Introduction to Communication

Summary
Good communication skills are very important in engineering practice. These skills include writing and speaking as well as ascertain unspoken kinds of communication.
In a design environment all communication media use the design notebook as a source of the information to be communicated. Once you have decided to communicate information the next step is to decide upon the communication medium. Writing and speaking have much in common. Both need a well-defined purpose, careful planning, repeated rewriting or rehearsal, and much evaluation and refining. ***Tables 1*** *through* ***4*** *summarize some of the important ideas.*

Introduction
Most communication activities involve solving open-ended problems and they can be addressed by the iterative use of creativity, analysis, and evaluation. These communication skills are developed by repeated practice and refinement.
Communication is an essential weapon in the arsenal of a successful engineer. If an engineer cannot communicate effectively, especially to decision makers in a company, then brilliant technical ideas and innovative design concepts may be lost. Good communication relates to all stages of the product realization process, but it is often difficult to achieve because engineers are often more interested in tinkering with apiece of equipment or undertaking mathematical analyses than in communication.
In the followings there are discussed 3 kinds of communication: writing, public speaking and some unspoken aspects of public appearances. Common to all three is the need to think and reason. Clear communication requires a clear understanding of the subject and the refinement of ideas based upon that understanding. The final form of the communication requires the author to think, evaluate ideas, and learn from them.

1. Some Basics

Communication is important in engineering because the product realization process is a team activity. Rarely will an individual in industry be solely responsible for designing a product. The engineer must interact effectively with a wide variety of people in different disciplines and be able to influence others through communication. You will need to communicate effectively with your subordinates, peers, and management.
It has been said that "Communication takes place when one mind so acts upon its environment that another min is influenced, and in that other mind an experiment occurs which is like the experience in the first mind, and is caused in part by that experience." Several different communication processes exist, but they all stimulate the human senses. Communication consists of six elements:

1) a source;
2) an encoder;
3) a message;
4) a channel;
5) a decoder;
6) a receiver.

Communication begins with a source. Information is assembled by one or more individuals to be communicated to one or more people. This information is then encoded into a form of message that depends upon the medium to be employed for transmission: the channel. To communicate you must identify the audience and the means of reaching them. Will you telephone, write a letter using paper or email, send a memo, generate a sketch or an engineering drawing, or write a formal report? Are you to

Table 1 Some characteristics of a design notebook

1) It should be durable, hardbound, (not loose-leaf), and page numbered sequentially. All entries should be written in permanent ink and dated. Pages should not be torn out of the notebook.
2) The project number or project title should be recorded to readily identify the project.
3) It should record all original work pertaining to a design project. Thus it may contain a mixture of useful and not so useful information. All information must be recorded because the future is always uncertain and in a new context information that appears useless today may be valuable tomorrow.
4) It should contain all of the plans, calculations, observations, experimental procedures, and data from experiments and prototype testing in such detail that the work could be repeated later by someone else. All assumptions, mathematical models, decisions, and evaluative thinking both good and bad should be recorded. This information should be signed, dated, and witnessed. The witness must be an individual who understands the technical aspects of your work.
5) It should be a diary of events; consequently important dates, meetings, and attendees should be recorded. Relevant telephone and fax numbers, email addresses and other information should be recorded. Summaries of important telephone conversations and other communications should be written as they occur.
6) It should contain an index of important information as the project evolves. This index can be established at the beginning of the notebook so that it evolves with the project. The retrieval of information can be simplified by an organizational structure of headings and cross references throughout the notebook. Use the pages liberally. Do not try to cover every square millimeter with writing, but cross out and initial blank spaces to prevent later insertion of information. Clarity is important it information is to be retrieved quickly.
7) Mistakes should be crossed out in ink, initialed, and dated. The corrected version should appear on subsequent pages.

speak to a group or simply exchange ideas with a coworker? Which is most appropriate? Hence there are numerous channels for transmitting information. Upon stimulating the human senses, the message is decoded before it is processed by a receiver such as an individual or a group of people, and feedback is generated. This feedback to the source of the communication can indicate whether the intended message has been received and understood. Appropriate modifications can then be made if necessary to clarify the message.

