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ABSTRACT

This practitioner's guide was developed for instructors in schools and business and industry who need to gather materials and design, develop, and implement job-specific basic skills programs. It provides a practical model for establishing cost-effective basic skills and literacy programs. It also provides practical advice about how to use the information to develop instructional materials and basic skills job simulations. The guide covers the following ideas: why take a job-literacy approach?; what is literacy task analysis?; needs analysis; and conducting a literacy task analysis. A bibliography is included. Extensive appendixes provide a step-by-step walk-through for gathering or developing materials for a literacy program for a company or industry. They include site interview guidelines, materials for low-literate adult learners, vocabulary exercises, sample lessons, readability formulas, and resources. (KC)

A Practitioner's Guide

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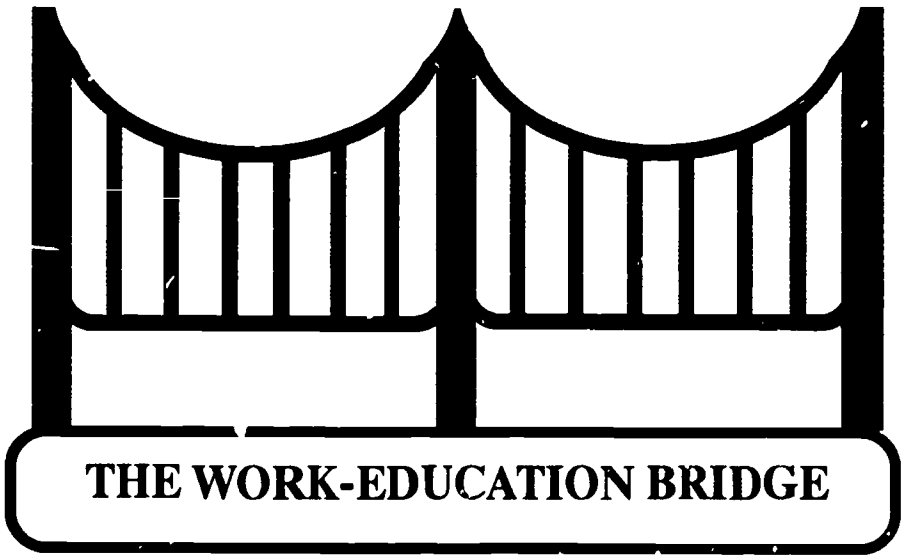

Developed for the **Work-Education Bridge** Project.
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A Practitioner's Guide

How to Gather and Develop Job Specific Literacy Materials for Basic Skills Instruction

By

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School of Education
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James A. Pershing, Ph.D.

A Practitioner's Guide

How to Gather and Develop Job-Specific Literacy Material for Basic Skills Instruction

INTRODUCTION

This practitioner's guide was developed for people (reading teachers, adult basic education teachers, vocational instructors, trainers in business and industry, and other basic skills providers) who are faced with the task of gathering materials and designing, developing and implementing job-specific basic skills programs for learners.

This guide is a supplement to The Work-Education Bridge, which provides a comprehensive review of basic skills research and practice. This guide is intended to provide educators and business trainers with a practical model for establishing cost-effective basic skills and literacy programs. It also provides practical advice about how to use the information to develop instructional materials and basic skills job simulations.

This approach to basic skills training is founded on a growing body of research which indicates people learn more rapidly and are able to retain more of what they learn when job-related materials and tasks are used in instruction. In order to provide such instruction, educators and trainers need to observe tasks as they are performed in the workplace, gather materials, and then develop instructional materials which will simulate the key basic skills and problem-solving tasks that learners will face on the job.

This doesn't mean every trainer must develop all the instructional materials he or she intends to use. The key to success is to focus on job-related tasks. A trainer might create a simple simulation by asking students to gather information from manuals or fill out forms related to a quality control procedure. If the learner experiences difficulty with decimals or computation, the trainer might ask him or her to practice with commercial mathematics training materials before returning to a more difficult job simulation. If reading manuals is a problem, learners might first practice with simpler commercial materials or with simpler safety instructions gathered by the trainer from the workplace. The goal remains the mastery of basic workplace skills and problem-solving tasks.

Although the time spent on simulations and instruction will differ from learner to learner, time might be divided in the following manner:

Direct Personal Instruction:	10-20%
Simulation Practice:	20-30%
General Job Reading Practice:	20-30%
Related Commercial Materials Practice:	20-30%

Although only 2 or 3 of every 10 hours of instruction may require simulations based on literacy task analysis, these simulations will be the key component in the instruction. Other activities will support performing these key job tasks.

WHY TAKE A JOB-LITERACY APPROACH?

Traditional academic methods for teaching reading, computation and problem-solving have failed to give adults the basic skills they need to function on the job (Mikulecky and Drew, 1987). Civilian and military research indicate that general literacy training is of limited value for the workplace. Gains made in classes using student-oriented materials often do not effectively transfer to the workplace and, in addition, what little gains are made tend to be lost in approximately eight weeks (Sticht, 1982). Studies have shown that workers and students read for different purposes. Workers typically read to find information to do a task. This "reading to do" is different from the "reading to learn" students do in school. These different types of reading require different strategies. By developing literacy materials that are built from the charts, manuals, and references tools workers use on the job, teachers can teach workers the literacy skills they need in order to perform these tasks successfully.

Successful workplace literacy programs are built around the daily literacy tasks workers encounter on the job. Instructional materials should emerge from the job task. For example, a worker unable to fill in a form because he can't compute decimals or read two column charts could do job context exercises which simulate these job tasks. The worker could also use commercial materials that show how to read charts or use decimals, but only as a supplement to the workplace simulation exercises.

Teaching literacy in a job context is more relevant for workers and therefore more motivating. The job literacy approach allows people to draw on their work and life experience so that they can more easily make the connection between what they know and what they need to learn. This approach builds confidence and leads to improved performance on the job.

WHAT IS LITERACY TASK ANALYSIS?

Traditional task or job analysis can be described as a way of critically assessing the components of a given job in order to describe the job, determine the required behaviors of that job, and identify the conditions under which these behaviors should occur (Davies, 1973).

Literacy Task Analysis is similar to traditional job analysis, but it emphases analyzing the aspects of job tasks which require reading, computation and problem solving. (Mikulecky, 1985). Literacy Task Analysis describes a method for 1) interviewing and observing workers on the job, 2) gathering the printed materials workers read to do their jobs, and 3) understanding the thought processes used by competent workers as they use printed materials to solve problems at work. For more information about Literacy Task Analysis, see Mikulecky and Drew, 1987, pages 45-51 and Mikulecky, 1985.

By observing and interviewing workers and examining job-related printed materials, instructors will be able to better understand the demands of the job, which will allow them to teach the basic skills required for those jobs. Although an instructor must be familiar with a worker's job, it is not the job task but the basic skills a worker needs in order to accomplish the job task that is to be taught. For further discussion of this distinction and other related issues, see Philippi, 1988.

In addition to providing teachers with background information about the job, Literacy Task Analysis is a way for analysts to identify a broad range of job tasks involving reading, math and problem-solving skills. [Note: The term "analyst" is used throughout this paper to refer to the person conducting the Literacy Task Analysis. It is expected that the analyst will usually be a company trainer, college reading teacher, adult basic education teacher, vocational instructor or other literacy provider involved in developing and delivering instructional materials.] Instructors can begin to see the nature of the literacy demands that different jobs impose on workers.

Other outcomes of Literacy Task Analysis include samples of printed materials that workers use on the job, job task scenarios which can be used to create simulation exercises for workers, and notes on a competent worker's thinking process as he or she completes a task on the job. The worker's thinking process, also called metacognition, refers to the strategies and methods a worker uses to focus his attention while completing a task or solving a problem on the job. Sometimes these strategies are so automatic that to articulate them workers will need to be carefully questioned by analysts. Through Literacy Task Analysis, analysts can begin to see how a competent worker thinks through a task and can use this information when teaching other learners. The analyst's objective is to document the process a competent worker goes through, and then to use a model of that process to teach other people job-related basic skills. See Mikulecky 1985; Mikulecky and Winchester, 1983; and Mikulecky and Ehlinger, 1986, for more information about problem solving and metacognition.

NEEDS ANALYSIS

Whether you are a vocational or ABE teacher, or a trainer developing materials for an in-house literacy program, the key question is: "For which job tasks should I conduct a Literacy Task Analysis?" Answering this question requires conducting some form of needs analysis. Needs analysis refers to a process for identifying the areas of greatest need, or the areas where performance should be improved. Needs analysis can take many forms that vary in depth and comprehensiveness. The form chosen is often--unfortunately--dictated by the resources available. Needs assessment helps analysts make decisions about which jobs and literacy tasks to analyze. It is also a way to gather information about workers, their environment and their jobs which analysts can use later to develop instructional materials. For an in-depth discussion of needs analysis, see Davies, 1981, pages 127-142; Davies, 1973, pages 57-70; Gagne and Briggs 1979; and Rossette, 1986, pages 60-67.

Choosing the Appropriate Job for Literacy Task Analysis

The information you gather in interviews with managers and supervisors will help you choose which jobs to analyze. Look for areas of agreement among managers and supervisors when

selecting jobs and job tasks on which to focus the literacy task analysis. For example, if four of five managers report that entry-level quality control technicians have difficulty reading materials and gauges, calculating decimals, and recording the average, range and total for product weights, then the job of quality control technician would be appropriate to analyze. The job tasks best for Literacy Task Analysis should meet the criteria in Figure 1 in Appendix A.

Critical Tasks. To determine need, the most direct methods are to interview and observe workers, supervisors, and plant managers. The analyst will want to know which tasks are critical to the completion of the job. For example, will a worker's poor performance in a particular task lead to damaged products, safety hazards, personal injury, or great cost to the company? When a lack of basic literacy skills prevents a worker from doing his job adequately and the consequences are critical, this task may be a good target for literacy task analysis.

Promotability. Promotability is also a factor used to choose jobs for Literacy Task Analysis. Employers often report they have reliable workers who demonstrate desirable employability traits, such as a positive attitude, punctuality, and seniority, but who lack the basic skills required for higher level jobs. Employers may want to promote these workers but are understandably reluctant to do so. Conducting Literacy Task Analyses of these higher level jobs will enable analysts to develop materials that will prepare these workers for promotion to better jobs.

Jobs Requiring Retraining. Other jobs to target for Literacy Task Analysis are those for which workers must be retrained. Retraining has become commonplace in business and industry. The implementation of new technologies and processes occurs regularly. Many workers are required to return to the classroom to learn how to operate highly technical equipment or to master sophisticated processes. Some have been out of school for years and lack the basic learning skills required for retraining. By conducting a Literacy Task Analysis of a new job and examining relevant commercial training materials, analysts can help prepare workers for the demands of being retrained.

Frequent Mistakes. Tasks in which workers make repeated mistakes because they lack basic skills may be good targets for Literacy Task Analysis. By observing workers on the job and by questioning workers and supervisors, analysts may be able to determine basic skills deficiencies. These deficiencies may indicate a need for literacy training.

CONDUCTING LITERACY TASK ANALYSIS

This section focuses on the practical aspects of conducting Literacy Task Analysis. The following guidelines will help you be more effective as you gather information and printed materials, from which you will later design and develop instructional materials.

Choosing a Site

The first step in the Literacy Task Analysis process is choosing a site to visit. For vocational or adult basic education programs, industry in the community provides the best opportunity for observing workers on the job. Vocational teachers may want to select companies where their

students are frequently placed. Adult basic education teachers may want to choose companies that can provide a wide range of occupational opportunities. If your program does not already have a working relationship established with a potential site, begin by contacting the personnel directors or the plant managers about the possibility of site visits and interviews. A good approach is to introduce yourself as an educator who is trying to improve instruction to better meet industry's needs. Large companies, or manufacturing companies in highly competitive markets, may be reluctant to allow outsiders into their plants for fear of exposing proprietary information. When contacting companies, explain the nature of your visits and assure managers that plant security will not be jeopardized.

Scheduling Site Visits

The most successful site visits are scheduled two to three weeks in advance. Scheduling in advance allows the analyst time to orient the contact person at the host company and allows the contact person time to schedule interviews and prepare for the analyst's visit.

The more carefully planned and well structured, the more productive a visit will be. Scheduling is best done with the personnel director, plant manager, training director, or other designated company representative. It is important the contact person at the company be aware of the purpose of the visit so that he or she can prepare to facilitate the interview and observation processes. Because it is unlikely that the contact person will be familiar with Literacy Task Analysis, it is critical the analyst state specifically what the visit will entail.

When scheduling a site visit, analysts must be prepared to explain the purpose of the visit and provide details of what will be required of the company. The Site Interview Guidelines in Appendix B is a summary of items the analyst should discuss with the company contact person. Then, after scheduling the visit, a copy of these guidelines can be sent to the contact person as a reminder. Modify the guidelines to reflect any special arrangements, such as agreements about the number of workers available for interviews, or the amount of time the company can allow workers to be away from their jobs. Even those trainers working within their own plant, who may have the advantage of familiarity with personnel and the workplace, should contact managers in advance and give them the Site Interview Guidelines. Advance scheduling facilitates more productive Literacy Task Analysis.

