

ED 324 442

CE 055 957

**TITLE** Literacy and Trowel Trades Project. Evaluation Report.

**INSTITUTION** International Masonry Inst., Washington, DC.; International Union of Bricklayers and Allied Craftsmen, Washington, DC.

**SPONS AGENCY** Office of Vocational and Adult Education (ED), Washington, DC. Div. of Adult Education and Literacy.

**PUB DATE** 90

**CONTRACT** V198A90

**NOTE** 50p.

**PUB TYPE** Reports - Evaluative/Feasibility (142)

**EDRS PRICE** MF01/PC02 Plus Postage.

**DESCRIPTORS** Adult Education; Basic Skills; \*Computer Assisted Instruction; Educational Technology; \*Literacy Education; \*Masonry; Mathematics Instruction; \*Problem Solving; Reading Instruction; Teaching Methods; \*Tutoring; Unions; Videotape Recordings; Writing Instruction

**IDENTIFIERS** \*Workplace Literacy

**ABSTRACT**

In a workplace literacy program designed by the International Union of Bricklayers and Allied Craftsmen and the International Masonry Institute, the basic skills of 615 participants were assessed in mathematics, reading, writing, presentation, listening-responding, and problem-solving at sites in Chicago, Los Angeles, and New York. Available data indicate that 116 individuals participated in workplace literacy skills instruction during the program's fourth quarter. Eligible participants worked in the trowel trades (bricklaying, tile setting, plastering, terrazzo work, stone masonry, cement masonry, marble masonry, pointing, cleaning, and caulking). The three delivery systems used to deliver instruction were videotape technology, individual tutoring, and computer-assisted instruction. Participants liked the videotape delivery system in that they could be trained at home on their own schedule. Participants suggested that the time needed to request tapes be shortened, that they be allowed to watch the tapes with another participant, that the tapes be better matched to the individual's skill level, and that the tapes be based on the individual's particular trade. The tutoring delivery system was considered supportive by participants but also inconvenient. Participants suggested group tutoring might be more effective than individual tutoring. The computer-assisted instruction was the least successful method, with participants indicating a continuing fear of using computers and finding the software unsuitable for adults. Once software appropriate for adults and specific to the trades was found, greater participation was reported. (A sample individualized learning plan and a literacy assessment instrument are included.) (CML)

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LITERACY AND TROWEL TRADES PROJECT  
EVALUATION REPORT

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# EVALUATION REPORT

## I. SUMMARY

The Literacy and Trowel Trades Project achieved a number of successes, illustrated several design limitations and produced recommendations that should facilitate replication of the project in other, similar situations.

Among the successes of the project are the following:

1. The project served over 600 Trowel Trades Workers in three locations -- New York, Chicago and Los Angeles -- by providing an assessment of their workplace literacy skills and by providing instruction geared toward improving individual basic workplace literacy skills.

2. The project developed an instrument useful to assess individual workplace literacy skills. The instrument was based on an audit of necessary, trade-based, literacy skills in the workplace. It was designed to examine the target skills in an easy to administer and score format. It produces diagnostic data by pinpointing areas of particular strength and limitation for individual trowel tradesmen. Also, it allows an instructor to assess progress that an individual may be making when working on a particular skill.

3. The project developed a BAC to Learning Workshop. It was used successfully to recruit people into the program as well as to help trowel tradesmen make decisions about their future and become more comfortable with the notion of returning to some type of educational endeavor.

4. The project produced information on the usefulness of several delivery systems for providing basic workplace literacy training to masonry workers. The data suggests that at least one system is particularly well suited to the difficulties inherent in working in the construction trades.

5. The program resulted in the implementation of the Educational Assistance Program (EAP). The EAP was designed by the International Masonry Institute (IMI) and the International Union of Bricklayers and Allied Craftsmen (BAC) to enable members to continue their education beyond basic workplace literacy, within accredited educational institutions, if members so choose.

6. The program generated an Individual Learning Plan (ILP) form and strategy to help instructors and participants focus on career decisions. The ILP also served as a learning contract for participants.

7. The program resulted in policy initiation within IMI and BAC that made participation in the program, at least the assessment, mandatory for new apprentices. Equally important, interest in the project stimulated efforts to expand literacy training to Canada. In addition the project helped generate new efforts in the U.S. for English as a Second Language (ESL) initiatives and topics to provide training specifically related to safety issues where workplace reading is particularly critical.

8. The program stimulated incorporation of workplace literacy into instruction and instructor training and resulted in adding new skills and courses to the list of abilities expected to be practiced by trade instructors in IMI schools throughout the United States. Teaching Basic Literacy Skills has been added to the annual Trowel Trades Instructor Training Program. In addition, in-service training was created and provided to the instructors who were working with trainees involved with the literacy program. Furthermore, and importantly, the project created an awareness within IMI trade instructors concerning the importance of literacy with the result that IMI instructors began to build workplace literacy topics into their on-going teaching. They also came to realize that problems with apprentice skills and behavior sometimes have roots in problems with basic skills.

Several design limitations also were identified through the course of the project. They fell into four basic categories as follows:

1. Promotional problems: A number of strategies were initiated as promotional strategies. Data suggested that some of the strategies were effective; however, there is need to concentrate on finding more effective ways to bring tradesmen--particularly older tradesmen--into this type of training.

2. Specific Materials: Available commercial materials were used in each of the three delivery systems. Through interviews with instructors and trainees, the project was able to identify a number of weaknesses or limitations with those materials and to generate suggestions for new materials that should be developed.

3. Local Support: The project illustrated the importance of a strong, continuing, consistent local leadership support to achieve success. When local programs experienced sporadic support, the project experienced difficulties in attracting and keeping participants.

4. The Assessment Instrument: Even though the assessment instrument is a strength of the project, it is not available in all languages that are important within the

Union. However, the formal provisions of the DOE award did not allow for the ESL activity to convert the document into Spanish or other languages. The instrument also does not address all the workplace literacy skills that were identified through the audit because funds and time prevented its continuing refinement.

**Recommendations:** Based on project data, at least the following recommendations are offered for future consideration.

1. Develop specific trade-related materials for adult workers in the trowel trades in math and reading.

2. Continue to work on reading issues and reading curriculum within the safety arena, particularly to deal with the Material Safety Data Sheets (MSDS) and other regulations within the Federal Hazard Standard.

3. Continue to experiment with and expand promotional activities to make literacy training more available to the membership.

4. Find ways to draw local leadership into supporting the project earlier and on a more continuing basis. Also, continue use of local coordinators.

5. Provide specific ESL training as well as ESL literacy training to the membership.

6. Involve trade instructors more directly in the program. More specifically, and perhaps most importantly, find ways to make instructors more responsible for literacy training and enable them to provide it in an on-going basis and in an on-going context within the regular training program. Use video and tutoring efforts to supplement the efforts.

7. Use delivery systems that allow for/use teamwork for social support.

8. Continue using and refining the BAC to Learning Workshop until it is a one-day activity.

9. Translate the assessment instrument into other languages.

## II. INTRODUCTION

Eleven objectives defined the scope of activity during the eighteen month project. The basic project goal was to assess and provide training for up to 600 apprentices and

journeymen in three cities: New York, Chicago, and Los Angeles. In addition, the delivery system in each of those locations was to use different materials and different techniques. Specifically, the New York effort was to use computer-assisted instruction; the Chicago effort was to use tutoring; and the Los Angeles effort was to use video technology. The idea was to assess the relative merits of each delivery system in terms of skill gains and member participation. In addition, the project intended to assess the usefulness of commercially available materials that fit within each of those systems with the thought of expanding the project across the United States.