2 The Design Notebook

Communication derives from some source. In engineering design the source for the written word or the spoken word is often the design notebook. It chronicles the product realization process and contains essential information about a product from early marketing studies and the product design specification to manufacturing data. Each member of a design team probably will own several of these books. They are receptors for all information about a product and its evolution. A design notebook should be a resource from which a set of events can be recalled accurately several years later. It must contain the original entries describing events, assumptions, decisions, and conclusions along with relevant theoretical and experimental data. **Table 1** lists some characteristics of a design notebook. This notebook is of crucial importance in the context of intellectual properties: namely ideas and how they are represented. It is particularly relevant to publications, computer programs, and inventions that are legally protected by copyrights, patents, and trademarks.

Clearly, design notebooks are very valuable tools and resources in the product evolution process and are essential in all engineering design activities.

3 The Written Word

Writing should be clear and unambiguous. Furthermore, its style should hold the reader's attention. This can only be accomplished by constant practice. Writing and graphical communication skills can been enhanced by reading quality literature. Reading high quality publications can help your design activities innumerous ways. The writing of technical literature, such as memoranda, reports, and proposals, is an iterative process and six steps of the process can be outlined as follows:

1) Define the Purpose of the Document

Before you begin to write, be absolutely clear about the purpose of the document. Define the problem! Write a sentence defining the objective of the manuscript in the least number of words. Do you want to impart knowledge? Are you asking the recipient to do something? Are you soliciting a response? Clarify your purpose before you formulate a plan to achieve your objectives.

2) Assemble Information

Writing begins with a plan. Plan a communication project as you would any other. Use a Gantt chart or some other time management scheme. Understand the specifics of the assignment, the characteristics of your readership, any constraints on mathematical explanations, and the types of words used in the document. Are there constraints on the number of pages, page format, number and sizes of figures, tables and graphs, etc.? You must know the deadlines and constraints on your time to avoid being rushed during writing.

Assemble information you think may be necessary. You may need your design notebook and related literature. Start putting ideas down on paper. Don't worry about organization yet just write down your thoughts and notes. Discouragement is quite natural at this stage of many writing tasks. You may feel overwhelmed.

3) Outline the Document

Out of the chaos and clutter of assembling information you will begin to see the big ideas and the less important ones the first glimmer of an outline. An outline, as it grows and takes shape organizes your thoughts and directs your writing so that it becomes a logical progression of ideas. The various sections become a series of headings and subheadings. This skeleton provides the basis for your subsequent writing, and it may be used as a guide for readers. Most documents are based upon the three-part model of an **introduction**, a **main body**, and a **conclusion**.

- The introduction contains a preview of what you are writing about. It introduces the body of the document so that the background and ramifications are clear to readers who are not experts in the field. The introduction should strive to ignite an interest in the main body of the document and should encourage the reader to continue.
- The body of the manuscript is its longest part. It contains facts, ideas, logical arguments, analyses, supportive themes, details and illustrative examples.
- Finally the conclusion restates the primary information and summarizes the document.

4) Write the First Draft

The secret of first drafts is to simply record your ideas on paper or into your computer. Use your outline and expand it even if only in the form of sequential lists. Initially write the text to present the logical flow of ideas. Don't wait until the perfect sentence materializes. Don't worry about typos, spelling, or syntax. You can address these issues later. Neither should you feel compelled to begin with the introduction and write the manuscript from beginning to end. It is often easier to write the introduction after the main body of your document has been written. Provide ample space for the inevitable corrections and modifications.

If you are using a pencil and paper, leave a blank line between each line of writing. If you are using a word processor, print your document, double-spaced.

5) Edit the Manuscript

Editing is an analytical process involving a critical review of the first and subsequent drafts of the manuscript. It is an iterative process. This is best undertaken at least a day after the first draft was written so that the arguments and logic used to develop the draft are forgotten and you can scrutinize your work with a fresh, critical eye. The text must be read with great attention to details. Reading aloud may help you identify the "feet" of sentences and sections that need to be reworked. If you use a word processor, you may find it helpful to print a paper copy now and then to develop a different feel for the work.