By allowing the analyst to interview and observe workers, the company is contributing its resources: the time a worker is away from his or her job costs the company in lost productivity. Acknowledging this contribution--whether the analyst is an outside literacy provider or an in-house trainer--is important in establishing rapport with the company. Discuss time frames with the contact person when scheduling a site visit to reach an understanding about how much time workers will be away from their jobs. Depending on how much the company is willing to contribute, it may be necessary to spend less time with workers, or to schedule additional visits in order to interview more workers. This may be especially true if it is a busy time for the company.

Analysts (especially those from outside the company) should plan to spend at least a half day on site, but no more than 2 days in succession. Less than a half day will not allow enough time to gather information; more than two days usually becomes draining for both the company and the

analyst. However, each company and the relationships it forms with outside analysts will be different, so analysts will need to determine what works best in each situation. Even trainers working within their own companies, who may have the advantage of spending more time on location, need to be conscientious about not taxing their relationship with workers and managers. The goals for in-house and visiting analysts are same, but in-house analysts may have a longer period of time in which to accomplish them. In fact, the process may become ongoing for trainers who are developing materials for in-house literacy programs.

Components of a Site Visit

Analysts from outside the site may want to include some combination and variation of the following guidelines in their site visits:

- o 10-30 minutes. Interviews with professional staff, such as the plant manager, personnel director, training director, and union officials.
- o 30-60 minutes. Site tour.

(Repeat the following steps for each worker interviewed)

- o 15-30 minutes. Interviews with direct supervisors.
- o 15-20 mintues. Select workers to interview and observe.
- o 15-30 minutes. Interview with worker.
- o 15-30 minutes. Observe the worker as he/she performs basic skills tasks.
- o 20-30 minutes. Gather and photocopy literacy materials.
- o 20-30 minutes. Photograph, tape record and/or video tape the worker on the job.

These guidelines work, but analysts should modify them to suit their situations. The guidelines are discussed in the sections below.

Interviews with Professional Staff

Professional staff are a good source for information. When gathering information about the company to determine its literacy needs, start at the top of the organizational structure and work down. Talk first with managers and supervisors to get a broad perspective, the "big picture" about the company and its special needs.

Figure 2 in Appendix A lists the various professionals in a typical company that you may want to interview and gives suggested questions for each. Don't feel you have to interview each of these company officials, or that you can ask only the questions suggested here. Talk with as many officials as time allows, using the questions in Figure 2 to gather information. Be prepared to

rephrase questions to get responses. Many supervisors and managers will tell you, "These workers don't have to read anything on the job." The fact is, most workers DO read in performing their jobs, but the reading they do is often overlooked by managers.

Plant Manager. The plant manager can provide you with a comprehensive overview of the company, including its organizational philosophy and the relationships among departments. He or she will have very definite ideas about how employees should be performing and where major problems exist. Through careful questioning, he or she can often identify areas where poor basic skills inhibit performance. Sometimes, however, plant managers will not be aware of basic skills deficiencies among workers.

Personnel Director. The personnel director is a good source of information about the administrative materials workers need to read. Ask for copies of company policy manuals, insurance manuals, claim forms, sample check stubs, and general, company-wide safety material when meeting with the personnel director. Ask which company policies are most important and with which ones workers seem to have the most difficulty. Find out if workers frequently make errors in filling out claim forms or tax withholding information. Get copies of all printed materials workers must fill out or refer to regularly.

Training Director. Companies which have in-house training programs may have tested and measured their workers' literacy levels, reading and math abilities and have other records which will help you compile a profile of workers. If you are developing an in-house literacy program, you will want to know as much as possible about the workers you will be training. Ask the training director about the level of education of workers, any special training they have had, how long it has been since workers have been in a classroom or training situation, and about their study skills. This information will help you develop training materials that address the needs of the workers.

Union Official. In many companies a union official has an excellent rapport with workers and will be able to provide you with additional information about workers' job skills weaknesses. The union official may also know which skills workers want to acquire or improve. Ask for samples of the union contract, arbitration forms, union publications and any other printed materials made available to workers by the union. Find out about opportunities for promotion and about the literacy requirements of the higher level jobs. Ask about the role literacy plays in meeting those qualifications.

For trainers establishing in-house literacy programs, understanding the relationship between union and management can help you determine how to set up your training program. Some union officials will voice the concern that Literacy Task Analysis is nothing more than a subtle form of job evaluation. Others will want to know the relationship between training and promotion. Finding out about the company's current practice and trying to provide answers to such pressing questions can help establish a trainer's credibility. A supportive union official can help recruit workers for Literacy Task Analysis and in-house literacy programs if other recruiting efforts fail. An endorsement for a program from a respected union leader can have a positive influence on workers.

Site Tour

Before you begin interviewing, take a tour of the site at which you will conduct Literacy Task Analysis. Figure 3 in Appendix A lists things to look for when touring the site. These items can help you begin to form a "big picture" of the company, of its operations and employees. Learn about the company's different departments and their functions. For example, a food processing plant may have separate departments responsible for raw materials, quality control, packaging, shipping and receiving, and warehousing. Learning the relationships between these different parts of a company will help you communicate with managers and workers. Familiarity with the workings of the company will allow you to ask good questions and have a better understanding of his or her answers.

Touring the site before you begin analysis will also give you a better idea of what to expect during observations. For example, if the work site is noisy it will be difficult for you to talk with the worker as he or she works. Noisy conditions may require that you hold your questions during observation and ask the worker about them later in a quiet room away from the work station. If a job site is hazardous, you will need to take extra precautions as you observe workers. Be especially aware of safety regulations at the site and wear any protective or sanitation gear provided, such as safety glasses, ear plugs, hard hats or hair nets. Many manufacturing or food processing plants are noisy or dangerous.

Finally, as you tour the site, tune in to the attitudes of the employees you see. Do they appear to enjoy their jobs? Are they enthusiastic? Do they greet you as you walk through the plant? Look for clues that will prepare you for what to expect in the interviews. You may have to work a little harder to get information from workers who are unhappy or bored with their jobs.

Interviews with Direct Supervisors

Direct supervisors work most closely with workers and may therefore be the most knowledgeable about their strengths and weaknesses. When talking with direct supervisors, ask questions which focus on the results of workers' performances, such as "What happens when workers don't do the job correctly?" or "What mistakes do workers make most often?" These questions can help you locate the weaknesses in workers' basic skills and choose jobs for Literacy Task Analysis.

Selecting Workers to Interview and Observe

The workers you interview and observe provide you with the foundation information you need in order to develop instructional materials. For this reason, it is important to identify those workers who are capable and willing to work cooperatively with you. This section provides guidelines for choosing workers to interview, as well as suggestions for what to ask during interviews and how to establish rapport with the workers you meet.

Select workers with the help of the contact person in the company. Select workers who volunteer to be interviewed and observed. Tell workers that the interview will be confidential and

that they are not being evaluated or tested. Assure them that the results of the interview will not be revealed to their employer and will be used only for the development of instructional materials.

You might choose (or be forced to choose) one of three different types of workers to interview: a master performer, an average performer, or a low performer. A master performer is a worker who is highly skilled in the job, probably with many years of experience. You should try to interview and observe this type of worker whenever possible, because he or she will show how the job can be done efficiently and effectively. When developing instructional materials, you can use this worker's performance as a model for learners. But there may be times when you will interview a worker who performs the job adequately, but has intermitent difficulty (an average performer), or a worker who is new to the job and performing poorly (a low performer). Average and low performers can provide information about where to make improvements. By comparing your observations of poor performers to master performers, you will discover the gaps between poor and superior performance. This will help you make decisions about what tasks to include in the instructional materials.

Interviewing Workers

Before beginning the interview you should already have toured the company and decided which of the following methods for interviewing and observing to use. Each method is described below, and their disadvantages and advantages are described in Figure 4 in Appendix A.

Option 1. Option 1 allows you to observe the worker perform the task and then move to a quiet area to ask him or her questions. If the job site is hazardous or noisy, and the job task has a small number of reading materials involved and is relatively simple, then Option 1 may be the best method. Have the worker bring all the forms, manuals, measurement tools, and any other materials he or she uses to perform the task. After asking the worker questions in a quiet area, return to the workplace and watch as the worker performs the task a second time. Use the second observation to clarify your understanding of the task.

Option 2. Option 2 follows the same steps as Option 1, but the analyst spends less time observing and more time interviewing the worker about the task. For a complex task that involves several printed materials and is also performed in a noisy or hazardous work area, Option 2 is a better choice than Option 1. For tasks which integrate several printed materials, the extra time spent talking with a worker is often needed.

Option 3. This method is the optimum situation for conducting the Literacy Task Analysis. When the work area is quiet and safe, you can ask questions during the job performance and you will achieve better results. The worker can explain each step of the procedure as he or she is performing it. You will have the opportunity to immediately ask questions about any steps that are unclear. There is less chance of misunderstanding when you can simultaneously observe the worker perform and question him or her about the task.

Regardless of which Option you choose, when observing workers on the job it is important to obey all safety rules and avoid interfering. Be prepared to get out of the way if an emergency arises and the worker must attend to his job without interruption.

Establishing Rapport. The interview will be more productive if you establish a good relationship with the worker right from the beginning. Start by introducing yourself and explaining in the worker's terms who you represent and the purpose of your visit. Explain that you would like to talk about the reading, writing, and math he or she uses on the job, and that you would like to watch and ask questions while he or she works. Make your purpose clear from the beginning so the worker is aware of the focus and objectives of your visit. You may need to explain what you mean by such terms as "reading." You might begin by explaining your intentions in the following way:

> I'm interested in any reading, writing, or math you do in your job. When I say 'reading,' I'm not just talking about books. I'm interested in the forms you read or fill out when you do your job. Blueprints or work manuals are also examples of the kinds of things I'll be asking you about during the interview. What I learn from you today will be used to make training materials for others who need to learn to do a job similar to yours. What kinds of things do you read or write as you do your job?

This explanation may seem painstakingly obvious to trainers and teachers, but many workers don't think of using these materials as "reading." Using this statement to begin an interview can save time and help workers understand more quickly what the analyst is looking for during the interview. If you begin the interview with the question "What kinds of materials do you read in your job?" you are likely to hear, "I don't read much on my job." as an answer. Figure 5 in Appendix A lists sample interview questions that can be used to help you conduct an informative interview.

Unproductive Interviews. You may find yourself in an unproductive interview. Perhaps the job you are observing is too basic to have any literacy tasks. A line worker whose job is to tape boxes shut or check the seal on packages may have nothing to read which is directly related to the job. Planning site visits and interviews in advance with the company contact person will usually avoid this type of problem and insure that you meet with appropriate workers. However, if you find yourself in an interview that appears to contain no job specific basic skills materials, switch the focus of your interview from the worker's job-related reading to whatever general reading he or she might do on the job. For example, ask the worker if he or she reads safety material, or written company policy or union information. You may be able to turn an otherwise unproductive interview into a useful one. But if after changing its focus you still feel the interview will not be not profitable, bring it to a close and see if there is another employee who is available to meet with you.

Observing Workers as They Perform Basic Skills Tasks

You will probably find that the task you observe has many sub-tasks which involve basic literacy skills. Focus on each sub-task and ask the worker detailed questions about how he or she uses the material. For example, as a machine operator performs the task of drilling a piece of stock to specification, he or she may complete the following sub-tasks:

- o read a specialized work order form,
- o refer to a blue print for dimensions,
- o check a metric conversion chart, and
- o fill out a job completion ticket.

If the sub-tasks are complicated or take a long time to perform, you may decide to focus on one sub-task per visit, such as reading the work order form. Your goal is to observe and interview the worker to gain enough information to develop a training activity that explains how to perform the sub-task. Then, if the entire sequence of sub-tasks performed by the worker justifies complete Literacy Task Analysis, you may choose to develop instructional materials that will simulate the entire process: reading the work order form, referring to the blueprint, checking the conversion chart, and filling out the job completion ticket. Observing workers perform sub-tasks will allow you to develop a simulation that combines sub-tasks into one complex task. The key to success is to realize that analysis of complex tasks cannot be accomplished in one visit, and to therefore schedule multiple visits.

Gathering Literacy Materials

One of the main purposes in conducting Literacy Task Analysis is to identify and collect samples of the reading, writing and computation workers do in the course of their jobs. There are two types of job-related reading material: task oriented and general. Both include many things that you or the worker may not initially think of as reading. Task-oriented materials include items that workers must read in order to actually perform their job. Examples of task-oriented materials include work orders that tell a machine operator which size drill to use, or maintenance manuals that tell a mechanic how many quarts of oil to put in an engine. On the other hand, general job-related reading materials include items that workers do not need to read in order to carry out a job, but are materials that make workers more confident, more knowlegeable, more efficient, and more valuable to a company. Examples include company policy manuals, safety rules, or insurance information. Figure 6 in Appendix A shows some of the different types of job-related literacy materials.

To supplement the materials you gather during Literacy Task Analysis, there are commercial materials on the market which are written to meet the needs of workers with low levels of basic skills. For help finding and choosing commercial materials designed for low-literate learners, see the list of materials in Appendix C. Many of these materials are written for vocational and technical school students and take a job-oriented approach. Some titles of commercial materials are listed in Figure 7 in Appendix A. For more information and sources of additional materials, see Derby, 1987 and Brown and Chang, 1982.

