

Communication of Technical Information In Research & Business Organization



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Skills & Behaviors Necessary for Effective Performance in an R&D Environment

- Effective Communication:
 - *Written*
 - *Oral*
- Time Management
- Managing People
- Promote Team Work
- Value Unique Contributions
- Give and Seek Feedback
- Set The Example

Employee Professional Development Training Courses Taken

- **Effective Technical Communications:**
 - *A 3 day course by Center for Professional Advancement, East Brunswick, NJ (J & J Sponsored)*
- **Effective Presentations:**
 - *A 2 day Course by Colgate-Palmolive Co. Management Development Program*
- ??
- ??



What is Communication

Few Definitions:

“Process by which an individual (**the communicator**) transmits stimuli to modify the behavior of other individuals” *Hovland, Janis & Kelley*

“Process of creating a meaning between two or more people” *Tubbs & Moss*

“The act of transmission of information, ideas, emotions, skills, etc. by use of symbols, words, pictures, figures, graphs, etc.” *Berelson & Steiner*

Elements of Communication

Certain **Common Elements** That Together Define **Communication** Process

- People
- Messages
- Channels
- Feedback
- Noise
- Context (setting)
- Effect



Types of Communications

➤ Verbal: (Intellectual Activity)

- *Verbal/non-vocal*

only words, no speaking: written messages

- *Verbal/vocal*

communicate through spoken words

➤ Non-verbal: (Emotional Activity)

- *Non-verbal/vocal*

no words, only sound: sighs, groans

- *Non-verbal/non-vocal*

no words, no sound, only gestures and appearance

Communication of Technical Information in Research & Business Organization

- **Written Communication**
- **Oral Communication**

Part A

Written Communication

Verbal-non vocal

Technical Writing

- It's **NOT** About Writer's Knowledge
- BUT**
- About Readers Understanding

Goal: Communicate Data

- ❖ **Accurately**
- ❖ **Clearly**

The background of the slide is a photograph of a vast blue ocean under a bright blue sky with wispy white clouds. The sun is visible on the left side, creating a shimmering reflection on the water's surface.

How To Assess The Clarity Of A Written Text ?

Gunning Fog Index*

Gunning Fog Index is a **Readability Test** for English writing, is used to evaluate how easily some text can be read by its intended audience.

**Developed in 1952 by Robert Gunning, an American businessman who was involved in news paper and text book publishing.*

Gunning Fog Index

Gunning Fog Score

$$0.4 \times \left[\left(\frac{\text{total words}}{\text{total sentences}} \right) + 100 \left(\frac{\text{complex words}}{\text{total words}} \right) \right]$$

Complex Words = 3 Syllables or more

Advantage 3

Amazement Syllables

Calculation 4

Architecture Syllables

Fog Index:

Example A

A studied consideration of heat-induced expansion of aqueous substances necessarily entails significant complications on account of the following reasons:

A definite linear or surface dimension is not demonstrated by them as they align themselves exactly according to the vessel containing them.

A container is essential to hold fluid materials.

Accordingly, when heat is applied to the container, there is a veritable difference between the heat-generated expert: of the container and that of the fluid. For this reason, it is possible to record in document the expansion of the fluid material as compared to the expansion of container holding it

Words: 101

Word/Sentence: 20.5

Complex Words: 17

Fog Index: 15

Example B

The study of thermal expansion of liquids involves special problems due to the following reasons:

They do not have fixed linear or surface dimensions, as they take the shape of the container. Liquids require a container to hold them. Hence, when the container is heated, expansion of the liquid does not correspond with that of the container. Thus, we can record thermal expansion of liquids relative to its container.

Words: 69

Words/Sentence 13.5

Complex Words: 6

Fog Index: 7.8

Write short sentences, Average Sentence length:15-20 words

Gunning Fog Index..... *Contd*

The index also estimates the years of formal education a person needs to understand the text on the first reading.