Editing is of two kinds: content editing and copy editing. When you edit the content of a document your primary concern is to develop a manuscript with the best organization and the best combination of words to express your ideas clearly. Copy editing is a later editing stage in which the nearly finished document is meticulously examined for misspellings, grammatical errors, superfluous words, and other details. We will discuss it more fully in a section on the details of writing. At this stage the objective is clear writing. However, this objective cannot be achieved the first time; good writing requires rewriting.

6) Rewrite the Document

Writing is an open-ended problem, a design problem involving creativity (a draft document), analysis and evaluation (editing), and further creativity (rewriting). This is an iterative process. Most of the time you spend creating a document should be spent rewriting it. Rewriting can consume eighty percent of your writing time, and the document can be rewritten many, many times if it is complex and important.

Table 2 The Details of Writing

Watch for spelling, punctuation, and grammatical errors
Give your report a descriptive title
Start with the big picture, an overview of the report
Using headings and subheadings to give structure
Keep paragraphs short and logically related
Use short, variable length sentences
Use the correct tense
Avoid personal pronouns

The Details of Writing

The previous section took a global look at writing a document. We now focus on the details. Good technical writing requires accurate facts, sound ideas, and a logical organization. But the little things set professional work apart from the unsuccessful beginner. Several rules may help you write a good manuscript. They are summarized in **Table 2** and a discussion of each one follows.

Checkpoints as you write a technical report.

The devil is in the details

Spelling must be correct. Look up words you're not sure of, and if possible, use a spelling checker on a computer. Similarly, there is no excuse for poor punctuation in technical literature. Modern punctuation is quite simple. Read and reread a good up-to-date guide. Mistakes in the little details can suggest to the reader that you maybe quite careless or inaccurate in your technical work.

The tools for this phase of writing are punctuation, spelling, word selection, sentence structure and the flow of ideas from paragraph to paragraph. Use a dictionary and a thesaurus. While text can be edited on

the screen of a computer, some people like to print a hard copy of the manuscript periodically and make corrections in the margins with a colored pen.

Create a descriptive title

The title of a report should describe its contents. Thus "Design Report" is an unacceptable title; it is not descriptive enough. Amore appropriate one might be "The Design, Fabrication, and Testing of a Birthday Candle Powered Vehicle." A delicate compromise must be sought between brevity and detail. There are no hard and fast rules but an upper limit on the length of the title might be twelve or fifteen words.

Start with the big picture

The early pages of the document should introduce its primary topic. If the targeted audience contains nonexperts, the early pages should give them an overview and some background information. Discuss the details later.

Provide structure for the document

The document should have a clear structure defined by headings and sub headings. This naturally follows if a good outline has been developed. This structure can be further clarified by the selection of appropriate fonts and type sizes. Headings and subheadings serve to divide a document into major elements in a logical way, and they clarify themes.

Paragraph format

Keep paragraphs short and logically connected, with ideas flowing smoothly through them. Each paragraph should begin with a topic sentence that expresses the primary idea of that paragraph. Other sentences amplify the primary idea.

Table 3 Format for a technical report.

1) Title page
2) Summary
3) Content list
4) Nomenclature
5) Introduction
6) Theoretical developments
7) Experimental investigation
8) Results
9) Discussion of results
10) Conclusions
11) Acknowledgements
12) References
13) Appendices
14) Tables
15) Figures

Use short variable length sentences

Information transfer and the maintenance of interest by the reader can best be achieved by using short sentences of variable length and structure because short sentences help keep the structure simple, whereas sentences longer than about 40 words, like this one that has 70, are likely to involve more complicated grammatical construction, contain separate ideas that can be better stated by several sentences, and can make documents difficult to read. A balance of shorthand longer sentences often helps ideas flow smoothly

Use the correct tense

Use the past tense to describe work done in the past. Use the present tense to describe facts, theories, and results that are as valid now as they were in the past.

No personal pronouns

Technical reports in the engineering profession do not contain personal pronouns. Thus they are devoid of words like “we, “ “I, “ “my, “ etc. Be careful that other pronouns don’t create ambiguous language.

