technical sophistication. Notice how the details progress from the overall sound capability to the specific details of the individual speakers.

Regardless of the object being described, a physical description has the same purpose: to present the facts about the object. Technical writers use descriptive terms carefully and precisely, with exact terms. They use modifiers sparingly, but when they do, the modifiers are adjectives that add meaning, such as *parallel*, *perpendicular*, *cylinder*, or *grainy*. Avoid abstract and vague words such as *nice*, *very*, *really*, *a lot*, or *pretty*.

Certain types of information add meaning to physical descriptions:

Color	Size	Shape
Texture	Quantity	Part names

TIP A typical outline for a physical description contains the following elements:

- **Orientation to the object or device**, including a technical definition, and when and why the device is used.
- **General description of the device**, including the overall dimensions, appearance, and components of the device.
- **Description of each component**, in sequential or logical order, including its physical appearance, purpose, and relationship to other components.

Exercise 5.5 *The following description is taken from the instructional manual for a Fluke digital multimeter, model 8010A/8012A. Underline the physical details, nouns, and adjectives describing color, texture, size, quantity, shape, or part names.*



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Rule 8: Fractions that express exact measurements are written as figures. Mixed numbers (a whole number and a fraction) are written either with a hyphen or a space between the whole number and the fraction. The best method is the one that best clarifies your information. Be consistent.

Hazard: In technical writing, decimals, degrees, and most percentages and fractions are written in figures.

90° angle	1 $\frac{1}{8}$ inch wire
80% efficiency	1 $\frac{1}{8}$ inches
10.3 hours	2.0 kW

Rule 9: Spell out units on first usage, with abbreviations in parentheses. Leave one space between the numeral and the abbreviation, except when they are part of an adjective preceding a noun, and then use a hyphen.

First Usage	Second Usage
400 megahertz (MHz)	450 MHz or 450-MHz processor
4.3-gigabyte (GB) disk	5 GB or 5-GB disk drive

When using units as a noun in measurements, add *of* to form a prepositional phrase:

You must have 100 MB of hard-disk space to install the program

Exercise 5.9 Rewrite the following sentences to correct any incorrect number expressions.

1. The supervisor received 9/10ths of the credit. _____

2. He added five quarts of ten W forty oil. _____

3. The blueprint is shown in Figure 5.three. _____

4. Scott was hired on January fifth, 1999, and JoAnne was hired exactly one year later. _____

5. In the cse of a twenty- μ A movement, we would need five hundred k Ω between the terminals to make the ten-volt measurement. _____



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

scope's stunning photos are showing the world about the wonders of space. Many of the world's foremost astronomers are using Hubble to probe the horizons of space and time.

Designed to last 15 years, Hubble is providing intriguing new clues to monster black holes, the birth of galaxies, and planetary systems around stars. To provide astronomers with the latest Hubble data, the Earth-circling observatory must be maintained by hundreds of scientists, engineers, and computer programmers at the Space Telescope Science Institute in Baltimore, MD, and the Goddard Space Flight Center in Greenbelt, MD.

All in a Day's Work

The Hubble Space Telescope is as large as a school bus and looks like a five-story tower of stacked silver canisters. Each canister houses important telescope equipment: the focusing mirrors, computers, imaging instruments, and pointing

and control mechanisms. Extending from the telescope are solar panels for generating electricity and antennas for communicating with operators on the ground.

The 12-ton telescope collects faint starlight with an 8-foot-diameter mirror. The mirror—tucked inside a long, hollow tube that blocks the glare from the sun, Earth, and moon—is slightly curved to focus and magnify light.

Unlike ground-based telescopes, astronomers cannot look through Hubble's lens to see the universe. Instead, Hubble's scientific instruments are the astronomers' electronic eyes. The telescope's instruments include cameras and spectrographs. The cameras don't use photographic film, but rather electronic detectors similar to those used in home video cameras. The spectrographs collect data by separating starlight into its rainbow of colors, just as a prism does to sunlight. By closely studying the colors of light from a star, astronomers can decode the star's temperature, motion, composition, and age.

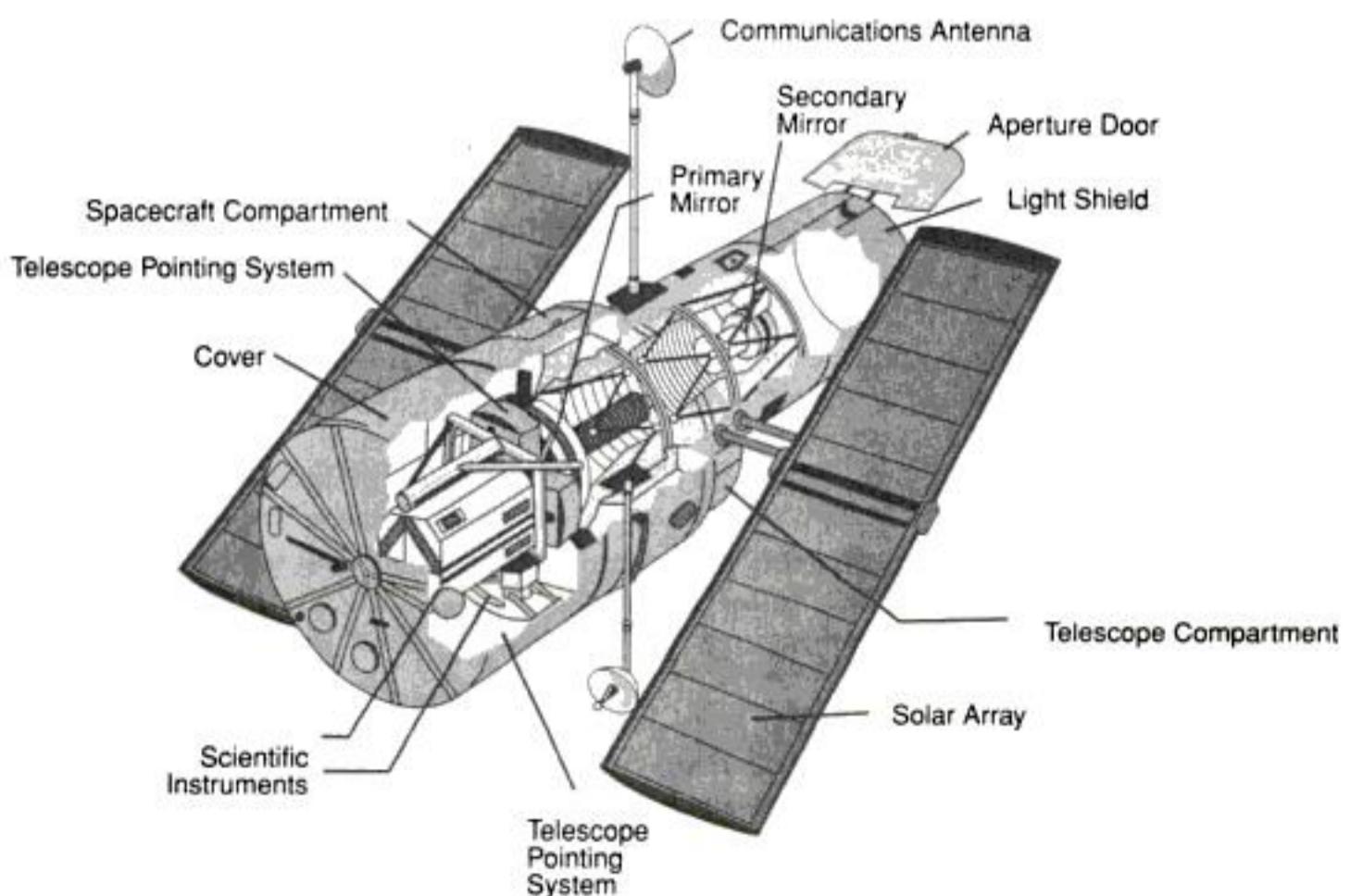


FIGURE 6–2
Hubble Space Telescope

Courtesy of NASA.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

WRITING: Summaries

The article about the Hubble Space Telescope (HST) includes an overview of the purpose, design, and operation of the HST, as well as a summary of its key discoveries. For this summary, the author uses consistent headings, followed by a brief description of each discovery. Readers can quickly skim over the last section of the article and still have a fairly good idea of the wide variety of discoveries.

Headings, as well as the use of numbers, letters, dots, or dashes, make the material easier to read and remember because it usually means fewer words and concentrated information.

Summary
A condensed account of a report to recap the main points.
Usually located at the end of the document.

A **summary** is a condensed account of the essential information included in a longer piece of writing. A summary usually appears at the end of an article or report. The function of a summary is similar to that of a schematic diagram, which gives a clear, brief presentation of a device without the clutter of the actual materials necessary to build the device.

For example, if you needed information on a report about the HST, you would find information in many sources, too many sources to actually read. You might find professional abstracts of journal (magazine) articles. By reading these brief summaries, you would be able to judge which articles would be most useful to you.

A summary answers the basic questions that readers want answered before they devote more time to reading the article or book. Many people who are interested in keeping up with technology do not have the time to read every article printed about their field. They often rely on professional abstracts to find the most useful articles.

A reader searching for information has predictable questions for each article:

What? Who? Where? When? Why? How?

Go back to the HST article, and underline the answer to each of these questions. They will normally be found early in a summary. Summaries include only the key facts, ideas, and conclusions.

TIPS Follow these helpful steps when writing a summary.

1. Read the article carefully—more than once—before starting to write. Use your pencil to mark key ideas, phrases, and conclusions.
2. Look for the author's own summaries at the beginning or end of the article. Often, boldface headings indicate a transition and a new key idea.
3. Note the author's organization—find the main idea of each paragraph or section.
4. The length of a summary is usually about 33 percent of the length of the article, although this is by no means a rule. Instructors seldom require more than one page, and professional abstracts are rarely longer than one paragraph, no matter how long the article.
5. Summarize each section (of longer articles) or paragraph (of shorter ones). Disregard figures of speech, examples, detailed descriptions, and discussions.
6. Do *not* include personal interpretations, agreements, or disagreements (no *I* statements). Write in the third person (*he, she, it, they*).
7. Read the article once more and compare it to your summary. Make any revisions that are necessary for clarity.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Phono or *phone* means "sound, tone, or speech."

- telephone
- phonograph

Photo means "a light" or "produced by a light."

- photograph
- telephoto lens

Graph means "something that writes or records" or "something written."

- graphics
- telegraph

Gram or *Gramma* means "something written down or recorded."

- grammar
- electrocardiogram

Note: Do not confuse *gram*, the root word, with *gram*, the metric unit of weight.

Exercise 6.6 Write a brief meaning of each word as it relates to the Greek root. Use the dictionary only as a last resort.

Example: telecommunication—communicating from a distance

1. telescope _____
2. telephonic _____
3. phonograph _____
4. photograph _____
5. telephoto lens _____
6. graphics _____
7. telegraph _____
8. grammar _____
9. photosensitive _____
10. telecast _____

WORD WATCH: *lose*, *lost*, *loss*, *loose*, and *loosen*

The words *lose*, *lost*, *loss*, and *loose* can be confusing. With attention and a crutch, you can be sure of the correct use of each of these words.

Lose (pronounced *loo^z*) is a present-tense verb meaning "misplace," "be deprived of," "give up," "waste," or "bring to ruin." The other tenses are *lost* (past, past participle) and *losing* (present participle). There is no such word as *losed*.

I tried not to *lose* the phone number.

I *lost* it anyway.

I have *lost* several valuable phone numbers.

I think I am *losing* my mind.



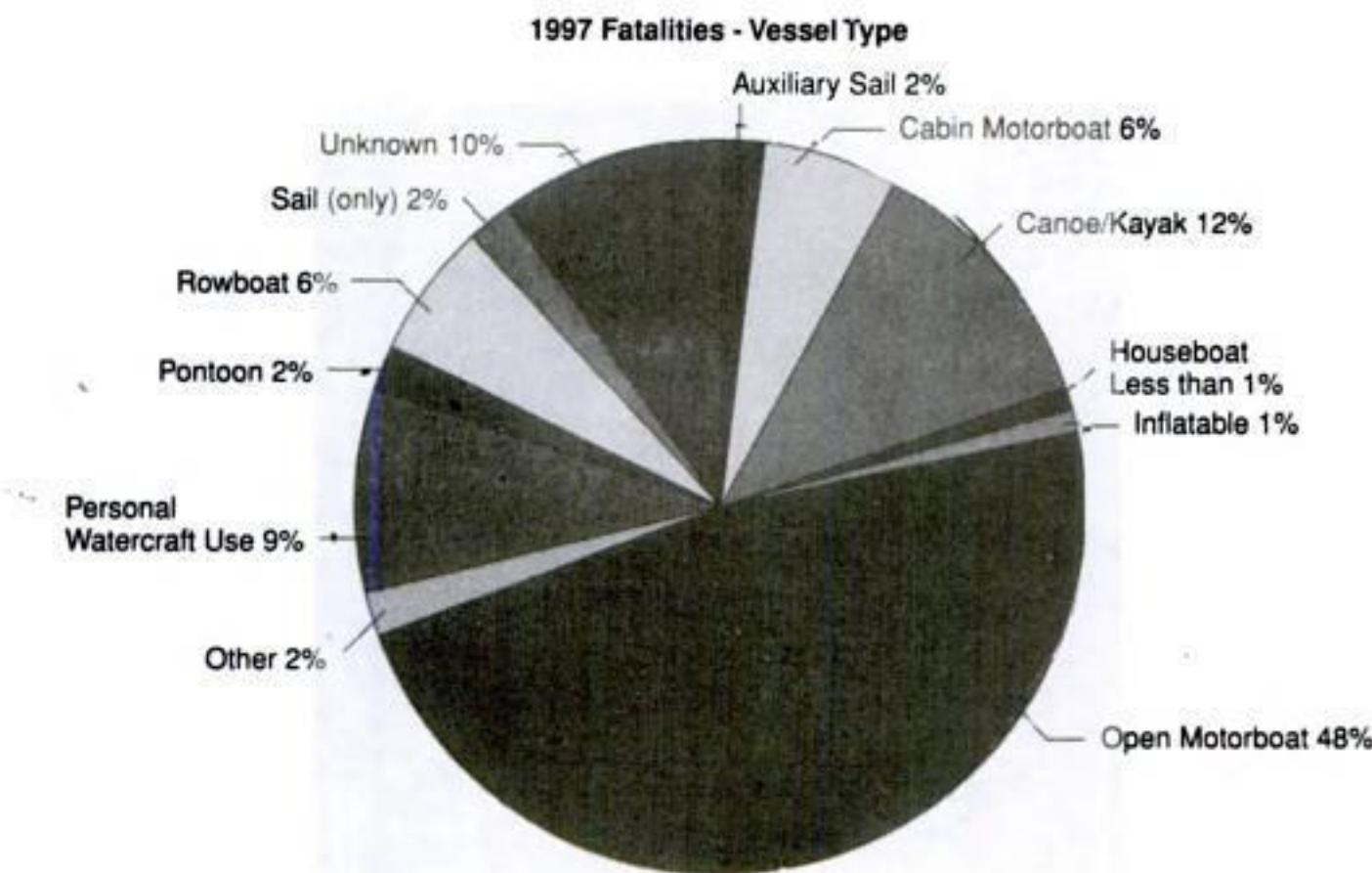
You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

FIGURE 7-2

information could help direct safety efforts. Until recently, a reported boating injury could be either three stitches or an amputated limb. Only in the past year or so have data about the specific type of injury been reported.

