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ABSTRACT

This manual, which was developed on the basis of a 1990 workplace literacy program delivered to employees of Motorola, Inc., in Texas, is intended to serve as a guide to other adult education providers interested in creating partnerships with local companies. It is organized into eight chapters. The introductory chapter presents background information on the Comal, Guadalupe, and Kendall Counties Adult Education Co-op and Motorola, Inc. In chapter 2, adult education providers are given guidelines for getting acquainted with the company's needs, selling their organization, and designing a program specific to the company. Recruiting students, assessing participants, and obtaining initial participant feedback are discussed next. The fourth chapter begins with a class schedule and basic class structure and includes guidelines, sample work, and sample lessons for three math classes and a reading class. Covered in chapter 5 are final assessment of participants and final participant feedback and results. Employee/participant, manager/supervisor, and instructor evaluation forms and selected comments are provided in chapter 6, and chapter 7 discusses various program hurdles (getting started, initial assessments, class schedules, and final assessments). A brief conclusion and 7 references conclude the guide.
 (MN)

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WINNING THE RACE AGAINST TECHNOLOGY

IMPLEMENTING LITERACY PROGRAMS IN THE WORKPLACE

1990-1991

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Workplace Literacy Coordinator
Comal, Guadalupe, and Kendall
Counties Adult Education Co-Op
Schertz, Texas

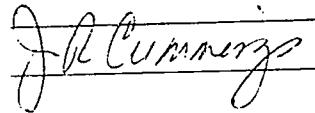
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CE-064 503

**"We must build an emphasis on
workforce literacy if the nation
is to meet the economic and
social challenges of the years
to come."**

**Forrest P. Chisman
Jump Start: The Federal
Role in Adult Literacy
October, 1988**

"No issue is as critical to the future of America as illiteracy in the workforce. We simply cannot allow this nation to enter the 21st century without a literate, skilled, and flexible workforce. The answer lies in working together....What is required is the establishment of partnerships."

**James E. Duffy
Pres. of Comm., ABC
Broadcast & Network
Divisions, Capital
Cities/ABC, Inc.**

**"Only 20% of job applicants at
Motorola can pass a simple
seventh-grade test of English
comprehension or a fifth-
grade mathematics test."**

**Carlton Braun
VP Motorola, Inc.
1987**

FORWARD

The Schertz-Cibolo-Universal City Independent School District Adult Education Co-Op and Motorola embarked on a joint employee education program a little over one year ago. The first component was a pilot math class that took place in May, 1990. The second component came about when the Co-Op was able to obtain funding from the Texas Education Agency for a workplace literacy program. In November, 1990 we assessed 93 volunteer employees at Motorola. After assessing the employees, we recommended to Motorola what reading and math class level (A, B, or C) each employee should be placed into. A total of 59 employees were placed into math classes and 26 into reading classes. Classes began on February 5, 1991. All 26 reading students were divided into three level A classes. The Math A skills class was designed to cover basic arithmetic instruction in addition, subtraction, multiplication, and division of whole numbers. One class of nine students was scheduled. The Math B skills class was designed to cover addition, subtraction, multiplication, and division of fractions and decimals. There were two B classes; one of nine students and one of 17 students. The Math C skills was designed to cover percentages, proportions, measurements, charts/graphs, and simple equations. Two C classes of eight and 16 were formed.

This manual reflects the planning, implementation, and closure of our project with Motorola. Our hope is that this manual will serve as a guide for other adult education providers in creating partnerships with local companies.

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I. Opening Ceremonies

A. Acknowledgements

B. Comal, Guadalupe, & Kendall Counties Adult Education
Co-Op

C. Motorola

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This manual is a product of a demonstration project funded by a Texas Education Agency Adult Education Special Project Grant. The grant was attained by the Comal, Guadalupe, and Kendall Counties Adult Education Cooperative. The partnership was formed with Motorola, Inc. in Seguin. The project coordinator would like to thank all those who provided cooperation, support, and encouragement throughout the project.

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Guadalupe Co. Literacy Council
Evelyn Curtis, TEA Monitor

COMAL, GUADALUPE, AND KENDALL COUNTIES ADULT EDUCATION CO-OP

The Schertz/Cibolo/Universal City Independent School District has served as the fiscal agent for the Comal, Guadalupe, and Kendall Counties Adult Education Co-op since 1984. The Co-op offers classes in English as a Second Language, English Literacy, Amnesty, Citizenship, Adult Basic Education, and GED preparation throughout the three counties. Basic skills classes are held at Randolph Air Force Base and Westpoint Pepperell for their employees. The Co-op also works in cooperation with the Department of Human Services in Seguin to provide classes for AFDC recipients three full days a week. Other cooperative efforts take place with MHMR, probation departments, and the county jails. In all three counties the volunteer literacy councils are under the direction of the Co-op.

MOTOROLA

Motorola Inc., one of the world's leading manufacturers of electronic equipment and components, is engaged in design, manufacturing, and sale of a diversified line of electronic products. These products include two-way land mobile communications systems, cellular car telephone systems, paging systems and other forms of electronic communication systems; semiconductors, including integrated circuits, discrete devices, and microprocessor units; information systems products such as low, medium, and high speed modems, multiplexers and network processors; electronic equipment for military and aerospace use; electronic engine controls, digital appliance controls, and other automotive and industrial electronic equipment; and multi-function computer systems for distributed data processing and office automation applications. Manufacturing using such competitive methods and technology is continually becoming more complex. Employees must be more proficient in literacy and math skills in order to comprehend and perform within these new advances and thus maintain their employability. It is for this reason that the partnership was formed between the Adult Education Co-op and Motorola--Seguin, Texas.

II. Warm-Up

A. Getting Acquainted With The Company's Needs

1. What is the function of this company?
2. To whom do you talk to at the company?
3. Why does this company need a literacy program?
4. When and where would this program take place?

B. Selling Your Organization

1. Organization's success in the community
2. Results from previous programs in this company

C. Designing a Program Specific To The Company

1. Advisory committee
2. Type of classes and class scheduling
3. Available assessment tools
4. Staff
5. Responsibilities of the company and organization

A. GETTING ACQUAINTED WITH THE COMPANY'S NEEDS

The most difficult part of developing a workplace literacy program very well may be the initial contacts with a company. It was our job to show Motorola that they could benefit from a basic education program and that we could successfully provide that program. This section will focus on the initial contacts with the company.

1. What is the function of the company?

Before contacting the company it is important to have an idea of the functions the company performs. The Adult Education representative should learn as much as possible about the company's products or services, organizational structure, and employee qualifications. General information can be gathered by simply calling the personnel or marketing office.

2. To whom do you talk to at the company?

Although it is possible that the company may make the first contact, probably it is the Adult Education representative who will have to initiate the communication. The representative will have to decide whom to approach within the company: the training director, personnel manager, or the company administrator. An introductory letter can be sent to the company describing your education program. The letter may then be followed-up with a phone call to set an appointment. This approach allows the company time to appoint an appropriate contact person. In working with Motorola, it was the training manager who served as our contact. Eventually the contact was transferred to another

training department staff person who was able to devote more time to the project.

3. Why does this company need a literacy program?

When a meeting is arranged, the adult education representative then has the task of convincing the contact person that his/her company would benefit from a basic education program. Determining what kinds of training program the company has is beneficial at this point.

Companies already deal with adult education in a variety of ways. Depending on the size and type of company, anything from job-specific instruction to seminars on people skills to continuing formal education may already be offered. However, for the undereducated worker, few of these opportunities are appropriate. This is where your organization could become useful.

Most employers know the direct relationship educational level has on job performance. Today's industries are demanding more and more skill in English, reading, writing, and mathematical competency. Much of the workforce may be unable to perform on the level demanded because they lack the basic skills. Some of the dilemmas this creates for both employers and employees include more job related accidents which lead to higher insurance rates, lower production output, more production rejects which leads to higher production costs, and less chance for promotions and movement within the company. For Motorola, the advancement of technology and methods made it imperative that employees become more proficient in literacy and math skills.

By providing a basic skills program to their undereducated workforce, an company may increase job performance in two ways. The first has already been pointed out above. Basic education classes can increase education level of employees thereby raising job performance. In addition, providing these classes acknowledges that the undereducated employees are an important asset to the company. This attention, plus employees' progress during the classes, will bring about a positive change in self-esteem resulting in increased job performance.

4. When and where would this program take place?

When and where the program would possibly take place is a crucial factor even before the final decision to have a program is made. Many companies might be willing to admit they have a literacy problem, but less willing to take company time to implement a solution. The adult education representative should provide the different options for the company. The company might want to utilize adult education classes already established in the community. Other options might be to provide classes only for employees either at the worksite or at an alternate location. Hours can be mornings, afternoons, evenings, or any combination. This could be company time, employee time, or both. The program could be volunteer or mandatory. At this point in planning, specifics are not important. What is important however, is the adult education provider letting the company know what options are available from their end. The company should also be informed about it's financial responsibility relative to each option. The company should then be in a position to decide what kind of

program they want to implement. Motorola decided that classes would be held at the plant, and that they would be held on company time during the first and second shift. Each class would meet two hours twice a week. The program would initially be voluntary, but if the program continued after the first year, however, it might become mandatory. Motorola would provide classroom space, utilities, and employees. The Co-op would provide materials, supplies, teachers, and an administrator.

B. SELLING YOUR ORGANIZATION

For those of us not in the corporate world, selling our program is a hard concept to adopt. Basically you must show your track record. One thing we learned in the process of setting up our workplace literacy program with Motorola was that figures are important in the corporate world. Charts and graphs showing percent increases helped "sell" our program.

1. Organization's success in the community

The most obvious way to sell your program to the company is to show what you are already doing in the community. A packaged report telling more about your organization, your programs, other workplace projects you have had before, and curriculum you use may be helpful. Again, numbers are good to include at this point: average number of GEDs per year, before and after results from assessments done in other projects, number of students continuing on to college, absentee rates, attendance rates, and dropout rates.

2. Results from previous programs in this company

In the case of Motorola, we had been in the plant teaching GED classes in previous years. Also, when this particular project was initially considered, we began a pilot math class with 15 students to get an idea of how it might work. Because we showed success in both the GED classes and the pilot class, Motorola had confidence that the full-scale project could also be a successful endeavor.

C. DESIGNING A PROGRAM SPECIFIC TO THE COMPANY

If the company finally decides that your program is the best route for them to go for workplace literacy, then the real planning can start. A number of organizational components should be introduced and talked about at this point. Some of these will not be finalized until the program actually begins.

1. Advisory committee

The formation of an advisory committee may be beneficial to your program. The advisory committee should be composed of interested or affected individuals from both the company and your organization (for example, supervisors, student/employees, teachers). The primary duty of this committee is to set goals, coordinate activities, review the program, offer guidance and direction. In our program, we did not implement an advisory committee. However, the program director, coordinator, and teachers were in constant contact with the training manager and a training staff member to perform the same duties as a committee.

2. Type of classes and class scheduling

These next decisions may have already been discussed in the initial meetings, but now need to be finalized. The types of classes offered can range from individualized GED/ABE instruction to structured classes covering ESL or a specific subject and will depend on the needs of the company. The number of students will depend on whether the program is mandatory or voluntary, and whether it is on company time, employee time, or a combination. The number of classes you will hold is determined by both the company and your organization, based on their needs and on available resources. Motorola was interested in basic skills classes in literacy and math. The Co-op was able to offer up to eight classes with funding from TEA. The original design included one low-level, two mid-level, and one advanced-level math classes, and one low-level, two mid-level, and one advanced-level reading classes. The program was voluntary but because employee interest was high, we estimated 120 students would participate in the program (15 per class). Each class was scheduled on company time two hours twice a week. This was the plan, however after assessments were done we had to rework the schedule somewhat. Be prepared to do the same.

3. Available assessment tools

Once you know the type of classes you will be holding, then you need to pick an assessment tool. If you will be teaching the same types of classes as you teach in the community you may want to use your usual placement test. If your program will be more job-related then a specific placement test will have to be created.