The evaluation framework was a three-part design that focused on impact, process and product. By impact, the project meant the number of members who were involved in training, as well as the skills, knowledge and attitudes that were gained as a result of participating in the training.

By product, the project meant the materials that were produced, used and assessed as part of the Trowel Trades Workplace Literacy Project. These included materials such as the assessment instrument and the BAC to Learning Workshop.

By process, the project meant the policy and procedures through which the program was delivered to our members. Components of the process evaluation included not only policy and coordination, but also the support services provided the clients as well as the administrative arrangements associated with program activity.

The objectives for the project are displayed by type of evaluation in Figure 1: Evaluation Design. Please note that each type of evaluation had at least 3 specific objectives focused on project activity. The data about outcomes for the objectives constitute the remainder of this report.

### III. IMPACT/OUTCOMES

Impact/outcomes dealt not only with the number of members involved in the program, but also with the changes in their skill levels and attitudes as a result of participation.

A. Participation: A total of 615 apprentices and journeymen participated in the Trowel Trades Workplace Literacy project. The specific numbers, grouped by location and by quarter of participation, are noted in Figure 2: Participants. Please note that participation rates were greatest toward the end of the project when word-of-mouth promotion as well as the full-time local coordinators were

**Figure 1: Evaluation Design**

Type of Evaluation	Objectives
Impact	<ol style="list-style-type: none"> <li>1. Provide assessment, counseling and literacy training for up to 600 apprentices &amp; journeymen.</li> <li>2. Improve the literacy skills--in specific job-related areas--of participating trowel tradesmen.</li> <li>3. Promote increasing productivity and career advancement by favorably impacting the self-esteem and job satisfaction ratings of participating trowel tradesmen.</li> <li>4. Promote increased productivity by increasing awareness, interest and ability of participating trowel tradesmen to pursue continuing education and training.</li> </ol>
Process	<ol style="list-style-type: none"> <li>5. Determine what strategies, procedures, and materials work best to teach workplace literacy to trowel tradesmen.</li> <li>6. Establish policy to encourage replication and expansion of literacy training in the International Union.</li> <li>7. Refine the procedures of the tested systems to match them to the needs of participating trowel tradesmen on a continuing basis.</li> </ol>
Product	<ol style="list-style-type: none"> <li>8. Test the relative effectiveness for construction tradesmen of each of three proven systems for teaching literacy skills to adults.</li> <li>9. Develop an effective BAC to Learning tool to recruit tradesmen and make them more comfortable about participating in continuing training.</li> <li>10. Produce technical assistance, counseling, tutoring, training materials, and return to learning materials that can be used throughout the United States in construction to begin to address workplace literacy in the trowel trades.</li> <li>11. Develop an assessment instrument that accurately produces diagnosis of individual workplace literacy skills so as to target instruction.</li> </ol>

**Figure 2: Program Participants**

	<b>Participants</b>		
	<b>Total</b>	<b>Assessed</b>	<b>Trained</b>
<b>1st Quarter</b>	<u>87</u>		
New York	50	50	
Chicago	20	20	No Data Available
Los Angeles	17	17	
<b>2nd Quarter</b>	<u>158</u>		
New York	49	49	
Chicago	22	22	No Data Available
Los Angeles	74	74	
** Piney Point	13	13	
<b>3rd Quarter</b>	<u>108</u>		
New York	29	29	- 0 -
Chicago	18	18	- 0 -
Los Angeles	61	61	10
<b>4th Quarter</b>	<u>262</u>		
New York	31	31	6
Chicago	130	130	37
Los Angeles	101	101	63
<b>Totals</b>	<b>615</b>	<b>615</b>	<b>116</b>

**\*\*Instructor Training Seminar in 1989, at Piney Point, Maryland, included participants from each of the three locations.**



functional. Also note that this participation period was during the cyclical "downtime" of the calendar year for construction activity.

While the numbers of trowel tradesmen assessed exceeded the goal of 600 set initially for the project, the number who engaged in literacy training did not. However, the increase in participation late in the project indicated that the project was gaining momentum as it drew to a conclusion. It also suggested that continuation of literacy activities would be well-received by members, particularly in Los Angeles and Chicago, where participation rates exceeded, by significant amounts, the rates in New York City.

**B. Skill Improvement and Attainment:** Skills were assessed in four major areas:

1. Writing and visual representation
2. Mathematics
3. Reading
4. Problem Solving

These skills, and the specific competences within these skills, were identified through a workplace literacy audit conducted by the evaluation specialist. The specific competency areas have been displayed in Figure 3: Skill Gains. For example, the competency area for mathematics includes: basic operations such as addition, subtraction, multiplication and division; more complicated and important functions such as working with decimal fractions, calculating percentages, manipulating fractions, using mixed numbers, finding common denominators, using number values, measuring objects, converting units of measure; and critical geometry skills such as finding perimeters, calculating area, calculating volume, determining angles and finding unknowns.

In addition to an initial assessment of every participant, a 20% random sample of participants were assessed again after being involved in training for 90 days to determine what difference participation in the literacy training activities had made. Figure 3 illustrates, for the sample, the gain scores that resulted from participation. Notice that only the areas of writing and visual representation, mathematics and reading are included in the chart because neither the tutorial sessions nor other (video or computer-assisted) materials dealt specifically with problem solving; therefore, the local coordinators decided not to use that part of the assessment instrument in conducting the post-test. Also note that the figure only includes the scores for the areas in which the participants received training. Their scores for other content areas remained the same between pre-test and post-test.

Figure 3: Skill Gains

Item	Pretest Rating					Post Test Rating				
	Diagnosis Letters	Basic (0)	Work (1)	Review (2)	Satisfactory (3)	Diagnosis Letters	Basic (0)	Work (1)	Review (2)	Satisfactory (3)
<b>WRITING/VISUAL REPRESENTATION</b>										
View	—	—	—	—	—	—	—	—	—	—
Proportion	—	—	+	—	—	—	—	—	—	+
Lines	—	—	—	—	—	—	—	—	—	—
Dimensions	—	—	+	—	—	—	—	—	—	+
Symbols	—	—	—	—	—	—	—	—	—	—
Writing	—	—	+	—	—	—	—	—	—	+
<b>MATHEMATICS</b>										
Addition	—	—	—	—	—	—	—	—	—	—
Subtraction	—	—	—	—	—	—	—	—	—	—
Multiplication	—	+	+	—	—	—	—	+	+	—
Division	—	+	+	—	—	—	—	+	+	—
Decimal	—	—	—	—	—	—	—	—	—	—
Fractions	—	—	++	—	—	—	—	—	++	—
Percentages	—	—	++	+	—	—	—	—	++	+
Fractions	—	—	+++	—	—	—	—	—	+++	+
Mixed Numbers	—	—	+++	+	—	—	—	—	+++	++
Common	—	—	—	—	—	—	—	—	—	—
Denominators	—	—	—	—	—	—	—	—	—	—
Number Values	—	+	+	—	—	—	—	+	+	—
Measurement	—	+	—	+	—	—	—	+	—	+
Conversion	—	—	—	—	—	—	—	—	—	—
of Units	—	+	—	—	—	—	—	—	—	+
Perimeter	—	+	—	++	—	—	—	—	—	+++
Area	—	—	—	—	—	—	—	—	—	—
Volume	—	—	—	—	—	—	—	—	—	—
Angles	—	—	—	+	—	—	—	—	—	+
Unknowns	—	—	—	—	—	—	—	—	—	—
<b>READING</b>										
Word Use	—	—	+	—	—	—	—	—	+	—
Specific Information (Prints)	—	+	+	+	—	—	—	+	—	++
Specific Information (instructions, lists, tables)	—	—	+++	+	—	—	—	—	++	+
Conclusions	—	—	++	+++	—	—	—	++	—	+++