Photographing, Tape Recording and Videotaping

Always get a worker's permission to tape record, photograph or videotape him or her performing a job. Some people, especially those with poor literacy skills, may be sensitive to being asked questions about their abilities or to having their actions recorded. Be responsive to how a worker reacts to your questions and avoid being judgmental or critical. Make adjustments if a worker appears uncomfortable.

If you decide to tape record interviews for later reference, make arrangements with the company contact person to reserve a quiet space. It is best to find a room where you will be undisturbed by other workers. If possible, avoid the employee lounge during break times and the cafeteria during lunch hour. Even if you are tape recording the interview, take complete notes to

avoid missing important details. The recorded interview can be useful in filling gaps in your notes or verifying key points, but should not be considered a substitute for note-taking.

Documentation

Your documentation of the observation and the interview are crucial. When you begin doing Literacy Task Analysis, there are two things which you should avoid because they prevent you from obtaining useful information:

- o incomplete documentation, and
- o failure to acquire the necessary forms and printed materials.

Do not rely on your memory alone to remember a process or the definitions of technical vocabulary or abbreviations. Developing successful instructional materials requires your close attention to detail. Thorough notes will eliminate the need for you to make unnecessary visits to the site. During the observation, take notes on the procedures or steps the worker goes through to perform the task; pay special attention to the sequence. Take notes on any reference materials the worker checks, questions he or she asks co-workers, notes he or she writes, and calculations he or she makes. Also take notes on the result or outcome of the worker's performance. Your notes will be helpful later when you begin developing materials. Be sure not to overlook any terms or abbreviations on the form that might be unfamiliar to a new worker. These words will become the key vocabulary in the instructional materials you develop.

For each form the worker uses in the task, be sure to get the following: two blank copies and one completed copy. The completed copy will serve as a model to which the worker can refer as he or she describes the process. This completed copy will also serve as a model when you begin developing instructional activities and simulations. One blank copy should be kept clean so that it can be used later to produce other blanks for the instructional materials you develop. Use the second blank copy to help you document the process and clarify specialized terms and abbreviations as the worker describes them to you.

Get copies of any other materials used by the worker; for example, obtain complete copies of reference manuals, including the table of contents, the indices and appendices. Likewise, if a worker uses a measurement tool, such as a caliper or micrometer, get copies of manuals or instructions that explain how these tools are used. These materials can be used during extended practice activities and they often contain illustrations that can be included in instructional materials.

DEVELOPING INSTRUCTIONAL MATERIALS

The purpose of the Literacy Task Analysis interviews and observations is to identify the areas in which worker performance needs to be improved, and to gather job-related materials and scenarios to use as the basis for developing instruction materials. Once these interviews have been conducted and job-related materials have been collected, you are ready to begin developing instructional materials.

Keep in mind that the materials you develop will be slightly modified to serve three different purposes:

- o pre-tests
- o basic skills instruction, and
- o post-tests

First, exercises and simulations will be used as "pre-tests" to screen workers to determine specific basic skills weaknesses. Upon entry to the program, workers will be asked to complete job simulations and activites using job-specific materials. Job sub-tasks (e.g., locating information on a form, computing product cost, and writing a brief summary) which workers are unable to complete will be targeted for instruction.

Second, increasingly difficult versions of instructional simulations will be used by workers to master the basic skills with which they are having difficulty. Teachers can use the simulations as teaching guides, modeling the process for workers who can then attempt to complete the tasks on their own.

Finally, the simulations and other instructional materials can be modified to be slightly different from the pre-test materials. They can then be used as post-tests to see if after instruction workers are able to complete the job simulations.

Curriculum Planning

Your should develop the activities and simulations directly from the Literacy Task Analysis you perform and the job materials your gather from the job site. Though you may encounter additional basic skills areas, your curriculum will probably include the following skill clusters:

- * locating information,
- * writing summaries,
- * troubleshooting:
  - -formulating questions,
  - -devising alternate solutions,
  - -making and checking predictions,
- * using multiple sources of information,
- * problem solving and,
- * technical vocabulary.

Keep these clusters in mind as you begin organizing your Literacy Task Analysis notes. Organize the literacy tasks you identify into these skill clusters. Other common job literacy processes identified by Philippi (Journal of Reading, 1988) are shown in Figure 8, Appendix A.

Documenting the Results of Literacy Task Analysis

To avoid forgetting important information, begin organizing and documenting the results of your Literacy Task Analysis as soon as possible after you have completed the interviews and ob-

servations. Use your notes to begin to isolate each task that you discussed with the worker. For example, in an interview with a warehouse clerk you may have discussed the task of filling an order using a Bill of Lading. Begin documenting your results by analyzing the steps for this task as described by the worker. What did he or she do first, second, and so on? What forms or manuals did he or she refer to?

To help organize the information, form two columns on a sheet of paper. In the left column, write a brief description of the steps of the task. Next, in the right column, list the related literacy elements contained in the steps you have written in the left column Your table might look like this:

Steps of the Task	Related Literacy Elements Contained in the Step	
I-1 Reviews Bill of Lading to determinewho the order is going to, which carrier will be used, which product items and quantities are to be shipped. Checks date and fills orders in order they are due.	1.1	Read and comprehend "Ship To" portion of Bill of Lading; understand technical vocabulary and abbreviations.
	1.2	Scan for date and prioritize; earliest due is first loaded.

Continue the process for the task "filling an order using a Bill of Lading" until you have listed each of the steps and related competencies that were revealed in your worker interview and observation. When you have finished, your table might look like the one in Figure 9, Appendix A.

Creating Instructional Simulations

Documenting the results of Literacy Task Analysis gives you a "blueprint" for developing an instructional simulation. You can design a complete simulation which would require a learner to do all of the steps in sequence as one job task, or you can develop more detailed lessons for individual.

Following is a simulation developed for a warehouse clerk. The job task is "filling an order using a Bill of Lading". The simulation begins with a short scenario of the job task.

Job Simulation Example: WAREHOUSE CLERK

An order has been received. There is not enough product in stock to fill the order. The worker must ship only part of the order. This requires that the worker:

1. Know the technical vocabulary and the abbreviations needed to read the note from the supervisor.

2. Read a chart and find the weights of the cases and skids ordered.

3. Multiply and divide to figure the total weights.

4. Write notes on the form using special punctuation and abbreviations. Note any changes in what was ordered and what has been shipped.

5. Correctly mark changes on the Bill of Lading.

6. Write a brief note to the supervisor of the next shift, explaining what has been done with the order.

Tell the learner what you'd like him or her to do. Give the simulation instructions and list the objectives you have for the learner. For example, you could say:

> This activity is very much like a job task you do as a Warehouse Clerk. As you do this activity, you will play the role of a warehouse clerk. You have been given an order and some information from your supervisor. It's your job to fill the order and complete the form correctly. Read the note and use the attached Bill of Lading and Product Code Chart to fill the order. Fill the order just as you would on the job. You have 45 minutes to complete the simulation. Please time yourself or ask a friend to.

Among the sub-tasks you will need to complete are the following:

1. Calculate the changes in the orders and record

    * the cases shipped,
    * the new weights, and
    * make any changes in the number of full units and loose cases.

2. Choose which skid numbers you'll send. The note tells you which skids you can choose from. Make the selection and add up the skids in the center of the form.

3. Complete the Bill of Lading Summary at the bottom of the form. Be sure to fill in these blanks:

* total units
* total loose cases
* number of packages
* weight (subject to correction)
* total cases
* total weight
* date shipped (use today's date)

4. Write a note to your supervisor that explains how you took care of this order.

* explain that you did what was asked
* detail any changes that you made on the Bill of Lading

Provide the learner with the appropriate forms needed to complete the simulation. These include 1) note from supervisor explaining changes to be made 2) partially filled out Bill of Lading Form and 3) the Product Code Chart. See Figure 10 in Appendix A for copies of those forms.

A competent, experienced worker may have little difficulty completing the simulation. He or she may use the simulation as a way to practice and enhance existing skills. Other workers who are new to the job or less experienced may have difficulty with some parts of the simulation. For example, workers who have difficulty understanding abbreviations and specialized terms may need to work through a lesson designed to familarize them with specialized vocabulary. Others may need instruction in how to locate information on the product code chart and do the calculations to correct portions of the Bill of Lading. If the instructor is present during the simulation, it will be possible to quickly spot learners who are having difficulty. If the learner cannot do the simulation, the instructor can walk the learner through it asking questions and making note of problem areas (i.e., technical vocabulary, knowing how to set up computations, being able to summarize, etc.).

Tailoring Simulations to Workers' Needs

To develop instructional activities for complex forms and tasks, it may be necessary to break the forms and tasks into smaller parts and develop instructions which focus on each part. For example, the Bill of Lading form is made up of three main parts:

1. the top part with carrier and billing information,

2. the middle part with product description and quantity, and

3. the bottom part which summarizes product and shipping information.

Whether the job task is reading and filling out a form (like the Bill of Lading example), locating information in manuals, or reading diagrams, breaking the task into its smaller parts to create lessons is an effective technique. The key is to keep the lessons you create imbedded in a

locating information in manuals, or reading diagrams, breaking the task into its smaller parts to create lessons is an effective technique. The key is to keep the lessons you create imbedded in a work-related context so that they are relevant to workers. Following are examples of lessons developed from task oriented and general job reading materials. They focus on vocabulary building, locating information, and reading charts and tables. Since workers often need to be able to understand technical vocabulary specific to their job, orienting the learner to the printed technical language is a good place to start.

Technical Vocabulary. Begin by identifying the key vocabulary words used in the job and preparing short lessons which focus on and orient learners to these specialized terms. Technical vocabulary may include frequently used technical terms, acronyms and abbreviations. They may be words that appear on a form, or words that a worker pointed out to you during Literacy Task Analysis. There is an example of a vocabulary lesson which focuses on technical terms in Appendix D, Example 1.

You can also develop vocabulary exercises by using the forms themselves. This technique produces lessons quickly without expensive production costs. First, provide learners with verbal instructions about the function of the form being covered. Tell the learner about all the key areas on the form and the key terms with which they need to be familiar. (If you are addressing a group of learners, show an overhead and provide a handout of the form and the terms to each learner if possible.) Next, take a blank form and number the key terms on the form that learners are to know. Ask learners to do one of two things:

1) Write, in their own words, the meaning of the term numbered on the form. This is especially good for abbreviations and acronyms.

or

2) Match the key term numbered on the form with its correct description provided on a separate sheet. (This requires that the teacher write the definitions or explanations of key terms available to the learner in advance of the exercise.)

For an example of this type of vocabulary exercise, turn to Appendix D, Example 2.

The examples shown in the Appendix D were developed from task-oriented job forms. Similar vocabulary lessons can be developed using general job literacy materials such as insurance and company policy manuals. The example in Appendix E deals with a general job literacy task, understanding a company's group insurance plan. In this example, the words from a company insurance manual have been used to create lessons which link these job-related words to synonyms from more general language.

Locating Information. Workers frequently must be able to access information quickly, often from multiple sources. In your Literacy Task Analysis with workers you probably identified several sources of information, such as safety bulletins, repair manuals, or company policy and insurance

sure to make the exercises as realistic as possible by creating situations, examples and questions that are similar to those a worker might encounter on the job.

Appendix F contains a sample lesson on using a table of contents. The subject matter for the lesson comes from an employee handbook which is issued to each employee and is reportly used regularly by employees. In delivering lessons on these and other basic skills tasks, the teacher should first "model," or demonstrate for the learner, the process which he or she goes through to use the table of contents. He or she should then give learners the opportunity to practice the process.

Reading Diagrams, Charts and Tables. Lessons on reading diagrams, charts and tables can be effectively complemented by making a reduced copy of the diagram and then making notes in the margins with arrows to point out the key components. Give photocopies of these diagrams marked with your notes to learners to supplement your modeling of how to read the diagram. Write the same notes into the lesson instructions to provide the learner with additional reading practice and to reinforce the key information about the diagram. Two sample lessons for reading diagrams and tables can be seen in Appendix G. Lesson 1 focuses on reading a ceiling fan diagram to get part numbers and Lesson 2 shows how to read a table to determine hourly pay rates. Notice the scenarios which precede each exercise to these provide learners with a realistic purpose for doing the activity. These scenarios are key to helping learners identify the activity and recall background information about the setting of the activity.

These are some of the types of task oriented and general basic skills instructional materials that can be developed from Literacy Task Analysis and printed workplace materials. But as mentioned earlier, the simulations and literacy materials you develop will constitute only about 40% to 60% of the instructional time spent with learners. A trainer will spend about 10% - 20% of his or her time in individual instruction with the learner and may devote 20% - 30% of class time activities with related commercial materials.