Another thing to keep in mind is that the company may want to use a standardized test such as the TABE or ABLE. This was very important to Motorola in our pilot class. However, it was later changed because it did not accurately measure what the students had learned. For this program, Motorola and the Co-op decided on using the Reading for Understanding (SRA) and the Mastery Math Test (Steck-Vaughn). A sample of each can be found in Chapter III (starting on page 22).

4. Staff

After you have a general idea of the types and numbers of classes you will be holding for the company you can start to gather your staff. Our Co-op felt we would need a part-time coordinator and three teachers to handle the program. The staff needed to be experienced in teaching adults literacy and math skills. The coordinator needed to have additional experience in administrative duties and curriculum building. At the end of this chapter (page 16) you will find our project job descriptions.

5. Responsibilities of the company and organization

It is important to have a clear understanding of the partnership roles and responsibilities before proceeding further with the program. Who will pay for what costs? Who will provide support staff? Who will be the primary contact person at the company? Who will be the primary contact person at your organization? What does the company expect from your organization? What do you expect from the company? These are a few of the questions to consider during this phase. If an oral agreement is unreliable, a

written contract might be preferred by both parties. Since Motorola and the Co-op had worked together on other projects we decided to forgo a written contract. Motorola's responsibilities were to advertise the program to employees, arrange assessments and final class schedule, provide classroom space and utilities, provide a contact person from the training department, and allow limited photocopying. The Co-op would provide a coordinator, teachers, assessments, student materials and supplies, additional photocopying, administrative support, and a final report.

The remainder of this manual is specific to the process we used in implementing our workplace literacy program with Motorola. Although the process can not apply purely to any other workplace literacy program, we hope it will provide a practical framework for your endeavor.

MOTOROLA WORKPLACE LITERACY JOB DESCRIPTIONS

COORDINATOR:

The coordinator of the project will be responsible for the organization and day to day operation of the eight classes being held at Motorola. The coordinator will directly supervise all teachers in the project. This person will also serve as a liaison between the Adult Education Co-Op and the Motorola Training Department and intervene between teachers and student employees if needed. The coordinator will be instrumental in helping to solve problems as they arise in the project. Collecting monthly records from teachers as well as any reports requested by the Training Department will be another duty of this position. The coordinator will produce a manual by the end of the project funding period (Summer, 1991), describing the implementation of, methods used throughout, and problems encountered during the Motorola project. The coordinator will report directly to the Co-Op director.

TEACHERS:

The teachers will be responsible for the organization and day to day operation of their particular classes. Teachers will be well prepared for classes and turn in daily lesson plans. Lesson plans will be based on objectives designed for each class. The teachers will implement different methods of presenting material so student/employees can comprehend information. Classwork, homework, quizzes, and tests will be part of the curriculum. Attendance and grades will be kept by the teachers and turned in monthly. The teachers will report directly to the project coordinator.

III. Starting Gate

A. Recruiting Participants

B. Assessing Participants

C. Initial Participate Feedback And Results

A. RECRUITING STUDENTS

In many programs it might be your organization's job to do the recruitment of student employees. If so, you could publicize in a number of ways: flyers, posters, announcements on electronic message boards, company newsletters, word of mouth. Recruitment for our program was done by Motorola. The training staff dispersed forms for employees to fill out if they were interested in participating in a voluntary reading and math assessment program (page 21). This was only for the employee to take the reading and math assessment and be confidentially advised about his/her results. Confidentiality was imperative if employees were going to participate. This did not ensure placement in a class. However, in order to be considered for a class an employee had to take the assessment.

B. ASSESSING PARTICIPANTS (INITIAL)

The assessment tools Motorola and the Co-Op decided on were the Reading for Understanding (Science Research Association) numbers 41-89 and the Math Mastery Test (Steck-Vaughn). Samples of these can be found starting on page 22. The coordinator did assessments with groups of 10-25 employees. It took two hours for each group. During the first hour, employees took the RFU and during the second hour they took the Math Mastery Test. A total of 93 employees were assessed.

C. INITIAL PARTICIPANT FEEDBACK & RESULTS

After the assessments were scored, the coordinator held individual conferences with each employee. In the conference the

employee was informed about his/her results. Reading results were shown by a grade level. Before the employee got too discouraged, this was compared to the amount of schooling the employee had and how long he/she had been out of school. Math results were shown by skill mastery. Employees were shown which math skills they had mastered and which ones they needed work in. Employees were given forms bearing these results (page 27). They were also informed that scores were confidential and the Adult Education Co-Op would not distribute identifiable individual results to Motorola management. Initial assessment results were given to Motorola without identifying information. These results are on page 28. Essentially, Motorola only knew what level classes each individual was recommended for but not his/her actual assessment scores.

VOLUNTARY READING AND MATH ASSESSMENT PROGRAM

Volunteers will be assessed (tested) to find out what, if any help they need with reading and math skills. Volunteers will be individually advised about the results .

IMPORTANT

Only you and the advisor will ever see or be told about how you do on the assessment.

Those requiring help will be provided with an opportunity to attend reading and/or math classes to satisfy their individual need.

Yes, I am interested in the voluntary reading & math assessment program.

NAME: _____ SS#: _____

SUPV: _____ DEPT. _____ SHIFT: _____

Employee Signature

Date

Please complete and sign this form, then place it in the ballot box outside of the Training Center. You will be notified in the future as to the assessment schedule.

Motorola is an equal opportunity affirmative action employer

RFU II

Reading for Understanding Placement Test

By Thelma Gwinn Thurstone

Name _____ Grade _____ Age _____

School _____ Teacher _____

DIRECTIONS:

The following sentence is incomplete. One of the four words below it will complete it. Read the sentence and find the right word.

You don't know whether you can play the game until you have

A — run.

B — won.

C — tried.

D — lost.

Tried is the best word to complete the meaning of the sentence. Notice that a ring has been drawn around the letter C to show that the C-word *tried* is the best word to complete the sentence.

Below are three practice exercises. Read each carefully and choose the best answer to complete it. Draw a ring around the proper letter to show your answer.

- 1 When waves hit against rocks, small pieces of the rock are broken off. When these broken pieces rub against other rocks, they break up again, making
A — rains. B — sand. C — waves. D — floods.

- 2 If the pilot of an airliner meets too much ice, he can ascend or descend to different flight levels until he finds a warmer
A — engine. B — transport. C — temperature. D — day.

- 3 When a sudden shift in wind direction made the temperature drop thirty degrees in an hour, Jim was glad he had
A — expected rain. C — worn an overcoat.
B — carried his lunch. D — several errands to do.

The teacher will tell you the answers to the problems on this page. The following pages contain similar reading exercises. Read carefully and try not to make mistakes. If you cannot understand a sentence, skip it and go on to the next one.

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

Source: SRA

- 41 In areas where wood is widely used for building, there is plenty of work for
 A – masons. B – carpenters. C – electricians. D – architects.
-
- 42 All the crew bailed out of the plane. The plane crashed and burned but no lives were
 A – saved. B – lost. C – rescued. D – parachuted.
-
- 43 Even primitive man found it necessary to have a home of some kind to protect himself from changes in the weather. Since he had no tools for constructing such a shelter, he had to live in
 A – caves. B – houses. C – cottages. D – cabins.
-
- 44 Instead of using one word over and over again, a person who has a good vocabulary uses different words with the same
 A – sound. B – length. C – spelling. D – meaning.
-
- 45 The shrill note of the referee's whistle told the team that they had broken a
 A – rule. B – leg. C – record. D – habit.
-
- 46 The Board of Health is responsible for matters of public health policy and for drafting the city's
 A – tax laws. B – house numbers. C – traffic regulations. D – sanitary code.
-
- 47 There are several types of human blood. The blood given in a transfusion must match the patient's blood. If the transfused blood is of a different type from the patient's blood, blood clotting and death will result. When a patient is given a transfusion, his very life is dependent on the
 A – anesthetic administered. C – amount of blood available.
 B – surgical skill of the doctor. D – type of the transfused blood.
-
- 48 There were few people at his funeral. He had outlived his hundreds of true friends who would have been at the funeral if they
 A – could have sent flowers. C – had not been so old.
 B – had known about it. D – had been alive.
-
- 49 There was baseball at the Polo Grounds that night. Eight banks of 120 lights, with each light 1500 watts, turned night into
 A – sport. B – suspense. C – day. D – pleasure.
-
- 50 As cities become larger, it is necessary for engineers to seek new sources of water to meet the demands of growing
 A – populations. B – lakes. C – children. D – gardens.

Source: SRA

Reading For Understanding--Grade Equivalency Chart

TABLE III

Grade Equivalents of Placement Test Scores and Practice Levels

Placement Test Score	Practice Level	Grade Equivalent	Placement Test Score	Practice Level	Grade Equivalent
Below 17		Below 2.5	55	18-19	5.2
17		2.5	56	20-21	5.3
18		2.5	57	22-23	5.4
19		2.6	58	24-25	5.5
20		2.6	59	26-27	5.7
21		2.6	60	28-29	5.8
22		2.7	61	30-31	6.0
23		2.7	62	32-33	6.1
24	1	2.8	63	34-35	6.3
25	2	2.8	64	36-37	6.5
26	2	2.9	65	38-39	6.8
27	2	2.9	66	40-41	7.0
28	2	3.0	67	42-43	7.2
29	2	3.0	68	44-45	7.4
30	3	3.1	69	46-47	7.6
31	3	3.1	70	48-49	7.8
32	3	3.1	71	50-51	8.1
33	3	3.2	72	52-53	8.3
34	3	3.2	73	54-55	8.5
35	4	3.3	74	56-57	8.8
36	4	3.4	75	58-59	9.0
37	4	3.4	76	60-61	9.3
38	4	3.5	77	62-63	9.6
39	4	3.5	78	64-65	9.9
40	5	3.6	79	66-68	10.2
41	5	3.7	80	69-71	10.4
42	6	3.8	81	72-74	10.7
43	6	3.9	82	75-77	11.0
44	7	4.0	83	78-80	11.3
45	7	4.1	84	81 or RFU General Edition	11.6
46	8	4.2	85		11.9
47	8	4.3	86		12.2
48	9	4.4	87		12.5
49	9	4.5	88		12.8
50	10	4.6	89		13.1
51	11	4.7	90		13.4
52	12-13	4.8	91		13.6
53	14-15	4.9	92		13.8
54	16-17	5.0	Above 92		Above 14.0

Source: SRA

MASTERY TEST —

Student _____

Social Security # _____

Instructions

Please place your answers on the answer sheet given to you.
If you need to figure out a problem on paper, please use scratch paper, not the test to write on.

The test is divided into six parts: Whole Numbers; Fractions; Decimals; Per Cent; Measurements and Formulas; and Ratio, Proportion, and Simple Equations. When you have finished the test and it has been scored, enter your score in the chart below. This will enable you to determine exactly where there are any weaknesses and where you need to acquire more skill.