Writing a technical report

An engineer must write many kinds of documents memos, letters, industrial reports, papers for publication in academic journals, etc. One of the most important of these documents is a technical report. The ability to produce a high quality report is an important skill for any engineer. Indeed these documents are frequently the only permanent record of the evolution of a product other than the design

notebooks. Writing a good technical report also is important in design classes. The form of a technical report is suggested in **Table 3**. This format is only a guide because many organizations have a preferred format often described in accompany style guide.
The **title page** contains a concise descriptive statement of the subject of the report. It should tell the reader in less than about a dozen words what is the primary thesis of the manuscript. There should be no doubt. In addition, the title page should contain the name of the author or group of individuals who wrote the report and their affiliation.

This first page is followed by the summary or the abstract. It should be no longer than a single page of text that concisely describes the contents of the document. The purpose of the abstract is to provide a clear indication of the scope and outcome of the investigation, and the reader should then have sufficient information to decide whether to read the complete document. It is sometimes also used to provide key words and phrases for storage and retrieval by the abstracting services.
The contents list provides the skeleton of the document by listing the headings and subheadings of the various sections and their page numbers. Some contents lists also identify appendices, tables, and figures.

The nomenclature section lists the symbols and their interpretations used in the document. This is particularly common in mathematical documents. The list should be ordered alphabetically, beginning with uppercase letters and then lowercase letters.

Greek symbols should be followed by subscripts and superscripts.
The introduction puts the report into perspective with other common information. It provides the reader with background information and explains how the report relates to other reports, incidents, and technical fields.

The main body of the paper can contain several parts, depending upon the type of report. These typically include theoretical developments, experimental investigations, results, and a discussion of results.
The theoretical developments section contains a description of the system being analyzed, the assumptions of any mathematical models, the justification for these assumptions, and explanations of the computer programs developed or used to generate simulations.

The experimental investigation section explains the development and operation of equipment used to investigate the behavior of a physical system. Enough detail should be included to permit someone else to create the same system and verify results at a later date. This section also includes an explanation of the experimental procedures used to operate the physical system and to generate experimental data.
Experimental data are presented in the results section of the report. Invariably a combination of experimental and theoretical results are presented, along with error bands on the data. Results can be presented as tabulated data, graphs, or figures. Sometimes voluminous results are best presented in appendices or other latter portions of the report. Data must be clearly identified by table and figure numbers, and in the main text the reader should be advised where they can be found.

Results are evaluated and interpreted in the discussion of results section of the report. There results are analyzed to develop a specific theme or recommendation. Theoretical and experimental results should be compared and arguments proposed to explain why there are differences between them. Discuss how analytical and computational models could be improved to enhance the predictive capabilities of the mathematical tools. Statistical arguments and experimental errors are also developed in this section.

The conclusion section contains the essence of the results and their ramifications. The conclusions are directly related to the title of the report, and this section summarizes findings presented earlier in the document. No new information appears in this section.

Acknowledgements formally recognizes the contributions made by individuals other than the authors. It can also be used to recognize the support staff and others who made contributions. This section often identifies organizations funding the work upon which the report is based.

References to the work of others typically appear in two forms in a technical report or a paper. Publications are cited within the main body of the report and also as a list of references at the end of the report. In the main body of the report the reader can be referred to prior published literature in order to put the current text into perspective relative to the existing literature, to add clarification, and to provide contrast. Various methods are employed to do this; they depend on the policy of a company or the policy of the professional journal in which the paper is to be published. For example, square brackets containing one or more numbers at the end of a sentence may be used to refer the reader to numbered publications in the references section. Other publications use an author's name followed by a superscripted number to designate the reference. Some cite the author's name and the year of publication within curved brackets. If an author has several cited papers published in the same year, then the lower case letter a can be appended to the year of the first paper and a lowercase *b* can be appended to the year for the second publication. If a publication with three or more authors is referred to in the main body of a report, only the last name of the first author is generally used along with the abbreviation, et al. (Latin *et alii*, meaning and others). All authors' names are listed in the references section.