Direct Personal Instruction

In the time you spend providing direct instruction to workers, show one or two examples of the materials you use to teach the reading process. Model the desired process for learners by showing them each step and verbalizing the questions you ask yourself as you work through the process. For a task such as using an index or looking up information in a glossary, you may want to do a modified Literacy Task Analysis on your own strategies and relay these to the learners. For more task-oriented basic skills, rely on what you learned from your Literacy Task Analysis with workers. Model for the learners how an experienced worker does the task, explaining as fully as possible the subtleties of the task and those aspects that might seem obvious to someone with a higher level of basic skills. Provide several examples and allow learners to increase their level of participation in the completion of the task until they are ready to attempt the simulation activities alone. Then, allow the learners to work through several simulation activities; provide them with feedback as necessary. Be sure to develop 2-3 variations for each simulation to provide learners with enough practice to master the task. For more information about meeting the needs of a diverse group of learners, see Philippi, 1988.

Use of Related Commercial Materials

Related commercial reading materials may be used to supplement the task-oriented and general job reading instructional materials you develop. For example, if you are teaching learners to read charts and graphs for their jobs, it would be appropriate to provide learners with generic commercial materials which address these skills and provide additional practice. However, these commercial materials on their own are not likely to lead to improved performance on the job because they lack the specific content to tie them directly to the worker's job. Without a direct subject matter link, the learner will be less likely to make a connection between the activities and their own jobs. Therefore, when commercial materials are used, point out and emphasize to learners the connections between what is featured in the commercial materials and what is required of them on their jobs. When this is done effectively, commercial materials can provide the instructor with useful literacy material.

Other Commercial Sources

Other sources of supplementary reading material for learners can be found in local and national newspapers and magazines. Articles about the employee's company or about a company product with which the learner is familar are excellent sources for reading practice. Although many newspapers and magazines are written at a reading level that will be too difficult for some learners in your program, research shows that adults are able to read and understand a higher level of material if it is on a subject with which they are familiar. Background knowledge can make a limited difference in the ability of a worker to comprehend difficult reading material. Mikulecky, Sticht and others have found that workers can understand job-related material that averages 1-2 grade levels beyond their normal ability level (Mikulecky, 1982; Stitch, et. al., 1986). Adults bring a lifetime of background knowledge to a reading task. If workers are able to make the connection between what they know and what they read about a subject they are often able to read material that would otherwise be too difficult.

Uses and Limitations of Readability Formulas

"Readability" refers to the index of the ease of comprehension of a particular passage. There are many formulas available for computing readability, including some on computer programs, which you can use to determine the approximate reading difficulty of materials.

Readability formulas can help you choose materials to use in the classroom. The ability to approximate readability levels of workplace materials can also help when you explain to company managers and training personnel the reading challenges presented to workers by particular materials. Appendix H contains examples of the Fog and Forecast readability formulas and explains how to apply these to assess job materials. Even though these formulas can be helpful use them with the understanding that they only approximate how difficult material is to read and are not conclusive in their determinations.

Readability formulas are of limited utility in the sense that they can only assess factors such as word difficulty and sentence length. Difficult words are usually only able to be broadly defined as being multi-syllable words. The formulas cannot be applied to non-prose passages (i.e. poetry or graphic material) and they are usually based on a particular audience (i.e. school children or a cross-section of the reading public). When a target audience or a passage is outside the scope of a given readability formula, the utility of the formula drops considerably.

On the whole, if two passages are written on the same topic, readability formulas can indicate which passage is easier to read. The formulas are far from perfect, however, and need to be modified by informed human judgment. For example, if a passage is filled with conceptually difficult but short words (i.e. ion or valance), and the words are likely to be unfamiliar to the reading audience, the user would be wise to mentally increase the difficulty level computed by readability formulas. If, on the other hand, the reader is likely to be very familiar with a topic and it's vocabulary (i.e. a sport or technical area), then words which the formula considers difficult may actually be simple to a reading audience. In such a case, the user of the formula would need to mentally lower the difficulty level computed by the formula.

Novices with readability formulas are often overly impressed with the apparent accuracy of a figure like 10.33 grade level. In actuality, the figures are not anywhere near the level of accuracy implied by two decimal places. View the grade level figures as of a range of difficulty levels (i.e. 10.33 + or - a year on each side). It is still helpful to know that a person with a grade school level of reading ability might have extreme difficulty with the passage, but one should not exclude from the potential audience readers at the 9th grade level.

In short, the formulas can give indications of reading difficulty levels. However, they should be used with a good deal of caution and modified by intelligent judgments based on information about the reading audience. It is important to note that more expensive, actual test-case information from a trial run that has readers use materials is often more accurate then to the short-cut of using readability formulas.

Sources of Support and Assistance

As you work to develop instructional materials for workplace literacy programs, you may have a need for professional support or collaboration. Community resources such as colleges and universities, adult basic education centers, literacy coalitions, and employment and training councils or agencies may provide information, materials and consultation. Kangisser writing for the New York Business Council for Effective Literacy (Kangisser, 1987, pp. 9-12) suggests a variety of ways to create an effective literacy program planning team. Kangisser points out the importance of choosing a capable educational provider to assist with program development and offers guidelines for making this choice. In addition, Kangisser has compiled a list of individuals and organizations (Ibid., pp 30-35) from around the country who have agreed to be listed as potential resources in program planning, development, operation, and other areas including:

* job analysis
* job-related curriculum development
* curriculum for limited-English speakers

* assessment and evaluation
* using computers for skills training
* using volunteers
* general technical assistance
* reading and writing development,
* operation of general literacy/high school diploma programs
* union programs.

Featured on the list are experienced professionals from organizations including businesses and industries, universities, adult basic education centers, vocational schools, community colleges and government agencies. Write to the Business Council for Effective Literacy, 1221 Avenue of the Americas, New York, NY, 10020, for copies.

In addition, Appendix I contains references for sources of basic skills programs, teaching materials, program development guidelines, and occupation-specific competencies from a variety of civilian and military programs.

SUMMARY/CONCLUSION

Civilian and military research indicate that general literacy training is of limited value for the workplace. Gains made in classes using school-type materials are minimal at best, and often do not effectively transfer to the workplace. In addition, gains tend to revert in approximately eight weeks. In contrast, workers who learn basic skills using materials drawn from the workplace tend to master basic skills more rapidly and retain what they learn over time. This may be because adults find in workplace applications of basic skills more relevant and because workplace instructional materials are more likely to lead to continued practice of basic skills on the job.

A workplace literacy approach to basic skills instruction requires some custom designing of instructional materials. Instructional materials which simulate actual job tasks can be devised after conducting Literacy Task Analysis which involves:

* gathering print materials,
* observing workers use those materials on the job, and
* interviewing workers about their thought processes while using workplace materials to solve problems.

The process of gathering information and designing materials need not be overwhelming. Custom-designed instructional simulations can comprise the core of an instructional program without taking the majority of instructional time. Simulations based on Literacy Task Analysis can constitute 20% - 30% of learning time. Simulations are supplemented by a combination of directly related commercial materials (e.g., skill exercises in math, graph and instrument reading, and form-filling). and general job-related materials (e.g., safety manuals, insurance booklets, and company policy manuals).

BIBLIOGRAPHY

Brown, J. M. and Gerald Yuh-Sheng Chang. "Supplementary Reading Materials for Vocational Students With Limited Reading Ability." Journal of Reading, Vol. 26, November 1982; pp. 144-149.

Davies, I. K., 1973. COMPETENCY BASED LEARNING: Technology, Management, and Design. McGraw-Hill Book Company, New York.

Davies, I. K., 1981. Instructional Technique. McGraw-Hill Book Company, New York.

Derby, T. "Reading Instruction and Course Related Materials for Vocational High School Students." Journal of Reading, January 1987.

Gagne, R. M., and L. J. Briggs, 1979. Principles of Instructional Design. Holt, Reinhart, and Winston, New York.

"JOB-RELATED BASIC SKILLS: A Guide For Planners of Employee Programs." BCEL Bulletin, Issue No. 2, June 1987. Business Council for Effective Literacy, 1221 Avenue of the Americas, 35th Floor, New York, NY 10020.

Mikulecky, L., 1985. Literacy Task Analysis: Defining and Measuring Occupational Literacy Demands. Paper presented at the National Adult Educational Research Association (Chicago, Illinois, March 31-April 4, 1985). (ED 262 206).

_____. 1982. "Job Literacy: The Relationship between School Preparation and Workplace Actuality." Reading Research Quarterly 17: 400-419.

Mikulecky, L. and R. Drew, 1987. "Basic Literacy and Communication Skills for Vocational Education." Chapter 2 of The Work-Education Bridge, Vocational Education Services, Indiana University, Bloomington, IN 47405.

Mikulecky, L., and J. Ehlinger, 1986. "The Influence of Metacognitive Aspects on Literacy of Job Performance of Electronics Technicians." Journal of Reading Behavior 18: 41-62.

Mikulecky, L., and D. Winchester, 1983. "Job Literacy and Job Performance among Nurses at Varying Employment Levels." Adult Education Quarterly 34: 1-15.

Moore, D. M., 1987. "Applying the Work-Education Bridge: A Nuts and Bolts Approach." Presented at "Integrating Basic Skills in Vocational Education: A National Forum," The National Center for Research in Vocational Education, Ohio State University, Columbus, Ohio.

Philippi, J. W., 1988. Matching literacy to job training: Some applications from military programs. Journal of Reading, April 1988 (in press).

Rossett, A., 1986. "Commentary: Analyzing, Assessing, and Disambiguating Whatchamacallit." Chapter 4 of Introduction to Performance Technology. National Society for Performance and Instruction, Washington, D.C.

Sticht, T. G., 1982. Basic Skills in Defense. Alexandria, VA: Human Resources Research Organization.

Sticht, T. G., L. Amijo, R. Weitzman, N. Koffman, K. Roberson, F. Chang, and J. Moracco, 1986. Teachers, Books, Computers, and Peers: Integrated Communications Technologies for Adult Literacy Development. Monterey, Calif.: U.S. Naval Post-graduate School.

APPENDIX A

FIGURES

Figure 1

Choosing the Appropriate Job for Literacy Task Analysis

Jobs Usually Selected for Literacy Task Analysis

Entry-level jobs
Mid-level jobs to which entry-level workers could be promoted

Analyze those job tasks in which:

- results of performance are critical
- frequent mistakes are made
- workers need training in order to be promoted
- workers report difficulty
- new technology has been implemented

Figure 2

Appendix A

Interviews with Professional Staff

TITLE	PERSPECTIVE	QUESTIONS TO ASK	INFORMATION TO BE GAINED
PLANT MANAGER	Big picture; top down, relationships among departments	Where do you perceive performance gaps caused by lack of basic skills?	Areas perceived to have greatest need for improvement.
		In which departments do basic skills have an important, even critical, impact on the performance of entry-level workers?	Jobs most critically affected by lack of basic skills . Which jobs to task analyze.
		Where do you see the greatest need for improvement in basic skills education?	Which reading tasks have greater priority and importance.
		Where whould you notice effects if improvements are made? If they aren't?	Which jobs have major productivity and accident problems which might relate to basic skills.
PERSONNEL DIRECTOR (In smaller companies, personnel directors may take on training responsibilities.)	Broad; policy-oriented	How does basic skills literacy affect hiring and promotability?	
		Do applicants have the necessary basic skills to perform the job once hired?	The extent to which new hires are able to independently learn on the job.
		Do employees have trouble reading insurance information, or filling out applications or claim forms?	
		Do employees need help understanding company policy manuals regarding sick time, benefits, holiday pay, etc?	Which general reading tasks are important for workers to master (i.e., memos, insurance information, etc.).
		Do employees have difficulty calculating wages or figuring out deductions from their paychecks?	Areas of weakness in math and problem solving.
DIRECT SUPERVISOR	Focused on tasks of job; sees workers' daily needs	In which entry-level jobs do workers seem to have the greatest need for literacy skills?	
		How is plant productivity affected by workers' ability in reading, writing and math?	Consequences of poor performance due to lack of basic skills (i.e., productivity, safety, etc.).
		Do you have workers you'd like to promote but feel they can't handle the literacy requirements of a higher-level job?	Areas where improvements in basic skills can lead to a better chance of promotion.
			If workers lose time covering for others with low basic skills.

continued

TITLE	PERSPECTIVE	QUESTIONS TO ASK	INFORMATION TO BE GAINED
TRAINING DIRECTOR	Training issues: learner characteristics; learning needs;	What is the company philosophy regarding basic skills literacy training?	The extent to which basic skills training is matched to actual job demands.
		Is there a basic skills program in effect?	Extent and nature of current education and training.
		What other training is currently going on?	Worker characteristics to be considered when designing literacy materials.
		What difficulties do workers have in current training programs?	Worker's educational background and learning skills.
		What is the reading level of your average entry-level worker?	
		What is the education level of your average entry-level worker?	
		What special training needs do workers have?	
		What is the age range of workers?	
UNION OFFICIAL	Employee needs; managment issues	What is the relationship between management and workers?	
		What role does the union play in training and basic skills education?	Role of the Union.
		What printed materials should workers read to be informed of their rights and responsibilities and of union services and issues?	Literacy requirements for fulfilling union participation.
		Have previous problems ever undercut training programs?	Workers' concerns about training and evaluation.