Gunning Index	Read Level By Grade
6	Sixth Grade
7	Seventh Grade
8	Eight Grade
9	High School Freshman
10	High School Sophomore
11	High School Junior
12	High School Senior
13	College Freshman
14	College Sophomore
15	College Junior
16	College Senior
17	College Graduate

Fog Index

Literature/Publication	Fog Index
Bible	6
Shakespeare	
Mark Twain	
Time Magazine	11
News Week	
New York Times	
Wall Street Journal	
Technical Documents	10-15
Professional Prose (Novels, Text Books, Literature)	18

Other Reading Indices

- **Coleman Lian Index**
- **SMOG Index**
- **Flesch Kincaid Reading Ease Index**
- **Automated Readability Index (ARI)**

**Microsoft Word can Auto check
Fog Index and other indices**

Fog Index

A General Guide

**Not A Substitute for
Clear Logical Thinking
Foundation of Clear Writing**

Four Steps of Writing

Step One: **Plan**

Step 1: Planning

First step:

Consideration of Organization with a view to eliminate those unsuited to the material

Second Step:

Consider who the readers are and organize in a manner most helpful to them

Four Steps of Writing

Step 1: Plan

Step 2: Write (Rough Draft)

Step 3: Cool

Step 4: Revise

Revisions: A Necessary Evil

**“.... I rewrote every day
whatever I had written
before, and also went over the
whole when it was completed,
then corrected and rewrote
the typescript and finally
revised the proofs ...”**

Ernest Hemingway
Nobel Prize in Literature: 1954

“... I write everything many times over. All my thoughts are second thoughts. And I correct each page a great deal, or rewrite it several times as I go along ...”

Aldous Huxley

Nominated for Nobel Prize : 7 times

First Revision.....

Two Questions in Mind

- 1.** Does this paper contains all the materials that the reader needs
- 2.** How munch material can I remove without interfering with my reader's understanding and needs?

H. J. Tichy

How Scientists Should Write

- **Explanation**
 - **Needs of the Reader**
 - **Explain what it is**
 - **What have you done**
- **Clarity**
- **Impartiality**
- **Order**
- **Accuracy**
- **Objectivity**
- **Simplicity**

Parts of A Research Report

Introduction	<i>What did you do and why?</i>
Methods & Materials	<i>How did you do it?</i>
Results	<i>What did you find?</i>
Discussion	<i>Interpretation of Results</i>
Summary	<i>Statement of Main Findings</i>
Acknowledgements	<i>Who helped you?</i>
References	<i>Details of Ref. Cited</i>



Business Letter

Date: / /

Full Name

Title ?

Complete Add.

Dear Dr./Mr./Ms.

- Opening - reason for the letter**
- Preparation - set the stage for message**
- Motivation - ask for action**
- Close**

Sincerely

DR. SANDHU,

My name is Richard [REDACTED], we spoke together earlier today, 5/4/98 around 2:00 pm concerning the internship position. Here is a copy of my resume that you requested. Thank you for any consideration.

Sincerely,

Richard [REDACTED]

Author: "Kamalpreet [REDACTED]" <kpvirdi@eden.rutgers.edu> at INTERNET
Date: 4/22/98 8:07 PM
Priority: Normal
TO: Sukhvinder Sandhu at USAPWPT
Subject: job????

----- Message Contents -----

Hi, I read about the internship position on the job track. But I am looking for a full time position. So if you guys have any full time positions I will be real grateful if you would consider me for that. Thanks

[REDACTED] Gorniak Drive KAMALPREET [REDACTED] VIN [REDACTED] ph:
[REDACTED]
Parlin, New Jersey E-mail: kpvirdi@eden.rutgers.edu
Beeper: ([REDACTED])

Objective A position within the Pharmaceutical Industry that will use my educational and organizational skills and further enhance them.

Education Cook College, Rutgers University, New Brunswick, NJ
B.S in Biochemistry
Cumulative Grade Point Average: 3.41, Expected date of graduation- May 1998

Honors Dean's list 1994-1997, Recipient of Biodiversity Scholars Award
Alpha Zeta Freshman of the Year Award

Publications Co-Author of an article on Chlorophyllin Copper Compounds in journal "Cancer Letters"

Laboratory High Performance Liquid Chromatography, Gas Chromatography, Tissue culture, Tissue extraction, Column Chromatography, skills
Thin Layer Chromatography, Fluorometry, Spectrophotometry, determination, purification and sequencing
Gel electrophoresis, PCR Amplification, Protein