Examples of these three methods are:
"A major consequence of the lack of tools to assist with design for assembly is that those who wish to improve the design process by using concurrent design must do so totally manually [4-6]."
"The volumetric flow of fluid through a porous bed was modeled by Darcy[3] in 1856."
"Weibull (1939) demonstrated a statistical analysis that was particularly effective in describing experimental fatigue data."
At the end of the technical report, a references section contains a list of the original sources of cited material. In the absence of a style set by others, references should be listed in alphabetical order dependent upon the last name of the first author of each paper. (Some style manuals require references to be listed in the order of their citation in the report.) The surnames of the authors should be presented along with their initials. Reference to books and industrial or government technical reports should include the authors and tide of the publication, the publisher, the city and year in which the report was published, and any necessary page numbers. Professional papers appear in magazine like publications called journals that appear at regular intervals. References to journal articles should include the names of the authors, the title of the article, the name of the journal (sometimes in a standard abbreviation set by a profession society), and the volume, page numbers, and year of the particular issue.
Several formats are in general use to define references. journals published by the American Society of Mechanical Engineers(ASME) require an unabbreviated format unlike many other journals. Their format for books, a journal article, a thesis, and a conference paper are illustrated as follows. (A slightly different but common format is used for references in this book.)

Wilson, C. E. and Saclier, J. P., 1993,Kinematics and Dynamics of Machinery, Harper Collins, New York.
Stoll, H. W, 1986, "Design for manufacture: An overview," ASME Applied Mechanics, Reviews, Vol. 39, No. 9, 13561364.
Tung, C. Y., 1982, " Evaporative Heat Transfer in the Contact Line of a Mixture, "Ph.D. Thesis, Rensselear Polytechnic Institute, Troy, NY.
Takagi, T., 1992, "A Concept of Intelligent Materials and the Current Activities of Intelligent Materials in Japan," Proceedings of the First International Conference on Smart Structures and Materials, Glasgow, Scotland.
B. Cuishaw, P. T. Gardiner and A. McDonach, eds., co-published by the Institute of Physics publishing and EOS/SPIE, pp. 1319.

Appendices are bodies of text, data, mathematical proofs, etc., that support the main body of the report but which, because of their detail, length, or complexity, would detract from the flow of the report. Short Tables of data can be included in the main text but extensive sets of tabulated data extending over several pages are best presented in appendices. They always should have sequential table numbers and a title. The table number should be used for reference in the text. If a table is presented within the main text, it should not occupy more than one page. Figures (line drawings, graphs, and photographs) should be numbered consecutively and should be identified with a title.

The Spoken Word

Most people spend a considerable proportion of their day talking informally. While this is a common occurrence, many individuals do not relish speaking to a large group. They have stage fright. Nevertheless public speaking is a frequent requirement for a professional design engineer. Designers must present information at regular program meetings or before an audience that may include senior management or clients. The objective might be to explain the status of a project. Because this activity is commonplace in industry, it is an important part of the undergraduate design curriculum.

In this section we suggest some guidelines that will help you prepare and deliver an oral presentation. You must know your audience, know your subject, and organize your message as you would if it were written. **Table 4** lists some important points.

Table 4 Checkpoints during speech preparation

Know the purpose of your presentation
Analyze your audience
Write down ideas to crystallize your thinking
Decide on your presentation format
Repeat important points along the presentation
Use slides or other forms of illustration
Use show and tell hardware where possible
Practice your talk
Anticipate questions and prepare answers
Think about unspoken messages you convey
Check out the room and its facilities ahead of time

Determine the purpose of your presentation

Why are you speaking to your audience? You need to define the problem just as when you write a document. What are you trying to accomplish? Are you trying to motivate a group to do something? Are you trying to educate people? The result of this analysis will determine your format once you have analyzed your audience.

Analyze your audience

Tailor your speech to fit the audience; you must analyze your audience to understand their needs. Typical attributes include their education and knowledge of the topic of your presentation, their relationship to the work you are presenting, and the size of the group. These attributes govern the vocabulary that you can use, the complexity of the ideas you can present, and the kinds off acts you need to introduce.

Thus if you are going to talk to company managers about a product, you might need to focus on development problems, production alternatives, process costs, etc. However, if you are to speak to a group of technicians about the same product, then other topics become more important. These might include maintenance protocols, operating instructions, ergonomics, safety issues, service manuals, and reliability.