Figure 3

Things to Look for During a Site Tour

ENVIRONMENT	WORK FORCE	LITERACY MATERIALS
(what aspects of the workplace will influence my observations and safety?)	**(What social networks seem related to job problem solving?)**	**(What materials requiring basic skills are visible from the floor?)**
noise level	work in groups or alone?	safety signs
sanitation	use telephone?	policy notices
safety	ask questions of lead workers?	bulletin boards
hazardous conditions	operate independently or with	safety or health brochures
machines	group conferences?	signs or job aids at work
special tools	group approaches to problem solving?	stations
vehicles	enthusiastic or bored?	computer displays
chemicals	friendly toward you and host?	libraries or information
gases		centers

Figure 4

Methods for Interviewing and Observing

METHOD	ADVANTAGES	DISADVANTAGES
Option 1 Observe worker perform task with no opportunity to ask questions. Interview worker away from job. Observe worker perform task with no opportunity to ask questions.	Interviewer can observe procedures, see literacy tasks and note processes before discussing with the worker. Good when workplace is noisy or hazardous. Return for 2nd observation- - opportunity for demonstration and clarification. Can tape record interviews.	Can be more time-consuming than options 2 & 3; interviewer can miss details.
Option 2. Interview worker away from job site Observe worker perform job and ask questions Interview worker away from job site.	Can focus quickly on literacy tasks; can be selective in observation; 2nd interview provides clarification. Good for hazardous or noisy worksites or complex job task involving multiple reference materials. Can tape record.	Can take more time than option 3. Extended interviews difficult for some subjects.
Option 3 Simultaniously observe and interview worker while performing job	Best in safe, quiet work environments. Worker can explain as he/she does job task. Interviewer can immediately question unclear procedures. When permissible, the most desirable approach.	Cannot be done in noisy or hazardous work site; can interfere with worker doing job. Little opportunity for tape recording.

Figure 5

Sample Interview Questions

BACKGROUND

What is your title and job description?
How long have you been in this job?
How did you learn this job?
What special training did you have for this job?
How important is reading, writing and math to the successful completion of your job?
What do you find is the most challenging part of your job?
What is the most important part of your job?
What could go wrong if you didn't do this part of your job correctly?

LITERACY TASKS

Will you please show me the books, manuals, forms or charts you read in order to do your job?
Which of these is hardest to read?
How often do you use this manual (chart, form, etc.) in doing your job?
If you were training a new person to do this part of your job, what would he have to know before you could teach him/her?
What would a new person find most challenging about learning your job?
What reports, memos, summaries or other written messages do you read or write in your job?
What math or science skills do you use in your job?
What technical equipment do you use in your job?
What special measuring tools do you need to read to do your job?
What computer equipment (or computerized machines and tools) do you use in your job?

TRAINING AND PROMOTABILITY

In which parts of your job would you like to improve?
What skills would you need to learn in order to be promoted to a different or better job?
Are you currently being trained (or are you training someone new) to do this job?
What is most difficult about the training you are in now?
How has your job changed since you first started it?
Do you expect to be going back to school or training in this or another job?
Will you please show me the training manuals and exercises which are most difficult for you?

PROBLEM SOLVING (METACOGNITION)

Explain what information you are looking for when you read this manual (form, chart, etc.)
Tell me, step by step, how you get information from this manual (etc.).
Tell me, step by step, how you got the information when you were new on the job.
Show me how you know....
Explain in detail...
How did you know to do that?
How did you learn that part of your job?
What do you do first, second, third, etc.
What do you do if you don't find what you are looking for the first time?
Where else could you go for this information?

Figure 5 cont'd

ADMINISTRATIVE

Will you please show me the general safety material you read in your job?
Will you tell me how you read:

your insurance manual
your time card or check stub
your income tax withholding forms
company policy manuals
union literature
company news bulletins

Figure 6

Appendix A

Job-Related Literacy Materials

Task-Oriented Reading	General Job Reading	Related Materials
reference manuals	safety manual	Vocational Basic Skills Booklets
job aids	company policy manual	Graph & Instrument Reading Excerises
measurements tools	insurance manual	Measurement Exercises
graphs, scales, charts, tables	insurance forms	Functional Problem Solving Exercises
blueprints	accident forms	Using Tables and Reading
procedural guides	company newsletters	Form-Filling Exercises
work orders, forms	bulletin board memos	Trade Literature
first aid instructions	union brochures	Automotive
computer printouts	payroll check stub	Nursing
computer screen displays	calculate wages	
metric conversion charts	posters	
diagrams & flowcharts	training manuals	
product labels	textbooks	

Figure 1

Appendix A

Commercial Literacy Materials

Ackerman, Anne S., Miriam Levitt Baygill, and Marilyn Fishel. It Happened on the Job. New York, NY: Globe, 1978.

Crouse, William H. The Auto Book. New York, NY: McGraw-Hill 1984.

DeKryger, William J., Robert T. Kovacik, and Saverio G. Bono. Auto Mechanics: Theory and Service. West Chicago, IL: South-Western Publishing, 1986.

Mikulecky, Larry J. and Rad A. Drew. On the Job: Readings in Real-life Competencies. Cambridge Book Company, New York, NY, 1987.

Physician's Desk Reference. 40th ed. Oradell, NJ: Medical Economics Company, 1986.

Project Earth. Sauk Centre, MN: Vocational Biographies, Inc., 1982.

Project Explore. Sauk Centre, MN: Vocational Biographies, Inc., 1985.

Sanders, Donald H. Computers Today. New York, NY: McGraw-Hill, 1983.

Webster, Jay. Auto Mechanics. Encino, CA: Glencoe Publishing Company, 1986.

Adapted from: Derby, T. "Reading Instruction and Course Related Materials for Vocational High School Students." Journal of Reading, January 1987.

Figure 8

On-the-Job Reading Processes

(Excerpted and adapted from Philippi, 1988)

VocabularyVocabulary
Recognize common words and meanings
Recognize task-related words with technical meanings
Recognize meaning of common abbreviations and acronyms

Literal comprehension
Identify factual details of specifications in texts
Follow detailed, sequential directions to complete a task
Determine the essential message of a paragraph

Locating information within a text
Use table of contents, index, appendices, glossary, to locate information
Locate page, title, paragraph, figure, or chart needed to answer questions or solve a problem
Use skimming or scanning to determine if text contains relevant information

Using charts, diagrams, and schematics
Use a complex table or chart requiring cross-referencing
Apply information from tables or graphs to locate malfunctions or to select a course of action
Isolate each major section presented in a schematic diagram
Follow sequenced illustrations or photographs as a guide

Comparing and contrasting
Combine information from multiple sources that contribute to the completion of a task
Determine presence of a defect of extent of damage
Classify objects by size, color, or significant marking

Inferential comprehension
Determine meaning of figurative, idiomatic, and technical meanings of terms, using context clues or reference sources
Make an inference from text that does not explicitly provide required information
Interpret codes and symbols

Recognize cause and effect, predicting outcomes
Use common knowledge to avoid hazard or injury
Apply preventative measures prior to a task to minimize security or safety problems
Select appropriate course of action in an emergency

Figure 9

Appendix A

Literacy Task Analysis
Warehouse Clerk

Task: Filling an order using a Bill of Lading

Steps of the Sub-Task	Related Literacy Elements Contained in the Steps
I-1 Reviews Bill of Lading to determine who the order is going to, which carrier will be used, which product items and quantities are to shipped. checks date and fills orders in order they are due.	1.1 Read and comprehend "Ship To" portion of Bill of Lading; understand technical vocabulary and abbreviations. 1.2 Scan for date and prioritize; earliest due is first loaded.
I-2 Use specialized ID numbers on Product Code Chart to show which cases are being shipped and the origin of each case.	2.1 Read and understand specialized locator codes, and check against skids to determine proper shipment. 2.2 Compare cases shipped to cases ordered and note any differences. Correct with notation.
I-3 Use the Product Code Chart to document jar size, weight per jar and weight per skid.	3.1 Classify by product code. Check to be sure code and shipment match. Locate info on Product Code Chart and to Bill of Lading.
I-4 Correct the order to reflect what is actually shipped. Note why the order is changed (product not in stock, etc.)	3.2 Locate information on Product Code Chart. Use to calculate loose cases. 3.3 Locate and verify maximum weight by checking routing information on "Ship To" portion of Bill of Lading.
I-5 Leave brief note for supervisor or next shift explaining shortages in stock, reasons for delay or other noteworthy message.	4.1 Use proper abbreviations for corrections on form. 5.1 Summarize changes made, shortages, etc. Write legible note summarizing changes made, etc.

Figure 10

Forms For Warehouse Clerk Simulation

Form 1

Note From Supervisor:

Joe:

Please take care of this order for me. There are just a couple of things you should know before you start.

1. The order calls for 9 full units of 48805. We only have 8 1/2 units. Send what we have and make the adjustments to the Bill of Lading.

2. The order also calls for only 10 units of 48814. We have 11 1/2 units in stock. I'd like you to ship the entire 11 1/2 units. Make the changes on the Bill of Lading.

Take the shipments for the units 48805 from the V76JL skids numbered between 150 and 250.

Take the shipments for the units 48814 from the V76JL skids numbered between 245 and 345.

Be sure to record all this on the bill of lading. Let me know with a note how all this works out.

Thanks,

Jan

APPENDIX A

Form 2: Bill of Lading

UPC MFG I D 27000
DUNS 04-240-3188

Shipping Order Number 743052

Ship To Wicker Products Company
1543 South Street
Bakersfield, Calif.
92634

Ship-Via Car/Van No

Sales Ord No	Trans	Terms Cd	Terr Type	Order Date	Req Ship Date	Price Class F F G	Sls Rep	Bill To Cust Code

Terr	Ship To Cust	Loc Code	Shipped From	Routing	Del Carrier
			Bigger, W. Virginia	National Trucking	Interstate Loaders

Zone	Block	Cust P O Number	Sched Ship Date	Rec Loc	Bill To Name And Address
			03/10		

T/M	Carrier Cd	Route Cd	EX CD 1	EX CD 2	EX CD 3	DCC Order Recvd Date	Comm Code	Seal No	Master B/L No

Cas. Ship	Qty Ord	Wt./Cs	Prod Code	Size	Description	Full Units	Loose Case	Gross Wt	Frt. Cd	Remarks/Total Cas Recvd	Remarks/OS & D
	630	36.5	48805	12/30	POPCORN	9		22995	K		
	600	34.5	48814	8/45	POPCORN	10		20700			
				V7450							
				V76JL							

Tot Units	Tot Lse Cas	Total Cube	Control Center Date	Entered By	Product Hash Total	Terminal Serial No
						895178

Bill Of Lading Summary

No Of Pkgs	Frt Code	Weight (Sub To Corr)	Class Or Rate	Frt Chg	No Of Pkgs	Frt Code	Weight (Sub To Corr)	Class Or Rate	Frt Chg	No Of Pkgs	Frt. Code	Weight (Sub To Corr)	Class Or Rate	Frt Chg

Pg Of	Date Shipped	Address Correspondence To Beatrice/Hunt-Wesson Inc	Total Cases	Total Weight	Date Received

Form 3
Product Code Chart

48805 - 12/30 oz. - 1 case 36.5 lbs., 1 skid 2,555 lbs.
1190 cases Weight 43,435 for 17 skids
1260 cases Weight 45,990 for 18 skids
1330 cases Weight 48,545 for 19 skids
1400 cases Weight 51,100 for 20 skids

48810 - 24/15 oz. - 1 case 37 lbs., 1 skid 2,072 lbs.
1008 cases Weight 37,296 for 18 skids
1064 cases Weight 39,368 for 19 skids
1120 cases Weight 41,440 for 20 skids
1176 cases Weight 43,512 for 21 skids
1232 cases Weight 45,584 for 22 skids

48814 - 8/45 oz. - 1 case 34.5 lbs., 1 skid 2,070 lbs.
1080 cases Weight 37,260 for 18 skids
1140 cases Weight 39,330 for 19 skids
1200 cases Weight 41,400 for 20 skids
1260 cases Weight 43,470 for 21 skids
1320 cases Weight 45,540 for 22 skids

48819 - 18/15 oz. - 1 case 28 lbs., 1 skid 2,240 lbs.
1360 cases Weight 38,080 for 17 skids
1440 cases Weight 40,320 for 18 skids
1520 cases Weight 42,560 for 19 skids
1600 cases Weight 44,800 for 20 skids
1680 cases Weight 47,040 for 21 skids
1760 cases Weight 49,280 for 22 skids

48822 - 10/5 oz. - 1 case 53.0 lbs., 1 skid 2,120 lbs.
720 cases Weight 38,160 for 18 skids
760 cases Weight 40,280 for 19 skids
800 cases Weight 42,400 for 20 skids
840 cases Weight 44,520 for 21 skids
880 cases Weight 46,640 for 22 skids

48833 - 144/4 oz. - 1 case 39.5, 1 skid 1,106 lbs.
560 cases Weight 22,120 for 20 skids
616 cases Weight 24,332 for 22 skids
672 cases Weight 26,544 for 24 skids

APPENDIX B

SITE INTERVIEW GUIDELINES

Purpose:	To identify and analyze the basic skills of entry level jobs which are critical to successful job performance.
Interview with Supervisors (15-20 min.)	Interviews with plant supervisor and (or) the employee's direct supervisor to find out: o which job tasks are most critical to job success o which job tasks are most frequently performed o which job tasks are most problematic o where poor performance is occurring o useful pre/post measures of employee performance o current performance standards, measured by: * time/motion study * worker efficiency * rate/production
Site Tour	To acclimate the interviewer to the work environment.