Since the non-fatal accidents and injuries that are reported are what's called "self-selected"—the boaters involved chose to file a report—no real conclusions can be drawn from these figures because they do not represent a valid random sample of boaters. These days, when professional pollsters can accurately predict the outcome of a national election based on a random sample telephone survey of a handful of voters, you'd think basic boating statistics could be brought up to speed.

It's unlikely the public is going to change its reluctance to self-report, so it's time to get at this information through a different method, using basic survey methods. Random sampling could be it.

On the plus side, the lack of a national survey should be addressed soon. BOAT/U.S. lobbied hard in Congress for some \$2 million in additional funding for a comprehensive national boating survey, plus an update every five years.

According to Capt. Mike Holmes, chief of boating safety at the Coast Guard, a previous national survey conducted under a grant is being finished up this year, and its strengths and weaknesses will be used to refine the national survey in 2000. He expects it will take at least a year to complete the next survey and it will be done by an outside contractor. Holmes said he expects to finally get valid data on hours and days spent boating as well as better accident data.

What Do We Know?

Since it is generally accepted that virtually all boating fatalities are reported to police, we do know what causes the majority of boating deaths. Spectacular boat crashes and high-seas sinkings are simply not the norm. Without a doubt, the vast majority of people who die in boating accidents drown, most often in calm water and fair weather and on lakes and rivers. The victims most often either fell overboard or the boat capsized and they weren't wearing a life jacket.

Nearly half of all boating deaths occur in boats of 16 feet or less, and just over one-fourth of fatalities involve alcohol.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

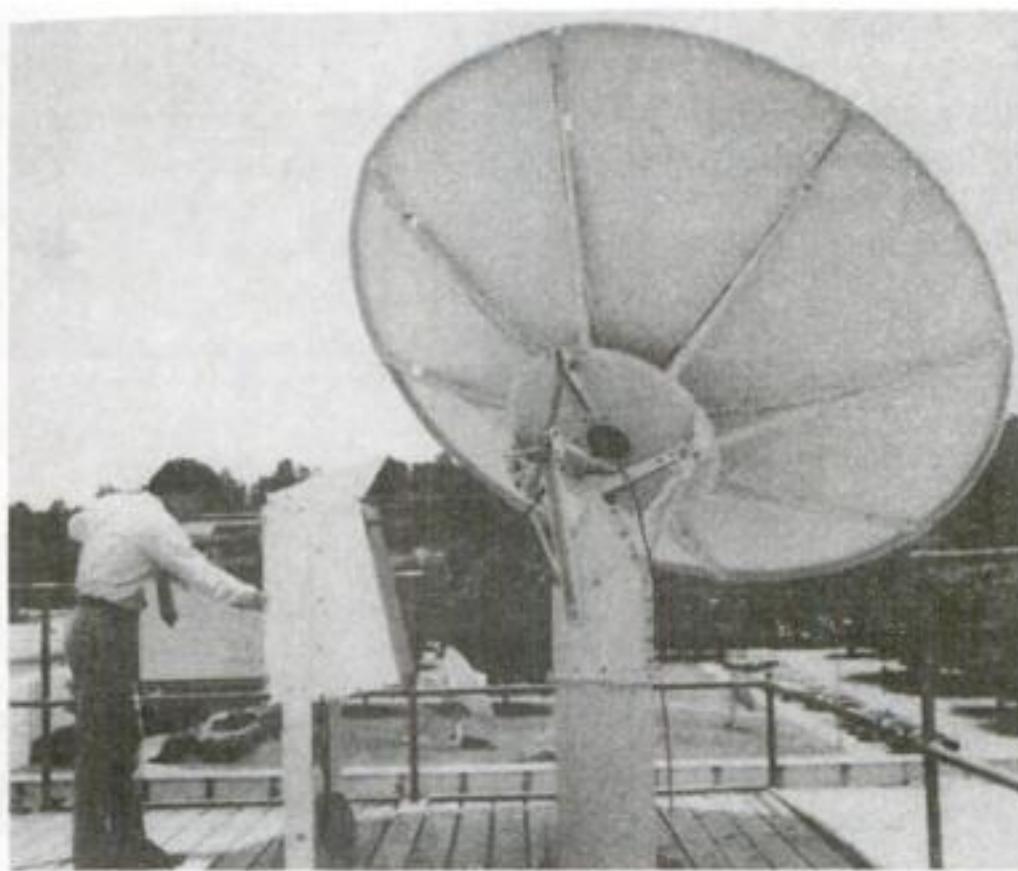


You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

FIGURE 7-4

Scientific-Atlanta's IBT-1200.
Ku-band transmit/receive digital
earth station.

Courtesy of Scientific-Atlanta.



Because the style for each type of graphic varies, we will review some general guidelines and examples of each.

Photographs

Camera-produced graphics are easy to insert into reports using a scanner or digital reprints from negatives. They may be useful to show the overall appearance of an object, but line drawings also serve this purpose. If used, photos should always be clearly focused and include only the intended object—easier said than done. Because photographs do not necessarily indicate size, some photographs show the object next to something common, as in Figure 7-4. Here the reader can see the size of the satellite dish antenna in relation to a person.

Line Drawings

Line drawings include the vast majority of the graphics in your textbooks. Schematics, drawings of components, and block diagrams are all examples of line drawings. Follow these general guidelines:

1. Label all the significant parts of a drawing. If you use arrows or lines, they should touch the specific parts to which they point.
2. Use standard abbreviations, symbols, and terms in labels and explanations of figures. Be sure that the terms are consistent with those used in the text. Add a legend (a key for unfamiliar terms or symbols) if you are writing for a general audience.

V = volts A = amperes

Hz = hertz ac = alternating current

3. Add enough white space so that neither the drawing nor the labels will be too crowded.
4. Use the type of line drawing that best fits your subject. These include front, side, exploded, and cutaway views; cross sections; and block diagrams.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

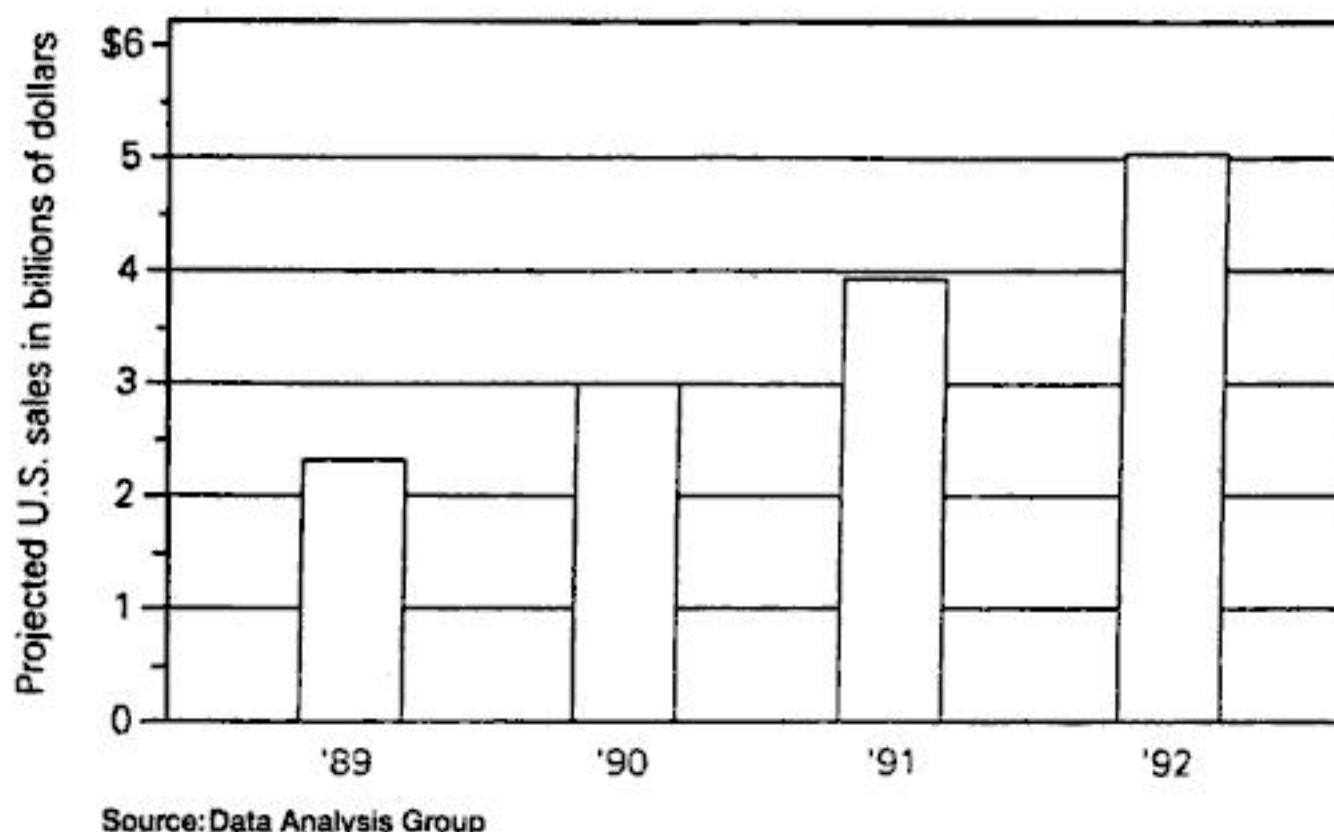


You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

A Growing Market for Laptop and Portable Personal Computers



Source: Data Analysis Group

FIGURE 7-11

Bar graph of laptop and portable personal computer sales.

Reprinted by permission of the Atlanta Constitution, 9/7/89.

laptop and portable personal computers for 1989 through 1992. The Data Analysis Group projected sales to be about \$2.2 billion for 1989, with a steady increase to about \$5 billion for 1992.

Line graphs and waveforms are made up of dots placed at coordinates according to fixed increments on the vertical and horizontal axes. The dots are then connected by straight lines or smooth curves to show the subject's response to changing conditions. The horizontal axis usually represents the changed condition, and the vertical axis usually represents the subject's response or activity. Line graphs are particularly useful for displaying patterns and for predicting future activity. Normally, both axes begin with zero in the lower left corner, but in electronics, this is not always the case.

In Figure 7-12, a line graph represents the current (I_c) and voltage (V_{ce}) relationship in an electric circuit. It is clear that as current increases, voltage decreases. The increments are even, and the origin is zero on both axes. Dashed lines are used to plot current and voltage combinations (see Table 7-1 for another method of representing these values).

Pie charts are partitioned circles in which each partition represents a percentage or proportion of the category. The first segment usually begins at a line from the center to the top of the circle. The segments are automatically arranged in alphabetical order starting at the top (or midnight position), and proceed in a clockwise direction. If needed, label the last segment "others" to include all the remaining segments, and itemize the "others" below the circle. Print explanatory information horizontally inside the segment, if possible. If the segment is small, draw a line from it to a space outside the circle and explain it there. The pie chart in Figure 7-13 shows the activities in which victims of 1997 boating fatalities were participating at the time of their deaths.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

FIGURE 7-16
Unrelated cause-and-effect
relationship.

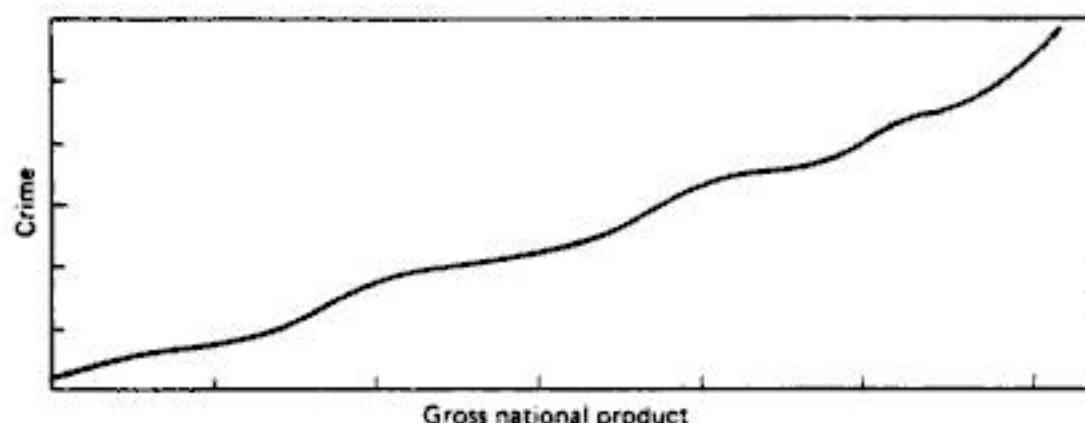
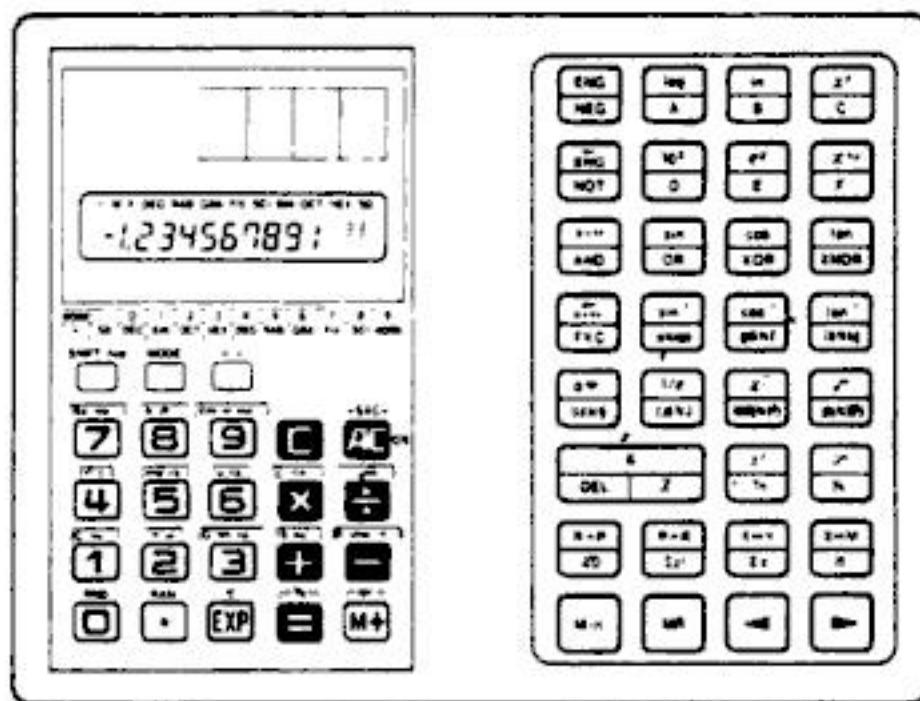


FIGURE 7-17
Scientific calculator.
Reprinted with permission of Radio Shack,
Tandy Corporation.