What is the attitude of the audience toward the topic of your presentation? Are they inclined to agree, disagree, or be indifferent? If they are likely to belong to the latter category, you may need a stimulating or possibly humorous argument.

The size of your audience affects the formality of your presentation. Speaking to half a dozen engineers gathered around a conference table requires a different approach than addressing an audience of five hundred from a lectern on a stage. But don't let the size of the audience determine the seriousness of your presentation. Your career is just as likely to rise or fall from a presentation in a conference room as from one in an auditorium.

Write down the contents

You should carefully plan your oral presentation. Write down your ideas much as you would prepare to write a document. This will crystallize your thinking. Henry Beecher's statement on the cover page of this appendix eloquently captures this activity.

Many of the concepts in Section A.3 on The Written Word are applicable to planning and preparing for a speech. You will need an introduction, a main body, and a conclusion. Ideas should flow logically, and you should consider what diagrams and data you will need to present. Should you bring parts, physical models, or engineering hardware as illustrations? Will you need a projector for slides or computer images?

Presentation format

A speech can be delivered in many ways. You could read from a typed document, you could speak from notes, you could speak in an impromptu fashion, or you could memorize your speech. Whichever method you choose, it must fit the occasion and you must be comfortable with it.

If you decide to read your presentation, then you need not concern yourself with forgetting something, and with practice you can ensure that you can deliver the desired information in the allotted time. However, reading a manuscript rarely leads to a successful speech unless you are trained and experienced in that art not the usual case for a young engineer. If you decide to read your speech you are likely to speak in a monotone that quickly loses listeners and you will probably never look at the audience. A poorly read speech suggests to the listener that the speaker doesn't know the subject well enough to talk about it in an organized way. Nevertheless, if you do decide to read your presentation, you should type the document in a large type and double spaced format so that it can be easily read. In addition, you need to remember to look up at your audience often.

If you decide on an impromptu format or your speech, you will require minimal preparation time. You fly by the seat of your pants. This approach requires intimate familiarity with your subject and permits you to deliver a spontaneous presentation that can be adjusted quickly to the mood and response of the audience. However, you may suffer from an unorganized delivery and consequently may fall to deliver the desired information.

If you decide to speak from notes often called extemporaneous speaking you must outline your ideas on a sheet of paper and use it to guide your presentation. This is the most commonly successful type of delivery. It allows spontaneity yet maintains the structure of a written outline. Of course a speech delivered from notes requires a comprehensive knowledge of the subject and a thorough rehearsal.

If you decide to memorize your speech you will need to compose it and store it on paper before committing it to memory. This can involve many extra hours of work. Furthermore, you might forget important points during your delivery, or you might become so engrossed with the recollection process that your presentation becomes unnatural. This approach is only for a trained speaker in a special situation.

Repetition

Oral and written communication have much in common. One is the structure of the presentation. You should introduce the topic before the main body of the talk and then conclude with summarizing remarks. (Recall a previous section on outlining a document.) There is, therefore, a repetitive element to the presentation. If repetition is overdone it can become boring, but complex technical information presented orally may need more repetition than written material. It may help to use a slide projector or projected computer screen to keep information before the audience and to guide their thinking. You can use a chalk board in the same way.

Illustrations

Illustrations, diagrams, photographs, charts, films, and engineering drawings are part of most presentations. They often are more effective than speech in emphasizing important points. Recall the old Chinese proverb that "A picture is worth a thousand words." Furthermore, engineers are adept at thinking visually.

Audiovisual aids can add variety to your presentation. They can illustrate, clarify, or dramatize an idea. When preparing these visual aids be sure they are not cluttered. Use no more than about four bullet headings per slide to provide you with prompts for your presentation and a focal point for the audience. Ensure that the text is easily read by individuals at the back of the room. Use color whenever you can.

Once you have placed information on a projection screen, don't simply read the prose; explain and interpret it. This is your queue, your prompt, your note card. Finally, allow your audience at least a minute to absorb each image.