Literacy Task Analysis

Purpose:	To analyze designated job tasks and gather job-related printed and computational materials. The emphasis is on finding out how employees use printed materials to solve problems on the job.
Employee Interview Part 1 (15-20 min.)	The first phase of the Literacy Task Analysis begins with a one-on-one meeting between a model employee and the interviewer. This should take place in a private meeting room and not at the work station. The employee will be asked to describe his/her job in detail with particular emphasis on job-related reading, writing and math. The employee should bring samples of job-related reading materials to his or her meeting.
Employee Interview Part 2 (20-30 min.)	In the second phase, the interviewer will observe the worker on the job performing designated tasks. It is ideal if questions can be asked while the employee does the job. If this is not possible, it will be necessary to return to the meeting room for further discussion.

Employee Interview Part 3 (10-20 min.)	Return to meeting room (if necessary) to clarify any procedures, steps, rules, processes, etc., which the employee has described.

Site Interviews

Materials	Explain to the employee that throughout the interviews, you will be gathering work-related reading materials. Make it clear that you will need originals or photocopies of materials to take with you to be used for developing training materials. Examples of materials include: o reference manuals, o job aids, o instructions, o scales, graphs, charts, tables, o company benefit booklets, o company insurance forms and information, o union materials (guidelines, greivance forms, etc.) o safety manuals, o accident forms, o production records, and o time sheets, etc.
Clearance to Photograph & Record	You will need clearance (when necessary) to photograph materials that cannot be taken from the work site, for example, a sign near a machine that lists safety precautions. Ask permission to tape record or videotape during the interview. Be certain the employee being interviewed as well as affected are informed about and agree to recording, taping, etc.
Confidentiality	Employee interviews are strictly confidential. Names of employees should not be used in any way. Employee comments about supervisors, the workplace. etc., should not be divulged.
Proprietary Information	Recognize the company's interest in protecting proprietary information and agree to cooperate in any way to ensure security.

APPENDIX C

MATERIALS FOR LOW-LITERATE ADULT LEARNERS

Following are references containing bibliographies of materials for use with low-literate adult learners:

Brown, J. M., and Gerald Yuh-Sheng Chang. "Supplementary Reading Materials for Vocational Students with Limited Reading Ability." Journal of Reading, Vol. 26, November 1982, pp. 144-149.

Connett, D., and R. Rathburn. Innovative Materials for High Risk ABE Students Oregon State Dept. of Education, Salem, OR. June 1984.

Curriculum Materials 1979. New Jersey Vocational-Technical Curriculum Laboratory, Rutgers University, 1979.

Derby, T. "Reading Instruction and Course Related Materials for Vocational High School Students." Journal of Reading, January 1987.

Gottlieb, S. M. Reading Materials for Vocational-Technical Students: An Annotated Bibliography. Pennsylvania State Department of Education, 1975.

Liu, C. C. Teaching Basic Skills through Vocational Education. Technical Report. Office of Vocational and Adult Education, Washington, DC. April 1980.

Nemko, B. and E. Dutton, Resources in Health Careers Programs for Teachers of Disadvantaged Students. Publication Sales, California St. Dept. of Education, Sacramento, CA 95802. 1983.

O'Brien, R. L. Books for Adult New Readers, Second Revised Edition. Project Learn, 2238 Euclid Avenue, Cleveland, OH 44115. Sept. 1984.

APPENDIX D

VOCABULARY EXERCISES

Example 1

Technical Vocabulary -- Bill of Lading

Instructor will point out the important parts of the completed form. Use overhead when addressing group. Provide students with a handout that identifies the important parts on the form.

Divide form into its three parts:

1. **Top: Carrier/Billing Information**
2. **Middle: Product Description and Quantity**
3. **Bottom: Bill of Lading Summary**

1. Top: Carrier/Billing Information

Point out these sections of the form:

"Ship to:" Tells where the shipment is going.

Car/van # The warehouse clerk (WC) fills in this blank. The WC must record this number from the carrier's vehicle. This identifies the shipping vehicle.

Seal # Seal # refers to the seal on the door(s) of the carrier vehicle. Each door has a seal with a number. The warehouse clerk must record the seal number(s) in this spot on the form. There should be one seal # for each door on the vehicle.

Shipping order #: This is the number that identifies this transaction. The WC may be asked to record this number on other forms, or refer to the number whenever talking about the form with a driver or supervisor.

Student Activity

You have just finished loading an order when you get a call from your supervisor, Jan. She has some questions to ask you about the order you just filled. Write your answers to her questions in the spaces below. Use the Bill of Lading on the next page to answer these questions.

QUESTIONS:

"Hello. This is Jan. I have some questions about the shipment going to Fullerton, California. First of all, can you give me the street address where we're sending this shipment?"

1. _____

"Great Now, what shipping order number do you have on that Bill of Lading?"

2. _____

"Thanks. A Couple other things. I need the Car Number and I can't read it on my copy. Can you make it out on yours? What's the Car Number?"

3. _____

"I also need the Seal Number. I can only read the first number. Can you give me the rest of it?"

4. _____

"One last thing and I'll let you go. What's the routing on this order?"

5. _____

"Thanks for your help. See you this afternoon. Bye."

Example 1, APPENDIX D

Ship To Wicker Products Company
1543 South Street
Bakersfield, Calif.
92634

Ship Via Car/Van No	Shipping Order Number
A-3241	743052

Sales Ord No	Trans	Terms Cd	Terr Type	Order Date	Req Ship Date	Price Class F F O	Sls Rep	Bill To Cust Code

Terr	Ship To Cust	Loc Code	Shipped From	Routing	Del Carrier
			Bigger, W. Virginia	National Trucking	Interstate Loaders

Zone	Block	Cust P O Number	Schd Ship Date	Rec Loc	Bill To Name And Address
			03/10		

T/M	Carrier Cd.	Route Cd	EX CD 1	EX CD 2	EX CD 3	DCC Order Recvd Date	Comm Code	Seal No	Master B/L No
								020251	

Css Ship	Qty Ord.	Wt./Cs.	Prod Code	Size	Description	Full Units	Loose Case	Gross Wt.	Frt. Cd.	Remarks/Total Css Rcvd	Remarks/OS & D
	630	36.5	45805	12/30	POPCORN	9		22995	K		
	600	34.5	45814	8/45	POPCORN	10		20700			
				V7450							
				V76JL							

Tot Units	Tot Lse. Css.	Total Cube	Control ... Date	Entered By	Product Hash Total	Form Serial No.
						895178

Bill Of Lading Summary

No. Of Pkgs.	Frt. Code	Weight (Sub To Corr.)	Class Or Rate	Frt. Chg	No. Of Pkgs.	Frt. Code	Weight (Sub To Corr.)	Class Or Rate	Frt. Chg.	No. Of Pkgs.	Frt. Code	Weight (Sub To Corr.)	Class Or Rate	Frt. Chg.

Pg Of	Date Shipped	Address Correspondence To Business/Hunt Wesson, Inc	Total Cases	Total Weight	Date Received

Example 2

Matching Exercises:

(See blank shipping order form on next page with items numbered.)

Match the number of the term on the form with the best definition or explanation below.

_____ Short for Cases Shipped. Write the number of cases shipped in this column.

_____ Short for Quantity Ordered. This line will be filled out before you receive the form. In most cases, the number of cases shipped and the number of cases ordered should be the same.

_____ Stands for Weight Per Case. This will be filled out before you get the form. This tells you the weight in pounds of a case of the product.

_____ Short for Product Code. Each size jar has a different product code number. This will be filled out before you get the form. You might need this number when referring to the product code chart to find the weights of a shipment.

APPENDIX D

UPC MFG I D 27000
DUNS 04-240-3168

Shipping Order Number

Ship To

Ship Via Car/Van No

Sales Ord No	Trans	Terms Cd	Terr Type	Order Date	Req Ship Date	Price Class F F G	Sls Rep	Bill To Cust Code

Terr	Ship To Cust	Loc Code	Shipped From	Routing	Del Carrier

Zone	Block	Cust P O Number	Schvd Ship Date		Rec Loc	Bill To Name And Address

T/M	Carrier Cd	Route Cd		EX CD 1	EX CD 2	EX CD 3	DCC Order Recvd Date	Comm Code	Seal No	Master B/L No

Cas Ship	Qty Ord	Wt /Cs	Prod Code	Size	Description	Full Units	Loose Case	Gross Wt	Frt Cd	Remarks/Total Css Rcvd		Remarks/OS & D	
1.	2.	3	4.	5.		6.	7.	8.					

Tot Units	Tot Lse Css	Total Cube	Control Center Date	Entered By	Product Hash Total	Form Serial No
						895178

Bill Of Lading Summary

No Of Pkgs	Frt Code	Weight (Sub To Corr)	Class Or Rate	Frt Chg	No Of Pkgs	Frt Code	Weight (Sub To Corr)	Class Or Rate	Frt. Chg	No Of Pkgs	Frt Code	Weight (Sub To Corr)	Class Or Rate	Frt Chg.

Pg Of	Date Shipped	Address Correspondence To Beatrice/Hunt Wesson Inc	Total Cases	Total Weight	Date Received

APPENDIX E

SAMPLE LESSON: Understanding Your Company's Group Insurance Plan

As a company employee you are entitled to buy insurance for yourself and your family. You may have received a booklet that tells about your insurance plan. Some people have a hard time reading insurance manuals. Words used to describe insurance policies can be hard to understand. For example, benefit is a technical word often used when talking about insurance. In everyday usage, benefit means anything good. But in the insurance language, benefit means the payment you receive for an insurance contract.

The words in the list below came from your company booklet on group insurance. Study the words below. Next to each word is its definition and another word that means about the same thing. The word that means the same is called a synonym. Each word is used in a sentence to show its meaning.

Words About Insurance

Word		Definition	Synonym
1.	**accidental**	happening by chance or accident	unexpected

The insurance policy pays if there is an accidental death.

2.	**benefit**	money paid from an insurance contract	payment

You may apply for sickness benefits after you have used all your paid sick time.

3.	**beneficiary**	the person who receives insurance benefits	receiver

Shirley named her husband as beneficiary of her life insurance policy.

4.	**claim**	request for payment of insurance benefits	request

Shelly filed an insurance claim after her accident.

Word		Definition	Synonym
5.	**coverage**	the type of protection provided by an insurance policy	protection

Ted bought dental coverage with his policy.

6.	**dismember**	to cut, tear or pull off a limb (such as a hand or foot)	separate

Some machines can dismember workers if operated incorrectly.

7.	**disability**	inability to work	handicap

Jack hurt his back and the disability kept him off the job for two years. He had to meet with his doctor every month to prove his continued disability.

8.	**exclusions**	what the insurance does not cover.	exceptions

Pregnancy that starts before a person is insured and dental work are exclusions of the policy.

9.	**maternity**	having to do with pregnancy or childbirth	pregnancy

Charlotte received maternity benefits when she was away from work to have her baby.

PRACTICE

A synonym is a word that means almost the same thing as another word. "Cup" and "mug" are synonyms because they mean almost the same thing. "Slacks" and "trousers" are synonyms because they mean almost the same thing. Using synonyms for words you are trying to learn is a good way to remember them. Sometimes a word doesn't have a synonym and it takes a few other words to say the same thing. Talk with your husband, wife or friend about the kind of insurance you have. Use some of the new words from the list when you talk about your policy.

Exercise One: Write a definition or synonym for each word on the list below. Refer to the first part of this lesson if you need help.

Word	Synonym	Word	Synonym
1. coverage	_____	6. maternity	_____
2. accidental	_____	7. dismember	_____
3. claim	_____	8. exclusions	_____
4. benefit	_____	9. disability	_____ _____
5. beneficiary	_____		

Check and correct your answers before you go on.

Answers: [place upside down on page or in answer key at end of module]

1. protection
2. unexpected
3. request
4. payment
5. receiver
6. pregnancy
7. separate
8. exceptions
9. handicap

Exercise Two: Circle the correct synonym for each numbered word below:

1. **maternity**
   a. creative
   b. pregnancy
   c. payments
   d. sickness

2. **coverage**
   a. blanket
   b. benefits
   c. protection
   d. extra

3. **exclusions**
   a. inclusions
   b. expectations
   c. exceptions
   d. prevention

4. **claim**
   a. request
   b. yield
   c. sue
   d. money

5. **disability**
   a. strength
   b. handicap
   c. disturbance
   d. premium

6. **beneficiary**
   a. receiver
   b. giver
   c. exemptions
   d. expense

7. **benefit**
   a. wreck
   b. insurance
   c. payment
   d. health

8. **deductible**
   a. costly
   b. removable
   c. expensive
   d. free

9. **accidental**
   a. planned
   b. prearranged
   c. unexpected
   d. predictable

Exercise Three: Use each of these new words in a sentence of your own. Write each sentence about the type of insurance you have or would like to have. Think of ways to use these words when you talk with your friends and family.