		PROBLEMS	PERFECT SCORE	MY SCORE
Whole Numbers	Addition	1 - 4	4	
	Subtraction	5 - 8	4	
	Multiplication	9 - 12	4	
	Division	13 - 16	4	
Fractions	Addition	17 - 20	4	
	Subtraction	21 - 24	4	
	Multiplication	25 - 28	4	
	Division	29 - 32	4	
Decimals	Addition	33 - 36	4	
	Subtraction	37 - 40	4	
	Multiplication	41 - 44	4	
	Division	45 - 48	4	
Per Cent		49 - 68	20	
Measurements and Formulas		69 - 84	16	
Ratio, Proportion, and Simple Equations		85 - 100	16	
TOTAL SCORE			100	

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Whole Numbers

Add:

1.

$$\begin{array}{r} 17 \\ 29 \\ 78 \\ 85 \\ \hline 34 \end{array}$$

2.

$$\begin{array}{r} 2176 \\ \hline 3429 \end{array}$$

3.

$$\begin{array}{r} 2943 \\ 34 \\ 176 \\ \hline 2053 \end{array}$$

4.

$$\begin{array}{r} 27965 \\ 30609 \\ 22079 \\ 30705 \\ \hline 50078 \end{array}$$

Subtract:

5.

$$\begin{array}{r} 546 \\ \hline 227 \end{array}$$

6.

$$\begin{array}{r} 1943 \\ \hline 849 \end{array}$$

7.

$$\begin{array}{r} 2050 \\ \hline 1564 \end{array}$$

8.

$$\begin{array}{r} 907086 \\ \hline 548299 \end{array}$$

Multiply:

9.

$$\begin{array}{r} 247 \\ \hline 24 \end{array}$$

10.

$$\begin{array}{r} 306 \\ \hline 24 \end{array}$$

11.

$$\begin{array}{r} 305 \\ \hline 240 \end{array}$$

12.

$$\begin{array}{r} 2516 \\ \hline 123 \end{array}$$

31

Grade Sheet

NAME: _____ SHIFT: _____

SSN: _____ DEPT: _____

TEST DATE: _____ CONFERENCE DATE: _____

READING (RFU II)=

MATH (STECK-VAUGHN)=

SUGGESTIONS:

STRENGTHS:

SUGGESTIONS:

STUDENT'S SIGNATURE: _____ TESTER: _____

Report: final scores
 Selection: READING is not blank
 and MATH is not blank

SHIFT	D.O.B.	DEPT	ETHN	SEX	YEARS	READING	MATH
1	12/16/60	ME001	Black	F	12	8.1	27 B
1	12/27/35	ME001	White	F		8.1	41 C
3	03/17/57	ME001	White	F	14	8.1	61 C
1	02/09/53	ME001	Hisp.	F		8.1	14 A
1	08/10/54	ME001	Hisp.	F	12	8.1	32 B
1	07/01/53	ME009	Hisp.	F	9	8.1	17 A/B
1	02/25/61	ME001	Hisp.	F	12	8.3	31 B
3	12/11/51	ME001	Black	F	12	8.3	39 C
1	10/18/53	ME001	White	F	12	8.3	55 C
1	09/14/40	ME001	Hisp.	F	9	8.3	15 B
1	09/06/60	ME001	Black	F	12	8.3	19 B
1	02/02/51	ME001	Black	F	12	8.5	30 B
1	02/16/51	ME009	Hisp.	F	11	8.5	39 B
3	11/29/50	ME080	Hisp.	F	12	8.5	44 C
1	11/07/33	ME001	White	F	12	8.5	42 C
1	07/20/48	ME001	Hisp.	F	8	8.5	22 A/B
3	04/29/52	ME001	Hisp.	F	12	8.5	27 B
1	04/17/56	ME001	Hisp.	F	11	8.5	18 B
1	01/15/54	ME001	Hisp.	F	12	8.5	17 A
2	01/15/58	ME001	Hisp.	M	12	8.5	39 B
3	02/26/53	ME001	Hisp.	F	8	8.5	22 B
1	06/07/30	ME001	White	F	9	8.5	31 B
1	01/29/53	ME080	Hisp.	F	9	8.5	16 B
1	10/11/37	ME001	White	F	12	8.8	28 B
1	03/26/65	ME001	Hisp.	F	12	8.8	52 C
1	08/10/51	ME001	Hisp.	F	10	8.8	32 B
1	12/22/52	ME001	White	F	12	8.8	37 B
1	06/03/42	ME001	White	F	12	8.8	63 C
1	01/06/54	ME001	White	F	12	8.8	12 B
1	09/04/37	ME001	White	F	12	9.0	55 C
1	04/04/51	ME001	Black	F	12	9.0	33 B
1	02/12/48	ME009	Hisp.	F	7	9.0	24 B
1	01/23/52	ME001	Hisp.	F	9	9.3	35 B
1	05/26/55	ME080	Black	F	12	9.3	28 B
1	10/02/56	ME001	Hisp.	F	12	9.6	37 B
2	07/12/54	ME001	Black	F	12	9.6	19 B
1	12/20/46	ME080	White	F	8	9.6	37 B
1	09/03/49	ME001	Hisp.	F	12	9.6	43 B
1	04/06/51	ME001	Hisp.	F	12	9.9	30 B
1	11/06/55	ME001	White	F	12	10.2	31 B
1	11/02/52	ME009	Hisp.	F	12	10.2	44 C
1	04/16/28	ME001	White	F	12	10.4	25 A/B
1	09/15/52	ME001	Hisp.	F	12	10.4	42 C
1	02/06/66	ME009	Hisp.	F	13.5	11.0	46 B/C
1	07/25/51	ME001	White	F	11	11.6	34 C

NOTE: SHIFT- employee's work shift
 D.O.B.- employee's date of birth
 DEPT- employee's work department
 ETHN- employee's ethnicity
 SEX- employee's sex
 YEARS- number of years of formal education employee had
 READINGI-initial reading assessment score (RFU)
 MATHI-initial math assessment score (Steck-Vaughn Mastery Math)

File: scores
 Report: final scores
 Selection: READING is not blank
 and MATH is not blank

2/1/91

SHIFT	D.O.B.	DEPT	ETHN	SEX	YEARS	READING	MATH
2	12/26/47	ME001	Hisp.	F	3	4.6	1 A
1	03/19/57	ME001	Hisp.	F	9	5.0	13 A
1	12/30/61	ME001	White	F		5.0	34 B
1	01/21/33	ME001	Hisp.	F	4	5.0	9 A
1	04/15/32	ME001	Hisp.	F	8	5.3	18 B
2		ME001	Black	F	12	5.3	25 B
1	11/12/33	ME001	Hisp.	F	6	5.4	8 A
2	08/12/68	ME001	Hisp.	M	12	5.5	21 A
2	11/09/58	ME080	Hisp.	F	12	5.5	28 B
1	05/28/49	ME001	Hisp.	F	10	5.7	16 A
1	08/03/57	ME001	Hisp.	F	12	5.7	25 B
1	11/24/54	ME001	Hisp.	F	12	5.7	19 A/B
1	01/20/57	ME001	Hisp.	F	8	5.7	10 A
1	05/09/50	ME001	Hisp.	F	9	5.8	23 B
1	11/06/46	ME001	Black	F	12	5.8	25 B
1	03/23/47	ME001	Hisp.	F	9	6.1	37 B
1	06/11/49	ME001	Hisp.	F	9	6.1	50 C
1	06/13/48	ME001	Black	F	12	6.1	28 B
1	12/31/39	ME001	Black	F	11	6.3	3 A
1	02/23/53	ME001	Hisp.	F	7	6.3	28 B
1	09/16/48	ME001	Hisp.	F	9	6.5	28 B
3	10/05/57	ME001	Hisp.	F	9.5	6.5	11 A
3	04/09/35	ME001	Hisp.	F	7	6.8	26 B
1		ME001		F	12	6.8	33 B
3	04/11/55	ME080	Hisp.	F	12	6.8	50 C
1		ME001		F	9	6.8	27 B
3	06/18/51	ME001	Black	F	12	6.8	33 B
2		ME001	Hisp.	F	6	6.8	22 B
1	02/22/56	ME009	Black	F	12	6.8	30 B
1	05/29/45	ME001	Hisp.	F	8	7.0	23 A
1	08/05/49	ME080	Hisp.	F	11	7.0	27 B
1	01/01/62	ME001	Hisp.	F		7.0	8 A
1	06/20/60	ME001	Hisp.	F	9	7.0	13 A
1	02/23/59	ME001	Hisp.	F	12	7.2	20 B
1	06/06/51	ME001	Hisp.	F	12	7.2	22 B
1	08/10/41	ME001	White	F	12	7.2	28 B
3	05/01/45	ME001	Hisp.	F	11	7.2	30 B
3	03/31/49	ME001	Hisp.	F	12	7.4	25 B
1	12/13/61	ME001	Hisp.	F	12	7.4	39 B
1	10/27/55	ME001	Hisp.	F	10	7.6	43 B
2	03/01/34	ME001	Hisp.	F	12	7.6	21 A/B
3	01/08/59	ME001	Hisp.	F	9	7.6	35 B
2	04/11/54	ME001	Hisp.	F	9	7.8	44 C
1	06/27/64	ME001	Hisp.	F	12	7.8	27 A
1	12/04/43	ME001	Black	F	12	7.8	45 C
1	09/05/65	ME001	Black	F	12	7.8	17 A
1	05/26/58	ME009	Hisp.	F	12	8.1	25 B
2	05/13/62	ME009	Hisp.	F	8	8.1	24 B

IV. And They're Off...

A. Class Schedule & Basic Class Structure

B. Math A Class

C. Math B Classes

D. Math C Classes

E. Reading Classes

A. CLASS SCHEDULE & BASIC CLASS STRUCTURE

Once we had the results of the assessment, the next task was to form the classes. We suggested to Motorola which class each employee should be in. Motorola made the final decision on class participation because it called for dealing with company time, three shifts, and a production line requiring a certain number of employees. A total of 85 students were chosen for the program. We did have eight classes but not the same classes as originally planned. 26 employees were placed into three low-level reading classes, 8 into a low-level math class, 27 into two mid-level math classes, and 24 into two advanced level math classes. After the first week of classes, one student transferred from a mid-level math class to the low-level math class. Classes were called Reading, Math A (low-level), Math B (mid-level), and Math C (advanced-level) to avoid any labeling of student employees. Some of the classes contained student employees from different shifts. Those who came after or before their shift were compensated by the company for the time. Two classes had to be held after the student employees' shifts. They were also compensated for the time. The two Math C classes had to be held one day a week for three hours. All other classes started as originally planned -- two hours twice a week. A little more than midway through the program all three reading classes and the Math A class had to drop to one class per week due to increased production rates. These classes were extended one extra month. A class schedule can be found on page 34. On the first day of classes, student employees filled out information sheets (page 35). Students signed in every class period and teachers kept attendance records

as well as grades (pages 36-37). A weekly absentee report was turned into Motorola's training staff. Lesson plans were turned into the coordinator monthly (page 38).

In the following sections of this chapter are the objectives for each class, teachers' comments, and samples of lesson plans and participants' work.

ILCTOROLA WEEKLY SCHEDULE

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7:30 Am					
8:00					
8:30					
9:00	MATH C	READING 1	MATH B	READING 1	MATH B
9:30					
10:00					
10:30					
11:00		READING 2		READING 2	
11:30					
12 NOON					
12:30					
1:00					
1:30					
2:00					
2:30		READING 3	MATH C	READING 3	MATH C
3:00					
3:30					
4:00	MATH B				
4:30					
5:00		MATH C	MATH B		
5:30					
6:00					
6:30					
7:00					

STUDENT INFORMATION FORM: SECTION 1

PLEASE PRINT

Class Location _____ Class Time _____ Evening _____ Day _____

Teacher's Name _____ Date _____ CONTACT HOURS

Ministry # _____ Student # _____ ACCUMULATED

Social Security# _____ Date of Birth _____

Student's Name(Print Last, First) _____

Student's goals _____ Phone # _____ Alternate phone _____

Address _____ City _____ Zip Code _____

Highest grade completed _____ Hobbies and interests _____

How did you find out about the program? _____

Have you participated in our program before? Yes No If yes, explain _____

Do you prefer _____ Group Study _____ Individual Study

Check () Student's Age: Sex: Check () ONE Ethnic Group:
 _____ 16-17 _____ Male _____ American Indian, Alaskan Native
 _____ 18-21 _____ Female _____ Asian/Pacific Islander
 _____ 22-24 _____ _____ Black
 _____ 25-44 _____ _____ Hispanic
 _____ 45-59 _____ _____ White(Not of Hispanic origin)
 _____ 60 plus

Check () ALL that apply to student at beginning of program:

- | | |
|--|---|
| _____ 1. Employed | _____ 7. Immigrant (refugee-alien) |
| _____ 2. Unemployed | _____ 8. Adult in correctional facility |
| _____ 3. Adult on public assistance | _____ 9. Institutionalized (other) |
| _____ 4. Disabled Adult | _____ 10. Homeless |
| _____ 5. Receiving AFDC Aid | _____ 11. Seek Citizenship |
| _____ 6. Adults on Parole or Probation | |

Signature: _____

TEACHER INFORMATION ONLY

Record Student's Score and Entry Level

Pre-test Name _____

Score _____

Subject _____	Score _____
Subject _____	Score _____
Subject _____	Score _____
Subject _____	Score _____
Subject _____	Score _____
Subject _____	Score _____