E. Draw a bar graph and a line graph to display the following information.

According to the Acme Business Bureau, the Hot Circuit Company has experienced the following annual sales:

- In 1992, its sales totaled \$2 million.
- In 1993, its sales totaled \$8 million.
- In 1994, its sales totaled \$21 million.
- In 1995, its sales totaled \$50 million.
- In 1996, its sales totaled \$74 million.
- In 1997, its sales totaled \$103 million.
- In 1998, its sales totaled \$97 million.
- In 1999, its sales totaled \$95 million.

Write a one-paragraph description of the eight-year sales history of the company.

F. Bring in three examples of graphics from a newspaper or magazine article or advertisement. Write a one-paragraph interpretation of each graphic and include an evaluation of its purpose, effectiveness, and honesty.

Computer Images

Writers eventually learn how to create and process their own computer graphics images, sometimes through classroom training, mentoring, or just plain trial and error. Computer graphics can be very demanding of your computer's capabilities. Graphics



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 7.3 Add ei or ie to spell each word correctly.

1. Credit-card companies have been plagued by counterf____ters.
2. It was a rel____f when the Nevada test results y____lded positive results.
3. N____ther sc____ntists nor engineers predicted the applications of lasers in l____sure and recreation industries.
4. Dr. Maiman has rec____ved acknowledgment for his ach____vement.
5. Lasers have worked th____r way into many facets of soc____ty.

Exercise 7.4 Proofread the following paragraph for ie/ei errors. There are six errors. Write the correct spellings above the incorrect words.

Passing through an airport customs line in a foreign country can be a wierd experience. Travelers can expect that officials may sieze suspicious-looking items for examination. If the traveler has purchased anything illegal, even unintentionally, he or she will have to forfeit the item. Freinds patiently prepare each other for thier inspections. It is always a releif to see each peice of luggage pass through an inspection.

Exercise 7.5 Write the ei/ie verse from memory. Make sure that you include the second part.

VOCABULARY: Roots spec and son

The Latin root *spec* (*spect*) means "look at." For example, *spectrum* means "visible light waves."

The Latin root *son* means "sound." Combined with the suffix *ic*, meaning "having to do with," we form the word *sonic*, meaning "having to do with sound."

Exercise 7.6 Using spec and son, complete the words.

1. A person who watches or observes is called a _____tator.
2. An instrument to aid vision is called a pair of _____acles.
3. A musical composition written in three or four movements is called a _____ata.
4. A remarkable sight that attracts onlookers is called a _____acle.
5. Several people singing one melody are said to be singing in uni_____.
6. A close examination of an item is called an in_____tion.
7. A descriptive statement issued by a new company is called a pro_____tus.
8. A noise out of harmony is described as being dis_____ant.
9. A device used to increase vibrations is called a re_____ator.
10. A thought or conjecture formed from thinking about various aspects of a subject is called a _____ulation.

Exercise 7.7 Using the Latin meanings of spec and son, write definitions of the following words as they apply to technology. Use the dictionary if necessary. Remember to define the words by using the term, class, and characteristics.

1. specifications (specs) _____



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

PLEASE EXECUTE INSTRUCTION #39. PRIOR
TO INSTRUCTION #3.



Society for Technical Communication's Communication Trends Committee. First, women are entering what was a male-dominated field and second, documentation now has to be written with a broader audience in mind than technicians. There are also more opportunities for freelance technical writers; with companies downsizing, many inhouse communication departments are being disbanded and documentation writing is being outsourced.

Most important to being a successful technical writer, Hackos says, is understanding how people interact with text and knowing the end users' goals. In addition to honing their writing skills, Hackos advises developing technical expertise.

"Know something about computer programming—it's going to make a difference," she says. In addition, she encourages picking up a course or two in cognitive psychology or human factors to "become more knowledgeable about users."

"There's lots of opportunity for people who want to do something interesting and have a variety of experiences," says Hackos.

How Do I Get Started?

The first step in a technical writing project is identifying what you need to communicate and why you need to communicate it. That's called an "objective."

Always write down your "objective" in a way that keeps you focused on what information must be conveyed.

Now that you know what needs to be conveyed, you hone in on to whom you're going to convey it. This is called "audience analysis," but it's really a combination of common sense and proven research tools.

To write effective technical documentation, you need to know as much about your audience as possible, including education, attitude toward you as the writer, attitude toward the documentation, prior training, experience in the subject of the documentation, professional or job responsibilities, any cultural characteristics, and their intended use of the document. Don't make the mistake many technical writers make—you are not the typical target reader. Undoubtedly, the person who wrote those teeter-totter instructions understood them perfectly!

How do you get information about your readers, especially in cases where you don't have direct access to them? Technical communicators employ a variety of tools to gather information about potential readers, including interviews, surveys, questionnaires, observation and letters. In addition to your own research, clients or bosses may provide useful information.

The next step is to measure the difference between your objective and your



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

- **Step-by-step instructions.** In each step (usually numbered), use the active, imperative voice with the implied “you.”
- **Graphics.** When needed for clarity or understanding, add numbered or labeled graphics. Reference each numbered graphic in the text, or add a description under the graphic to orient the reader to the figure. Use consistent terms in the text and the description.
- **Conclusion or summary.** Describe the final state after following the instructions so readers can complete the project, and add information for any additional or optional procedures.

Some instructions for complex devices or procedures also include troubleshooting tips or frequently asked questions. This information should address typical problems with the procedures, based on your own testing and customer feedback.

Guidelines for Writing Instructions

The following guidelines describe the general process of writing instructions. As an example, consider the task of writing instructions for using a new software program. Whether the end product will be a one-page “Fast Track” for colleagues or a full manual for users, the general guidelines are the same.

Step 1: Perform the procedure yourself. Learn all you can about the process or product before you start writing anything. This might include observing others performing the procedure or talking to the experts (such as a developer or engineer) or other involved people. Read the product specification or user manual. Become familiar with all the features and terminology.

Perform the procedures, logging all the steps you complete. It is easy to miss the small steps unless you perform them yourself. Don’t rely on others to tell you how something is supposed to work.

If you experience problems, log the scenario in which the problem occurred. Then log what you did to correct the problem. Use your log to add information in your steps at the appropriate spot to prevent those same problems. Or, for longer documents, add a troubleshooting section with the problems you encountered and a description of what you did to correct (or prevent) them.

Step 2: Prepare a working draft. Write a draft of the numbered steps. Focus on the behaviors. Don’t worry about spelling, grammar, or even complete sentences at this point. Let others read your draft, following each step. Their feedback will uncover missing or confusing information. Often, test subjects uncover confusing wording, such as: *“When you said to ‘Close all applications before starting the installation,’ did you mean I have to close Windows, too, or just the programs running on my Windows desktop?”*

Thinking like a new user can be the hardest part of writing instructions. If you write for the broadest audience (nontechnical), your instructions should pass the “6th-grader test,” meaning that the instructions should be clear enough for the average 6th-grade student to follow. Revise your initial draft to clarify the instructions.

Step 3: Write the steps using simple, direct language. Now start to refine the language. If you struggle with describing a step, do more research and experimentation. Ask others to suggest alternatives for vague words or confusing sentences. Rewrite the instructions using an action verb and the implied “you.” Don’t worry about



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

for technical accuracy. Each reviewer might suggest different revisions. Most professionals consider the review process an integral part of document development—a time to fine-tune the instructions before they “go out the door.” From time to time, reviewers disagree with each other or write conflicting edits. Sometimes you might disagree with their edits. When this happens, focus on the audience, your intended readers. Discuss disagreements with your reviewers, letting them understand the other viewpoint.

This is also the time to examine grammar and spelling, reduce wordiness, eliminate repetition, and sharpen your language. Revise the steps as needed, based on the review process.

Step 10: Observe someone follow your instructions. The best way to test instructions is to ask someone (a test subject) to read and follow your instructions. Avoid helping the subject; let the person rely only on the written information. Keep a log of difficulties experienced by the tester—they are bound to occur at unanticipated spots. Note where, when, and why the test subject had problems.

Then revise your document accordingly, clarifying misunderstood steps and adding missing information in places where the test subject had problems. If possible, ask another person to test your revised document.

Step 11: Put the final touches on the instructions. Complete the final revisions based on the testing. Take a last look at the layout, send the document to the printer, and give yourself a standing ovation!

Writing instructions might not be as easy as one, two, three, but you can feel a great deal of satisfaction from producing instructions that work.

The following (abridged) example illustrates a set of organized instructions. For an example of complete instructions, see Appendix 2.

Building a Bookcase

Our pine bookcase features a simple design to be built with basic woodworking tools. We made the case out of materials available at most lumberyards. These instructions will produce a 4-shelf bookcase with overall dimensions of 10" deep \times 34" wide \times 48" tall. While the depth of the case is directly tied to the 1 \times 10 stock, you can vary the height....

Materials List

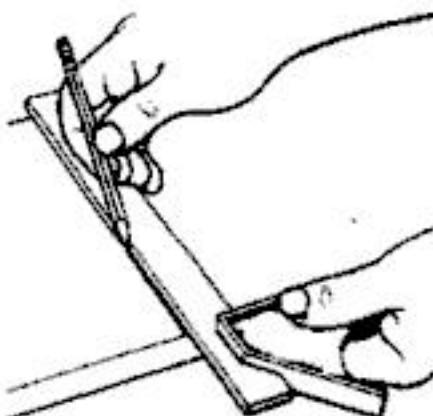
Basic tools:

Portable circular saw	Lumber:
Block plane	(1) 1/2 \times 1/4" parting strip
Combination square ...	(2) pieces of 1 \times 4 pine
	(5) pieces of 1 \times 10 pine ...

Lumber:

Cutting the Parts

1. Make a simple, self-aligning T-guide for your circular saw ...
2. Butt the crossbar of the T-guide ...



1. Use the T-guide to mark crosscuts.

Assembly

1. Hook your tape measure to the top edge ...
2. Extend the tap and place marks at the following locations ...

Adding the Fascia

1. Mark the stock for crosscutting to fit the 1 \times 2 fascia over the case front edges.
2. Make the vertical pieces 48" long to match the sides ...

Adding the Finishing Touch

If you plan to paint your bookcase, first apply two coats of shellac over each knot to prevent the knots from bleeding through the final paint job. Then prime and paint the bookcase according to the manufacturer's instructions ...



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Comparison and Contrast

- Write a comparison and contrast outline of two similar products.
- Write a comparison and contrast essay of two similar products.
- Spell words with *ough* correctly.
- Use *retro*, *circum*, *intro*, *intra* and *inter* correctly.
- Use *effect* and *affect* correctly.

READING: Your PC is Listening

by Leslie Ayers

Say something. I'm listening. Go ahead—tell me, already!

If your computer could talk, and if you had speech-recognition software installed, that's probably what it would say. It would tell you to put the mouse down, pull your hands away from the keyboard, put your feet up, and simply talk. Dictate a letter, a memo, or a report. Format the document. Print it. Save it. Paste its contents into an e-mail message. Send it on its way.

You can do all this with continuous speech-recognition software. Still hunt-and-peck typing at 40 words per minute?

Voice software lets you feed text to your PC three times faster. The toughest part is getting used to talking out loud, especially if you work in Cubicle Land, and keeping your hands off the keyboard and mouse.

But once you get the hang of it, nothing will shut you up. With four speech programs to test, we certainly had a lot of talking to do. Two of them, Dragon Systems' Dragon NaturallySpeaking Preferred 3.0 and IBM's ViaVoice 98 Executive Edition, are upgrades. Lernout & Hauspie's Voice Xpress Plus and Philips Speech Processing's FreeSpeech 98 are brand-new.

FIGURE 9-1
Speech-Recognition Software

Speech-Recognition Software

	Dragon Naturally Speaking	IBM ViaVoice 98	L&H Voice Xpress Plus	Philips FreeSpeech 98
Control Menus in Windows Apps		✓	Limited	✓
Systemwide Voice Navigation		✓		
Supports Multiple Users	✓	✓	✓	
No Training Required to Start	✓	✓	✓	

Reprinted from *PC Computing*, September 1998, with permission. Copyright © 1998, ZD, Inc. All Rights Reserved.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

WRITING: Comparison and Contrast

The purpose of the article "Your PC Is Listening" is to compare and contrast four similar speech-recognition software programs released at about the same time and to make a recommendation for the readers of the magazine.

Magazines that conduct product comparisons usually test each product under identical, controlled conditions and use the same testing procedures or scenarios—in the computer industry; this process is sometimes called a "shoot-out." Products being compared must be similar in purpose and general function. The writers then rate the products based on their experience with it, not on what the marketing literature claims. The article begins with a brief introduction to speech-recognition software for readers who are not familiar with this technology. The common elements of all four speech-recognition products are described briefly.

The article then describes how each program performed in three preselected categories:

- Continuous-speech dictation power
- Dictation accuracy
- Voice control of the Windows desktop and other applications

The final paragraph of the article summarizes the key strength of each product: the best all-around product, most accurate product, most flexible, and most cost-effective. The product summary charts display the comparative rating of each software program, as well as the pros, cons, system requirements, and product information.

Writing: Comparison and Contrast

When two or more objects are being compared, we often use a technique called *comparison* and *contrast*. Writers want to present facts and details in a meaningful, sometimes persuasive way, so that the reader can see the differences and similarities of the objects. The content and scope of the details will depend, naturally, on the purpose of the report: Is the writer simply informing the reader, or is the writer making an argument to persuade the reader?

In a **comparison**, we look for *correlation*. In a **contrast**, we look for *differences* in certain features. It is important to determine the standards of comparison before beginning a report. Many people are familiar with the phrase *comparison shopping*. When we shop, we find similar products and decide which one to purchase based on our standards, such as price, quantity, and quality. Depending on the product and how we intend to use it, one feature may be a priority. If all the products are equal in the priority feature, the decision will be made based on the remaining features. For other products, we try to get the best buy for our money with no single priority.

Certain magazines, such as *Consumer Reports*, specialize in comparing and contrasting products. Because they want readers to trust their opinions, it is vital for them to present complete and unbiased information. Technical magazines, such as *PC Computing*, occasionally compare and contrast new components and devices. People who are in the market for these products will read these magazines to gather pertinent information quickly. Sometimes, magazines cater to a certain audience, such as a group of people who use the products professionally. These magazines may not use cost as a feature of comparison, or may review only the most popular products, totally ignoring other worthy, but lesser-known competition. Readers need to evaluate whether an article is presenting completely neutral information or whether the magazine is biased toward a certain item or audience. As the saying goes, "Let the buyer beware!"



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

VOCABULARY: *retro*, *circum*, *intro*, *intra* and *inter*

Retro is a root meaning “backward or behind.” It is similar in meaning to the prefix *re*.

Retrorockets are used to slow rockets down in space.

Retrogression and *regression* are the opposite of *progression*.

Circum and *circu* are roots meaning “around.”

The *circumference* is the distance around.

Circuits are the pathways through which current flows.

Intro and *intra* are roots meaning “into” or “within.”

Intramural teams are from within a single school.

The *introduction* leads into the report.

Inter is a root word meaning “between” or “among.”

The scientists met to *interchange* ideas.

The *intercom* connected all the rooms.

Exercise 9.5 Add the correct root to complete each sentence.