1. **Accidental**

2. **Benefit**

3. **Beneficiary**

4. **Claim**

5. **Coverage**

6. **Dismember**

7. **Disability**

8. **Exclusions**

9. **Maternity**

These activities should be followed by a brief reading exercise that uses part of the insurance language that includes some of the terms used above. Make the assignment as "real world" as possible. For example, instead of merely asking questions which require reading, create scenarios which make the reading assignments more relevant for the learners.

Example:

You had an accident at home and now you cannot work. Your doctor says you should not go back to work for two months. Read page 9 of the insurance handbook to see how your insurance will help you while you are off work. Answer the question below:

WEEKLY ACCIDENT AND SICKNESS INSURANCE

If while insured, you become totally disabled as a result of a non-occupational injury or sickness, benefits will be payable each week while you are so disabled and under the care of a licensed physician.

Benefits will be payable beginning on the first day in case of total disability due to injury, and on the eighth day in case of total disability due to sickness; however, no benefits shall be payable for any day for which you are entitled to payment under our Company's Sick Leave Plan.

These benefits will continue for the maximum duration specified in the Schedule of Insurance for any one continuous period of disability. Successive disabilities separated by less than two weeks of full-time work will be considered one disability, unless the subsequent disability is due to a different cause and does not begin before you return to full-time work.

After your return to work, if you again become totally disabled from a different and unrelated cause, you will again be eligible for benefits to continue up to another maximum duration as described above.

In no event will benefits be payable while you are not under the care of a licensed physician.

In the event of disability due to pregnancy, benefits will be available provided pregnancy commences while you are insured.

—9—

1. When you are injured or sick and cannot come to work, you are

_____.

2. The payments you receive from the insurance company while you are sick are called

_____.

APPENDIX F

SAMPLE LESSON: Using a Table of Contents

Most manuals and reference booklets you use on the job have Tables of Contents. The table of contents is in the front of the manual. It lists the subjects that are covered in the manual and gives the page number where you can find each subject. The subjects are listed in the order that they appear in the manual. For example, in a car manual you might find subjects like tires, lights and fuses.

The table of contents helps you quickly find the subject you are looking for. Instead of wasting time paging through the manual, check the table of contents to find the page number of the subject you need.

Imagine that you have missed work twice and are afraid you might be fired. You could ask the supervisor what the rules are for missing, but you would rather find out without making a big deal out of it. You ask a friend who says he isn't sure. He says it's probably in the Employee Handbook sitting on the bench in the back of the lunchroom. You check the table of contents and this is what you find:

TABLE OF CONTENTS

A quick look at the Table of Contents tells you:

1. what subjects are covered in the booklet,
2. which page to turn to read about each subject, and
3. that each subject is in a different section, (A, B, C, etc.)

Now, remember that you are looking for information about missing work. "Missing Work" does not appear in the table of contents. Ask yourself, "Under which heading would I find something about missing work?" You will probably see the subject "Attendance Policy" on page 4. This appears to be the only subject listed that has anything to do with missing work. If you were to turn to page 4 of the handbook, reproduced for you on the following page, you would find the Attendance Policy.

Read page 4. Remember, you missed work and you are trying to find out if you might get fired. Even though you missed, you remember that you did call in each time to tell your supervisor that you would not be in on time.

1. Which papagraph tells what you should do if you are going to miss work? _____

2. From what you see on page 4 can you tell if you need to be worried about your job? Why or why not? (Write your answer in the space below.)

_____

_____

Reading the table of contents is a good way to find out what is in a book or manual. It's a good habit to read through the table of contents of any book. You might see a subject that you hadn't thought of that might be of interest to you.

Think about the books and manuals you use on your job. Which of them have tables of contents? Make a list of some of the manuals you have at work or at home that have tables of contents.

1. _____ 5. _____

2. _____ 6. _____

3. _____ 7. _____

4. _____ 8. _____

The next time you use these books take a minute to read the table of contents.

E-9 Do not punch another employee's time card or persuade another employee to punch your time card.

E-10 Do not falsify or alter a time card.

F. ATTENDANCE POLICY

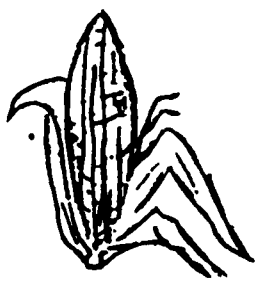
As in all types of business and industry, certain practices must occur in order to maintain maximum efficiency of operations. Your job is important, and it is very important that you are here and ready for work on time.

Various work hours apply to all employees at ORPD. Each employee shall be informed of his/her scheduled work day by your supervisor or the Personnel Office, and each employee is expected to be at work each time they are scheduled.

F-1 New employees are expected to be at work each time they are scheduled during their probationary period.

F-2 Upon reaching seniority, all employees shall follow the current year attendance policy which will be given to you upon reaching seniority. This policy can also be found posted on the bulletin board in the cafeteria.

F-3 If for some reason an employee is unable to report for work as scheduled, notification of such absence or tardiness must be reported to your supervisor or the Personnel Office as far in advance as is possible.



Subtopics

Some tables of contents list topics and subtopics. Subtopics are usually indented under the main topic heading. A quick glance will tell you the subtopics listed under each topic.

Look at the example below. This is the table of contents from your company's Pension Plan For Hourly Employees handbook.

TABLE OF CONTENTS

You might need to use your Pension Plan manual if you needed to know:

* how long your disability pension would be paid
* how your pension is affected if you get married
* what the initials ERISA stand for and what rights ERISA provides for you as an employee

This table of contents has subtopics included. Look at topic "B. Definitions." There are five subtopics under topic B. Subtopics give you a more complete idea of what is included in the manual. They make it even easier for you to find exactly the information you are looking for.

Look closely at the complete table of contents from the Pension Plan For Hourly Employees. Refer to it as you answer the questions that follow. When you finish, check your answers with the answer key at the end of this lesson.

Applying What You Know

Use the table of contents from the Pension Plan For Hourly Employees manual, on the following page, to help you find answers to the sample questions on page 5.

SAMPLE QUESTIONS

1. How many subtopics are in Section I?

2. On which page does topic "C. Cost" appear?

3. On which page could you find information about how long your disability pension would be paid?

4. If you are married, to which page would you turn for information about your pension? If you are single?

5. To which page would you turn to find information about ERISA?

Answers: [place upside down on page or in answer key at end of module]

1. 4 subtopics
2. page 2
3. page 5
4. page 3
5. pages 10 and 12

Simulation/Application Exercise

Think of two questions you have about how your pension plan works for you. Write the questions below.

1._____

2._____

Now, use your Pension Plan for Hourly Employees handbook to find the answers to your questions. Use the table of contents to help you locate the information in the handbook.

Make a note of your answers. Sometime soon, talk with a fellow worker or your spouse about your pension plan and what you have learned about it.

COMPLETE TABLE OF CONTENTS

PENSION PLAN FOR HOURLY EMPLOYEES

APPENDIX G

SAMPLE LESSONS FOR DIAGRAMS AND TABLES

Lesson 1: **Reading a Ceiling Fan Diagram**

Diagrams are an important part of many manuals and books you read to do your job. The better you can read diagrams, the more quickly and better you will be able to find the information you need to do your job.

Imagine that your supervisor told YOU to fix the broken ceiling fan in the paint room. He gave you a diagram and the list of parts and told you to let him know what parts need to be ordered for the fan.

Attached is a diagram your supervisor gave you. It is a diagram of a ceiling fan. You would use the diagram when ordering parts to repair this ceiling fan.

Look at the box at the top of the diagram in Example 1. These headings are listed across the top:

Key No.	678 Part No.	679 Part No.	676 Part No.	684 Part No.	Description

"No." is a common abbreviation for "number". So "Key No." stands for Key Number. Each part of the ceiling fan shown in the drawing has a Key No., or a number that "keys" it to the part number and description.

For example, look at the fan part in the bottom left corner of the diagram labeled with a "1". Next, find "1" in the column under "Key No." on the parts chart. Run your finger across the chart to the "Description" column. The description for key number 1 is "Plastic Lens." The item labeled number 1 in the diagram is called a plastic lens.

Each of the other columns in the parts chart list the part numbers for the different models of ceiling fans. Look at the numbers above "Part No." in each of the columns. The numbers are 678, 679, 676, and 684. Each of these numbers is a "Model" number. There are four different types, or models of fans that are similar, but different. Beneath each model number are the part numbers for the parts that go with that model.

EXAMPLE 1

"NO." STANDS FOR NUMBER

THE NUMBERS 678, 679, 676 + 684 ARE MODEL NUMBERS.

A DASH (-) IN THE PART NUMBER COLUMN SHOWS THE PART DOES NOT GO WITH MODEL 684.

SERVICE PARTS

KEY NO.	678 PART NO.	679 PART NO.	676 PART NO.	684 PART NO.	DESCRIPTION
1	99110677	99110677	—	—	Plastic Lens
2	97005316	97005316	—	—	Acorn Nut
3	99770005	99770005	—	—	Bulb Holder
4	95306276	95306276	—	—	Light Reflector
5	99110522	99110522	97006160	97006160	Grille
6	97006989	97006989	97006957	97006987	Motor Plate
7	99080229	99080166	99080095	99080095	Fan Motor
8	99110630	99110446	99020002	99020002	Blower Wheel
9	99270011	99270011	99270011	99270011	Receptacle, black
10	99270479	99270479	—	—	Receptacle, white
11	98003036	98003036	95003036	95003036	Mounting Bracket (4 Req.)
12	97004092	97004092	97004091	97004091	Housing
13	97003932	97003932	97003932	97003932	Damper
14	99390015	99390015	99390015	99390015	Grounding Clip
15	99170245	99170245	9917C245	9917C245	#8 x ⅜ Screw
16	99260466	99260466	99260425	99260425	Motor Nuts (2 Req.)
17	99160309	99160309	—	—	Grille Stud
18	99260473	99260473	—	—	Tinnerman Nut
19			99100399	99100399	Rubber Spacer (2 Req.)

Always order by "Part No - Never by "Key No."

THE ITEM MARKED "NO. 1" IS CALLED A PLASTIC LENS.

PART NUMBERS ARE LISTED HERE. MODELS 678 & 679 ONLY

MATCH THE NUMBER 1 WITH THE KEY NO. ABOVE.

MODELS 676 & 684 ONLY

For example, we know that item number 1 in the diagram is a plastic lens. Look at the column under "678". What is the part number for the plastic lens for model 678? The part number is 99110677. Models 678 and 679 have the same type of plastic lens. You know this because the part numbers are the same.

Fan models 676 and 684 show a dash (-) in the part number column. This means that this part is not available for this type of fan. These two fan models don't have a light built into them.

Applying What You Know

Use the diagram and the parts chart for the ceiling fan to answer the following questions by filling in the blank or circling the correct answer.

1. The part in diagram labeled "8" is called a _____.

2. The part labeled number 8 is used on which of the fan models?

   a. 687 only
   b. 678 only
   c. 678 and 679 only
   d. it is used on all four models

3. The part labeled 3 is called a _____ .

4. Which models use the part labeled 3? _____.

5. You need to order a white receptacle for ceiling fan model number 679. What part number would you use to place your order?

_____

6. In all fans, the fan motor is connected to the

   a. grille
   b. bulb holder
   c. blower wheel
   d. grounding clip

7. The damper is connected to the

   a. mounting bracket
   b. housing
   c. grille
   d. grille stud

8. Which fan models require rubber spacers? _____

9. What is the part number for item 5 on fan model 676? _____

10. Notice the message under the parts box that says, "Always order by Part No. -- Never by Key No." Explain why you think this is good advice. _____

_____

_____

Check your answers with the answer key before going on.

Answers: [place upside down on page or in answer key at end of module.]

1.	Blower wheel	6.	c
2	d	7.	b
3.	bulb holder	8.	models 676 and 684
4.	models 678 and 679	9.	97006160
5.	99270479		

10. The key number doesn't tell what type of part is needed. Many models may all use a special part like a motor, but each motor is different so the part number is needed to tell them apart.

Lesson 2: Reading an Hourly Pay Rate Table

Whether using job manuals or company policy booklets, everyone needs to know how to get information from tables and charts. A table is a good way to organize a lot of information in a small amount of space on a page. Tables are good sources of information if you know how to read them. Because information is displayed next to other information, tables can help you make comparisons.

The table below is from a page in your company policy manual. It lists the hourly pay rates by labor grade. You will notice that across the top of the table are the different hourly rates. Down the left side of the table are the different labor grades. Reading this table can tell you much of what you need to know about the pay scales in your company.