Computer Software: MS WindowsNT, MS Windows95, MS Windows3.1, Sigma Plot, ChemDraw, Hyperchem, MS OFFICE 97, Word Perfect, Quatro Pro, Graph Builder, Millenium Chromatography Manager, Lotus 123, Adobe photoshop 3.0, Internet Explorers, DOS6.1, UNIX, C++

Experience
Dept of Biochemistry and Microbiology, Rutgers University, New Brunswick, NJ
Research Assistant, May'96-Present
* Worked with a pH independent lipophilic photosensitizing drug (CAME), derived from specifically modified plant chlorins on rats to enhance Photodynamic Therapy.
* Cultured and grew tumor cells to be used for subcutaneous injection in rats.
* Injected tumor affected rats with the preparations of CAME and at

CLAUDINE M. ~~PULICCHIO~~

~~2 Revere Court~~
Hazlet, NJ 07730
~~07730~~

April 19, ~~1999~~

Dr. Sukhvinder S. Sandhu
Senior Technical Associate
Colgate Palmolive Co.
909 River Rd.
Piscataway, NJ 08854

Dear Dr. Sandu:

The Colgate Palmolive Company, according to reliable publications, is a fast growing firm which is reliable and beneficial to all its customers. I am interested in the CosMair Co. because of their continued dedication to safety and quality in their products and manufacturing.

I noticed your advertisement for a Biologist position on a Web-site called Jobtrack. I have submitted my resume for your consideration. I am currently attending Rutgers University. I plan to graduate in May 1999 with a Bachelor of Science degree. My major is Microbiology (Biological Sciences).

You mentioned in the advertisement that the successful candidate must meet certain requirements and I do have the following qualifications for those:

- 1) Working towards BS in Biology
- 2) Can work independently
- 3) Has good laboratory, computer and interpersonal skills
- 4) Works well with others, is reliable, a self-starter, and responsible

This is a job that I believe was made for me. I am available immediately, and offer you competence, dedication, and a good work ethic. If you do not mind, I will call you next week to see if a personal interview can be scheduled. Thank you for your consideration and I look forward to speaking with you soon.

Sincerely,

Claudine ~~Pulicchio~~

Metlars Lane.
Piscataway, NJ 08854

May 9, 1999

Colgate Polmolive Co.
909 River Road
Piscataway, NJ 08854
FAX: (732) 878-7134

Attn.: Dr. Sukhvinder S. Sandu
Re: Interest in Lab Intern Position #100445597

Dear Dr. Sandu:

After viewing Jobtrak this past Friday, I greatly appreciate the opportunity of being a team player for your company. Your company is a recognized innovator in the scientific industry. I am aware that you receive many resumes, but mine is worth reviewing. I have a unique background which gives me the expertise to make significant contributions to your company.

Actively working to receive my Biochemistry and Microbiology degree from Cook College, Rutgers University is, perhaps, nothing unusual. What is unique is that Cook College represents a professional school with a strong emphasis on environmental awareness. This experience has helped me become proficient in using the most cost-effective laboratory techniques with the reduction of environmental waste. Currently, I am launching my career with the goal of participating as a laboratory intern for your company.

My background is well suited to the needs of your company. Specifically, my education and positive attitude serves as a context for evaluating changes and issues that could impact the company. This translates into better informed analysis and, subsequently, more precise and effective decision making. My experience as a lab assistant for Dr. Gene Hall, Quantitative Chemistry Dept., allowed me the opportunity to sharpen not only my analytical skills but my communication skills as well. My previous lab team consisted of Ph.D. students from various ethnic backgrounds. This work setting enhanced the opportunity to communicate with a wide range of people. Through this I developed an ability to relate to people on all levels, which, combined with my quest for scientific inspiration, has given me a solid foundation for achievement.

I am excited at the prospect of broadening my career in the chemical industry. I look forward to hearing from you soon so that we can arrange a convenient time to meet and discuss how I can contribute to Colgate Polmolive's continued success. Thank you for your time and consideration.

Sincerely,

Debbie Casano

Suggested Readings....

**Effective Writing for Engineers,
Managers, Scientists**

H.J. Tichy

Scientists Must Write

Robert Barrass*

(* Students Must Write: Robert Barrass)

End: Part A

Written Communication

Technical Writing

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Thank You