LEVEL I

- _____ ABE (grades 0-5.9)
- _____ ABE (grades 6-8)
- _____ ESL I
- _____ ESL II
- _____ ESL III

LEVEL II

_____ Adult Secondary Education (grades 9-12.9)

July
August
September
October
November
December
January
February
March
April
May
June
Total

DIRECTOR'S COPY - WHITE

TEACHERS' COPY - CANARY



LESSON SUMMARY

Instructor: _____ Class: _____

Location: Motorola, Inc., Seguin Week#: _____

Date: _____

Objective: _____

Activities and Materials Used:

Date: _____

Objective: _____

Activities and Materials Used:

MATH A OBJECTIVES

Employees will demonstrate ability to:

- 1). Understand math vocabulary and math symbols
- 2). Understand math concepts
- 3). Understand whole numbers and number names
- 4). Understand place value of whole numbers
- 5). Understand estimation in problem solving
- 6). Add in whole numbers
- 7). Subtract in whole numbers
- 8). Multiply in whole numbers
- 9). Divide in whole numbers
- 10). Solve word problems using whole numbers

The Math A class will divide the class periods appropriately in order to introduce, practice, and master adding, subtracting, multiplying, and dividing of whole numbers. A good amount of time will also be spent on using these operations in practical situations. Word problems will be a large part of the curriculum. Job-related material will be used when possible. Books for this class will include:

- 1). Number Power 1 (Contemporary)
- 2). Basic Essentials of Mathematics I (Steck Vaughn)
- 3). Strategies for Solving Math Word Problems
(Educational Design)
- 4). Number Power 7 (Contemporary)
- 5). Critical Thinking with Math (Contemporary)

Teacher Comments

Math A Skills

W/F 2-4pm

This class has been absolutely super!!! It was a class of nine women who were totally cooperative. They never complained about the amount of work or having to copy problems from another book; they did whatever was asked cheerfully. The class had a very low absentee rate. One student was out for six weeks for surgery, and I thought it would be almost impossible for her to catch up. She had had great difficulty with multiplication facts. She wanted to stick with it, however, and although it took some time and much effort on her part, she caught up with the rest of the class.

My main task in this class was to try to help the students overcome severe math anxieties - the main handicap keeping them from learning. Once this was accomplished, learning progressed rapidly. Anxiety bashing had to be done each time a new activity was begun. Writing word problems and working "real life" problems helped. One student with several emotional problems was able to make some progress after I finally learned how to approach her.

The class members were extremely insecure, probably because of having low self esteem as math students. They became quite anxious at the thought of having a substitute and were very nervous when the class was observed by representatives from TEA. Having students work problems on the board and work in pairs helped to overcome some of this anxiety.

Students were also quite upset when the class changed from two classes per week to one. They felt they would not be able to remember from one week to the next. The class did not make as much progress after changing to one class a week. There was more of a problem with students forgetting books and homework. A certain amount of time was wasted each session in catching up from the previous week. Ideally, I think two class meetings per week is a better format, but some progress is certainly possible with one class. In this class, as in the other class I taught, students were often quite tired because of working overtime and on weekends.

In this class we covered basic facts of whole numbers - place value, addition, subtraction, multiplication, and division - with an emphasis on understanding concepts and word problems. I opened the class with a short, timed memory drill of addition, subtraction, multiplication, or division facts. In addition to the assigned text, I used the Steck-Vaughn book for additional drill when needed.

I spent several class sessions drilling students on the multiplication tables. I urged them to buy or make flash cards and to do as much drill as possible outside of class. A few students were very defensive about learning the tables, but most of them eventually learned them.

As soon as each math function was learned, I introduced word problems. We used Number Power Book 6 in class which explained tricks and strategy in working word problems. Students learned to choose the proper function to solve word problems, and as soon as students had worked representative problems from the book, they began writing their own. They started with simple, one step problems and by the end of the class were writing complicated, multi-step problems involving several math functions. Normally, students would trade word problems and would go to the board and show how to work another student's word problem. I typed up the last set of word problems turned in which all students worked for homework.

Students mastered whole number skills before the class ended. The last four or five weeks of class I introduced them to decimals (there was not time to teach fractions properly which I normally do first).

Activities of a practical nature included writing word problems from newspaper advertisements, figuring menus for restricted calorie diets from a calorie chart, figuring charges from a restaurant menu, preparing budgets and understanding salary statements and income tax statements. The students also learned to prepare their own income tax forms (none of the students prepared her own before).

PARTICIPANTS' SAMPLE WORK #1

During the course, students worked on writing their own word problems. These word problems included adding, subtracting, multiplying, and dividing whole numbers and decimals. Below are the final products of a long process of revising and editing. After the students finished, these problems were typed up for the entire class to work. Many of the problems were quite complicated and students were able to learn the importance of clear statement of the problem and that a knowledge of how to approach a problem is more important than the actual solving of the problem.

1. Joe makes \$62.75 a day as a carpenter. He works five and a half days a week. How much does he make in a week and 3 days?

2. I went shopping for some socks for my son. I went to store A. They had 12 pairs of socks for \$11.89. I went to another store. Store B had 12 pairs for \$8.89. What is the difference in the price of EACH PAIR of socks and how much will I save on the socks at store B?

3. Mary was making plans for her daughter's wedding. She would invite 242 people from her family and 102 distant relatives and 68 of their friends. The cost for catering is \$3,310. What is the average cost per person?

4. Helen went to the dress shop to buy herself 4 dresses. Each dress cost \$80, but Helen got 2 of the dresses on sale-one dress for \$40.99 and the other dress for \$37.56. The other dresses she got for \$29.99 and \$25.86. How much did she save by buying all four of the dresses on sale?

5. Helen went into the shoe store. In the store there were 17 rows. In nine of the rows there were 49 pairs of shoes. In the other rows there were 69 pairs of shoes. How many pairs of shoes are in the whole store?

6. Mary went grocery shopping. She had \$65.00. She found whole chicken fryers for \$.49 a pound. She got one at 2 pounds and one at 3 pounds and another fat chicken at 5 pounds. She also bought a family pack of ribeye steaks at \$4.99 a pound. There are five ribeye steaks in the pack weighing a total of 7 pounds. She also got 12 pounds of potatoes for \$1.19. How much did Mary have left from the \$65 she brought with her?

7. I purchased the following items: a dining room set (\$699.99), a china cabinet (\$699.99), an arm chair (\$99.99), and the tax was \$119.99. How much did I pay in all for these items? I paid \$475

down. What is the cost after the down payment? How much did I pay a month for 18 months?

8. Rosa bought 3 bras at \$14.40 each. She bought three pairs of panties for \$6.70. She bought three half slips at \$12.06 each, three tops at \$4.95 each, three pairs of shorts at \$9.99 each, and three pairs of sandals at \$6.99 each. How much did she spend? She had \$500. How much does she have left?

9. Pam and two of her friends are planning a barbeque party. They are having forty pounds of brisket at \$1.19 per pound, twenty-three pounds of chicken at \$.79 per pound, twenty one pounds of sausage at \$2.50 per pound, seventy pounds of potatoes at \$.39 per pound, and thirty pounds of pinto beans at \$.43 per pound. What is the total food cost? Pam and her two friends will split the cost. How much will each one have to pay?

MATH B OBJECTIVES

Employees will demonstrate an ability to:

- 1). Show mastery in all Math A objectives
- 2). Understand simple fractions and mixed numbers
- 3). Add fractions
- 4). Subtract fractions
- 5). Multiply fractions
- 6). Divide fractions
- 7). Understand decimals
- 8). Add decimals
- 9). Subtract decimals
- 10). Multiply decimals
- 11). Divide decimals
- 12). Solve word problems using fractions and decimals

The Math B class will divide the class time appropriately in order to introduce, practice, and master adding, subtracting, multiplying, and dividing fractions and decimals. A good amount of time will also be spent on using these operations in practical situations. Word problems will be a large part of the curriculum. Job-related material will be used when possible. Books for this class will include:

- 1). Number Power 2 (Contemporary)
- 2). Number Power 1 (Contemporary)
- 3). Basic Essentials of Mathematics I (Steck Vaughn)
- 4). Strategies for Solving Math Word Problems
(Educational Design)
- 5). Number Power 7 (Contemporary)
- 6). Critical Thinking With Math (Contemporary)

TEACHER COMMENTS

Math B Skills

M/W 4-6pm

This class was in many ways quite different from the other pilot class and Math "A" Skills class I have taught at Motorola, largely because the students did not attend during work hours. The class originally consisted of 17 students, but one student dropped early in the course for health reasons and another dropped midway through for unknown reasons. One student was attending during his work shift and missed 45 minutes of each Wednesday class in order to attend a meeting. Otherwise his attendance was regular and was able to progress quite rapidly. Another student worked a later shift and came in just to attend class. Although the class was to be only for those who volunteered, some indicated that they felt pressured to "volunteer."

Absenteeism was always a frustration with this class. Average daily attendance was approximately 12, and occasionally there were as few as ten attending. Often I passed students from the class leaving for the day as I was walking to the classroom. Those students who were absent alot often found it the most difficult to catch up with what they had missed. The rest of the class was held back when I had to explain to those students what I had explained the class period or periods before. Also, students complained of working a great deal of overtime. A few students were reluctant to do much (or any) of the homework assigned. The majority did as much as they could. Despite these difficulties, however, there was a core group of about 12 students who attended regularly and kept up with the progress of the class.

After a review of subtraction, multiplication, and division skills, the majority of the class time was spent on fractions. Fraction concepts are very difficult for most students. I used several methods and gave frequent quizzes over concepts relating to fractions. Three weeks were spent on fractions. Students had less difficulty with this concept.

I introduced and emphasized word problems after the first week of class. While students were learning fraction skills, they were also introduced to word problem solving techniques with whole numbers. Students worked and wrote whole number word problems. Students then worked word problems written by other students. The same procedure was followed for word problems using fractions, decimals, and mixed problems. Near the end of the class I typed up and duplicated a set of word problems using fractions that students had written, and the entire class worked them. (I was unable to get all students to cooperate in writing problems even though they had class time and several days to do them). Many of the problems were quite complicated and students and I were able to learn the importance of clear statement of the problem and that a knowledge of how to approach a problem is more important than the actual solving. Students also learned from this exercise how to determine whether it is easier and more accurate to use fractions or decimals.

In the last three class meetings I introduced ratios, proportions, and percents. It was very fast, and I counseled the students that they would not be required to know these concepts, but if they could remember at least some of it, it would be helpful. Many did quite well despite the short time in which it was presented.

I was quite satisfied with the progress of this class. Ideally, such a class would be during working hours because students would feel they had more of a stake in the class. A few students seemed to resent being in class and having homework. They were rather lackadaisical about whether they did the work or not; this was somewhat harmful to the class as a whole although most were quite cooperative.

Students in this class used higher analyzing skills and performed operations a great deal more complex than the skills on which they were tested. It would be great if somehow testing could reflect more accurately the actual progress of the student.

One of the main benefits of the math courses taught by the Adult Education Co-Op was the enabling of students to realize that they can do math. Psychological barriers in the learning of math are especially formidable, and I think we knocked down many of them. I would recommend that students be encouraged to continue with their studies in math.

Upon reviewing textbooks from SWTSU's two remedial math courses (noncredit) that prepare students for college algebra, I determined that the Math B and Math C skills classes held at Motorola basically covered the same information. With little upgrade in the Motorola classes (adding introductory algebra), students could forgo the university's remedial classes and enter directly into the college algebra course.

TEACHER COMMENTS

Math B Skills

M/W 7:30-9:30am

The selection of students for the courses I taught was well done. Most of my students were able to handle the material offered. Some students had difficulties due to extenuating circumstances, such as demands of the job or family. Those demands affected class attendance and the time they spent on homework.

The needs of the company dictated the class schedule. The "B" skills class was very satisfactory. This two hour class held twice a week worked well. The two hour periods allowed for introduction of new material easily without overwhelming the students and provided sufficient time to review material. This 15 week class allowed for 60 hours of instruction which was adequate to cover the course material.