Figure 3 includes the data from 22 apprentices and journeymen. The data indicate that there were changes--specifically gains--in participant competency levels in several skills as a result of participation. In general, each participant improved his/her achievement in two competency areas during the period of instruction. The highest concentration worked on manipulating functions and mixed numbers, two highly critical workplace literacy competencies.

More importantly, the 22 participants raised their skills a total of 53 skill levels or roughly two skill levels per participant for the period of participation. In other words, an average participant improved from the "basic" to the "work" level in working with fractions during the instructional period. Since each level represented several "school-based-grade levels," a one level skill gain in three months was a significant gain in ability to perform the specific competency. However, please note that the skill levels do not correspond directly to school grade levels. In fact, the project's position is that school grade levels are an inappropriate measure for adult learners.

The finding that most participants improved in one skill area at least one skill level, was fairly consistent across locations and across content areas. However, the possibility of determining the statistical significance of gain scores was eliminated due to limited numbers of post tests. An additional complicating factor that migrated against producing statistical comparisons of gain scores was the individualized and self-selecting design of classes: some participants worked in literacy training only one week while others worked an entire quarter. However, note that once a trowel tradesman became fully involved, he/she remained involved for a period of weeks.

C. Self Esteem: The data on self esteem was inconclusive. The assessment instrument contained questions related to self esteem as a function of internal and external loss of control. However, between the pre-test and the post-test, the results actually demonstrated a decrease in scores that would indicate a growth in self-esteem on the part of participants. While the finding was possible, a more likely explanation for the phenomenon was that trainees provided a more honest appraisal of their skills and attitudes during the post-test period, perhaps as a result of participation. The more truthful appraisal stands in contrast to the "norm of bravado" that seemed to prevail on all pre-tests regarding those particular questions.

Anecdotal information gathered from two sources suggested that participation had a positive effect on self esteem. First the individual career plans dealt with the

issue of career growth. Through that process, many participants indicated that they had given serious thought to the direction of their careers, perhaps for the first time since joining the trade. Second, self-reporting of participants suggested very favorable attitudes about themselves and their progress as a result of participation. In addition, the increasing requests for more training suggested substantial growth in self-confidence. One participant even expressed that during lunch at the job site, each day he wondered what he would learn when he had a chance to get home that day and participate in the program.

#### IV. PRODUCT

Product evaluation dealt with several aspects of the program including the assessment instrument, the actual skill levels of participants, and the BAC to Learning Workshop and the three delivery systems that were used to provide training.

A. Assessment Instrument: Even though coordinators score the outcomes, the assessment instrument was designed so it could be used as an individual, self-assessment. The instrument provides an opportunity to learn as well as a means to diagnose specific skills and limitations in the workplace literacy areas. The instrument was developed and validated using tradesmen and trades instructors within the International Masonry and the International Union of Bricklayers & Allied Craftsmen network. In addition, the outcomes revealed by the assessment instrument correlated highly with outcomes produced by a battery of skill assessment instruments used by the Westchester BOCES, a provider of related instruction to BAC members.

The initial instrument took approximately two hours to complete. It was revised to take approximately 1/3 as long and to improve its diagnostic capability. The resulting instrument provides skill assessment in four broad areas of concern: representation (writing and visual), mathematics, reading and problem solving. Each question is keyed to specific items that were discovered through the Workplace Literacy audit conducted on job sites.

The questions are arranged from easiest to more difficult and the scoring sheet and work provided by the apprentice gives the assessor the opportunity to pinpoint exactly the problems that the trainee is having in coping with the material. The instrument also includes a diagnostic sheet on which the assessor can report not only how well a participant responds to particular areas of questioning, but also can indicate the particular problems that the participant may be experiencing. A copy of the

instrument and the assessment sheet are included as Appendix A at the back of this report.

**B. Skill Level Findings:** In general, the assessment instrument provided useful information that could be translated into learning activities for participants. Among the findings of note were the following:

1. Most participants had a basic knowledge of sketching and were able to communicate their ideas. However, they had relatively little notion of the language of lines, dimension or proportion. Further, most participants wrote poorly or refused to participate in the writing exercise.

2. Basic math operations of addition, subtraction and multiplication were managed successfully by most participants. However, beginning with division, many participants experienced difficulty. By the time participants progressed to percentages and conversions fewer than half could answer the problems correctly or could illustrate an operational knowledge of the process that they were to undertake in their work in order to answer the problem correctly. Almost half of the participants even missed questions on basic measurement using the ruler when it came to determining the length of a line in fractions of inches. Of equal concern, almost 80% of participants experienced substantial difficulty in working with fractions and approximately half of the participants could not correctly work problems employing the geometry skills necessary for the trowel trades.

3. The reading scores suggested that participants were skilled at following specific instructions. However, when it came to reading specifications on prints; drawing conclusions and finding main ideas; or accurately reading graphs, tables and charts, at least 35 per cent of the participants failed to readily demonstrate "satisfactory" or "review" skill levels during their initial assessment.

4. In terms of problem solving, the participants perceived that the questions were difficult and often times did not complete them. When the questions were completed, questions that involved multiple step problems, or required multiple stage calculations to produce an answer, were not answered successfully by over 75 percent of the participants in the initial assessment.

**C. Delivery Systems:** Three delivery systems were used to provide instruction to participants in the program: videotape technology, individual tutoring and computer-assisted instruction. The findings regarding each delivery system follow.

1. Videotechnology - The videotechnology delivery system was endorsed and supported by apprentices because it best fit their needs in terms of their work schedule, recreation schedule, responsibilities to their family and their general mental attitude. Among the positive things that were said about this particular system were comments like the following: it was a joy not to have to go home, get dressed and go back out in order to go to training; or that they were able to look at the tapes AFTER getting their children to bed at night; or that if they were particularly tired on a given evening they did not have to look at the tape that day, but were rather able to use it the next day. Many participants who used this delivery system indicated that they developed routines where they set aside time every day or every other day to work with the particular tapes and indeed begin to look forward to work with the tapes as a normal part of their day or weekly activity.