If you write on a chalk-board, you must remember to keep turning to your audience to maintain eye contact. Do not stand between a projection screen and your audience and do not talk to the screen instead of to your listeners. Talk to the audience!

Physical models

Oral presentations are enhanced not only by illustrations but also by show and tell activities with physical models. Engineers like to see pieces of engineering hardware, parts, and equipment. Real objects improve understanding and help hold your audience's attention.

Information is collected by the brain through various senses. One of these is touch. If you can bring equipment or parts to your presentation, then do so. If the group is small, pass the parts around or invite people to examine large heavy hardware at the end of your talk.

Practice your talk

From sports to speeches, practice makes perfect. Adopt the iterative approach: After you create your speech, practice in front of a mirror, record the presentation on video or audio-tape, or collect a group of friends to listen and criticize your presentation. Analyze the speech, evaluate it, and refine it. Repeat that cycle as often as you can. Repetitive practice builds the confidence that helps overcome any nervousness. Talk, talk, talk, and talk again. Between each practice presentation critically evaluate your performance and then refine it again with more practice. Rehearsals are essential to good public speaking.

It is especially important to check the timing of your talk because invariably you will only have a specified block of time in which to deliver your presentation. If you are required to talk for fifteen minutes then a half-hour talk is too long!

Before you start speaking, breathe deeply and took out over your audience. If you have memorized the first few sentences, then your talk will be off to a good start and the subsequent topics will follow naturally. A good start is always a confidence booster. Your opening remarks are important because an audience can be won over or lost in the first five minutes. One of your goals should be to convey enthusiasm. If you sound interested and display enthusiasm then your audience will be more inclined to listen attentively and more likely to learn. Try to talk naturally by varying the cadence, the rate at which you speak, the power of delivery, the emphasis of certain words or phrases, and the tone of your voice.

Use pauses where appropriate, just as you would in a normal one-on-one conversation with another person.

Articulate your words carefully and ensure that words are not slurred together. Don't use colloquial or slang expressions in a formal presentation. Avoid the annoying use of filler words such as "like," "okay," "uh," "you know," "er" and "sort of". Obviously you will need to project your voice enough that everyone can hear you. This depend son the size of the room and the background noise level. Will you be using a microphone? Then just speak in a normal voice.

Questions

Most oral presentations include the opportunity for the audience to ask questions during your delivery or at the end. This is quite normal because the purpose of the presentation is to impart knowledge to your audience and to stimulate a desire to learn more. Therefore as you prepare your talk, anticipate the questions you may be asked and prepare your responses.

If the question and answer period is at the end of your presentation, you will need to wait for several seconds at the conclusion of your delivery so that your listeners can collect their thoughts and formulate their questions. If the room is large, repeat the question so everyone can hear it and you can verify that you have understood it. This will also give you time to formulate your response. If you are unable to answer the question, then say so and if it seems appropriate offer to try to find the answer and subsequently contact the questioner.

Body language

During any interaction between people, information is transmitted by words, appearance, and gestures. When you deliver a talk, you need to dress appropriately for the situation. If you are to give a progress report to a dozen coworkers in the company conference room, that might mean your normal work dress. If you are to present a paper at a professional society meeting, you should not appear to have just returned from a photo shoot for a fashion magazine but you should dress conservatively and professionally.

Eye contact with your audience holds attention and induces a feeling of one-on-one conversation. Your body language should suggest that you are knowledgeable about the subject, excited by it, and want to share your excitement with everyone in the room. Express this excitement through the tone and volume of your voice. Avoid a dull monotone. Stand up straight, don't slouch, smile when appropriate, and try to look comfortable and relaxed even if you are tense with stage fright. Deep breathing helps relieve nervousness.

Venue details

Despite perfect preparation, details associated with the place for your presentation can sometimes interfere with a good speech. Is the room arranged for the type of talk that you have prepared? Is there a cord long enough to reach an electrical outlet to power your projector? Is there a spare bulb? Has the easel that you requested been delivered to support your poster boards? Is there chalk or a marker for the board? How are the lights dimmed when you use a projection screen? These are a few of the questions that need to be answered before your presentation begins. You may want to arrive early at the room so that you can check these details and prepare for any inadequacies.