The "B" skills class curriculum was well defined: fractions and decimals. The 60 hours provided sufficient time to cover this material adequately. In fact, several hours were available to introduce percentages. Contemporary's Number Power 2 book was excellent. I suggest that this class be extended by 2-3 more weeks to allow percentages to be covered more fully.

MATH B SAMPLE LESSON PLAN #1

Students in the Math B class used this recipe to understand multiplication and division of fractions. The class cut the recipe in half and then doubled it.

POLYNESIAN PORK CHOPS

2 tablespoons butter or margarine	1 cup diced green pepper
1/2 cup chopped onion	1 tablespoon corn starch
1 tablespoon light brown sugar	12 ounces SKINNER [®] Vermicelli, uncooked
1-1/2 pounds (4 to 6) pork chops	
1 cup (8 oz. can) pineapple chunks in juice, undrained	
1/2 cup ketchup	
1/2 cup plus 1 tablespoon water, divided	
2 tablespoons Worcestershire sauce	
1/2 teaspoon salt	
1/4 teaspoon pepper	

In large skillet melt butter and saute onion until tender but not brown. Blend in sugar. Add pork chops and cook until lightly browned on each side. In small bowl blend pineapple, ketchup, 1/2 cup water, Worcestershire, salt and pepper. Pour evenly over pork chops and bring to a boil. Reduce heat and simmer, covered, 45 minutes or until pork is tender. Add green pepper and cornstarch blended with 1 tablespoon water. Stir until slightly thickened. Meanwhile cook vermicelli according to package directions; drain. Serve hot cooked vermicelli with pork and sauce. 6 servings.

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PARTICIPANTS' SAMPLE WORK #1

During the course students worked on writing their own word problems. These word problems included decimals and fractions, two areas the students were learning in the course. Below are the final products from a long process of revising and editing. After the students finished, these problems were typed up for the entire class to work them. Many of the problems were quite complicated and students were able to learn the importance of clear statement of the problem and that a knowledge of how to approach a problem is more important than the actual solving of the problem. Students also learned from this exercise how to determine whether it is easier and more accurate to use fractions or decimals in particular problems.

1. If a carpenter is going to build a $5 \frac{1}{8}$ feet by $12 \frac{3}{16}$ feet picnic table and two 1 foot by $12 \frac{3}{16}$ feet benches, how many 2 inches by 4 inches by 16 feet boards will he have to buy? (HINT: Length doesn't matter; the boards will be cut off at $12 \frac{3}{16}$ feet. Also, there are 12 inches in a foot; when inches are given, use the proper fraction of a foot to solve this problem.)

2. If a dart board has 80 squares and $\frac{1}{5}$ of the squares are odd numbers and $\frac{1}{3}$ are black, how many of the even numbered squares are red?

3. A carpenter had six customers who ordered two bookcases each. Six of the bookcases needed $3 \frac{1}{3}$ yards of lumber for each one, and the other six bookcases needed $3 \frac{3}{4}$ yards of lumber for each one. If he had 160 yards of lumber on hand would he have to order more lumber to make the 12 bookcases? If so, how many more yards? Also, each bookcase cost \$20.50. How much money would he make?

4. A family of three has \$475 saved for their vacation. If their room takes $\frac{1}{4}$ of the money, and food takes $\frac{2}{5}$ of the money, how much would each family member have for spending?

5. Mr. and Mrs. Reed has $480 \frac{7}{8}$ acres of land in Luling and $240 \frac{1}{3}$ acres of land in Lockhart which was to be divided equally among the four kids AFTER $\frac{2}{5}$ of the land was given to her two grandsons and $\frac{1}{4}$ of the land to a granddaughter. How much land would each of her children receive?

6. Mr. Turner had $35 \frac{1}{3}$ acres of land. He gave his son $2 \frac{3}{8}$ acres of land to build a house. $6 \frac{4}{5}$ of the remaining

acres were to be sold for \$673.75 an acre. How much will he get for the land he sells AND how much land will be left?

7. Mrs. Murphy was a lonely lady who had two toy poodles and a Persian cat. She died of a heart attack. Her estate was valued at \$760 million. She loved dogs more than cats. She left $\frac{1}{6}$ of her estate to various charity foundations. She left $\frac{1}{2}$ to her dogs. How much money did her cat get?

8. Thirty-eight and $\frac{1}{2}$ acres of land are on sale at \$9452, but I only want to buy $34\frac{1}{2}$ acres. How much will I have to spend? (HINT: Round off the price per acre to the nearest whole dollar).

9. Nina drove $6\frac{3}{10}$ miles on Monday, $4\frac{6}{8}$ miles on Tuesday, $9\frac{1}{16}$ miles on Wednesday, $3\frac{1}{4}$ miles on Thursday and on Friday she drove $8\frac{2}{20}$ mile. What was her average daily driving distance?

MATH C OBJECTIVES

Employees will demonstrate an ability to:

- 1). Show mastery in all Math A and Math B objectives
- 2). understand percent
- 3). understand ratios and proportions
- 4). understand basic measurements and formulas
- 5). understand simple equations

The Math C class will divide class time appropriately in order to introduce, practice, and master percents, ratios, proportions, basic measurements and formulas, and simple equations. A good amount of time will also be spent on using these operations in practical situations. word problems will be a large part of the curriculum. Job-related material will be used when possible. Books for this class will include:

- 1). Basic Essentials of Mathematics II (Steck Vaughn)
- 2). Basic Essentials of Mathematics I (Steck Vaughn)
- 3). Number Power 2 (Contemporary)
- 4). Strategies for Solving Math Word Problems
(Educational Design)
- 5). Number Power 7 (Contemporary)
- 6). Critical Thinking with Math (Contemporary)

TEACHER COMMENTS

Math C Skills
Math C Skills

M 7:30-10:30am
T 4-6pm

The selection of students for the courses I taught was well done. Most of my students were able to handle the material offered. Some students had difficulties due to extenuating circumstances, such as demands of the job or family. Those demands affected class attendance and the time they spent on homework.

The needs of the company dictated the class schedule. The "C" skills class was not very comfortable for either the students or me. This 15 week class was held once a week for 3 hours at a time. I felt the class was more difficult since it was hard for the students to assimilate 3 hours of instruction at one setting. Remember, some students attended class after completing a normal or extended work day. In addition, the time lag between weekly classes made for a slower paced instruction. A thorough review was required at the beginning of each class to cover the previous week's material.

This 15 week class at three hours per week provided 45 hours of instruction. Because the first two classes were devoted to review of fractions and decimals, instruction time for new material was reduced to 39 hours. Other adjustments-break time and delayed class start time-lowered instruction time to 32-33 hours for the afternoon class. Notwithstanding the low number of hours available, the class covered (shallow at times) all the material contained in the course outline.

The "C" skills class curriculum was not as well defined as the "B" skills class, but seemed to meet the needs of the company and students. More job related material (Pareto charts for example) could be incorporated into this course.

One area which needs to be reviewed is Algebra training. Several students expressed a desire for more Algebra instruction in preparation for a college level course. A possible solution is to offer a separate course on beginning Algebra, using Contemporary's Number Power 3.

I gave alot of thought to rolling the "B" and "C" skills courses into one long course. I do not recommend this idea. The "B" skills class is a must and the "C" skills class is a good review course for many of the employees. A fourth course in pre-Algebra should be offered.

MATH C SAMPLE LESSON PLAN

The job-related lesson was introduced at the Math C level. This was on reading and preparing Pareto Charts. A Motorola Participative Management: Problem Solving Manual explains a Pareto Chart as a tool for identifying the precise dimensions of a general problem that has been previously identified. It helps break a larger problem into its components parts, in order of their relative importance (magnitude or frequency).

An example of what a Pareto Chart might show is that one wave soldering machine accounted for 30 percent of the instances of a larger problem (lifting circuits).

On the following pages there is an example of a data gatherer, Pareto Chart with the construction steps and analysis, a Pareto Chart with a Cume line added, and a blank Pareto Chart.

Data Gatherer

Work area:

Warehouse receiving

Data taken by:

Data time period:

June 19

Data Gatherer: Check sheet

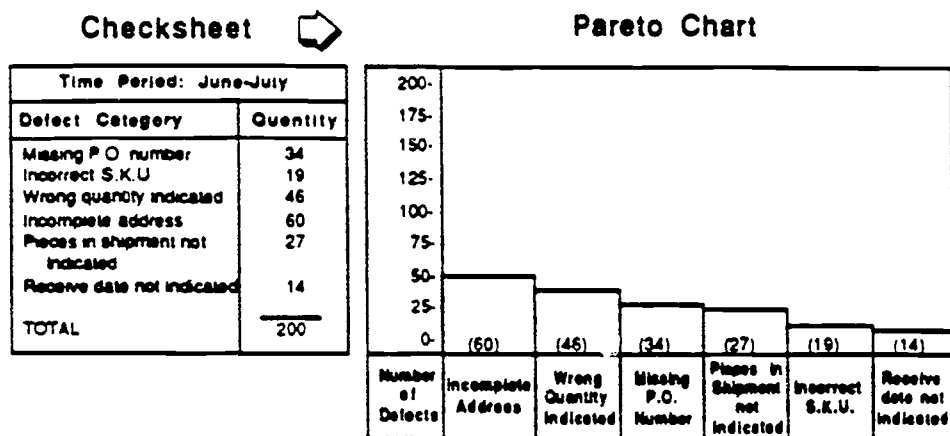
Raw Data

Categories	Quantity of Defects/Errors
SHIFT 1	.
Improperly prepared receiving reports	
Missing P.O. number	15
Incorrect SKU	7
Wrong quantity indicated	18
Incomplete address	35
Pieces in shipment not indicated	10
Receive data not indicated	10
Total	95
SHIFT 2	
Improperly prepared receiving reports	
Missing P.O. number	19
Incorrect SKU	12
Wrong quantity indicated	28
Incomplete address	25
Pieces in shipment not indicated	17
Receive data not indicated	4
Total	105
Total Defects	200

Source: Motorola Participant Management: Problem Solving

If a *Checksheet* is organized properly and the specified data is collected, a Pareto Chart can easily be constructed by transferring items directly from the Checksheet.

The following example shows a Pareto Chart constructed from a corresponding Checksheet.



Construction steps

1. The vertical scale of the Pareto Chart covers zero through the total number of defects from all data collected (in this case, 200).
2. The types of defects are arranged horizontally at the bottom, in descending order of quantity.
3. Vertical columns or boxes are drawn for each to show the step-down pattern of defect quantities.

Note: In a correctly constructed chart, the columns will just reach the top if stacked atop one another.

Analysis

By quickly looking at the Pareto Chart the team constructed, you can see that the first category accounts for almost one-third of all defects. Similarly, the first *two* categories account for more than half the total. They are clearly important parts of the problem. (The team would probably decide to work on them first.)

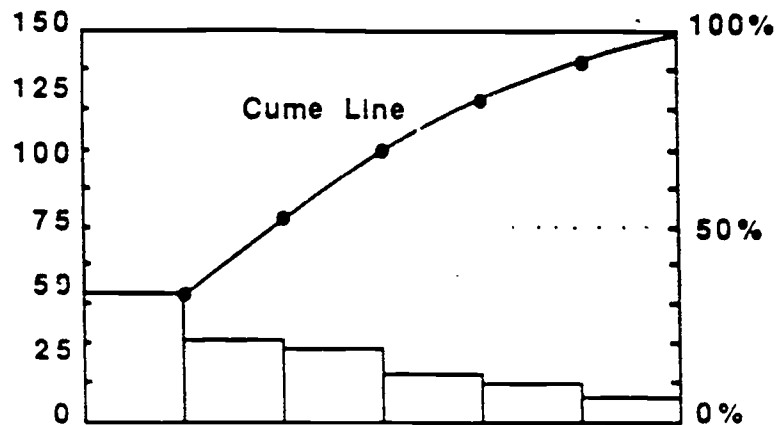
Source: Motorola Participant Management: Problem Solving

Adding the Cume Line

A 'cume' line superimposed on the Pareto Chart shows at a glance the cumulative percentage of total defects accounted for by one or more categories. Cume lines aren't always needed, but can be useful.