Four particular problems with the video technology were voiced by participants. First, they indicated a difficulty with timeliness, in that there was some delay between the time they would request a tape or indicate an interest in the program and the time that tape was received. Importantly, that period of delay was reduced to just under two weeks as the project progressed. However, participant suggestions indicated that it would be helpful if the "turnaround" were a matter of "a day or so rather than a week or so." Second, apprentices indicated that it would be helpful if they could use the tapes in pairs. Pairs would allow for mutual social support, but would not cause personal embarrassment. Third, apprentices indicated that the tapes would be more useful if they were specifically based on their particular trade or indeed on the trades in general. Several participants suggested that the Union should create workplace specific companion tapes. Last, apprentices expressed some concern that parts of the tape and indeed whole tapes were incorrectly matched to their particular skill levels. This was a special problem to some apprentices who needed review but may have gotten a more basic tape than "review" level. Further, it suggests that the tapes need to be indexed within each tape by skill levels.

2. Tutoring - The tutoring delivery system was perceived as being supportive by apprentices and as providing fairly targeted materials to their needs. However, apprentices viewed tutoring as inconvenient because they had to leave home after work to meet with a tutor, even though the site was supposedly a mutually convenient site. Furthermore, participants suggested that the tutoring program should routinely be group tutoring sessions so that they have the opportunity to support one another. Several participants also indicated that it took time to work out a

useful relationship with a tutor...or that they tried more than one tutor before they found someone they could work with.

In general, apprentices indicated general satisfaction with the materials used with the tutoring effort because the materials were customized to fit each individual's skill needs. Further, the more effective tutors worked with apprentices to develop specific trade-based examples (transfer of concepts to new situations) to facilitate mastery of the content. The numbers remained restricted in tutoring because of the inconvenience of schedule. However, the Chicago location did witness interest in the Educational Assistance Program as an extension of literacy with a dozen members choosing to participate. In addition, the Chicago effort afforded IMI an opportunity to pilot the idea of incorporating some of the tutoring/training directly into the on-going pre-job and related instruction apprentice training. The success suggests that an expanded version of a strategy where IMI instructors offer literacy training as part of the on-going apprenticeship program warrants further exploration.

3. Computer-Assisted Instruction - The computer-assisted delivery system was the least successful of the three delivery systems. Participants indicated a continuing fear of using the computer and a continuing dissatisfaction with the available software materials that could be used to teach basic literacy. Even though the instructor in this particular situation attempted to use computer games to overcome participant fear, and to some extent was successful, it remained a problem throughout the program. However, the greater problem seemed to be that the software available within the CCP system was juvenile enough to be "off-putting" to adult learners. Moreover, it held little relevance to workplace literacy needs and skills. Late in the project, the computer-assisted program secured computer-assisted design software that was relevant to the trade, designed for adults and dealt with issues like reading blueprints. The result was an increase in participation.

Of note with each of the three systems was a continuing suggestion that there is need to develop English as a Second Language (ESL) materials to use in any type of workplace literacy training in the construction trades.

D. BAC To Learning Workshop - A total of 14 BAC to Learning Workshops were conducted across the United States. In total, 157 participants representing all the International Union trades except cement mason participated in the programs. The majority of participants had been involved in the trade four to six years. However, the range of trade involvement extended from first-year-apprentices to journeymen-masons with over forty years in the trade.

The evaluation of the RAC to Learning Workshop was positive with 98% of the participants indicating that they would and did recommend participation to other members.

The BAC to Learning Workshops began in the spring and continued throughout the remainder of the project. However, none were held in the late summer/early fall due to scheduling confusion; unfortunately, the confusion resulted in missed opportunities for tradesmen to participate in the program because this was the time period when the program began to gain momentum and the time period when construction activity traditionally slows down.

The BAC to Learning Workshop was two days long and was conducted by two trainers--one of whom was a trade instructor--the other of whom was an instructor at a local community college. The presenters of the RAC to Learning Workshop were trained in two-day sessions in each location by CAEL developers of the program. The training sessions included modeling, participation in the workshop and practice conducting various segments of the workshop.

The BAC to Learning Workshop was an innovative and successful design. It was based on the premise of looking at the entire person from a wellness perspective. Workplace illiteracy was not a sickness or a disability rather, "wellness" acknowledged that participants had used their various attributes to cope with literacy problems. . . and could use these same attributes to master new Workplace Literacy skills. Primary in this perspective was the information on multiple intelligences that celebrated the positive contributions of all skills of adults. The BAC To Learning Workshop included topics such as multiple intelligence, setting individual goals, adult learning, making decisions about educational programming and looking for assistance.

In general, participants viewed participation very favorably as illustrated in Figure 4: Evaluation of BAC to Learning workshops. As noted in that figure, the vast majority of participants rated every item as useful or very useful on their evaluation forms. Only two items, the ability of the workshop to provide information on how to study, and the ability of the workshop to help individual participants to decide what to study were viewed as not very useful by as large a group as ten percent of the total participants. Perhaps even more important, well over 90% of the participants viewed as useful and very useful workshop activities that dealt with building their confidence, giving them encouragement, and helping them come to understand that they could deal successfully with new opportunities to learn. The only complaint was the difficulty in giving up either two consecutive Saturdays or the pay for a workday



**Figure 4: BAC to Learning Workshop Evaluation \***

	<u>Workshop Issues</u>	<u>Percentage of Participants who Agree with Comment</u>			
		Not Useful At All	Not Very Useful	Useful	Very Useful
1.	Learning about your skills	1	5	70	24
2.	Learning about your interests	1	8	67	24
3.	Learning about your values	1	7	56	36
4.	Learning about yourself	1	5	65	29
5.	Providing information on basic skills	1	6	62	31
6.	Providing information about different types of intelligence	1	4	59	36
7.	Providing information about advising and support services available to adults	1	4	53	42
8.	Providing information about the availability of prior learning assessment	1	5	63	31
9.	Providing information about how to study	1	13	67	10
10.	Providing information about how to manage time	1	8	68	23
11.	Providing information about how adults learn	1	6	69	24
12.	Helping to clarify your goals	2	9	64	25
13.	Helping you make decisions	1	9	64	26
14.	decision about taking additional training / education	1	5	58	36

15.	Helping you decide what to study	1	13	63	23
16.	Helping you feel more comfortable with the idea of returning to school/training/education	1	5	51	43
17.	Helping you feel confident about your abilities	1	6	57	36
18.	Helping you feel confident about your decisions	1	6	57	36
19.	Helping you feel that as an adult learner you are not alone	1	5	51	43
20.	Giving you encouragement	1	5	54	40

\* N = 157 Trowel Tradesmen

plus a Saturday to participate. Therefore, participants suggested that future workshops be compressed into a single day.

The idea of multiple intelligences and accompanying coping skills turned out to be a powerful concept. Not only was the idea legitimated through the BAC to Learning Workshops, but also IMI instructors found that participants typically used these "other" intelligences when attacking new content and learning/relearning literacy skills. Moreover, the project demonstrated for IMI instructors just how many different ways there are to teach adults and how many different ways adults process information.

## V. PROCESS

The process evaluation involved the actual administration and operation of the program. It dealt specifically with evaluating promotional activities, administrative activities, support services and policy.

A. Promotion: Promotion proved to be one of the limitations of the project. Over time, the best promotional activity was found to be "word-of-mouth" from participant (union member) to participant (union member).