1. A pay increase that reimburses a worker for a period already worked is called _____ active.
2. A/an _____ venous injection goes into a vein.
3. Draw a line to _____ sect the triangle.
4. People who are interested more in their own minds rather than in other people are called _____ verts.
5. The details surrounding an event are called _____ stances.
6. A/an _____ jection is a comment interrupting a discussion.
7. An argument in which the premise is also the conclusion is called a/an _____ lar argument.
8. Any unwanted signal that disturbs the reception or display of a wanted signal is called _____ ference.
9. The formula for finding the _____ ference of a circle is $c = \pi d$.
10. Taking a machine or device back to adapt it for a new procedure is called _____ tooling.
11. An electric current that is interrupted at intervals but always flows in the same direction is called _____ mittent current.
12. Paying someone back is called _____ tribution.

Exercise 9.6 Combine one of the roots above with the root *spect*, meaning “look” or “see,” to complete the following sentences.

A/an _____ view carefully considers all the information and circumstances before making a judgment or decision.

_____ ion means analyzing one's own feelings, emotions, and behavior.

In _____ we can often find value resulting from past misfortunes.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

**FIGURE 10-1**

The Ryan Transportation Group teams up with Eagle Group Consultants to implement the ISO 9000 standards.

Now we're about 75 percent completed with the registration process, and our attitude is very positive. We're interested in ascertaining the value-added benefits of being registered, and we're beginning to understand how this will happen. Put simply, we're formalizing many facets of our business that previously were informal.

For a long time at our company, uncertainty surrounded even our most basic business processes. Naturally, senior managers met regularly, and staff members were informed of current business plans. We handled situations and put out fires as they occurred, but until we began the registration process, we had no formal system to review what we were doing and how we could do it better. We now believe that, with a properly documented management system and a desire to practice what we preach, most of this uncertainty will clear up.

For example, with our purchasing process, which entails buying and maintaining equipment as well as recruiting and retaining owner-operator drivers, we expect to realize a significant payback for the time and effort spent achieving registration. We'll have a purchasing system in place that will mandate a more consistent vendor review, including work performance quality and pricing. But I think we'll benefit most from using ISO 9000 as a catalyst to achieve systemwide customer service improvement goals. Our new management system will clearly indicate where the buck stops and with whom.

As far as the actual implementation process goes, Ryan senior management

has expressed concern about how our current staff—which includes office clerks, dispatchers, maintenance personnel and midlevel managers—will handle the change to a management system that requires so much documentation and internal auditing. Ryan Transportation employs about 90 people, and we've trained seven staff members to serve as internal auditors.

At first, I thought that internal auditing might prove difficult for inexperienced staff members. They'd have to be responsible for auditing a business process they had very little prior exposure to. However, we recently completed our first round of internal audits, and I must admit I'm surprised at the confidence and enthusiasm our internal auditors have exhibited during this process.

Lisa Ann Throne, our deputy manager representative, is one of them. "Everyone here was very comfortable with the implementation process," she reports. "We mainly had to learn to write everything down, rather than simply going across the room and talking to someone. Now we have tracking devices to follow up our verbal quotes."

Concerning our consulting firm and registrar, our expectations were fairly simple. We wanted the consultants to be patient, thorough and committed as they taught the ISO 9000 system to Ryan Group staff. And they were. We're implementing a management system that will forever change the way we do business, and this radical change is not without its detractors. Having said that, I have full confidence that we will achieve all of our ISO 9000 goals.

With our registrar firm, NSF-ISR Ltd., we are expecting an audit that not only grades us on our ability to properly interpret the standard but also suggests ways we can continually improve our business processes. By the time we are ready for our certification audit this month, we anticipate having a functional system in place, but I predict it will take a couple of years for our company to have a well-oiled, excellent management system in process.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

The service delivery process documents how the customer actually gets the service. A tanning salon, for example, typically might require its customers to make specific appointments before they come in. In the case of a trucking company like Ryan Transportation, there may be several different processes, depending, for example, on whether its customer is looking for local deliveries or a long haul.

The customers' assessment determines if customers received—sufficiently—what they expected; sometimes this information is available only when the service is delivered, other times it's available afterward. From a transportation perspective, this evaluation would include not only delivering correct and undamaged parts but doing so in the time frame required and with proper documentation.

Because service industries deal with interpretation and applicability more than their manufacturing counterparts, it's probably true that more service organizations use the various resources, such as consultants, available to assist their efforts. Typically, service providers will have more questions for their registrars. At NSF-ISR, we assign the lead auditor to our client immediately after they apply to us so that the client can call the auditor directly.

Many registrars will respond to their clients' questions relating to interpretation or applicability. However, unlike the consultant, the registrar's auditors can't specifically advise clients. The auditor will determine whether a client's interpretation or procedure under discussion meets the standard's requirements. If it doesn't, the lead auditor can't recommend a specific solution. Using a consulting firm can help provide that insight during the implementation process.

As for all registration audits, the audit team must have relevant experience in the industry. This is certainly an important

factor for service providers because of the industry particulars previously discussed.

NSF-ISR uses a two-step approach for the on-site audit. Thus, after the document review has been completed and Ryan Transportation has had an opportunity to review the desk audit report, an on-site readiness review will take place. This will be followed some weeks later by the main audit. The readiness review provides an excellent opportunity to deal with those aspects of the ISO 9000 management system that are peculiar to a service organization. If any problem areas are detected, there is usually enough time to make any corrections before the main audit.

Ryan Transportation will soon undergo its certification audit, and as its registrar, NSF-ISR certainly can't prejudge the company's success. However, Ryan's sincere interest in the ISO 9002 standard and the benefits of a well-implemented system is evident from their involvement in this article, and we look forward to working with them.

Conclusion

For some service providers, a quality management system implementation might prove frustrating because the ISO 9000 standards are geared toward the manufacturing community. Their efforts therefore should focus on ways to integrate the ISO 9000 requirements into existing processes, making use of the ISO 9004-2 guideline and outside expertise for assistance.

All three stakeholders in the process described here are committed to attaining the same goal: a focused and effective quality management system that maintains and improves customer satisfaction. Teamwork is the key to reaching this common goal and succeeding in the ongoing effort to maintain the system in the future.

Reading Comprehension Questions

1. Who is the intended audience of the article? What will the audience do with the information in the article? _____
-



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

9. End with a summary. Restate the purpose and the thesis of the report. Opinions are not appropriate in most descriptive reports.
10. Number pages (if the body of the report is over three pages) in the bottom margin, either centered or in the right corner (be consistent). Start numbering from the introduction to the report. Pages before the introduction are marked with lowercase Roman numerals.

Some manuals and documentation are numbered using a decimal or hyphenated system. The chapter number is noted first, followed by the page within the chapter. At each new chapter, the page numbering begins with 1.

Examples of Page-Numbering Systems

	<i>Sequential</i>	<i>Decimals</i>	<i>Hyphens</i>
Chapter 1	1	1.1	1-1
	2	1.2	1-2
Chapter 2	3	2.1	2-1
	4	2.2	2-2

11. Staple the completed report in the upper left-hand corner. Do not include any blank sheets or use a plastic cover (unless required). If the report is longer than 10 pages, put it in a three-ring binder or folder.

Report Format

Use the following outline for report formats:

- | |
|---|
| <ul style="list-style-type: none"> I. PRELIMINARY SECTION <ul style="list-style-type: none"> 1. Letter of Transmittal or Preface 2. Title Page 3. Executive Summary or Abstract 4. Table of Contents and List of Figures and Tables
 II. MAIN SECTION <ul style="list-style-type: none"> 5. Introduction and Thesis Sentence 6. Body 7. Summary and/or Conclusion 8. Tables and Figures (if not included in the body)
 III. DOCUMENTATION <ul style="list-style-type: none"> 9. Notes (footnotes or endnotes, if needed) 10. Bibliography 11. Appendix |
|---|

1. *Letter of Transmittal or Preface (optional).* This page may be in memo or letter form (called a letter of transmittal), addressed to a specific reader. This page may also be in paragraph form (called a preface) for general readers. Use one or the other—not both. Provide background information: the reason for the report, the title of the report, special features of the report, and acknowledgement of any special assistance in the research/writing process.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



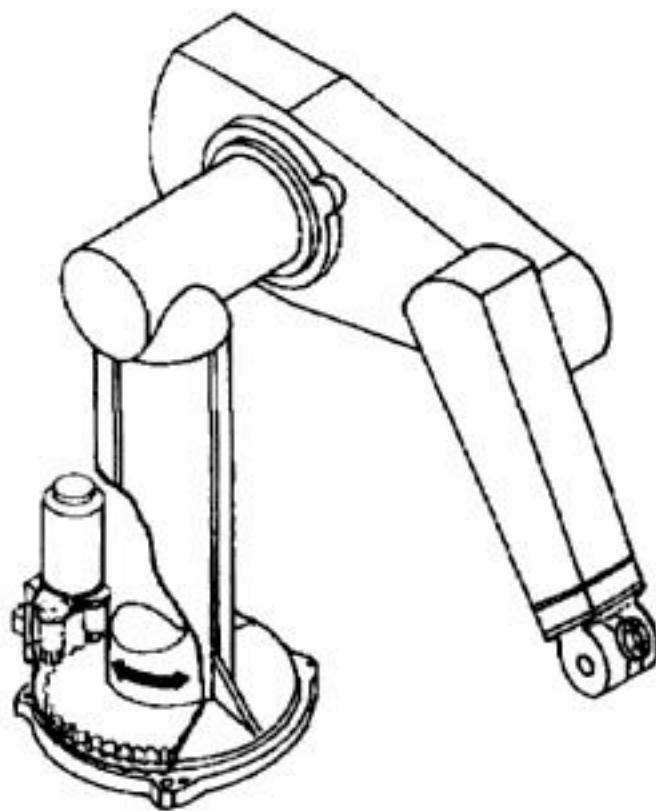
You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Outline of the Robot Arm

- I. Introduction
 - A. Background
 - B. Definition
 - C. Divisions of the report
 - 1. Base
 - 2. Body
 - 3. Arm
 - 4. Hand
- II. Base
 - A. Appearance
 - B. Function
- III. Body
 - A. Appearance
 - B. Function
- IV. Arm
 - A. Upper arm
 - 1. Appearance
 - 2. Function
 - B. Forearm
 - 1. Appearance
 - 2. Function
- V. Hand
 - A. Appearance
 - B. Function
- VI. Conclusion
 - A. Restate divisions
 - B. Restate purpose of robotic arm

THE ROBOTIC ARM
by Robyn McKnight

A technologist who can easily identify the parts of a robotic arm saves time and effort when interfacing the arm with a computer. In this report the physical characteristics of a robotic arm will be discussed in detail to aid in locating specific parts of the arm.

A robotic arm is a mechanical device which, when interfaced with a computer, simulates the action of the human hand and arm. The major parts of the robotic arm described are the base, body, arm, and hand.

THE BASE The base of the robotic arm is made of blue, lightly textured metal. The base is a rectangular platform 8 1/2 inches long, 6 inches wide, and 1 1/2 inches high. The base supports the remaining parts of the arm. The body swivels relative to the base on a hollow shaft that is attached to the base.

THE BODY The body consists mainly of tan, lightweight plates of metal. Two main plates, each 6 1/2 by 8 inches, extend upward, housing gears and cables in the 3-inch space between the two plates. There are three motor casings on the outer side of each plate. The motors are numbered and attached to their corresponding function on the arm. The upper end of the body is connected to the arm at a shoulder joint.

THE ARM The arm has two parts: the upper arm and the forearm. The upper arm consists of two 10-inch plates, 2 1/2 inches apart, with drive cables housed inside the plates. An elbow connects the upper arm and the forearm.

The forearm bends downward from the elbow. Two plates, 8 1/2 inches long and 2 inches apart, house the cables that connect the forearm to the hand at a wrist joint.

THE HAND The orange hand is the last part of the robotic arm. It consists of two sets of links, 3 inches and 2 1/2 inches long, which function as fingers that are able to bend at a midjoint. The hand can swivel in a circular motion at the wrist joint. At the finger joint, the plates can either open or close.

The two fingers have a 4-inch spread when extended and meet when pulled together, resulting in a clamping action similar to pinching. Springs located in the hand provide the return force needed to open the hand.

CONCLUSION All the parts of the robotic arm discussed in this report are hollow, lightweight sheets of metal. The main parts are the base, body, arm, and hand. These parts form a robotic arm which can be interfaced with a computer and follow programmed instructions.

FIGURE 10-4
The Robotic Arm



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Permanence

Unless your phone is bugged, a phone call leaves no permanent record. E-mail, however, does—and it can be forwarded again and again and come back to haunt you long after you have forgotten why you sent the original message. (This is especially true on mailing lists, where some list members may not see your message until weeks after you sent it.)

Because electronic mail is so easy to send and seems so ephemeral, people often forget just how permanent it is. You can achieve a kind of immortality through your e-mail well out of proportion to the amount of effort it takes to send it.

It can be a good idea to explain your intentions to the recipient of a message. If you do not want your message forwarded to anyone else, say so.

The convention on mailing lists and Usenet newsgroups is that private e-mail should not be publicly posted, but people are

occasionally thoughtless or unaware of the convention. To be safe, think very carefully before sending a hostile or angry message; you can wind up defending your writings long after the feelings that motivated you to write them are past. And you can wind up defending them to people you never thought the message would reach.

Unfamiliarity

Most people learn to use the telephone and to write letters as small children. Appropriate phone or letter etiquette is second nature to most adults. Most people on this campus, however, have had electronic mail for a much shorter time—maybe one to five years. Many incoming students have their first experience with e-mail during college orientation. Electronic mail is a very new method of communication for most of the people worldwide who use it—and they're still learning the ropes.

E-MAIL ETIQUETTE

Do

- Do review messages before you send them out to make sure you are really saying what you want to say.
- Do be as polite as possible; terseness can be taken as hostility.
- Do make it clear to the recipient what type of message you are sending, especially if it is official.
- Do give correspondents the benefit of the doubt; try not to assume the worst.
- Do be patient with inexperienced e-mail users.
- Do, if possible, include the portion of the message you're replying to in your reply; people often forget the original context.
- Do include a subject line that accurately reflects the subject of your message.
- Do use e-mail for praise or for neutral messages (such as moving a meeting time).
- Do enjoy and use responsibly the e-mail resources available to you.