Purposes

1. For presenting problem identification information to management or others outside the team
2. For looking beyond the first problem to be attacked, e.g., seeing at a glance that solving the first three problems may eliminate 90 percent of the big problem
3. For detecting changes from one chart to another as the data is analyzed differently
4. For detecting similar changes resulting from implementing a problem-solving action



Steps in Generating a Cume Line

1. Mark the right-hand vertical scale by *percent of total defects*.
2. Draw cume line diagonally from lower left to top right of first column.
3. Continue the process by going up (vertically) by the number of defects in the second column and completing the next segment of the line. Do the same for each column until the line reaches to top right corner of chart.

Analysis

By looking at the chart, we can see that the first two categories account for a little more than 50 percent of total defects. You can also read any one column as a percent of total by reading its height on the right-hand percent scale.

Source: Motorola Participant Management: Problem Solving

Pareto Chart

Subject: _____

Period: _____

Date: _____ Key: = Cumulative Percent

Categories

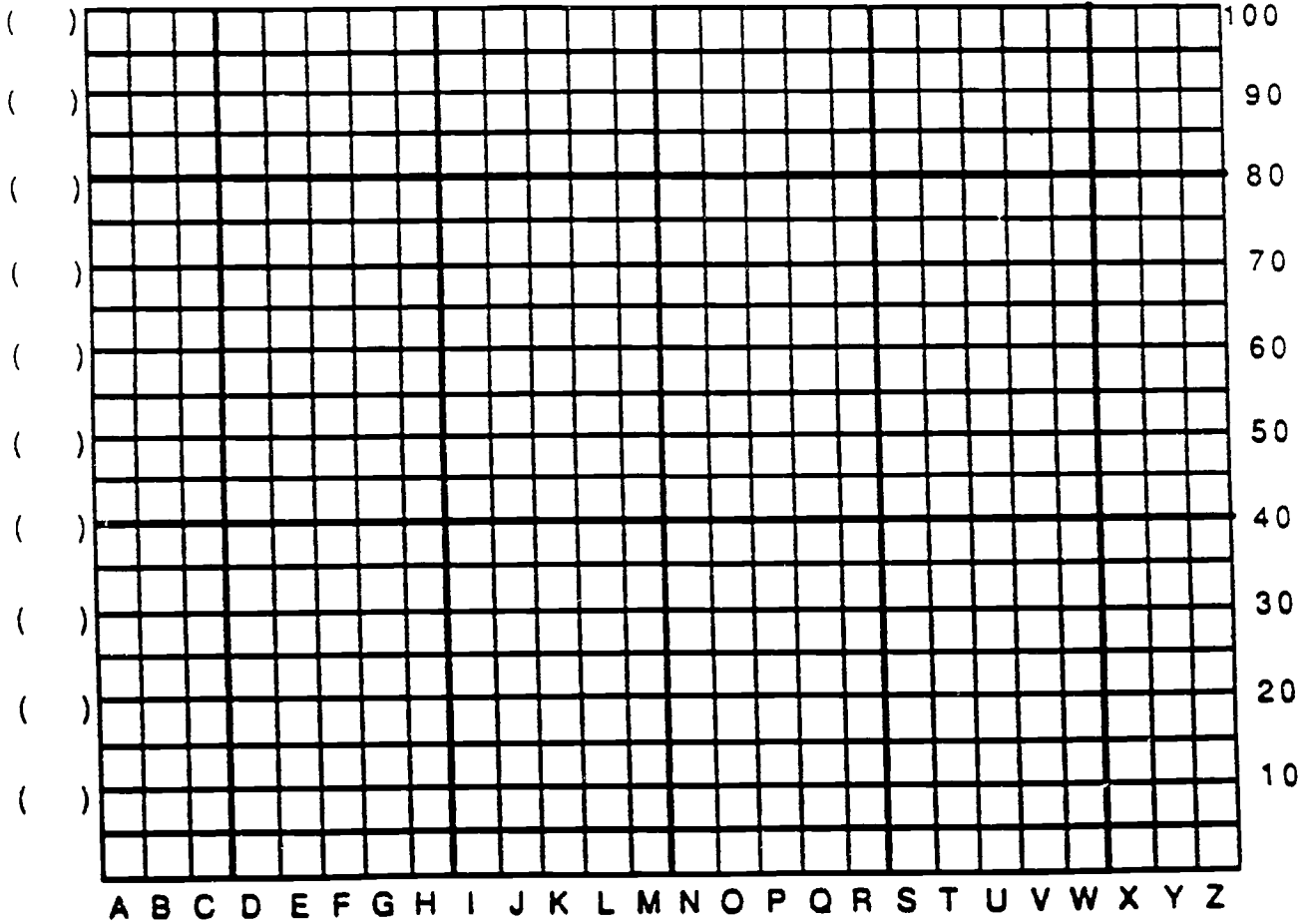
A = _____
 B = _____
 C = _____
 D = _____
 E = _____
 F = _____
 G = _____
 H = _____
 I = _____

J = _____
 K = _____
 L = _____
 M = _____
 N = _____
 O = _____
 P = _____
 Q = _____
 R = _____

S = _____
 T = _____
 U = _____
 V = _____
 W = _____
 X = _____
 Y = _____
 Z = _____

Raw Data

Percent



Source: Motorola Participant Management: Problem Solving



Reading Objectives

Employees will demonstrate an ability to:

1. Recognize and understand functional words in context
- 2). Develop expanded vocabulary
- 3). Use context to determine word meanings
- 4). Sequence
- 5). Identify the main idea
- 6). Recall specific facts and details
- 7). Identify fact and opinion
- 8). Identify cause and effect
- 9). Paraphrase / summarize a selection
- 10). Draw logical conclusions
- 11). Write a complete sentence
- 12). Write a paragraph with one main idea
- 13). Write a passage using proper punctuation, capitalization, and correct spelling

The reading class will use a reader containing 29 stories, each followed by exercises introducing and reviewing the following comprehension skills: main idea, details, context clues, sequence, conclusions, facts and opinions, multiple meanings, cause and effect. Written language arts skills will include using a dictionary, outlining, writing complete sentences, and summarizing. In addition, each lesson will be heavily supplemented with job related and life related activities. Books for the reading class will include:

- 1). Reading Skills for Adults--Green (Steck Vaughn)
- 2). Reading Skills for Adults--Brown (Steck Vaughn)
- 3). Critical Reading For Proficiency 1,2,3
(Educational Design)
- 4). In Your Own Words (Cambridge)
- 5). Building Basic Skills in Writing (Contemporary)
- 6). Longman Classics

TEACHER COMMENTS

Reading T/Th 7:30-9:30
Reading T/Th 10-12
Reading T/Th 2-4

These classes consisted of 26 students ranging from a 5.0 - 6.8 reading level. The 26 students were divided into 3 classes depending on shift time and line. By the end of class 3 students had dropped, 2 because of medical leaves and 1 because of a shift change.

The classes began in Steck Vaughn's Green Book (4-5 reading level) and progressed into the Brown Book (5-6 reading level). In addition to the text, supplemental reading material was also used. A large portion of class time was also spent on writing skills. Students kept journals and wrote for 5 minutes at the beginning of each class on various topics. Students also were required to write papers throughout the class. One activity we did in class was reading a classic (The Prince and the Pauper, Gulliver's Travels, The Swiss Family Robinson) and then watching the movie. The students then had to write a paper comparing and contrasting the book and the movie.

Classes went well with the two-hour, twice a week schedule. The 10am class was probably the best class time-wise. All 8 students were from the same shift and they were wide awake and ready to go by 10am. The 7:30 class posed a small problem because some students had just worked a shift and some were just coming to work. Students were tired, and it was more difficult to keep interest after one hour. However in both morning classes students were regularly there. In the 2pm class absenteeism was higher and many times employees were late or had to leave one-half to one hour early because of meetings. One student had a different vacation than the others, so she missed additional weeks of class.

The biggest problems came when the schedule was changed to one class a week. Students constantly forgot homework and books. Material was covered one week and then had to be completely recovered the next week. Progress slowed after this schedule change. In addition, students felt the class dragged on a little too long because of this.

Despite these problems, I was very pleased with the students' attitudes about the class and their progress. When the students began the class they were hesitant to answer questions or to voice opinions out loud. By the end of class I could see the difference in self esteem and confidence level. Throughout the class, students told me stories about how this class had helped them on the job or at home. They also told me how much they liked the class and hoped for its continuation.

READING SAMPLE LESSON PLAN #1

OBJECTIVES: Identify main idea. write a paragraph with one main idea

MATERIALS NEEDED: Reading Skills for Adults-Green Book (Steck vaughn), journals, paper, pencils, newsprint, marker, circus program.

- METHOD:
- 1). For 5-10 minutes at the beginning of class, let students write in their journals on one of the following topics:
"If I could be in the circus, I would like to do...
or I remember going to the circus and seeing..."
 - 2). Read Story 9, "Whitefaces, Dearedevils, and Wild Animals", as a class. Discuss and review any new vocabulary words.
 - 3). Break class into groups and have them do the "Applying Reading Skills" at the end of the story.
 - 4). Go over answers.
 - 5). On the newsprint, print the sentence "The circus life is not the easiest of lives." Pass the program from the circus and generate discussion around this sentence. Brainstorm with the class. Write all responses on the newsprint.
 - 6). Place a blank sheet of newsprint next to the list and tell students that the class is going to write a paragraph using the main idea and the supporting ideas they just brainstormed. Use the main idea for the topic sentence. Have students dictate sentences while you write them in paragraph form on the newsprint. Have a student read the entire paragraph when complete. If the students wish they may want to edit and rewrite the paragraph.
 - 7). Discuss the steps the class went through to develop a paragraph. For homework, you might give the students a topic with which they can follow the same process.

PARTICIPANTS' SAMPLE WORK #1
(Class 1)

MAIN IDEA: The circus life is not the easiest of lives.

BRAINSTORMING:	dangerous	challenging
	exciting	sad
	hard work	sleepless
	traveling	entertaining
	funny	colorful
	scary	wierd
	opportunities	

PARAGRAPH:

The circus life is not the easiest of lives. The circus performers put their lives in danger by attempting challenging acts. They spend sleepless nights traveling from show to show, setting up and taking down the tents. Although it is exciting for the audience, it can be scary and sad for the performers. As one can see, circus life is full of hard work and busy schedules.

PARTICIPANTS' SAMPLE WORK #1
(Class 2)

MAIN IDEA: The circus life is not the easiest of lives.

BRAINSTORMING:	hard work	little sleep
	training	different acts
	town to town	animals
	clowns	all sizes
	daring	trainer
	tame	hazardous
	danger	tricks
	people	crowding
	cage	costumes
	trucks	makeup
	acrobats	

PARAGRAPH:

The circus life is not the easiest of lives. There is alot of hard work in training animals of all sizes to do tricks. The circus people move from town to town. Therefore they get little sleep. A clown takes hours to change costumes and makeup for different acts. The daring trainer had a hazardous job in taming the tigers in the cage. Although the circus life is very rewarding, it is also very hard.

PARTICIPANTS' SAMPLE WORK #1
(Class 3)

MAIN IDEA: The circus life is not the easiest of lives.

BRAINSTORMING:

travel	food
clothes	makeup
sleeping hours	train
vehicles	animals
clowns	tricks
# of shows	# of towns
equipment	hours
permit from city	location
insurance	people
audience	photographers

PARAGRAPH:

The circus life is not the easiest of lives. The circus travels from town to town, putting on three to four shows a day. Small circuses travel by truck while large ones travel by train. The workers get to sleep about two or three hours a night. The clowns take hours to put on makeup and clothes in order to perform for the audience. When the show is over, they will pack up equipment and animals and move to another location to start all over.

READING SAMPLE LESSON PLAN #2

OBJECTIVES: compare and contrast, recall specific facts and details

MATERIALS NEEDED: Critical Reading for Proficiency I & II (Educational Design), paper, pencils, brown paper bag with 2 unknown objects in it, newsprint, marker.