A number of promotional strategies were implemented and assessed including the BAC to Learning Workshop, newspaper articles, presentations to local union meetings, direct mailing and brochures. In general the BAC to Learning Workshop was found to be fairly useful as a recruiting tool. However, the other tools, particularly the brochure, the letter and the union presentations had little effect. The union presentations seemed to miss the audience. The direct mailing was not read, perhaps because it did not come from the local leadership. The brochure was perceived to be too difficult to read, too cluttered, too hard to find the main point and too long. More importantly, it had little visual appeal and the evidence clearly suggests that this audience is one of visual learners.

The two promotional strategies that proved most successful were "word-of-mouth" advertising by participants to other union members and active solicitation by the local coordinator, particularly at the jobsite and with contractors and foremen. When these two strategies were used, participation rates greatly increased. Further, over time, project staff concluded that more effort needed to be undertaken to generate interest at the worksite, to elicit the strong and continuing support of local leadership, and to find ways to get the message to the membership in ways that they saw. Suggestions that came from participants late in the project period included billboards and/or local radio

advertisements in combination with notices in the union newspaper and their pay envelopes. However, key to any successful strategy was the realization that recruitment had to embrace and be supported by the local union leadership.

2. **Coordinators:** Project activity suggested clear preference for local coordinators in developing and running the program. While the national director helped to establish policy, he was relatively ineffective in generating local leadership support, in recruiting people into the program, or in insuring that the delivery of services beyond assessment took place. When the project moved from a national director to a national manager/coordinator in conjunction with a series of local coordinators, one per site, the number of participants increased dramatically and the skill level acquisition of participants increased concomitantly.

3. **Individualized Educational Plans:** The project developed individualized Learning Plans for each participant. When these plans were developed and implemented by the local coordinator, they served as learning contracts between the participant and the service provider. As a contract, the participants clearly understood their responsibilities since they work under collectively bargained contracts. As a result, participation increased when these learning contracts were used. A copy of the contract is included as Exhibit 5 in this report. Participants indicated that they liked the fact that it served as a record, a guarantee, and a decision-making tool.

4. **Instructor Training:** An important piece of the process was continuing in-service training provided to the local coordinator as a strategy to improve literacy training. The in-service training took place in Washington and on-site and enabled coordinators not only to rapidly and accurately score the assessments and fill out the individualized education plans, but also to work effectively with local service providers, to keep the records, to maintain the audit trail on expenditures and to implement the policy as it was created at the national level. Further, the importance of the in-service activity was carried over into IMI's Annual Instructor Development program, where providing for basic literacy skills has become an on-going class available to every instructor in the International Masonry Institute's North American cadre of instructors.

5. **The Educational Assistance Program:** Before the workplace literacy initiative, the Educational Assistance Program had been included as a part of the IMI Master Plan for Training. However, even though the design was in place, the initiative had never been implemented. The Trowel

## Figure 5: Individual Learning Plan (ILP)

### A. PERSONAL DATA

---

Name

---

Address

---

City/State/Zip Code

---

Phone Numbers--Home/Other

### B. WHAT I WANT TO LEARN

1. I'd like to develop my multiple intelligences:

- |                                   |   |
|-----------------------------------|---|
| <input type="checkbox"/> language | <input type="checkbox"/> logical-mathematical |
| <input type="checkbox"/> spatial  | <input type="checkbox"/> musical              |
| <input type="checkbox"/> bodily   | <input type="checkbox"/> personal             |

2. I'd like to improve my skills in the craft:

(Note: all of these may not be available through your local or IMI training program.)

- |   |  |
|---|--|
| <input type="checkbox"/> bricklaying                      | <input type="checkbox"/> tilesetting               |
| <input type="checkbox"/> stone masonry                    | <input type="checkbox"/> plastering                |
| <input type="checkbox"/> cement masonry                   | <input type="checkbox"/> marble masonry            |
| <input type="checkbox"/> pointing, cleaning, caulking     | <input type="checkbox"/> terrazzo                  |
| <input type="checkbox"/> mosaics                          | <input type="checkbox"/> restoration               |
| <input type="checkbox"/> ornamental plastering            | <input type="checkbox"/> panelization              |
| <input type="checkbox"/> refractories                     | <input type="checkbox"/> stone carving             |
| <input type="checkbox"/> insulation                       | <input type="checkbox"/> blueprint reading         |
| <input type="checkbox"/> drafting and plan making         | <input type="checkbox"/> foreman/supervisor skills |
| <input type="checkbox"/> architecture                     | <input type="checkbox"/> estimating                |
| <input type="checkbox"/> other construction related areas | <input type="checkbox"/> other (specify)           |
- 
- 

3. I'd like to improve my basic skills in these areas:

- |   |  |
|---|--|
| <input type="checkbox"/> reading                            | <input type="checkbox"/> writing         |
| <input type="checkbox"/> computation                        | <input type="checkbox"/> sketching       |
| <input type="checkbox"/> speaking and listening             | <input type="checkbox"/> problem solving |
| <input type="checkbox"/> speaking and understanding English |  |

4. Some other areas I'd enjoy learning more about or am interested in are:

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

C. **WAYS TO FURTHER LEARNING**

- \_\_\_ 1. I'd like to work on my basic skills.
- \_\_\_ 2. I'd like to get a GED
- \_\_\_ 3. I'd like to take an IMI-sponsored course:  
I want to learn \_\_\_\_\_
- \_\_\_ 4. I'd like to take a course at a local school or college related to the masonry trade.
- \_\_\_ 5. I'd like to take a course at a local school to learn about something not related to the trowel trades.
- \_\_\_ 6. I'd like to explore ways to learn outside the classroom (at home, at my own pace, when and where I want to).
- \_\_\_ 7. I'd like to find out if I can get credit for learning I've gotten outside the classroom.
- \_\_\_ 8. I'd like to get a college degree.
- \_\_\_ 9. I'd like to discuss my options and concerns with a counselor.

D. **MY PLANS FOR FURTHER LEARNING**

1. My current learning goal is:

\_\_\_\_\_

\_\_\_\_\_

2. What are some problems or obstacles I might run into?

---

---

---

---

3. What help do I need and where can I get it?

---

---

---

---

4. What steps I will take to achieve my goal:

	Step	When
a.	_____	_____
b.	_____	_____
c.	_____	_____
d.	_____	_____
e.	_____	_____

The Learning Plan has been reviewed by me.

---

Member Signature \_\_\_\_\_ Date \_\_\_\_\_

---

BAC to Learning Counselor Signature \_\_\_\_\_ Date \_\_\_\_\_

---

IMI Facilitator Signature \_\_\_\_\_ Date \_\_\_\_\_

Counselor / Advisor Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Approved Activity: \_\_\_\_\_  
\_\_\_\_\_

Copies to: BAC Member  
BAC to Learning Counselor

Original to: I.M.I.  
823 - 15th St., N.W.  
Washington, DC 20005

Follow-up: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Trades Workplace Literacy program resulted in implementation of the Educational Assistance Program so that participants who chose to continue beyond the basic literacy training could in fact continue their schooling with the financial support of the International Masonry Institute. The program reimburses a portion of tuition and books for participants who register and successfully complete training in approved institutions throughout North America.

About a dozen participants continued their literacy training--or began their training at a more advanced level--and took advantage of this new opportunity. Participants uniformly suggested that it was a good idea for them to continue their schooling--in some instances toward a GED, and other instances toward a college degree. Incidentally, these 10-12 people are not counted in the totals for service on Figure 2 because they were maintained in a separate cost category. It was a leveraged service for the project.