Don't

- Don't send a message when you're angry; cool down, look at the message again, and then decide whether you really want to send it.
- Don't copy an entire, large message in your response just to add a line or two of commentary.
- Don't reply to "all recipients" unless they *all* need to see your reply.
- Don't type in all capital letters; this is SHOUTING and is considered RUDE.
- Don't send off-topic messages to mailing lists, especially work-related lists.
- Don't send chain letters or messages recruiting participants in make-money-fast schemes.
- Don't edit quoted messages to change the overall meaning.
- Don't send criticism in e-mail; use the phone or, better yet, talk to the person face-to-face.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

												No. 793 PURCHASE REQUISITION																																																																																																																																																																																																
Supplier (if Known)												Purchase Order No. _____																																																																																																																																																																																																
												Date _____	Terms _____																																																																																																																																																																																															
												Buyer _____																																																																																																																																																																																																
Request Date		Order Date		Confirmed Delivery Date		Ship Via:		<input type="checkbox"/> Surface	<input type="checkbox"/> F.O.B.	<input type="checkbox"/> Destination	Conditions of Compliance Required:		Imports:		Don't Import:		Assumption/Contract Wk																																																																																																																																																																																											
								<input type="checkbox"/> Air	<input type="checkbox"/> Other	<input type="checkbox"/> Shipping Point	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yrs	<input type="checkbox"/> Mths	<input type="checkbox"/> Yrs	<input type="checkbox"/> Mths																																																																																																																																																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 1%;">Item</th> <th style="width: 1%;">Stock No.</th> <th style="width: 1%;">Sku No.</th> <th style="width: 1%;">Quantity</th> <th colspan="8" style="font-weight: bold; text-align: center;">Description</th> <th style="width: 1%;">Estimated Unit Price</th> <th style="width: 1%;">Actual Unit Price</th> <th style="width: 1%;">Unit</th> <th style="width: 1%;">Var Code</th> <th style="width: 1%;">Comm Code</th> <th style="width: 1%;">Job/Cust/PL-Work-Accnt</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td colspan="8"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>																Item	Stock No.	Sku No.	Quantity	Description								Estimated Unit Price	Actual Unit Price	Unit	Var Code	Comm Code	Job/Cust/PL-Work-Accnt	1																			2																			3																			4																			5																			6																			7																			8																			9																		
Item	Stock No.	Sku No.	Quantity	Description								Estimated Unit Price	Actual Unit Price	Unit	Var Code	Comm Code	Job/Cust/PL-Work-Accnt																																																																																																																																																																																											
1																																																																																																																																																																																																												
2																																																																																																																																																																																																												
3																																																																																																																																																																																																												
4																																																																																																																																																																																																												
5																																																																																																																																																																																																												
6																																																																																																																																																																																																												
7																																																																																																																																																																																																												
8																																																																																																																																																																																																												
9																																																																																																																																																																																																												
NOTE: REQUISITIONER SHOULD FILL IN ALL SHADED AREAS.																																																																																																																																																																																																												
Estimated Extended Value _____																																																																																																																																																																																																												
Actual Extended Value _____																																																																																																																																																																																																												
Requested By				Ext. #				Date				Approved By																																																																																																																																																																																																
Diller To																																																																																																																																																																																																												
<i>For more information, contact your supervisor or manager.</i>																																																																																																																																																																																																												

FIGURE 11–3
Purchase requisition.

Some companies supply employees with hand-held computerized devices for recording data. Technicians “key in data” (type the information), which is stored in memory. Later the data can be “downloaded” (automatically loaded) into a computer and printed out for analysis and interpretation. One example is the surveyor’s sealed data collector, which is plugged into the electronic distance meter (EDM) and, with the assistance of a global positioning satellite (GPS), will measure, record, transmit, manipulate, and analyze information automatically, requiring few manual entries. This and similar devices may eliminate some printed forms; however, many forms still exist and require careful completion.

Memos

Memos can increase your visibility within a company. Although most memos have a short life span, memos can be used to call attention to your projects, efforts, coworkers, and plans. They can generate enthusiasm, cooperation, understanding, and action. They can be upbeat and humorous, or deadly serious. They can be used to praise, question, inform, and complain. But they all have the potential to become a permanent record.

Most companies have protocol for memos. Study your company’s memos and use the format and style that are familiar to your readers. Be sure to have a well-defined purpose and state it early.

Because they are generally short, memos should be planned even more carefully than reports. Revise them as many times as necessary until the message is crystal clear and the tone is appropriate. Three types worth practicing are **status**, **negative**, and **personal memos**.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Sede is derived from the Latin word *sedere*, meaning “to sit.” We use this spelling with only one prefix.

Supersede = *super* (over) *sede* (to sit), to replace or to cause another to become obsolete
The transistor *supersedes* the vacuum tube in solid-state electronics.

Related words: *sedate* (to sit calmly)
sedentary (moving little, as in a sedentary lifestyle)
presides (sits before others as the head of a meeting)
session (a sitting or assembly of many people)

Cede is derived from the Latin word *cedere*, meaning “to yield,” “to go,” or “to leave.”

Cede = to surrender formally
Spain *ceded* Florida to the United States in 1819.

Secede = *se* (apart) *cede* (to go), to formally withdraw or separate
Florida *seceded* from the Union in 1861.
Related word: *secession* (a formal separation)

Intercede = *inter* (between) *cede* (to go), to mediate or make a request on behalf of another.

An attorney can *intercede* in legal disputes.

Related words: *intercession* (the mediation or pleading for another)
intercessor (a person who intercedes)

Antecede = *ante* (before) *cede* (to go), to go before in rank, time, or place
The Univac computer *antececeded* microcomputers.

Related words: *antecedent* (going before in time, logic, or order; prior)
ancestor (one who lived earlier in a family line)

Precede = *pre* (before) *cede* (to go), to go before in rank, time, place, or importance
The development of solid-state electronics *preceded* the use of integrated circuits.

Related word: *precedent* (a fact or procedure established before)

Concede = *con* (with) *cede* (to go), to admit as true or acknowledge

After the votes were counted, the loser *conceded* the election to his opponent.

Related word: *concession* (a privilege, right, or lease)

Recede = *re* (back) *cede* (to go), to go or move back

After the floodwaters *receded*, people returned to their homes.

Related words: *recess* (a temporary halt or withdrawal)
recession (a departing processional or inactivity in the economy)
recessive (a nondominant gene)

Accede = *ac* (to) *cede* (to yield), to consent or enter into duties—rarely used except in sophisticated, formal language.

Both nations *acceded* to the treaty.

Related words: *access* (approach or come near)
accessory (helping in a subordinate way)
accessible (can be approached easily)

Ceed is also derived from the Latin word *cedere*, meaning “to go.” This spelling is used with only three prefixes.

Exceed = *ex* (beyond) *ceed* (to go), to surpass or outdo
The driver was fined for *exceeding* the speed limit.
Related words: *exceeding* (extraordinary)
exceedingly (extremely)
excess (an amount more than is needed)
excessive (being too much or too great)



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

practices breathing exercises as assiduously as scales. You must do the same. Next, know exactly what you want to do. If you are certain that a meeting has potential for confrontation, take time to plan your strategy. Determine what you want to accomplish and how you can best make your point. Never lose sight of your objective.

Do not spoil your planning by getting irritated and snapping at the person you are talking to. You will undoubtedly say something you will regret. And if that happens when you are talking with the media, your unfortunate comment may be used to conclude a broadcast interview—or it may be the only thing you say that is broadcast.

Expert communicators direct their thoughts to those people who do not have an opinion on the subject at issue. (This “audience” may even be imaginary, as when you and your adversary are the only people present at a meeting.) An upbeat statement directed toward them will serve your purposes much better than a defensive quip aimed at your adversary.

Speak simply, clearly, concisely. We have become a people who think that we have to use big words or jargon to appear “in the

know.” I recommend that you replicate, interface and offload only in the privacy of your own home. Speak English in public.

All of us have four weapons that will help us communicate: the mind, the face, the body and the voice. Though we generally use them correctly in animated conversation, we almost never use them correctly when we are tense, afraid and intimidated.

How can you use your mind creatively when face to face with an adversary? The best tool is the pause. It gives you time to think of a positive response, time to eliminate negative comments.

Remember, however, that the pause will work only if it looks comfortable. The key is to remain silent and maintain eye contact with the person you are talking to.

This means that you should avoid such audible pauses as “uh . . . uh . . .,” “like,” “I mean” and “you know” and that you should not give the impression that you are afraid to look your adversary in the eye. Eye contact does not necessarily mean eye to eye. If you find that uncomfortable, try focusing on a certain part of the person’s face. Most people, in fact, look at the lips.

Television provides a wonderful opportunity to study the pause. The next time

FIGURE 12.1

In a confrontational situation, never lose sight of your objective.





You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

- If the letter is more than one page, number the pages, starting with page 2, in a consistent place, such as the upper-right or lower-right corner.
- Indicate at the end of the letter if you are sending enclosures and if you have copied the letter to someone else.
- Type envelopes using the style recommended by the U.S. Postal Service (USPS) (see the section "Envelopes" later in this chapter). Make sure the envelope is wide enough for the paper.

Elements of a Business Letter

TIP Business letters have the following parts, separated by a double space:

1. **Heading.** Type the sender's complete mailing address, sometimes included in the letterhead. (You can add phone and fax numbers and e-mail addresses here or within the body of the letter.) Include the following:

- Street address, apartment number, or office number
- City (followed by a comma), the two-letter state abbreviation (see Appendix 1 for a list of state abbreviations), and zip code (no comma between state and zip code)

Short Circuit Engineering
2110 Hotwire Drive
Minneapolis, MN 55455

2. **Date.** Type the date of the letter directly below the heading address. Use the American style (August 15, 2000) or the international style (15 August 2000).

3. **Receiver's name and title (if known) and address.** Skip one line after the date. Align the receiver's information with the left margin. Include the following:

- Full name
- Title, department (if known)
- Company name
- Street address, apartment number, or office number (see Appendix 1 for a USPS list of address abbreviations)
- City, two-letter state abbreviation (see the USPS list of state abbreviations in Appendix 1), and zip code

Forrest Henry
Century Products, Incorporated
1800 Overlook Lane
Bismarck, ND 58501

Take care to spell the person's name and company name correctly. If the person's title is one or two words, type the title following the name:

Forrest Henry, Manager

If the title is more than two words, type the title below the name:

Forrest Henry
Application and Design Engineering Manager



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

**Century Products, Incorporated
1800 Overlook Lane
Bismarck, ND 58501**

June 20, 2000

Eric Christianson, President
Short Circuit Engineering
2110 Hotwire Drive
Minneapolis, MN 55455

Subject: Latex and our standard o-ring material
Reference: NASP

Dear Mr. Christianson:

This letter is in response to your voice message concerning our standard Buna-N o-ring and latex content. According to our supplier, the Buna-N o-ring used in our PLC220-04 does *not* contain latex.

I hope this confirms that the product is acceptable for your use. If you have any other questions or need further clarification, please feel free to give me a call at (701) 555-3131. Thank you for your continued interest in our products.

Sincerely,

Ken Byrnes

Ken Byrnes
Design Engineer

cc: Forrest Henry

EXAMPLE 3:

Abbreviated inquiry response, modified memo style



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Types of Letters

Letters are either informative, persuasive, or a combination of both. They can be positive or negative in tone, depending on your purpose. They can be formal or informal, depending on how well you know the reader.

Technicians may be expected to write several types of letters, such as a request for sales or technical information from a manufacturer, a price quotation to a customer, a letter of acknowledgment for good service, or a letter of complaint about poor service.

Effective letters must be written in simple, clear language and must include accurate facts. An incorrect part number or a poorly worded request may lead to confusion or errors.

Questions to Add Focus and Purpose

Some questions to ask yourself before beginning a letter are the following:

- What results do I want from this letter?
- Who is my reader?
- How familiar is my reader with the topic?
- What does my reader need to know?
- What do I need to know?
- What relationship do I want with the reader?
- How do I expect the reader to react to what I am saying and how I am saying it?
- What impression am I making on the reader?

The first question is the most basic, and without a clear answer, it is doubtful that the letter will accomplish any purpose. When you know what you want, you can communicate it. Knowing the reader will make some word choices easier. Knowing your purpose will help identify appropriate and important information to request or provide. Leaving out relevant information will delay results. The last three questions will affect the tone of the letter: how formal, how friendly, and how directly to write the letter.

Forbidden Words and Phrases

Many words and phrases are overused, evasive, redundant, or wordy. Avoid them in any kind of writing, particularly business letters.

Wordy phrases:

as I am sure you know	I would hope
as of this date	I would like to express
as you are aware	I share your concern
as you know	it is my intention
at this point in time	it is our (un)pleasant duty
at the present time	we regret to inform you
due to the fact that	we are cognizant of the fact

Overused words and phrases:

access	meanwhile
best wishes	more importantly
bottom line	mutually beneficial
delighted	needless to say



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

	Universal Communications Company	1 Communications Plaza Fort Walton Beach, FL 32549 (404) 555-2345 www.unicom.com
	March 4, 2000	
[Introduction]	Mr. Carlos Torres Graduate Placement Office South Florida Institute of Technology Miami, FL 33157	
[Reasons for refusal]	Dear Mr. Torres:	
[Refusal and closing]	Thank you for your interest in the Universal Communications Company. I reviewed your résumé and application for a position as technician at Universal. Your education appears to cover all the areas of fundamental electronics and electricity.	
	Presently, however, we are interviewing only technicians with experience in maintaining digital devices, an area that does not appear on your résumé.	
	For this reason, Mr. Torres, I cannot consider you for our present positions. If you are able to complete the basic and intermediate courses in digital devices before graduation, please consider resubmitting your résumé to Universal.	
	Best wishes for the future.	
	Sincerely,	
	Tracy R. Canfield Human Resources Manager	
	TRC: na	

EXAMPLE 6:

Negative (bad news) letter, blocked style

The reasons for refusal are stated to clarify your position and reassure the reader that you considered the request fairly and can justify your refusal. Often, company policies or procedures can be cited, which then provide guidance for the reader's actions in the future. Reasons for refusal should be consistent and legally sound. Some companies provide legal advice for these types of letters. Avoid sounding evasive or as though you are blaming the refusal on someone else, such as "this was the manager's decision, not mine." If you are unclear of the reasons, find out the reasons before you begin writing, and write with confidence and conviction.

The Apple IIc that I worked on was out of warranty. The problems in the CPU and disk drive were caused by normal wear after heavy regular use. I found no evidence of equipment defects or malfunctions in either the CPU or the disk drive.

The next paragraph should clearly state what is being refused, and what, if any, further action can be taken. Acknowledging the reader's point of view, without changing your position, will make you sound more understanding and, thereby, make your decision more tolerable. Close with a positive, sincere statement that will keep the door open for further business or association with the reader.

Your claim for factory reimbursement has been denied and payment for my services is expected from you by the 15th of this month. Be assured that our company would not bill owners for factory defects.

Our company has always strived to give prompt, dependable service at reasonable rates. We value you as a customer and hope that you will continue to use our company to maintain your electronic equipment.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 12.11 *Use the correct word to complete each sentence.*

Use *stationery* or *stationary*.

1. The guard stood _____ while the crowd passed.
2. The _____ was white with black lettering.
3. The _____ machine collected dust.
4. The company's logo was printed on the _____.
5. How many envelopes were included with your _____?

Use *compliment* or *complement*.