- METHOD:
- 1). For 5-10 minutes at the beginning of class, let students write in their journals on Describe things that are alike and things that are different about you and your best friend.
 - 2). As a class, discuss Chapter 8, "Comparisons." Discuss some new vocabulary words that mean the same as 'alike' and 'different.' Do exercise in Chapter 8 out loud as a class.
 - 3). Pass the brown paper bag around for the students to feel the two objects inside. Make sure they do not peek. Place a piece of newsprint on the wall and have students start describing what they felt (don't have them guess at what the object are). Once the class has mentioned everything they can, have them group together all the characters of one object, then the other, and finally both.
 - 4). Put another piece of newsprint on the wall next to the list. Tell students that they will now write a paragraph comparing and contrasting the objects they felt in the bag. First they will need to come up with a topic sentence. Write the sentences in paragraph form as the students dictate them to you. When the class is through, have one student read the entire paragraph. If the students wish, they may edit and rewrite their paragraph.
 - 5). Have the students do Chapter 9, "Comparisons," in Critical Reading for Proficiency II for homework.

PARTICIPANTS' SAMPLE WORK #2
(Class 1)

OBJECT 1	OBJECT 2	BOTH
pottle-like	dome-like	hard
long	like a salt shaker	rounded
2-storied	buttons	smooth
glass/ceramic	fat	4 corners
	holes	round/square
	plastic	
	bigger	

The Comparison of Two Unknown Objects

There were two unknown objects in the bag. The two objects were hard. They were both rounded at one end and square at one end. They were also both smooth and had four corners.

One object felt like a bottle or a two story building. It was long and heavy like glass. The other object was fatter and shaped like a dome. It had buttons and holes. It was lighter and felt like plastic.

PARTICIPANTS' SAMPLE WORK #2
(Class 2)

OBJECT 1	OBJECT 2	BOTH
long	push buttons	round
layers	lump or ball	hard
top	hole	partly square
liquid	cube	partly flat
pointed end	plastic	
	fat	

The Comparison of Two Unknown Objects

The objects in the bag are different. The first object had a pointed top. It is also long and filled with liquid. The second object is made out of plastic. On one side it has push buttons. On the other side it is lumpy. There is also a little hole on one of the sides.

However, they are similar in some ways. Both have parts that are rounded and flat. Other parts are square and hard.

PARTICIPANTS' SAMPLE WORK #2
(Class 3)

OBJECT 1
buttons
plastic
square

OBJECT 2
long
heavy
metal

BOTH
cube/block
round
hard
2 diff. shapes
closed objects

Comparison of Two unknown Objects

There were two different objects in a brown bag. Both objects had a cube or block shape. They were both closed objects. They were round and hard. One had buttons and was plastic, while the other was long and heavy.

READING SAMPLE LESSON PLAN #3

OBJECTIVES: understand proverbs, understand hidden meanings

MATERIALS NEEDED: paper, pencil

- METHOD:
- 1). For 5-10 minutes at the beginning of class, let students write in their journals on "My favorite saying is ..."
 - 2). Discuss with the class about proverbs. Ask students if they know what they are and to give some examples of proverbs. Talk about how proverbs are invented. Have students think about how people visiting our country might react to American proverbs.
 - 3). Break the class into groups of 3-4 people. Give each group a different list of approximately 4 proverbs with explanations for each. Have each group come up with at least 1 example for each proverb.
 - 4). When the groups are finished, have each group take a turn telling their example. The rest of the class has to guess what the proverb is. You might to give hints such as how many words it has or the key words.

PARTICIPANTS' SAMPLE WORK #3

Putting the Cart Before the Horse

Lee went out to buy insurance for a new car before she knew if the loan would come through to buy the car.

A Stitch in Time Saves Nine

A panel went over the solder wave without a final check. Had she checked it before, it would have saved us rework for wrong parts.

If You Can't Stand the Heat, Get Out of the Kitchen

The cook started crying when she could not keep up with making the tortillas for a full house of customers.

Making a Mountain Out of a Molehill

Elene was told she would have to manually insert for 3 days. Elene went to personnel to get a transfer.

V. The Finish Line

A. Assessing Participants

B. Final Participant Feedback and Results

A. ASSESSING PARTICIPANTS (FINAL)

During the last session of each class, students were reassessed using the Steck-Vaughn Mastery Math Test, the TABE (math portion), or the RFU. Some students were unknowingly placed into the Math C class after taking a pilot class in the summer of 1990. That class was initially assessed with the TABE; therefore we reassessed them with the TABE. All other math students were given the Steck-Vaughn Math Mastery Test and all reading students were given the RFU. Samples of the Steck-Vaughn Math Mastery Test and the RFU can be found on page 22.

B. FINAL PARTICIPANT FEEDBACK & RESULTS

Each student was given a grade sheet (page 76) reflecting his/her results on the assessment and success in the class. Students were again informed that scores were confidential and the Adult Education Co-Op would not distribute identifiable individual results to Motorola management. Final assessment results were given to Motorola without identifying information. These results begin on page 78. All students who completed the courses were given a certificate in addition to their grade sheets (page 77). Because reading students did not receive a consumable book during their class, they were given a Longman Classic with their certificate and grade sheet.

grade sheet

Name: _____

SSN: _____

Class: _____

Grade for Class: _____

Assessment Results:

Comments:

Teacher: _____

CONFERENCE
ON
TECHNICAL
SKILLS

ACHIEVEMENT

This Certifies That

is awarded this Certificate for

MATH "A" SKILLS

Given at Motorola-Seguin, this 31 day of July, A. D., 19 91

Teacher

Coordinator

MATH A FINAL RESULTS

File: scores

Report: final scores

8/15/91.

Selection: CLASS contains AB

CLASS	YEARS	MATH1	MATH2	%INCREASE	GRADE	READING1
AB	12	27 A	32	13	A	7.8
AB		14 A	25	15	A	8.1
AB	12	21 A/B	33	15	A+	7.6
AB	8	22 A/B	36	18	A+	8.5
AB	12	12 B	25	18	B	8.8
AB		8 A	22	25	A	7.0
AB	12	17 A	32	28	A	7.8
AB	12	17 A	37	30	A	8.5
AB	9	13 A	32	33	A	7.0

TOTAL: 9

AVERAGE INCREASE: 21.7%

NOTE: CLASS-1st letter is for class level, 2nd letter is for teacher.

YEARS-number of years of formal education.

MATH1-initial math assessment (Steck-Vaughn Mastery Test unless otherwise indicated).

MATH2-final math assessment.

%INCREASE-% of increase from initial assessment to final assessment.
(MATH A % BASED ON 40 QUESTIONS)

GRADE-grade for class.

READING1-initial reading assessment score (RFU).

MATH B FINAL RESULTS (ALL)

File: scores

Report: final scores

3/15/91

Selection: CLASS contains BB
or CLASS contains BL

CLASS	YEARS	MATH1	MATH2	%INCREASE	GRADE	READING1
BB	8	37 B	41	4	B	9.6
BB	12	37 B	46	9	B-	8.8
BB	12	33 B	47	14	B+	9.0
BB	8	23 A	38	15	B-	7.0
BB	12	22 B	39	17	C-	7.2
BB	12	43 B	61	18	A	9.6
BB	12	28 B	46	18	B	7.2
BL	12	25 B	43	18	93	7.4
BB	9	15 B	35	20	C-	8.3
BL	11	30 B	51	21	87	7.2
BL	12	32 B	55	23	91	8.1
BL	7	24 B	48	24	95	9.0
BL	11	27 B	51	24	85	7.0
BB	9	35 B	60	25	B+	7.6
BB	12	27 B	53	26	A	8.5
BL	11	18 B	44	26	92	8.5
BB	12	39 B	28	28	B+	7.4
BB	12	39 B	69	30	A	8.5
BL	8	22 B	52	30	90	8.5
BB	12	28 B	59	31	A	9.3
BB	9	31 B	63	32	A	8.5
BL	9	17 A/B	50	33	93	8.1
BL	9	16 B	49	33	91	8.5
BB	12	19 B	63	44	A	8.3

TOTAL: 24

AVERAGE INCREASE: 23.5%

NOTE: CLASS-1st letter is for class level, 2nd letter is for teacher.

YEARS-number of years of formal education.

MATH1-initial math assessment (Steck-Vaughn Mastery Test unless otherwise indicated).

MATH2-final math assessment.

%INCREASE-% of increase from initial assessment to final assessment.

(MATH B % BASED ON 100 QUESTIONS)

GRADE-grade for class.

READING1-initial reading assessment score (RFU).

2 students dropped this class (not shown on results)

MATH C FINAL RESULTS (ALL)

File: scores
 Report: final scores
 Selection: CLASS contains CLA
 or CLASS contains CLP

3/15/91

CLASS	YEARS	MATH1	MATH2	%INCREASE	GRADE	READING1
CLP			97		A	
CLP			64		A-	
CLP		TABE 7.1	TABE 7.7	5	B-	
CLA	?	TABE 7.1	TABE 7.7	5	C+	
CLP	9	50 C	56	6	B-	6.1
CLP	9	44 C	52/57	8/13	B	7.8
CLA	12	44 C	53/73	9/29	B	10.2
CLP		41 C	54/65	13/24	B	8.1
CLA	13.5	46 B/C	60/63	14/17	B	11.0
CLA		TABE 7.4	TABE 9.2	14	B-	
CLP	12	42 C	56	14	B	10.4
CLP	12	44 C	58	14	B	8.5
CLA	14	61 C	75/80	14/19	B+	8.1
CLP	12	42 C	57/76	15/34	B+	8.5
CLP	12	45 C	60	15	B	7.8
CLA	12	63 C	79/87	16/24	A-	8.8
CLA	12	39 C	55/67	16/28	B+	8.3
CLP	11	34 C	51	17	B	11.6
CLA		TABE 7.5	TABE 9.7	17	B	
CLP	12	55 C	73	18	A-	8.3
CLP		TABE 7.1	TABE 9.7	20	B	
CLP		TABE 7.5	TABE 10.9	26	B	
CLP		TABE 7.0	TABE 12.9	45	B	
CLP		TABE 7.1	TABE 12.9	45	B-	

TOTAL: 24 AVERAGE INCREASE: *

NOTE: CLASS-1st letter is for class level, 2nd letter is for teacher, 3rd letter is for class time.

YEARS-number of years of formal education.

MATH1-initial math assessment (Steck-Vaughn Mastery Test unless otherwise indicated).

MATH2-final math assessment.

%INCREASE-% of increase from initial assessment to final assessment.
 (MATH C % BASED ON 100 QUESTIONS)

GRADE-grade for class.

READING1-initial reading assessment score (RFU).

* OVERALL AVERAGE INCREASE: 16.6% / 20.4%
 STECK-VAUGHN MASTERY TEST AVERAGE INCREASE: 13.5% / 19.4%
 (The 1st number indicates score or percent after 1 hour of the final assessment. The 2nd number indicates score or percent after a second hour of the final assessment.)

2 students had no initial assessment (shown here).

READING FINAL RESULTS (ALL)

File: scores
 Report: final scores
 Selection: CLASS contains R1
 or CLASS contains R2
 or CLASS contains R3

3/15/91

CLASS	YEARS	READING1	READING2	%INCREASE	GRADE	MATH1
R2	12	6.8	6.5	-2	B+	33 B
R2	10	5.7	6.0	2	B	16 A
R1	12	6.8	7.2	3	B+	50 C
R3	9	6.8	7.2	3	A-	27 B
R3	12	5.3	6.0	5	B	25 B
R1	9	5.8	6.5	5	A-	23 B
R2	9	6.1	6.8	5	B+	37 B
R1	12	6.8	7.4	5	B+	33 B
R3	7	6.3	7.0	5	A-	28 B
R2	12	5.7	6.5	6	A+	25 B
R1	9.5	6.5	7.4	7	B	11 A
R3	6	6.8	7.8	8	A+	22 B
R2	9	5.0	6.0	8	B	13 A
R1	6	5.4	6.5	8	B+	8 A
R2	12	5.7	6.8	8	A-	19 A/B
R2	8	5.7	7.0	10	B	10 A
R3		5.0	6.3	10	B-	34 B
R1	4	5.0	6.5	11	A	9 A
R2	12	5.8	7.4	12	B	25 B
R1	12	6.1	7.8	13	A	28 B
R1	12	6.8	8.8	15	A+	30 B
R3	12	5.5	9.3	29	A+	28 B

TOTAL: 22 AVERAGE INCREASE: 8.0%

NOTE: CLASS-1st letter is for class, 1st number is for class time.