6. Policy: Program policy evolved over time such that participation in the literacy assessment became mandatory with all new apprentices. However, the intake assessment was moved, as a result of participant suggestions from an initial intake instrument to one that occurred after the apprentice had been in school for several days or a week. This enabled the apprentice to become familiar with the routine in the school, to come to know the instructor and to gain support from that staff person as well as their peers when the time came to take the assessment and to begin literacy training if that's what they chose to do.

Another important policy finding related to the project had to do with the difficulty of apprentices getting started in the program. The project found that when apprentices expressed desire to be involved, the longer the delay between expressing the desire and the actual implementation of training, the less likely the apprentice was to continue that training. This was a particular problem with the video technology where initially a number of weeks lapsed between indication of desire to participate and receipt of initial videos. However, over time, that length of time was shortened from a number of weeks to two weeks or less. There is a continuing desire to shorten that period of time even further, such that it might only be a day or two between the time an Individual Educational Plan is completed and the time an apprentice takes home the tape. In fact, in the best case scenario, the coordinator would simply hand the selected tape to the apprentices that complete the individual educational plan and begin the process.

7. Counselors: Counselors were used to help participants complete individualized Learning Plans, to discuss educational goals, and to explore educational

options in the geographic area. They turned out to be an underutilized resource because participants did not seek them out; counselors were located within local community colleges and were viewed by participants as logistically inconvenient and somewhat detached from the work-a-day, blue-collar world. As a result, the trade instructors assumed more of this role as the project progressed. Even though trade instructors were not professionally trained, they had credibility with the participants that made their counseling efforts effective.

8. **Partnership Coordination:** Coordination between partners worked in spite of the differences that exist between business/industry and education. Two strategies that helped considerably were: A) the Memo of Understanding in which the duties/responsibilities of each partner were articulated and ratified; and B) the Executive committee for the project on which a senior official from each partner meet to set program policy and resolve problems. Even so, there remained some difficulty in fully integrating accounting systems and in staying in touch (due to complications of distance and schedule).

9. **Support Systems:** Construction and union culture emphasize the importance of team work as a type of social support. The importance of this idea was emphasized in the project as participants reacted cautiously, if not negatively, to individualized learning in each of the three delivery systems. Participants consistently indicated a preference for using the learning materials in teams. The idea was one of social support, not group training. There were even reports that the tutoring delivery system worked only because that location adopted a team method to service delivery and abandoned individual tutoring.

## VI. CONCLUSIONS

In conclusion, the findings suggest that the Trowel Trades Workplace Literacy project was a success. A number of apprentices and journeymen participated in the program. The majority of them experienced skills gains in particular competency areas of concern. The majority of instructors and participants suggested that their participation had been valuable, and continued to recommend it to other members. Indeed there is a continuing interest within the union to expand the literacy program and a Canadian as well as U.S. initiative is underway. The project also resulted in at least three very useful products: a workplace literacy diagnostic assessment instrument; an individualized learning plan format and procedure; and a BAC to Learning Workshop that can be used to recruit and train members of all ages about the opportunity of continuing training.

The specific recommendations growing from the project are as follows:

1. Develop specific math and reading trade-related materials for adults in the trowel trades.
2. Continue to work on reading issues and reading curriculum, particularly within the safety arena to deal with the Material Safety Data Sheets (MSDS) and other regulations within the Hazard Communication Standard of the Federal Government.
3. Continue to experiment with and expand promotional activities to make the project more available to the membership.
4. Find ways to bring the support of local leadership into the project earlier, and on a more continuing basis. Also continue using the idea of local coordinators.
5. Provide ESL and workplace specific ESL training.
6. Involve trade instructors more directly in the program. More specifically, and perhaps most importantly, find ways to improve instructor skills and use trade instructor skills to teach the literacy skills to trainees. Make them more responsible for literacy training and make them more able to provide it in an on-going basis in an on-going context within the regular training program. Supplement instructor classroom efforts with a combination of video training and tutoring efforts.
7. Use delivery systems that allow for/use teamwork for social support.
8. Continue refining the BAC to Learning Workshop until it is a one-day activity.
9. Translate the assessment instrument into other languages.

# INTERNATIONAL MASONRY INSTITUTE

823 FIFTEENTH ST., N.W., WASHINGTON, D.C. 20005



202/783-3908

Date: \_\_\_\_\_

## WORKPLACE LITERACY ASSESSMENT

### General Information

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

I.U. Number: \_\_\_\_\_ Date of Union Initiation: \_\_\_\_\_

Local Union Number: \_\_\_\_\_ Branch of Trade: \_\_\_\_\_

Phone Numbers (Home/Other): \_\_\_\_\_

Year of Birth: \_\_\_\_\_

Gender:     \_\_\_ Male     \_\_\_ Female

Ethnic Group:   \_\_\_ Caucasian   \_\_\_ Black   \_\_\_ Asian   \_\_\_ Hispanic  
                  \_\_\_ Native American (*Indian, Eskimo, Aleutian*)   \_\_\_ Other

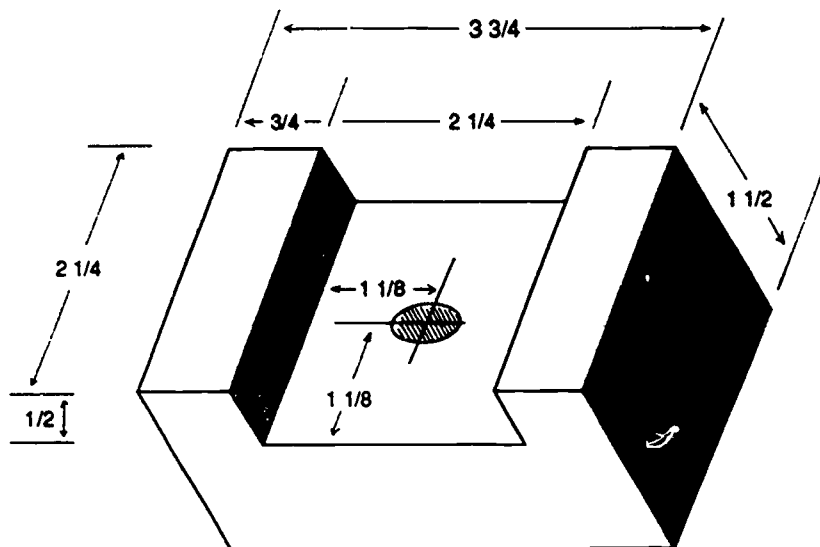
### Education and Training

Please check all levels of education and training in which you have participated.

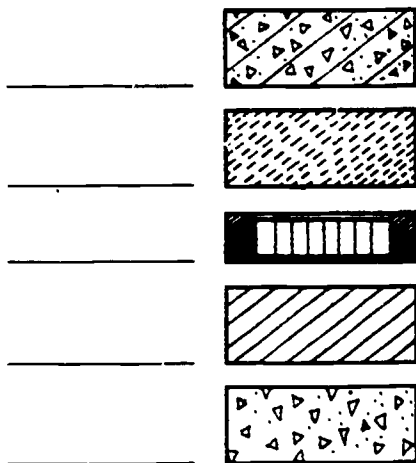
- |                            |                             |
|----------------------------|-----------------------------|
| ___ Some High School       | ___ Trade Specialty Courses |
| ___ High School Grad/GED   | ___ Some College/University |
| ___ Technical/Trade School | ___ College Grad/2 years    |
| ___ Business Training      | ___ College Grad/4 years    |
| ___ Apprenticeship         | ___ Advanced Degree         |

# I. Writing/Sketching

- 1) Draw and dimension this object from the front view in the provided space. Do not spend over 3 minutes on the drawing.