6. Some people do not know how to react to a _____.
7. Carol _____ ed her subordinate on his positive attitude.
8. A red tie will _____ a white shirt and dark suit.
9. A full _____ of personnel work the night shift.
10. His annual evaluation was _____ ary, and he was promoted.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Reading Comprehension Questions

1. Who is the audience of the address? _____
2. What analogy did President Kennedy use to demonstrate the “breathtaking pace” of space exploration? _____
3. Why did President Kennedy think the United States should be the first to explore space? _____
4. Why did he choose to explore the moon? _____
5. What were some of the immediate benefits to be gained from increased spending on the space program? _____
6. What did he propose to do “before the decade is out?” _____
7. What do you think President Kennedy’s purpose was in giving the speech? Why at a college? Why in the state of Texas? _____

WRITING: Presentations

The reading article is a speech delivered by President John F. Kennedy in 1962, just after the former Soviet Union launched the first satellite into space, which stunned many Americans and propelled the nation into an era that is sometimes called the “race to the moon.” He delivered the speech to announce his increased space budget and to challenge a newly emerging space industry to land a man safely on the moon by the end of the decade, “not because it is easy, but because it is hard.” Although President Kennedy did not live to see it, on July 20, 1969, U.S. astronauts Neil Armstrong and Edwin “Buzz” Aldrin Jr., became the first men to walk on the moon.

Review the speech by President Kennedy again to find some common elements in effective public speaking:

- Introduction (greeting guests and the audience)
- Statements to generate rapport (relating to the audience)
- Lead-in to his purpose
- Humor to relax the audience, or lighten a serious topic
- Metaphors that make data come to life
- Conclusion with a restatement of the purpose

President Kennedy uses traditional techniques to engage his audience, inform them, and persuade them. Underline the words he used to establish rapport with Rice University and Houston, Texas. Find the places where he added humor to lighten a serious subject and give his audience a mental breather. Find an example of how he made large numbers, inconceivably large numbers to most people, take on meaning. Find the statement that explicitly states his purpose. Find examples of repeated phrasing that add verbal symmetry and a pleasing sound. Find the quote he uses from a renowned adventurer to strengthen his conclusion.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

**FIGURE 13.2**

Body language sends nonverbal messages.

anger. Open, uplifted palms signal a need for understanding or help. Waving arms signal intense emotion.

Other nonverbal messages can be physiological reactions to situations that we cannot easily control. For example, when someone is angry, lips get thinner, brows furrow, and faces get red and warm (hence the expression “hothead”). When someone is afraid, eyebrows go up, causing eyes to get wide (“wide-eyed with fear”).

When the message delivered by body language contradicts the spoken message, listeners remember the body language. This means we must pay attention not only to what we say, but how we say it. Our entire appearance adds to our message, including our posture, where our eyes focus, how we move our hands, and how close we get to the audience.

Observe how professionals (actors or public speakers whom you consider convincing) use facial expressions and hands gestures to augment their words.

When you have written the content of your speech, practice speaking in front of a mirror, using expressions and gestures that support your message. Record yourself using a video camera, or ask someone you trust, to identify any distracting habits or mannerisms, such as words that you might overuse (saying “OK” frequently), wringing your hands, or fidgeting. Many times, we can break these habits just by becoming aware of them.

Follow three simple guidelines to get started:

- Smile occasionally, especially during introductions and conclusions. Usually a genuine smile can lighten the intensity of any information or news. It makes the speaker appear relaxed and confident, and that relaxes listeners, as well.
- Rest or fold your hands comfortably on the table or podium, or hold an appropriate object, such as a pointer. This reduces the chance that hand gestures will become distracting to listeners. With experience, speakers learn to use natural hand gestures that amplify the spoken message.
- Maintain eye contact with your audience. Move your eyes slowly from person to person. Watch out for staring at one person (which is bound to make that person uncomfortable) or staring at only a part of the room (the rest of the room will feel left out and possibly lose interest).



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

The Job Search: Résumés and Letters

- Résumés
- Job Applications
- Cover Letters
- Follow-up Letters
- Spell technical terms in résumés correctly.
- Use *meta* and *mega* correctly.
- Use *infer* and *imply* correctly.

READING: Web Spurs Change in Style of Résumé

by David Leonhardt

It is a tenet of the job search, passed down to college graduates for decades: Keep your résumé short, ideally no more than one page. A single sheet is more likely to hold an employer's attention and make an applicant look organized, not arrogant.

Now, however, the Internet is doing to one-page résumés what it has done to personal letters and travel agents. It is making them less relevant and perhaps even endangering their survival.

White space, brevity and verbs are out. Nouns and comprehensive descriptions—including obscure proper nouns, like the names of computer programs—are in. If the résumé continues page after page, or screen after screen, so be it. Even Headhunter.net, which has stricter rules than other Web sites, allows job seekers up to 6,000 characters, about three times the number in a typical one-page résumé.

Computer databases that screen job seekers are the culprit. With millions of applications sent by e-mail and the Web, employers lack the time to even glance at many. Instead, they sort through job-search Web sites like CareerMosaic or through their own virtual piles by asking computers to search for phrases in the résumés like "product manager" and "Microsoft Excel."

"It is a major change," said John A. Challenger, chief executive of Challenger, Gray & Christmas Inc., the Chicago firm that advises about 2,500 job searchers a year. "The more you can provide a company, in a way that makes sense, the better chance you have of being sorted out."

This movement of job hunters to the Internet is remaking one of the workplace's most enduring fixtures. "Résumés have been the same for 100 years," said



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

JANE MARIE DOE

555 Lakeside Lane
Miami, FL 33110

(H) (305) 555-1222
(W) (305) 555-4141
(E) jmdoe84@aol.com

Microsoft Certified Professional

OBJECTIVE
A challenging position in technical support and computer networking.

SKILLS SUMMARY

- Precise, self-motivated, and strong quantitative and interpersonal skills.
- Experienced in dealing with a diversity of professionals, clients, and staff members.
- Fluent in Spanish.

HARDWARE

Intel desktop	Server and workstation motherboards,
Intel processors	IBM-PC Compatibles.
	Macintosh

SOFTWARE

Windows NT 4.0	Access	Corel Word Perfect
Windows 98	Lotus 1-2-3	Adobe Photo Shop
Windows 3.1	Pascal	Microsoft Word
MS-DOS, VB	Fortron	Microsoft Visual C++

EDUCATION AND TRAINING

BS in Computer Information Systems, December 2000
University of Miami, Miami, FL

Microsoft Certified Professional, June 1999
Career Institute, Tampa, FL

Brokerage License Course, attended August-November 1995

WORK HISTORY

Candia, Inc., Miami, FL – February 1996 to present
Technical Support Engineer, Team Leader

- Provide technical troubleshooting and telephone support on the Intel account for all the integrators in Latin American region.
- Resolve technical problems of hardware and software on Intel's desktops, workstations, servers, motherboards, and processors.

FIGURE 14.2
Traditional résumé.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

555 Lakeside Lane
Miami, FL 33110
November 1, 2000

UniTec International
1515 Universal Drive
Atlanta, GA 31107

Dear Ms. Kendelson,

I want to thank you for the opportunity yesterday to interview at UniTec International. It was a pleasure meeting you and Mr. Santoya to discuss the computer networking position available in January.

When I arrived home, I located the networking proposal that I completed at my last position that I described to you, and I am enclosing it for your review. The transition to the new system at my former company was successful, thanks largely to the preparation and research provided by the proposal.

I was impressed by the direction your company is taking, and I hope I can become part of it. I look forward to hearing from you about the position at jmdoe

Sincerely,

Jane M. Doe

Jane M. Doe

Enclosure: Proposal

Reminder of interview

Answer open question

Restate your interest in the job

FIGURE 14.6
Follow-Up letter.

SPELLING: Technical Terms in Résumés

Technical terms and jargon are appropriate only for technical audiences. In most cases, the people reviewing résumés will be technical and will scan or search for specific jargon in résumés. Without the use of technical terms, and more importantly, the correct spelling and punctuation of technical terms, Internet searches might miss your résumé.

Frequently, technical jargon is based on abbreviations, acronyms, or registered or trademarked words. It is important to spell jargon in the standard way, using upper- and lowercase letters and spacing correctly. Before writing technical terms, observe the spelling carefully in textbooks, manuals, and industry magazines. Or conduct an Internet search to find the correct product or company spelling.

Examples of technical terms in computer programming include:

Fortran C, C++, C-language program Java, J++, Jscript, JavaScript

Exercise 14.10 *List 10 technical terms (including abbreviations and acronyms) used in your career field that you could include on your résumé. Confirm the spelling and punctuation.*

1. _____
2. _____



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Subjects and Verbs

The most fundamental elements of a sentence are the **subject** and **verb**. Without both, a written idea is incomplete and cannot be called a sentence. A subject can be either a noun or a pronoun, and a complete verb may consist of up to three verbs, either action or linking. We begin this review with a careful look at nouns.

Nouns

Most people can remember the informal definition of a **noun**: a person, place, thing, or idea. The first three types (persons, places, and things) are the easy nouns to spot. They can be singular or plural. The plural is usually formed by adding *s* or *es*.

The final type of noun is the idea. In fact, the word *idea* is a noun. Other examples of idea nouns are found in the following sentence.

Example: Your *education* and hands-on *training* will be useful in a technical *career*.

You can see that the italicized nouns in the example above are ideas, not things that we can see or touch. One test is to say the word with *a*, *an*, or *the* in front of it.

an education
the training
a career

If doing so makes sense, it is a noun. If not, it is probably some other kind of word.

You will probably remember that **pronouns** are similar to nouns. They take the place of nouns. In these exercises, we do not consider pronouns as nouns. We deal with pronouns in a later unit.

Exercise 1 Underline the nouns in the following sentences. The number of nouns in each sentence is given in parentheses.

1. Pliers are used for many jobs. (2)
2. The sharp teeth and the strength of their grip can damage fine objects. (4)
3. The power must be appropriate for the type of wood or metal. (4)
4. Many companies have produced imitations of the original Vise-Grip built by Peterson Manufacturing. (4)
5. The factory in DeWitt, Nebraska, still uses the original logo. (4)
6. The first patent was issued in 1921. (2)



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

3. The technique increases computer memory and provides faster access to it. _____
4. Each card is etched on a thermoplastic square. _____
5. The laser has worked into many facets of society. _____
6. They have transformed the science of eye surgery. _____
7. The laser has been used to keep tunnels true. _____
8. Laser disks store and play back up to 100,000 images. _____
9. An experimental computer memory uses laser disks to store information. _____
10. A laser processes the images for robots and missile guidance systems. _____

Special Case 1: Sometimes a sentence begins with an indefinite word such as *there*, *here*, or *where*. In sentences like this, the subject will come after the verb, and the verb must agree with what comes after it.

Example: There is an illustration.
There are two illustrations.

Note: The contraction for *there is* is *there's*. *There are* cannot be contracted.

Exercise 2 Using *is* or *are*, select the correct form for each sentence.

1. There _____ a similar rule.
2. Where _____ the executives?
3. Here _____ the reason.
4. There _____ three ways of determining power.
5. What _____ the source of power?

Special Case 2: Compound subjects joined by *and* are considered plural.

The scientist and the researcher agree.

In sentences with subjects joined by *or* or *nor*, the verb will agree with the closer subject.

Neither the scientist nor the *researchers* agree.
Neither the *researchers* nor the *scientist* agrees.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

2. Misfortunes in the home (happens/happen) every day.
3. A buyer of a policy (has/have) to read it carefully.
4. The coverage of different policies (was/were) different.
5. Valuable items in the home (has/have) to be appraised.
6. The replacement value of some structures (is/are) less than the actual cost.
7. Unique older homes under special policies (is/are) an exception.
8. Renters without many possessions (buys/buy) renter's insurance.
9. An umbrella policy for extended personal liability (increases/increase) coverage.
10. Premiums in many states (varies/vary) among companies.

Exercise 3 Rewrite the sentences in Exercise 2, changing the subject from plural to singular or from singular to plural. Use the correct verb.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Sentence Combining

Now practice putting sentences together again, using all the ideas in each group to make one, powerful sentence.

Exercise 4 Using the following example as a model, combine each group of sentences into a single sentence.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Exercise 3 Circle the correct pronoun in each sentence.

1. Tim, Angela, and (I/me) are lab partners.
2. Tim didn't do as much work as Angela and (I/me) did.
3. We showed our data to Bill, Nick, and (he/him).
4. Our instructor gave a warning to (he/him) and (we/us).
5. He said that Angela and (I/me) could no longer share results with (they/them) and Tim.

Possessive Pronouns

This group of pronouns shows ownership. The choice of a **possessive pronoun** varies depending on whether it is followed by a noun or whether the possessive pronoun is used by itself.

Example: That is *my* hypothesis.
The hypothesis is *mine*.

Person	Singular	Plural
First	my, mine	our, ours
Second	your, yours	your, yours
Third	his/their, theirs her, hers its, one's	
Question form	whose	whose

Exercise 4 Circle the correct possessive pronoun in each sentence.

1. (You/your) experience in troubleshooting is limited, but (their/theirs) goes back many years.
2. Each scientific field regulates (it/its) own professional standards.
3. The choice is (your/yours).
4. I had to make up (my/mine) own mind.
5. The team leader claimed that the responsibility was (her/hers).

Hazard: Do not put apostrophes in possessive pronouns except in the impersonal pronoun *one*.

Example: A career choice is *one's* own decision.

In other cases, adding an apostrophe changes the function of the word.

It's stands for *it is*.
You're stands for *you are*.
Who's stands for *who is*.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

4. Stanislaw Ulam, a Los Alamos mathematician, performed an experiment themselves.
5. Ulam and his colleagues used some of the earliest computers, the ENIAC and MANIAC, which are very slow.
6. Supernovas are simulated because it is rare and inaccessible.
7. In retrospect, the solution seems simple, but it was a challenge at the time.
8. A computer worked out the consequences of a physical law, but these are not new undertakings.
9. In the eighteenth century, an apparatus called an orrery simulates motions of planets and their satellites.
10. Clockwork gears turned balls in rhythmic patterns, and it predicted future configurations of the solar system.

Voice Shifts

Voice shifts refer both to the person (first, second, or third) and to active and passive voice. Remember that the active voice shows a subject performing the action of the verb.

The technician calculated the capacitance.

The passive voice shows an inactive subject, and the verb includes a helping verb.

The capacitance was calculated by the technician.

Determine your voice before beginning to write. Choose the appropriate voice for your audience and purpose. If your readers need directions or instructions, use the second person, active voice. If your readers need information, use the first or third person (first for informal communications, third for more formal communications), active voice. Then proofread for consistency after the rough draft is finished.

The easiest way to describe “person” is to look at the types of pronouns used in each style. The first person uses *I* and *me* because the writer is describing personal experiences.

I programmed the model.

The second person uses *you* or the inferred “you” because the writer is directing the reader.

Program the model.

The third person uses *he*, *she*, *it*, or *they* because the writer is informing the reader of someone or something else.

They programmed the model.

The most common voice shift error is using *you* after starting with another pronoun.

Wrong: I found that a simulation works well when you study supernovas.

Correct: I found that a simulation works well when I study supernovas.

Correct: I found that a simulation works well in the study of supernovas.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

The new salesperson wore a (an) _____ suit.

The _____ salesperson wore a three-piece suit.

Note: The articles *a*, *an*, and *the* are also adjectives since they are written in front of nouns and pronouns.

Exercise 1 Underline the adjectives in the following sentences. The number of adjectives in each sentence is indicated in parentheses. Draw an arrow to the word each adjective describes.