YEARS-number of years of formal education.

READING1-initial reading assessment (Reading For Understanding).

READING2-final reading assessment.

%INCREASE-% of increase from initial assessment to final assessment.

GRADE-grade for class.

MATH1-initial math assessment (Steck-Vaughn Mastery Test).

3 students dropped this class (not shown on results).
 1 student did not take final assessment (not shown on results).



VI. The Cool Down

A. Employee/Participant Evaluation

B. Manager/Supervisor Evaluation

C. Instructor Evaluation

MOTOROLA WORKPLACE LITERACY
PARTICIPANT EVALUATION

1. Do you feel that this class has been helpful to you? How?

2. Did you like the books and materials? How were they helpful (or not helpful) to you?

3. Did this course help you in your job? How?

4. Was the instructor knowledgeable about the subject?

5. What was your most favorite aspect of the course? Your least?

6. Would you like to see this course continued and expanded?

7. Do you have any suggestions to improve this course?

EMPLOYEE PARTICIPANT COMMENTS

1. Do you feel that this class has been helpful to you? How?

- "Yes, I read more now than I had before." (Reading)
- "Yes, it helps me understand the book that I am reading, and also how to write a paragraph." (Reading)
- "Yes, I learned my times tables." (Math "A")
- "Yes, I have learned about fractions and decimals and how to understand them." (Math "B")
- "Yes, it has. It will help with our job." (Math "B")
- "Yes, I learned how to do percents and how to deal with real life situations." (Math "C")
- "Yes, it improved my knowledge in solving word problems." (Math "C")
- "Very helpful-learned different ways of solving problems." (Math "C")
- "Yes-helping me to reach my goal." (Math "C")

2. Did you like the books and materials? How were they helpful (or not helpful) to you?

- "Yes, they were helpful because they helped me read and understand things clearly." (Reading)
- "Yes, they were helpful when I couldn't understand something." (Math "A")
- "Yes, they were helpful because I could refer to the step by step examples." (Math "B")
- "Yes, they were self-explanatory." (Math "B")
- "Yes, they showed different samples of working out problems." (Math "C")
- "Yes-easy to follow." (Math "C")
- "Sometimes they were not clear enough." (Math "C")

3. Did the course help you in your job? How?

- "It helped me alot to communicate with my co-workers and use it outside the plant." (Reading)
- "Yes, because in my job we have to know how to read. We have different models to deal with and parts." (Reading)
- "Not really, we don't read out on the line." (Reading)
- "Yes, because we use numbers on our job and it makes it easier when you know how to add." (Math "A")
- "Yes, I can figure out problems faster." (Math "A")
- "Yes, SPC charts." (Math "B")
- "Yes, adding." (Math "B")
- "Yes, we do alot of charts and graphs." (Math "B")
- "Yes, easier to calculate on some charts and other material." (Math "C")
- "Not really-I don't use math in my job." (Math "C")
- "Helped in preparing charts." (Math "C")
- "It helps me with my logic." (Math "C")
- "Yes, filling out my IQS report." (Math "C")

4. Was the instructor knowledgeable about the subject?

- "Yes, she was able to explain things so we could understand." (Reading)
- "Yes, she taught us to never give up--we could do it." (Math "A")
- "Yes, he was very helpful and explained everything to us until everyone understood." (Math "B")
- "Yes, very thorough and clear." (Math "C")

5a. What was your most favorite aspect of the course?

- "Reading out loud." (Reading)
- "Journals." (Reading)
- "Word problems." (Math "A")
- "Income tax returns." (Math "A")
- "Working together as a group." (Math "A")
- "Fractions." (Math "B")
- "The way he (the teacher) made everyone feel confident in responding in front of the class." (Math "B")
- "Being able to understand." (Math "B")
- "Learning at my own pace." (Math "C")

5b. What was your least favorite aspect of the course?

- "Spelling." (Reading)
- "Writing essays." (Reading)
- "Cutting our classes to once a week." (Math "A")
- "Not enough time." (Math "B")
- "Homework." (Math "B")
- "3 hours is too long." (Math "C")
- "Having to come after work." (Math "C")

6. Would you like to see this course continued and expanded?

- "Yes, for others that need help." (Reading)
- "Yes, I would like to attend more advanced classes." (Math "A")
- "Yes, very much. We need it." (Math "B")
- "Yes, it would help others to understand." (Math "B")
- "Yes, and everyone take the course." (Math "C")
- "Yes, going into algebra." (Math "C")

7. Do you have any suggestions to improve this course?

- "Continue it year-round." (Reading)
- "Have it more than once a week." (Reading)
- "We need more time." (Math "A")
- "Have more classes." (Math "B")
- "Maybe a little more time on the information." (Math "B")
- "The length of the course needs to be longer, so we can spend more time on each area." (Math "C")
- "Have more in-class reviews (tests)." (Math "C")

"Shorter hours and twice a week instead of 3 hours once a week." (Math "C")

"Go a little slower on the algebra for those who have never had it." (Math "C")

"Have a class on Algebra and a class on Geometry."
(Math "C")

MOTOROLA WORKPLACE LITERACY
MANAGER/SUPERVISOR EVALUATION

1. Do you feel the reading and math classes met the needs of your employees?

2. What improvements have you seen in job performance?

3. Please suggest improvements or point out problems you see.

MANAGER/SUPERVISOR COMMENTS

1. Do you feel the reading and math classes met the needs of your employees?

"An excellent idea and people are really enthused and work hard at it."

"They enjoy the class and they said it helped them in their job and also at home."

2. What improvements have you seen in job performance?

"Accuracy of counts improved greatly."

"The employees look forward to challenges besides day to day work."

"Better attitude."

"More confidence in presenting and receiving data."

"An excellent start in helping the employees self-esteem."

3. Please suggest improvements or point out problems you see.

"Having it during working hours for so many people at the same time really caused everyone headaches."

"Possible allow more study time/practice."

"We may have to budget a training workforce to sit on the line while they have class."

"Give classes to employees who are involved in counts of products for information daily."

MOTOROLA WORKPLACE LITERACY
INSTRUCTOR EVALUATION

1. Has teaching in a workplace literacy program been a positive experience for you?

2. Did you feel prepared for your teaching assignment? What could have helped you be more prepared?

3. How did (or didn't) the instructional materials meet the needs of your students? What criticisms do you have of the materials?

4. What did you feel were your greatest obstacles or challenges?

5. Comments or helpful suggestions are encouraged.

INSTRUCTOR COMMENTS

1. Has teaching in a workplace literacy program been a positive experience for you?

"Yes, I know how important it is for the employees to improve themselves and to feel good about themselves. I think I contributed to their success."

2. Did you feel prepared for your teaching assignment? What could have helped you be more prepared?

"I would like to see the teachers get together twice a month for staff meetings to keep things more organized."

3. How did (or didn't) the instructional materials meet the needs of your students? What criticisms do you have of the materials?

"Materials were good; I could have used more exercises for students having difficulties in some areas. Materials did not emphasize word problems enough and did not force students to choose a method of operation."

4. What did you feel were your greatest obstacles or challenges?

"The afternoon class with 16 students—a wide variety of ability and education—keeping them all interested."

"Working around absenteeism—students who were exhausted from working overtime and weekends and had no time for homework."

"Absenteeism—a student coming to class with a bad attitude ruining class for others—dealing with having class only one time a week."

5. Comments or helpful suggestions.

"Regular attendance is really essential in a math class. It throws everyone off when the teacher has to catch someone up. Also students do alot more critical thinking with math skills than is measured or reflected on the assessment test. This disturbs the students."

"The scope of the Math C course should be reviewed. I believe it was a good review for many of the students."

However, some of them wanted more algebra instruction. A separate pre-algebra course should be considered."

"Keep classes to two hours twice a week."

"The math assessment tool needs to be revised."

"Extend Math B to 16-17 weeks to allow percentages to be covered more fully in this class."

"Bring more job related material into the reading class."

VII. Hurdles

- A. Getting Started
- B. Initial Assessments
- C. Class Schedules
- D. Final Assessments

A. GETTING STARTED

The greatest hurdle we ran into with getting our program started was timing. The program was designed as a one year program with two semesters of classes. However, with the Co-Op receiving funds late, assessments did not start until October. Then Motorola ran into problems getting classes started. Classes finally began on February 5, 1991, leaving us with one semester of classes rather than two. An additional three to four months could have been used to allow for these mishaps and for planning.

B. INITIAL ASSESSMENTS

For the most part, the assessment tools successfully broke students into the class levels. The math assessment (Steck Vaughn Mastery Math Test) should have been edited to include more word problems and charts and graphs relevant to Motorola. If the program continues this would need to be done. The major problem we encountered was in administering the assessments. We allowed employees to work on the RFU for one hour and on the Math Mastery Test for one hour. Many employees completed the RFU within 40 to 50 minutes. However, with 100 problems, most employees were not able to complete the math test in one hour. Therefore, we did not get a clear idea of those employees' full math ability. Two and a half hours should be allotted for the total assessment, with one hour for the RFU and one and a half hours for the math test.

C. CLASS SCHEDULES

We found the best timing for classes was two hours twice a week. Unfortunately, it was impossible to have the two Math C classes in that framework. Math C classes were held one day a week for three hours. This proved difficult for both the instructor and the employees. The class was originally designed for 60 hours of instruction. Because of this scheduling, delayed class start time, and break time, only 32-33 hours of instruction was given. Our only other scheduling problem came in April. At that time the reading classes and Math A class were reduced to one class period per week but extended an extra month. Although the total hours of instruction remained the same, much of the it was spent relearning the previous week's lesson. Employees in those classes had a more difficult time remembering class times and homework assignments and felt the class "dragged on" having it only one day a week.

D. FINAL ASSESSMENTS

The problems we had with initial assessments were doubled by the time we started final assessments. As on the initial assessment, students did not have enough time to complete the test. This especially bothered the Math C employees because what they had learned in class were the problems in the last part of the assessment--a part they never got to because of time. Therefore, Math C students were given the opportunity to turn in what they did in one hour, and then work for another hour to complete the

test. We could not use this to show percent increase, but employees were able to show all they learned. Another problem we ran into was with the Math A students. Only 16 out of the 100 problems on the assessment were problems Math A students had learned to do in class. If we gave them the test the way it was, their self-concepts would fall back down to the level they were when we began classes. What we had to do was cut the test down and add more problems that they could do. We took out eight questions on multiplying and dividing fraction (noone had even attempted those on the initial assessment) and replaced them with whole number word problems. We also dropped the last 50 questions since they covered topics too advanced for the Math A employees. We did not use those word problems in finding their percent increase, but employees were able to show all they had learned in class. One last problem we came upon occurred again with the Math C classes. Unknowingly some employees were placed into the Math C classes from a pilot class done in the summer of 1990 without being assessed with the RFU and Steck-Vaughn Mastery Math Test. These employees had taken the TABE after the pilot class. Instead of giving them our final assessment, we gave them the math portions of the TABE and compared their scores from before. Despite all the problems with the final assessments, we feel we came to an accurate percent increase for each employee.

VIII. Awards Ceremony

A. Conclusion

B. Bibliography

A. CONCLUSION

Despite the hurdles and the frustrations met along the way, the partnership between Motorola, Seguin and the Adult Education Co-Op proved successful for both organizations. Results were higher than anticipated and feedback from employees and plant management was positive.

It is difficult to conclude what has only just begun. Motorola, Seguin is expecting continuation of a basic skills program in the plant. The next phase will be a larger scale project to include approximately 200 employees. They are in the planning stages of that phase now. Because of the success of the Motorola project, other companies from the Seguin area have contacted the Co-Op in hopes of starting basic skills programs in their plants. It is exciting to see industry accept the challenge of educating this country's workforce. We, as adult educators, accept the same challenge and extend our hand in forming partnerships to win the race against technology.

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