2) Match the symbol with the material it represents on architectural plans.



- a) brick
- b) tile
- c) concrete block
- d) plaster
- e) concrete
- f) cut stone
- g) glass block

3) Please circle the letter of the sentence (either "a" or "b") that best expresses how you feel. There are no right or wrong answers

- a. There is no such thing as luck; what happens to me results from my own actions.
- b. Sometimes I don't understand how I can have such poor luck.

- 4) A friend of yours is considering joining the union and applying for a masonry apprenticeship. Write him or her a letter explaining **why it is a good idea and what to do next**. Use the bottom of the page to write the letter. Do not worry if it is messy, if you misspell words, or you need to scratch out lines. **Do not spend over 10 minutes writing the letter.**

5) Writing Information

Do you write any of these?	I do this.	I'd like to do this better.
forms (pensions, insurance, tax)	_____	_____
letters (to friends, complaints)	_____	_____
notes to child's school/family/ union members	_____	_____
writing for self (stories, songs, opinions)	_____	_____
other (specify)	_____	_____

II. Mathematics

*Directions: Answer the following problems. SHOW YOUR WORK*

6)        6,213 feet  
          392 feet  
          10,451 feet  
          +    62 feet  
          \_\_\_\_\_

7)         $1/2$  in. +  $3 \frac{3}{8}$  in. = \_\_\_\_\_

8)         $.5$  lbs +  $3/4$  lbs = \_\_\_\_\_

9)         $1/8$ " +  $3/8$ " +  $7/8$ " = \_\_\_\_\_



10) 
$$\begin{array}{r} \$ 117.26 \\ - \quad 98.15 \\ \hline \end{array}$$

11)  $3 \frac{1}{2} \text{ in.} - 1 \frac{3}{16} \text{ in.} = \underline{\hspace{2cm}}$

12)  $12 \frac{1}{4}'' - .6'' = \underline{\hspace{2cm}}$

13) 
$$\begin{array}{r} 10.23 \text{ yards} \\ \times \quad 1.4 \text{ yards} \\ \hline \end{array}$$

14)  $\frac{3}{16} \times \frac{1}{2} = \underline{\hspace{2cm}}$

15)  $8 \frac{3}{8}' \times .25' = \underline{\hspace{2cm}}$

16)  $62 \overline{) 19840}$

17)  $6 \frac{5}{16} + \frac{3}{16} = \underline{\hspace{2cm}}$

18)  $\frac{3}{8} + \frac{3}{16} = \underline{\hspace{2cm}}$

19)  $\frac{1}{2} = \underline{\hspace{1cm}} / 8$  (what fraction?)

20)  $.15 = \underline{\hspace{2cm}}$  (what fraction?)

21)  $\frac{3}{8} = \underline{\hspace{2cm}}$  (what decimal?)

22) 87% of 55 =  $\underline{\hspace{2cm}}$

23) 45% of  $\underline{\hspace{2cm}}$  = 18 (what number?)

24)  $\frac{15}{21} = \underline{\hspace{1cm}} / 7$  (what fraction?)

25)  $66/9 = \underline{\hspace{2cm}}$  (what mixed number?)

26) Round off 2.47 to the nearest tenth:  $\underline{\hspace{2cm}}$

27) Find the lowest common denominator of:  $2/8$ ,  $9/10$  and  $7/16$   $\underline{\hspace{2cm}}$

28) Which number is  $> 27$ ?  $\underline{\hspace{2cm}}$

- a) 25
- b) 27
- c) 29
- d) ?1

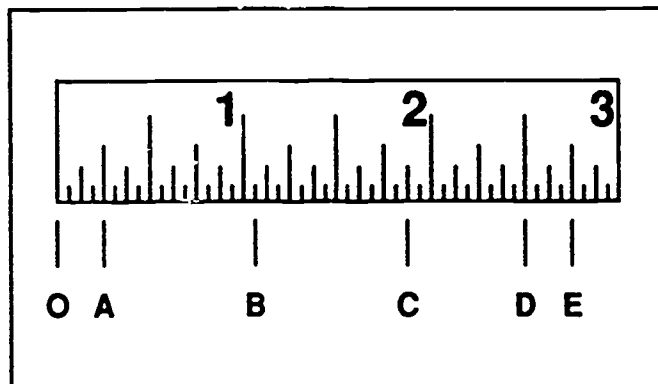
29) What does  $\pm 2''$  mean?  $\underline{\hspace{10cm}}$

Use the ruler to determine the following measurements.

30) O to B =  $\underline{\hspace{2cm}}$

31) A to B =  $\underline{\hspace{2cm}}$

32) D to E =  $\underline{\hspace{2cm}}$



33) 14 feet = \_\_\_\_\_ yds

34) 110 inches = \_\_\_\_\_ feet

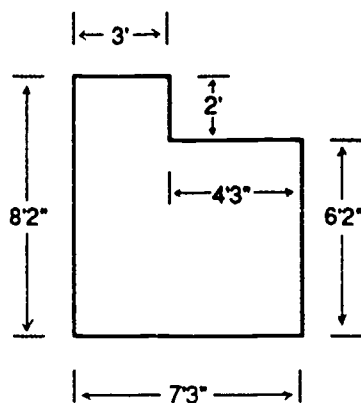
35) 16 yds = \_\_\_\_\_ inches

36) Please circle the letter of the sentence (either "a" or "b") below that best expresses how you feel. There is no right or wrong answer.

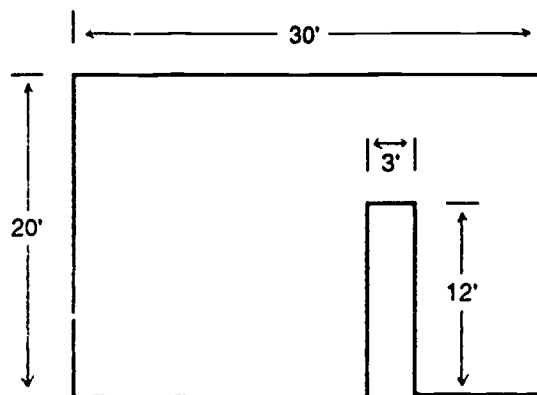
a. With luck like it is, many times I feel that I have little influence over the things that happen to me.

b. It is impossible for me to believe that chance or luck plays an important role in my life.