1. The consultant advised men to wear a blue or gray suit to the first interview. (6)
2. A black suit is overpowering. (3)
3. Black accessories often complement a business suit. (3)
4. A woman has several more color choices for a business suit. (6)
5. Blue is the favorite color of most men and women. (3)
6. Brown is a good, basic color for women, but should only be used as a background or accessory color by men. (6)
7. Burgundy is one of the most flattering, authoritative colors. (4)
8. Women can wear burgundy suits or accessories. (1)
9. Men can wear burgundy ties, either as a background color or a print, but they should not wear burgundy suits or shoes. (5)
10. Gray and navy business suits are the most authoritative colors for men or women. (6)

Hyphenated Adjectives

Sometimes two words are joined by a hyphen to become one adjective, as in the following examples.

middle-class neighborhood navy-blue three-piece suit
top-level management well-polished image

It would sound ridiculous to talk about a “middle neighborhood” or a “class neighborhood.” Instead, the two words have been joined with a hyphen to become the single adjective “middle-class.”

Rule: If two words require each other to describe the noun, use a hyphen between them.

Exercise 2 Add a hyphen between the adjectives that require each other to describe the noun.

Example: Graduation is a decision-making time.

1. He wears a two tone suit to interviews.
2. A lemon colored suit is not appropriate for an interview.
3. Some businesses allow an open collared, button down shirt.
4. The interviewer was impressed by her well polished image.
5. He bought a long sleeved, white shirt.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Some words have a negative meaning and should not be used with another negative word:

hardly	no one	rarely
never	none	scarcely

Wrong: *No one scarcely attends the early labs.*
He never has none of his work finished on time.

Some words have a positive meaning and are often used correctly with negative words:

any	anyone	ever
-----	--------	------

Correct: *No one ever attends the early labs.*
Hardly anyone attends the early labs.
He never has any of his work finished on time.

The following examples correct a double negative, each adding a slightly different emphasis.

Wrong: *I haven't hardly started thinking about clothes.*
Correct: *I have hardly started thinking about clothes.*
I haven't started thinking about clothes.
I hardly think about clothes.
Wrong: *We don't never shop there.*
Correct: *We never shop there.*
We don't ever shop there.
We don't shop there.

Exercise 6 Rewrite the following sentences to correct the double negatives.

1. I haven't never seen a man wear a yellow suit. _____
2. It ain't no proper color for a professional. _____
3. I can't never find the time to shop. _____
4. They don't hardly know where to begin. _____
5. Don't let no one talk you into buying a suit you don't like. _____

Exercise 7 Proofread the following paragraph for modifier and double-negative errors. You should find six errors. Write the correct forms above them.

Our response to color is as much emotional as physical. Certain colors deliver messages that haven't nothing to do with the individual wearing them. More darker colors generally convey authority. Medium-range colors like blue or tan make us look more friendlier and approachablier. Large expanses of pastels make us look less seriouser, sometimes unprofessional, and are more suited for off-the-job looks. Our response to colors may not be hardly deliberate, but colors contribute to our general impression of the person wearing them.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Warning: Remember that connecting compound sentences with only a comma or only a coordinator improperly fuses the two sentences.

Comma splice error: Laser light is monochromatic, it has a single wavelength.

Run-on error: Laser light is monochromatic and it has a single wavelength.

Correct: Laser light is monochromatic, and it has a single wavelength.

Exercise 3 *Fuse the two sentences into a compound sentence by adding a comma and coordinator. Use a logical coordinator. Smooth the fused sentences when necessary above.*

1. Laser devices are now used in construction work.
Laser devices are also used in welding and surveying.
2. Lasers are normally used in a fixed direction.
Lasers can be used in a revolving, horizontal pattern.
3. Care must be taken of the laser beam.
The beam can be deflected by dust or high humidity.
4. Lasers must not directly strike the eyes.
Lasers should not be used in poor weather conditions.
5. We don't normally think of lasers being used underground.
Lasers are commonly used in trenches.
6. To prevent underground humidity, blowers are used.
The laser could also be placed above ground with a signal-sensing target rod toward the trench.
7. A pipeline laser is mounted in a storm-pipe manhole.
Then the laser is used with a target for the laying of sewer pipe.
8. A laser sensor can be mounted on a backhoe.
The sensor gives a proper trenching depth.
9. Working above ground eliminates the humidity factor.
Working above ground allows for more accurate horizontal alignment.
10. Laser devices can be disturbed from their settings.
Automatic shutoffs are installed to prevent injuries.

Semicolons in Compound Sentences Another method of fusing compound sentences is using a semicolon (;) between the two clauses.

Maiman's first laser generated only red light; today lasers come in many different colors.

Notice that the second clause does not start with a capital letter and does not use a coordinator. The second clause is considered a continuation of the first clause. Semicolons should not be overused or their effectiveness will be diminished. If semicolons are used carefully and appropriately, they provide an abrupt, striking coordination; overused, they become weak and showy.

Remember that semicolons can be used if the following conditions are met.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

7. Unless you feel the impact, the lyrics sound bizarre.
8. Metallica made metal-music history when the group played "One" at the Grammy Awards ceremony in 1989.
9. Although the group did not win the first hard rock/heavy metal award, the nomination gave Metallica new respect.
10. Because Metallica keeps a consistently unconventional style, its fans remain loyal.

Commas in Complex Sentences

One of the clauses in a complex sentence is the main (independent) clause. Recognizing this main clause is the trick to knowing when and where to place commas in complex sentences.

The general rules for using commas are as follows:

General Rules:

- If the subordinate clause introduces the main clause, put a comma after the subordinate clause.
- Do not put a comma after the main clause when it is followed by a subordinate clause.

Exercise 2 Complete the sentences by adding your own dependent clause beginning with the signal word. Be sure that your added clause has a subject and verb. Make each sentence different and true.

1. Service technicians have interesting jobs because _____
2. Service technicians have interesting jobs after _____
3. Service technicians have interesting jobs unless _____
4. Service technicians have interesting jobs although _____
5. Service technicians have interesting jobs when _____

In the "picture" form below, the signal word represents a subordinate conjunction, and the lines represent clauses. The signal word makes the clause that follows it dependent (DC).

SIGNAL DC, IC .
 IC SIGNAL DC .

Exercise 3 Underline the main clause in each complex sentence. Draw a wavy line under the subordinate clause. Draw a box around the signal word. Add a comma, if necessary, to punctuate the sentence correctly.

Example: The music was too loud until I adjusted the dials.

1. Music is pleasant noise until harmonic distortion colors the sound.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Comma Splices

A comma splice is a sentence error in which two independent clauses (grammatically complete sentences) are joined only by a comma and are missing the required coordinating conjunction, such as *and*, *but*, *for*, *or*, *nor*, *so*, or *yet*. Correct a comma splice by adding the missing conjunction or by revising the sentence the same way you would a run-on.

Comma splice error: The Chandra was launched in 1999, it will operate for 20 years.

Revised: The Chandra was launched in 1999, **and** it will operate for 20 years.

The Chandra was launched in 1999; it will operate for 20 years.

The Chandra was launched in 1999; **furthermore**, it will operate for 20 years.

The Chandra was launched in 1999. **It** will operate for 20 years.

The Chandra was launched in 1999 **and** will operate for 20 years.

The Chandra, launched in 1999, will operate for 20 years.

Exercise 7 *Revise the following sentences to correct the comma splice errors. Vary the way you revise the sentences.*

1. The Chandra is an X-ray telescope it has 10 times greater resolution than other telescopes.
2. It has 50 to 100 times more sensitivity than any other telescope and it is orbiting Earth.
3. The telescope orbits Earth every 64 hours it was launched by a space shuttle in July 1999.
4. People devoted many years of their lives to the Chandra they wanted the Chandra to function perfectly.
5. The telescope's mirrors must be perfect it will send back continuous data.
6. It is a dream come true for scientists it will advance the science of astronomy.
7. The Chandra is an X-ray observatory it produces images of high-energy X-rays.
8. The information will be sent back to astronomers it will answer questions about the formation of the cosmos.
9. Scientists hope this is only the beginning Chandra should have a long life.
10. Future space launches might visit the Chandra the Chandra could have mechanical difficulties.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

4. after reading several issues of *popular mechanics*, i ordered a subscription.

5. nancy and tom were inducted into alpha beta tau last term.

6. all the teenagers in london were wearing levi jeans.

7. my english teacher told us to read *the great gatsby* and any two plays by shakespeare.

8. i looked through the heathkit catalog to find a project for my digital electronics class.

9. the student government association sponsored a halloween party at northside children's hospital.

10. he gave his wife a siamese kitten, and she gave him an airedale puppy.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

The class meets Tues. and Thurs. from 7–9 P.M., and the lab meets on Wed. from 7–10 P.M.
The semester runs from Sept. through Dec.
Either Dr. Manning or Prof. Gallagher will teach the class.
The recruiter from Scientific Creations, Inc., is on campus today.

Note: Do not use periods after abbreviations for company names or organizations, after most acronyms, or when spelling out a title.

IBM	NASA	DNA	RAM	GB
Professor	Doctor	Mister	Miss	

Follow conventions when using periods in some abbreviations, acronyms, and decimals (observe current styles and conventions in textbooks and industry magazines).

Ph.D.	.bmp	.exe	8.5 × 11
-------	------	------	----------

Question Marks

Use a question mark to end direct questions. Direct questions often begin with words such as *who*, *what*, *where*, *when*, and *how*.

Who purchased the software?
When did you register the software?

Some questions begin as a statement and end with a question.

The program runs correctly, doesn't it?

Use a question mark to signal a request.

Would you please complete the registration for me?

Use a question mark within parentheses to indicate uncertainty (in informal communication only).

I want to register the program (available online?) after finishing the installation.

Note: Indirect questions are statements that include a question but are not asked as a direct question. Do not use a question mark to end an indirect question:

He asked how to find the library.
She wants to know if the instructions worked.
I wonder if I have the most recent version.

Exclamation Points

Use an exclamation point to end sentences expressing genuine excitement or strong emotion.

Oh, no! I passed! Help!



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

The first sentence means that Richard, not another brother, attended the launch—the name is essential. The second sentence means that there is only one brother, his name is Richard, and he attended the launch—the name is not essential, therefore it is interrupting.

Phrases may be written between the subject and verb of a sentence. Commas are placed before and after phrases that interrupt the meaning of the sentence.

Multiwire boards, unlike other boards, have a flexible design. (*interrupting phrase*)

The design flexibility of multiwire boards creates an added benefit. (*essential phrase*)

Clauses may be written within the main clause of a sentence.

The technicians, who are about to graduate, are in the lab.

In the preceding sentence, the main clause is *The technicians are in the lab*. The dependent clause, *who are about to graduate*, is written within the main clause. Determine the difference between the two sentences that follow.

1. The technicians who are about to graduate are in the lab.
2. The technicians, who are about to graduate, are in the lab.

In sentence 1, the dependent clause tells where you can find the graduating technicians. The clause is necessary for the meaning of the sentence, so no commas are used.

In sentence 2, the dependent clause states that the students in the lab are also those who are about to graduate. As you read the sentence, you can hear a pause at the commas. The dependent clause is interrupting the main clause with extra (nonessential) information, so commas are placed before and after the dependent clause.

Another type of interrupter is the name of the person or group who is reading (or hearing) the message. We set off the person or group being spoken to with commas.

Students, go to the lab.

Start the experiment, Jack, and record the data.

Caution: Remember that commas around interrupters are used in pairs. If you use one comma at the beginning of a word, phrase, or clause, use a second comma at the end.

Wrong: The people who were talking about space are outside.

Wrong: The people, who were talking about space are outside.

Correct: The people, who were talking about space, are outside.

Exercise 3 Add commas around interrupting words, phrases, or clauses.

1. The manager of the company Mr. Mendez issued the new policy.
2. The workers many of whom were new employees seemed to accept the change.
3. Soon more policies unrelated to the first occasion were changed.
4. The manager knowing that the workers weren't fixed in old ways took the opportunity to make changes.
5. That situation workers accepting change without resistance was unusual.
6. Dealing with resistance something new managers are unprepared for takes some experience.
7. I want you Mr. Riley to learn from this experience.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

A Final Word about Commas

Many writers, especially beginning writers, recall being told to use a comma wherever they pause. Sometimes this generalization is useful, but more often it adds to the confusion and uncertainty of when to use commas and how many commas to use. It can also lead people to believe that there are no firm rules, that only breathing patterns determine comma placement. The truth is that you can pause wherever you see a comma, and that is about as far as breathing is involved in the matter.

Although it is true that exceptional cases can break the rules, and that professional authors seem to honor some rules and ignore others, commas are normally placed according to standard rules established to help the reader. Using or not using a comma can change meaning, as examples have shown. Use commas carefully as tools to make your message clear.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Ellipses

Ellipsis points (three spaced dots) ARE used to mark words left out of direct quotes. A fourth dot is a period.

Original: "The shuttle voice communications with the ground use the S-band 10-watt (2205.0 and 2250.0 MHz) transmitter."

Modified: "The shuttle voice communications with the ground use the S-band 10-watt ... transmitter."

Slashes

The **slash** is used to indicate choices or options.

1. The slash is generally used to replace the word *or*. Occasionally, it is used in ambiguous situations to allow for the possibility of singular or plural events (*result/s*), or male or female individuals (*she/he*). The slash should not be used too often for these purposes.

Some courses are not taken for a grade, but just for a pass/fail credit.

A manager will cause the death of his/her effectiveness by committing the seven deadly "sins" of management communication.

2. The slash is frequently used in dates consisting of numbers.

The order was dated 11/20/99.

Note: An enumerated date should be written and read as month/day/year.

3. In technical notation, the slash symbolizes division or *per*.

R = VII \$10/hour

Hyphens

1. The **hyphen** (-) is usually used to join two words. Some compound words always are hyphenated. Dictionaries include required hyphens.

ampere-turn high-pass
hard-core full-scale

Rules

Dictionaries sometimes disagree about hyphenated compound words, so be consistent in your own writing. Generally, follow these rules:

- A. Hyphenate compound modifiers preceding a noun, but do not hyphenate those modifiers if they follow a noun.
He was a well-dressed man.
The man was well dressed.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

If the name of the plural owner ends with an *s*, we don't have to add an extra *s* after the apostrophe.

the cities' problems (the problems of the cities)
the ladies' club (the club of the ladies)

Exercise 4 *Using the phrases from Exercise 3, rewrite each possessive phrase with a plural owner.*

Example: the neighbor's yard
Rewritten: the neighbors' yards

1. _____
2. _____
3. _____
4. _____
5. _____

Some possessives do not need apostrophes; these are the **possessive pronouns** such as *hers*, *his*, *yours*, *its*, *ours*, and *theirs*. These pronouns are usually used as adjectives, but they do not have an apostrophe.

Examples: The car is *hers*.
His job is difficult.
Hold the hammer by *its* handle. [Do not confuse *its* with the contraction *it's* (*it is*).]
The mistake was *theirs*.

Special Cases

1. For compound words or word groups, add the apostrophe plus *s* only to the last word.

Example: someone else's idea
Chief Executive's decision
father-in-law's consent

2. If a singular word ends in *s*, especially a name, add another *s* after the apostrophe.

Example: Chris's turn
the Willis's house

3. Add an apostrophe plus *s* to each individual owner.

Example: teacher's and students' experiences
workers' and managers' responses

4. To show joint ownership, you can either add an apostrophe plus *s* to both names or only to the last name.

Example: Mr. Nguyen and Mr. Lee's business
(the same business)

Or: Mr. Nguyen's and Mr. Lee's business
(the same business)



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Other Uses of Quotation Marks

1. Quotation marks are used to set off titles of articles, stories, songs, and poems—italicize or underline titles of books and magazines.