Section 3 - Hourly Pay Rates by Labor Grade

LABOR GRADE	HIRE RATE	PROB. RATE	BASE RATE	AFTER 6 MOS. REG. SERV.	AFTER 12 MOS. REG. SERV.	AFTER 18 MOS. REG. SERV.	AFTER 24 MOS. REG. SERV.
I	3.50	3.75	3.90	4.20	4.60	5.10	5.70
II	4.10	4.20	4.40	4.70	5.10	5.60	6.30
III	4.50	4.60	4.80	5.10	5.50	6.00	6.70
IV	4.80	4.90	5.10	5.40	5.80	6.30	7.00
V	6.50	6.60	6.70	6.90	7.20	7.45	7.80
VI	7.10	7.25	7.35	7.50	7.65	7.80	8.15
VII	8.10	8.25	8.35	8.50	8.65	8.80	9.15

For example, if your friend was just hired yesterday as a Labor Grade I, how much would he earn? By looking at the table, you can see that a Labor Grade I employee would earn the Hire Rate of $3.50 an hour. But if you have been on the job for over 24 months and you are a Labor Grade IV, how much would you be earning? Run your finger down the list of labor grades on the left of the table. Next, move your finger across to the column that says "AFTER 24 MOS. REG. SERV." (Months of Regular Service has been abbreviated as "Mos. Reg. Serv.".) How much would you be earning?

Use the table and the written information below it to answer the following questions.

1. What is the Base Rate for a Labor Grade I? _____

2. What is the Probationary Rate for a Labor Grade VII? _____

3. What could you expect to earn after 6 months as a Labor Grade III? _____

4. What could you expect to earn after 18 months as a Labor Grade V? _____

5. What would a Labor Grade II earn after 24 months? _____

6. At the base rate, how much more would a Labor Grade III earn than a Labor Grade I?

_____

7. Who earns more, a Labor Grade I at 24 months, or a Labor Grade IV at Base Rate?

_____

8. Who earns more, a Labor Grade III at 18 months, or a Labor Grade IV at 12 months?

_____

9. What is the highest hourly wage paid? _____

10. What is the difference between the highest and lowest wages paid in your company?

_____

Check your answers with the Answer Key.

Answers [place upside down on the page or in Answer key at end of module]

1. $3.90
2. $8.25
3. $5.10
4. $7.45
5. $6.30
6. $ .90
7. Labor Grade IV at Base Rate
8. Labor Grade III at 18 months
9. $9.15
10. $5.65

APPENDIX H

READABILITY FORMULAS

(Moore, 1987)

Readability is an index of the ease of comprehension of a written passage. Check the readability of instructional materials to ensure that you use them appropriately with the learners. Many formulas are available. Before using a particular formula, check to see that it is the best one to use given the nature of the material to be analyzed and the age of the learners. In addition, some microcomputer programs are available. These programs are faster than calculating readability formulas by hand.

Most formulas use one or more of the following factors to assess readability: average sentence length, percentage of long words, number of sentences, number of unfamiliar words, and number of polysyllabic words.

Since not all formulas will produce the same result on the same material, more than one formula should be used on each set of material (unless only a rough estimate is required).

Fog Readability Formula Characteristics

- uses the average sentence length plus the number of three or more syllable words in a 100-word passage
- tends to run a little higher than other formulas (especially on advanced material)
- how to calculate:
  - a.) Select at least three passages from the material.
  - b.) Count 100 words for each passage. (Count contractions and hyphenated words as one word. Count numbers and letters as one word.)
  - c.) Count the number of sentences.
  - d.) Calculate the average sentence length by dividing 100 by the number of sentences.
  - e.) Count the number of words that have three or more syllables. (Do not count capitalized words, combinations of short easy words [bookkeeper], or verb forms made into 3 syllables by adding -ing or -ed.)
  - f.) Add the two factors of average sentence length and number of three syllable words.
  - g.) Multiply the total obtained in (f) by 0.4. This is the approximate grade level.

SAMPLE READING PASSAGE: CALCULATING THE FORECAST

A sample reading passage, worksheet and solution follows.

From: Roth, A. C. (1981). Small Gas Engines. South Holland, IL: Goodheart-Willcox Company, Inc.

Friction is the resistance to motion created when one dry surface rubs against another. Even highly polished metal surfaces have irregularities (when studied under a microscope) that would create much friction if rubbed together. The microscopic roughness would resist movement and create heat.

As the relatively rough projections on the contact surfaces rub across each other, they eventually would break off and become loose particles. The particles, in turn, would work between the surfaces and gouge grooves in the metal. Then, as the friction and heat increases, the metal parts would expand, causing greater pressure between the surfaces and creating even greater friction. This condition of wear exists until the parts either weld themselves together or seize (expand so much that mating parts cannot move).

In some cases, the excessively worn parts lose so much material from their contact surfaces, they become too loose to function properly. When this happens, the scored part should be replaced with a new one.

Forecast Readability Formula Worksheet

1.) Number of 1-syllable words. _____

2.) #1 divided by 10 _____

3.) #2 subtracted from 20 _____

It is recommended that you sample from the beginning, middle, and end of the book or manual. You should then average the 3 to determine the readability of the total document.

Sample Passage #1 _____
Sample Passage #2 _____
Sample Passage #3 _____

Reading Level (average of 3 samples) _____

FORECAST EXERCISE SOLUTION

From: Roth, A. C. (1981). Small Gas Engines. South Holland, IL: Goodheart-Willcox Company, Inc.

[The one-syllable words are underlined.]

Friction is the resistance to motion created when one dry surface rubs against another. Even highly polished metal surfaces have irregularities (when studied under a microscope) that would create much friction if rubbed together. The microscopic roughness would resist movement and create heat.

As the relatively rough projections on the contact surfaces rub across each other, they eventually would break off and become loose particles. The particles, in turn, would work between the surfaces and gouge grooves in the metal. Then, as the friction and heat increases, the metal parts would expand, causing greater pressure between the surfaces and creating even greater friction. This condition of wear exists until the parts either weld themselves together or seize (expand so much that mating parts cannot move).

In some cases, the excessively worn parts lose so much material from their contact surfaces, they become too loose to function properly. When this happens, [150] the scored part should be replaced with a new one.

Forecast Readability Formula Worksheet

	82	
1.) Number of 1-syllable words.	8.2	
2.) #1 divided by 10	11.8	[approximate readability index of this passage]
3.) #2 subtracted from 20		

SAMPLE READING PASSAGE: CALCULATING THE FOG

From: Roth, A. C. (1981). Small Gas Engines. South Holland, IL: Goodheart-Willcox Company, Inc.

Friction is the resistance to motion created when one dry surface rubs against another. Even highly polished metal surface have irregularities (when studied under a microscope) that would create much friction if rubbed together. The microscopic roughness would resist movement and create heat.

As the relatively rough projections on the contact surfaces rub across each other, they eventually would break off and become loose particles. The particles, in turn, would work between the surfaces and gouge grooves in the metal. Then, as the friction and heat increases, the metal parts would expand, causing greater pressure between the surfaces and creating even greater friction. This condition of wear exists until the parts either weld themselves together or seize (expand so much that mating parts cannot move).

In some cases, the excessively worn parts lose so much material from their contact surfaces, they become too loose to function properly. When this happens, the scored part should be replaced with a new one.

Fog Readability Formula Worksheet

1.) Number of words in passage _____

2.) Number of sentences in passage _____

3.) Average sentence length _____

4.) Number of 3-syllable words _____

5.) Total of #3 + #4 _____

6.) #5 multiplied by 0.4 _____

It is recommended that you sample from the beginning, middle, and end of the book or manual. You should then average the 3 to determine the readability of the total document.

Sample Passage #1 _____
Sample Passage #2 _____
Sample Passage #3 _____

Reading Level (average of 3 samples) _____

FOG EXERCISE SOLUTION

From: Roth, A. C. (1981) Small Gas Engines. South Holland, IL: Goodheart-Willcox Company, Inc.

[Words having three or more syllables are underlined.]

Friction is the resistance to motion created when one dry surface rubs against another. Even highly polished metal surfaces have irregularities (when studied under a microscope) that would create much friction if rubbed together. The microscopic roughness would resist movement and create heat.

As the relatively rough projections on the contact surfaces rub across each other, they eventually would break off and become loose particles. The particles, in turn, would work between the surfaces and gouge grooves in the metal. Then, as the friction and heat increases, the metal parts would expand, causing greater pressure between the surfaces and creating [100] greater friction. This condition of wear exists until the parts either weld themselves together or seize (expand so much that mating parts cannot move).

In some cases, the excessively worn parts lose so much material from their contact surfaces, they become too loose to function properly. When this happens, the scored part should be replaced with a new one.

Fog Readability Formula Worksheet

1.) Number of words in passage	100	
2.) Number of sentences in passage	5	
3.) Average sentence length	20	
4.) Number of 3-syllable words	11	
5.) Total of #3 + #4	31	
6.) #5 multiplied by 0.4	12.40	[approximate readability index of this passage]

APPENDIX I

OTHER BASIC SKILLS SOURCES

Following are sources of basic skills programs, teaching materials, development guidelines, and occupational specific competencies.

Agency For Instructional Technology. Instructional Design for Applied Communication; A Curriculum and Learning Materials for High School Vocational Students. A Preliminary Design Report. AIT, Box A, Bloomington, IN 47402. Feb. 1987.

California State Department of Education, Sacramento, CA. Essential Living Skills. Consumer and Homemaking Education Guide to Proficiencies and Performance Indicators for the Occupation of Homemaking. Publication Sales, California Department of Education. 1984.

_____.Learning to Read and Write the Electronics Way. Publication Sales, California Department of Education. 1983.

_____.Learning to Verbally and Visually Communicate the Metalworking Way. VOICE, California Department of Education, 721 Capitol Mall, Sacramento, CA 95814. 1983.

_____.Learning to Verbally and Visually Communicate the Electronics Way. VOICE, California Department of Education, 721 Capitol Mall, Sacramento, CA 95814. 1983.

_____.Learning to Verbally and Visually Communicate the Automotive Way. VOICE, California Department of Education, 721 Capitol Mall, Sacramento, CA 95814. 1983.

Davis, B. and N. S. Woodruff, Project Trade Related Reading Packets for Disabled Readers. Final Report. New Jersey State Dept. of Education, Trenton. Division of Vocational Education and Career Preparation. 1985.

Dougherty, B. and J. Novak, (editors). Improving Basic Skills; Volume III - A Collection of Programs and Resources Selected for the Governor's Conference on Basic Skills. (Madison, Wisconsin, Dec. 1981). University of Wisconsin, Madison, Vocational Studies Center, Sept. 1982.

Fields, E. L., W. L. Hull and J. A. Sechler, 'Adult Literacy: Industry-Based Training Programs." The National Center for Research in Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, OH 43210-1090. 1987.

Flanagan, W. M. "Computerized Vocational Objectives Manual and Data Bank for Students with Special Needs. A User's Manual and Comprehensive Data Bank of Over 3000 Vocational Entry and Exit Level Objectives Designed for Special Needs Learners." University of Missouri, Columbia. Department of Practical Arts and Vocational-Technical Education. Nov. 1984.

Harding, S., B. Mogford, W. H. Melching and M. Showel, "The Development of Four Job-Oriented Basic Skills (JOBS) Programs." Northrup Services Inc. Sept. 1981.

Johnson, D. E. Basic Skills for Word Processing. Office Occupations Audiovisual Package. Instructors Guide. Student Activity Packet. Texas Education Agency, Austin. Dept. of Occupational Education and Technology. 1982.

Kangisser, D. "Job-Related Basic Skills: A Guide For Planners of Employee Programs." Business Council for Effective Literacy, Bulletin, Issue No. 2, June 1987. Business Council for Effective Literacy, 1221 Avenue of the Americas, 35th Floor, New York, NY 10020.

Milulecky, L. and T. G. Stitch, Job-Related Basic Skills: Cases and Conclusions. Information Series #285. Eric Clearinghouse on Adult, Career, and Vocational Education; The National Center for Research in Vocational Education; The Ohio State University, 1960 Kenny Road, Columbus, Ohio. 43210-1090. 1984.

Moe, A. J., et. al. The Literacy Requirements of an Industrial Maintenance Mechanic on the Job and in a Vocational Training Program. Purdue University, Lafayette, IN, Department of Education. January 1980.

New Brunswick Board of Education, N.J. The Career Exploration Program. Final Report. New Jersey State Dept. of Education, Trenton. Division of Vocational Education and Career Preparation. 1983.

Philippi, J. Reading-To-Do. Big Bend Community College, Bad Kreuznach, W. Germany, U.S. Army Europe. (Contract No. DAJA37-83-D-004.) Available from Big Bend Community College, European Division, Central Services, Bad Kreuznach, W. Germany, 1985.

_____. Reading-To-Learn. Big Bend Community College, Bad Kreuznach, W. Germany, U.S. Army Europe. (Contract No. DAJA37-83-D-004.) Available from Big Bend Community College, European Division, Central Services, Bad Kreuznach, W. Germany, 1986

Rush, T., A. Moe, and R. Storlie. Occupational Literacy Newark, Del.: International Reading Association, 1986.

Sticht, T. G. Functional Context Education. Applied Behavior & Cognitive Sciences, Inc. March 1987.

Walker, C. B. "Selected Standardized Tests and Assessment Instruments for Measuring Occupational Competencies: Teaching Basic Skills through Vocational Education." Cornell Institute for Occupational Education. April 1980.

Webb, R. B., et. al. The Basic Skills Instructional System: A Manual for Improving the Reading and Language Arts Skills of Low Achieving Students. Florida Educational Research and Development Council, Inc., Sanibel. 1983.