The article "Shuttle Communications" is in the summer issue of *Hands-On Electronics*.

2. Quotation marks are used to show words with special or unusual meanings.

Abraham "Honest Abe" Lincoln

Ice (especially "dry ice") can cause tissue damage if applied directly to a burn.

Note: Do not use quotation marks for common nicknames. Once a word has been highlighted with quotation marks, continued usage of that word does not require quotation marks.

Exercise 4 *Add quotation marks where necessary.*

1. The Technically Speaking column appears in most issues of *IEEE Spectrum*.
2. One issue talked about nouns that are being used as verbs, such as *keyboard* and *messenger*.
3. Add automated reasoning and smart machine to the list of items coming into frequent use from the field of artificial intelligence.
4. One reader asked if anyone could verify the following account:

At one time the British Labor Party, in its annual convention, came within a few votes of passing a resolution that stated No one shall receive less than the average wage.

5. I then looked up Great Britain on the Internet.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Getting Help

All programs include online help, which you can access from a menu or by pressing the **F1** key. Usually this will open a series of panels on your screen. Some might include links to other screens or topics. You can usually open a table of contents or index to search for a topic. To search, type the closest word you can think of to start an alphabetical search for the topic. Sometimes it takes creative thinking to find the exact topic.

If a window has a **Help** button or a question mark in the title bar, click it to open online help for the window. Or use the **What's This? Help** to open information about an area of the screen.

Accelerator Keys (or Hot Keys)

Many programs provide shortcuts, key combinations, and function keys (**F1**, **F2**, and so on) to activate a function without using the mouse and the menus—some people prefer keyboard commands. For example, in Microsoft Word, you can press and hold the **Ctrl** button and press **P** to open the **Print** window. To learn the accelerator keys, open the menus and look on the right side of the menu items. Using the previous print example, if you open the **File** menu, you will see **Ctrl + P** next to the **Print** command.

Most programs also include a Quick Reference card in the software package that lists the accelerator keys and other shortcuts for the program. Some accelerator keys have become standard among word processors, and it is hoped that this trend will continue.

Saving a File

Save often. Power outages and computer failures can mean losing hours of work unless you save periodically. The working computer memory is temporary. The disk or hard drive memory is permanent. If you lose power, you can retrieve your file, but it might lose everything you added since the last time you saved it.

The first time you save a file, you must use the **Save As** command. In the **Save As** window, you accept or change the location, name, and file type. Some word processors have their own file types, identified by a three-letter extension. Do not change the extension unless you plan to port the file to another program. Do not use unusual characters in the file name—generally, stick to letters and numbers, but check the documentation for the program for exact limitations.

Either select a specific drive and folder in which to store the file, or note the default file location in which you will save the file. If you lose a file (for example, if you didn't notice where it was saved), you will have to search for it using the **Find** feature. Or you can open it from the list of last-opened files (for example, at the bottom of the **File** menu), and then use the **Save As** window to show the current location of the file. Once a file is saved, you can use the **Save** menu item (such as **File > Save**), toolbar button, or accelerator key (**Ctrl + S**) to save the file periodically.

Once you have named a file, the name will appear in the catalog list or directory of the disk. If you give your new file the same name as an old file and save it in the same folder, it will overwrite the old file.

Automatic Word Wrap

This feature means that you do not have to press the **Return** key as you type close to the right margin. The computer will automatically “wrap” the last word around to the next line, called a soft return. Press the **Enter** key only when you want to start a new paragraph, called a hard return. Hard returns can make editing and revising a difficult process, so it's best to use the word-wrap feature.

If you want to double-space the printed copy of the file, use the formatting options to double-space for you, and you can continue to use word-wrap. For example, in Microsoft



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

414 Boxwood Drive
Decatur, Georgia
January 12, 1989

Ms. Andrea Rutherford
Department of General Education
State Institute of Technology
Atlanta, Georgia 30345

Dear Ms. Rutherford:

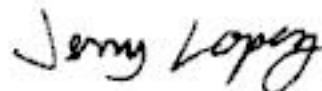
I am submitting this report to meet the requirements of Communication Skills (ENG-131). In this report, I have examined the greenhouse effect, with emphasis on the predictions made by climatologists concerning the future impact of current changes in the atmosphere.

The background of the phenomenon has been obtained from encyclopedias, but the primary source of significant data is from the *Global 2000 Report to the President*. Written in 1982, this document addresses the concerns of former President Jimmy Carter. It was his commitment to our quality of life and the preservation of life that spurred scientists to examine the effects of various changes in our environment.

I believe that this report will be useful in stressing the fragile balance which allows life on earth to continue. Awareness is the first step in correcting and eliminating life-threatening practices.

An abstract follows which explains my approach in this report.

Sincerely,



Jerry Lopez

CONTENTS

<u>Letter of Transmittal</u>	ii
Abstract	iv
Introduction	1
Cause-and-Effect Relationship	1
Components of the Greenhouse Effect	1
The Future	2
Conclusion	2
Bibliography	3



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Sample Report: Formal Lab Report

**COMMUNICATIONS LAB #7
LOW-FREQUENCY HETERODYNING**

by

**SHARON LINDELL
REG OLSON
CARL TALBERT**

**Professor H. Erickson
CS-301
March 4, 1989**



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

TABLE OF CONTENTS

	PAGE
Executive Summary.....	1
Evaluative Criteria	1
Advantages of Cellular Phones.....	1
Recommendation and Costs.....	1
 Discussion Section.....	 2
Powertel.....	3
Type of Phone.....	3
Features.....	3
Accessories.....	4
Option Packages	5
Coverage Area	5
Warranty.....	5
Cost.....	6
Benefits.....	6
Disadvantages.....	6
AirTouch Cellular.....	7
Type of Phone.....	7
Features.....	7
Accessories.....	8
Option Packages.....	8
Coverage Area.....	8
Warranty.....	8
Cost.....	8
Benefits.....	9
Disadvantages.....	9
Sprint PCS.....	10
Type of Phone.....	10
Features.....	10
Accessories.....	11
Option Packages.....	11
Coverage Area.....	11
Warranty.....	12
Cost.....	12
Benefits.....	12
Disadvantages.....	12



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

- Answer calls by pressing any key
- Signal strength and battery power indicator
- Fixed Antenna 5-line LCD Display
- 250 name and number memory locations
- Easy last 8 number redial
- Personal security code and keypad lock
- Caller ID
- Receive and send alphanumeric messages
- Message and voice mail waiting indicator
- Sleep mode for extended battery life
- Improved security-privacy and clone protection
- Data capable(Optional accessories required)
- Calendar
- 35 different ring tones
- 4 games
- Caller Groupings

Accessories:

- 4 battery options; Li-Ion 900mAh, NiMh 900 mAh; NiMH Vibra 900 mAh, or the Ultra extended Li-Ion Battery 1500 mAh.
- Complete car kit
- Compact car kit
- Compact desktop charging stand
- Headset car kit
- Rapid cigarette lighter charger
- Rapid travel charger
- Belt clip
- Leather carry sleeve
- Mobile holder
- 4 battery options; Li-ion 900mAh, NiMh 900 mAh, NiMH Vibra 900mAh, or the Ultra extended Li-Ion Battery 1500 mAh. The 1500 mAh is the best: 8 hours of talk time, 5.7 ounces, and 2 weeks standby time.
- Complete car kit
- Compact desktop charging stand
- Headset car kit
- Rapid cigarette lighter charger
- Rapid travel charger



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Accessories:

- 99 phonebook memory locations
- Customizable phonebook using SmartKeys
- Messaging system for voice mail and paging
- Caller ID
- Large, easy to read LCD display
- Four language options: English, French, Spanish, and Portuguese
- For an additional cost, the "Thin Phone" has 2 hot swappable piggy back batteries which give up to 10 hours of talk time and up to 17 days of standby time in CDMA digital mode using both the internal and external battery
- Available in colors

Option Package (\$50/month):

- 500 anytime minutes
- One time activation fee (\$20)
- Free long distance anywhere in the US

Coverage Area:

Local service includes the Metro-Atlanta area and parts of Alabama and South Carolina. Long distance service includes the entire United States. See Appendix A (p. 23) for local coverage area map.

Warranty:

Air Touch offers a 12-month warranty for all digital phones

Cost:

The cost of the AirTouch option package is \$50 a month. This package includes 500 minutes of airtime monthly. Any usage more than 500 minutes monthly is billed at the rate of \$0.35 a minute. The one time cost of the Qualcomm QCP860 is 129.95, and there is a onetime activation fee of \$20.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

BellSouth Mobility

Type of Phone

BellSouth offers a selection of eight different phones ranging in price from \$49.95 to \$699.95. The phone that is best suited to our needs is the Nokia 6190.

Bosch World 718



Figure 4

Source: BellSouth Mobility
<http://www.Bellsouthdcs.com>

Features:

- Illuminated display
- Battery charge indicator
- Signal strength Indicator
- Voice message indicator
- Text message indicator
- 27 Selectable ringer tones/melodies
- Any key answer
- Easy to use menu system
- Built-in phone directory
- Call Waiting
- Call hold
- Call forward



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Conclusion and Recommendation

Conclusion

The purpose of our research was to better connect our field representatives with both the home office and our clients. The best solution to this problem would be a cellular phone and cellular service. With features such as voicemail, caller id, numeric paging, and call waiting, our field representatives could be reached anytime.

We also had to take into consideration the coverage area so that our reps could be reached anywhere. This would eliminate the problem that we have with our current pager system. The coverage area must also be large enough to eliminate long distance and roaming charges for our traveling field representatives.

Recommendation

Based on our research we recommend Powertel for our cellular service and the Nokia 6190 for our cellular phone. The service provided by Powertel gives us the largest local coverage area, which should eliminate the need for long distance and roaming charges. Also, if C.I.S.E.T. should expand and need a larger coverage area, Powertel is the only cellular service that offers a fixed rate contract for long distance service. The airtime of the 500-minute package that we are recommending can be used anytime, anywhere. This will save us money by not having to pay peak rate prices for daytime usage. We feel that these features, combined with Powertel's large selection of option packages, will ensure that we will be satisfied both now and in the future.

Also based on research, we are recommending the Nokia 6190 phone. This phone supports the features that we feel best suit our needs. The Nokia 6190 also has the longest talk and standby battery life of any phone we investigated. This will reduce the need to purchase added charging stations.

Despite the onetime \$20 connection fee and the one-year contract, we feel that the Nokia 6190 phone and Powertel's Personal Power 50 service package best covers our needs for the lowest price.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Present	Past	Past Participle (Used with <i>have, has,</i> or <i>had</i>)
do	did	done;
drag	dragged (<i>not drug</i>)	dragged
draw	drew	drawn
drink	drank	drunk
drive	drove	driven
eat	ate	eaten
fall	fell	fallen
feed	fed	fed
feel	felt	felt
fight	fought	fought
find	found	found
fly	flew	flown
forget	forgot	forgotten, forgot
freeze	froze	frozen
get	got	got, gotten
give	gave	given
go	went	gone
grow	grew	grown
hang (execute)	hanged	hanged
hang (suspend)	hung	hung
have	had	had
hear	heard	heard
hide	hid	hidden
hit	hit	hit
hold	held	held
hurt	hurt	hurt
keep	kept	kept
know	knew	known
lay (place)	laid	laid
lead	led	led
leave	left	left
lend	lent	lent
let	let	let
lie (speak falsely)	lied	lied
lie (recline)	lay	lain
lose	lost	lost
mean	meant	meant
prove	proved	proved, proven
read	read	read
rise	rose	risen
run	ran	run
say	said	said
see	saw	seen



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

FORMER EMPLOYERS

LIST BELOW LAST THREE EMPLOYERS, STARTING WITH THE MOST RECENT ONE FIRST.

NAME OF PRESENT OR LAST EMPLOYER			
ADDRESS		CITY	STATE ZIP
STARTING DATE	LEAVING DATE	JOB TITLE	
WEEKLY STARTING SALARY	WEEKLY FINAL SALARY	MAY WE CONTACT YOUR SUPERVISOR?	<input type="checkbox"/> YES <input type="checkbox"/> NO
NAME OF SUPERVISOR		TITLE	PHONE
DESCRIPTION OF WORK			
REASON FOR LEAVING			

NAME OF PREVIOUS EMPLOYER			
ADDRESS		CITY	STATE ZIP
STARTING DATE	LEAVING DATE	JOB TITLE	
WEEKLY STARTING SALARY	WEEKLY FINAL SALARY	MAY WE CONTACT YOUR SUPERVISOR?	<input type="checkbox"/> YES <input type="checkbox"/> NO
NAME OF SUPERVISOR		TITLE	PHONE
DESCRIPTION OF WORK			
REASON FOR LEAVING			

NAME OF PREVIOUS EMPLOYER			
ADDRESS		CITY	STATE ZIP
STARTING DATE	LEAVING DATE	JOB TITLE	
WEEKLY STARTING SALARY	WEEKLY FINAL SALARY	MAY WE CONTACT YOUR SUPERVISOR?	<input type="checkbox"/> YES <input type="checkbox"/> NO
NAME OF SUPERVISOR		TITLE	PHONE
DESCRIPTION OF WORK			
REASON FOR LEAVING			



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.



You have either reached a page that is unavailable for viewing or reached your viewing limit for this book.

Basic Communication Skills for Technology

Second Edition

Andrea J. Rutherford

This book provides practical applications of writing in vocational/technical fields. Presenting clear, simplified explanations of key concepts and skills in written communication, Rutherford's guide covers the writing process in a systems approach that integrates reading, planning, writing, and revising.

This book highlights:

- Fourteen technical reading passages that introduce or demonstrate each writing topic.
- Integration of reading, writing, spelling, word usage, and vocabulary exercises and assignments within each chapter.
- Complete and independent grammar and mechanics units for flexible planning and individualized study.
- Exercises and models using common technical vocabulary and concepts.
- Explanations of concepts in language that is easy to understand and apply.

This book is designed to help readers gain a working knowledge of all the major skills for career-related communication, including e-mail, graphics, reports, business correspondence, presentations, job interviews, and resumes.

New in this edition:

- Updated reading passages to reflect current communication needs and practices.
- Updated writing topics to reflect current trends in writing, including the use of e-mail, desktop publishing, and the Internet.
- Updated chapter on report-writing (with sample reports) that introduces three common business/technical documents: the descriptive report, lab report, and proposal.
- New assignments that require use of the Internet for research and communication.
- New chapter on public speaking that introduces the basic techniques for preparing and delivering professional presentations and interviews.
- New chapter on the job search that focuses on the electronic job search, preparation of traditional and electronic resumes, cover letters, and thank-you letters.

ISBN 81-7758-407-3



This edition is manufactured in India and is authorized for sale only
in India, Bangladesh, Bhutan, Pakistan, Nepal, Sri Lanka and the Maldives.

9 788177 584073