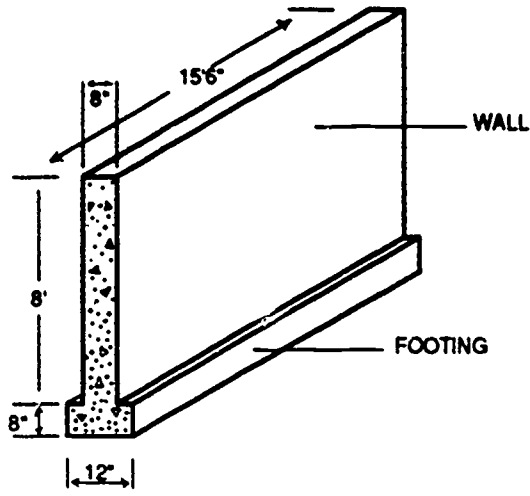
37) What is the perimeter of this figure? \_\_\_\_\_



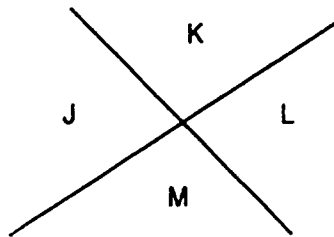
38) What is the area of this figure? \_\_\_\_\_



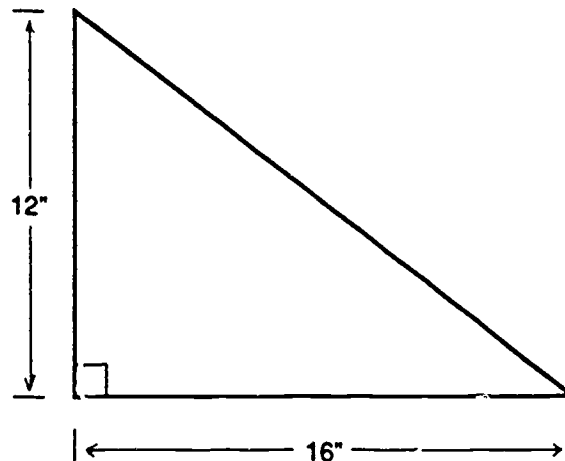
39) What is the volume of this figure? \_\_\_\_\_



40) If angle J is 105 degrees, how large is angle K? \_\_\_\_\_



41) How long is side "H"? \_\_\_\_\_



42) Please circle the letter of the sentence (either "a" or "b") below that best expresses how you feel. There is no right or wrong answer.

- a) My getting a good job or promotion in the future will depend a lot on my being lucky.
- b) When I get a good job, it is always a direct result of my own skills and efforts.

43) Number information

What math do you use?	I do this	I'd like to do this better
checking/payslips	_____	_____
checking bills/bank statements	_____	_____
measurement/rulers	_____	_____
dealing with credit/loans/mortgages	_____	_____
arithmetic ( + - x + )	_____	_____
fractions	_____	_____
decimals	_____	_____
using a calculator	_____	_____
other (specify) _____	_____	_____

### III. Reading

44) *Directions:*

On the following page is a sample of a new kind of test. It was made by copying a few paragraphs from a book. About every sixth word was left out of the paragraphs and blank spaces have been put where the words were taken out. Your job is to guess what word was left out of each space and to write that word in that space. It will help you in taking the test if you remember these things:

- a) Write only one word in each blank.
- b) Try to fill every blank. Don't be afraid to guess.
- c) You may skip hard blanks and come back to them when you have finished.
- d) Wrong spelling will not count against you if we can tell what word you meant.

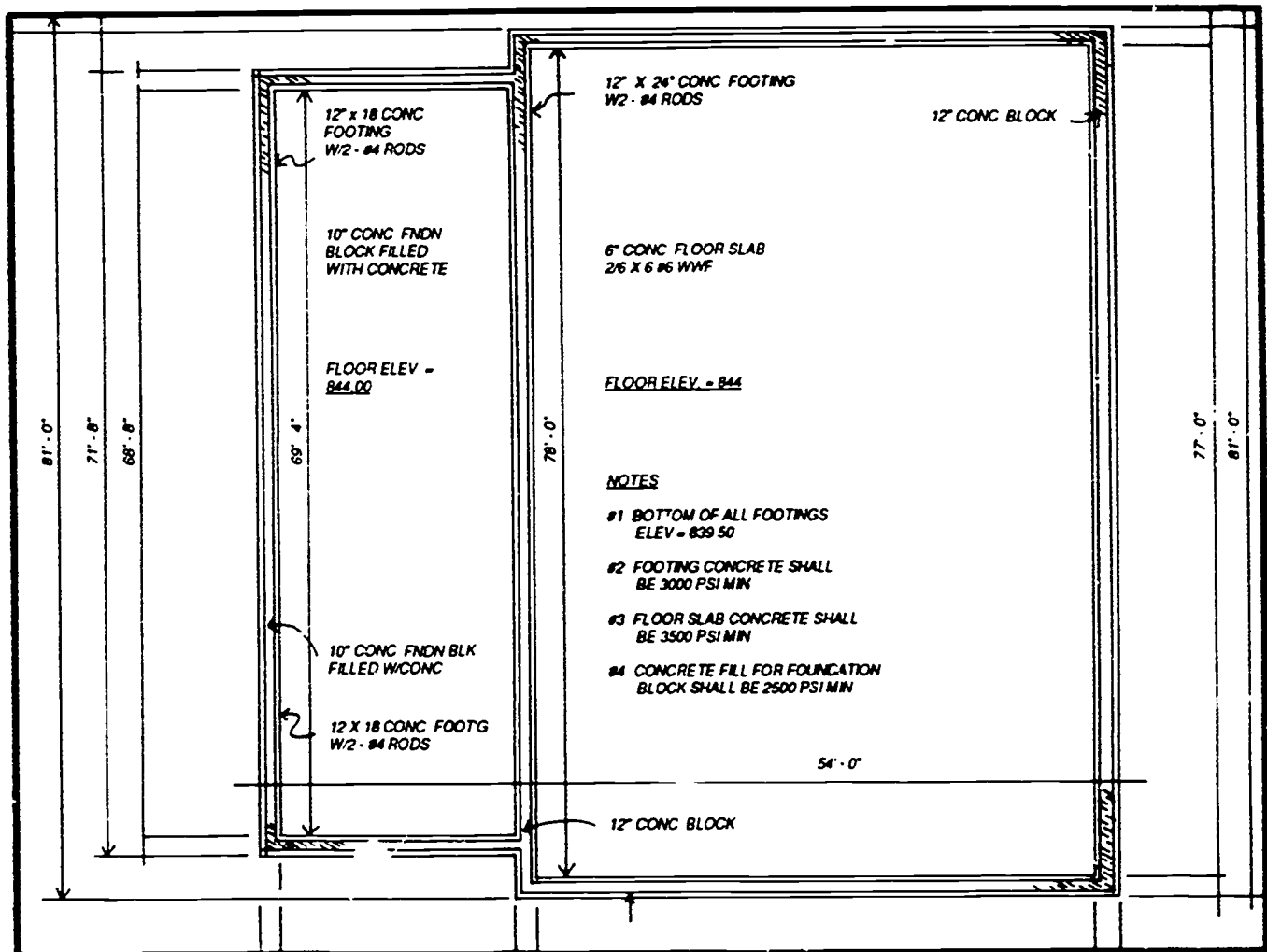
The term "union" means \_\_\_\_\_ joining together for a common \_\_\_\_\_ and purpose. The International Union of Bricklayers and Allied Craftsmen (BAC) is such a joining together. Its purpose, \_\_\_\_\_ at the beginning of \_\_\_\_\_ Constitution, is to "unite into one body, for mutual protection and benefit, all members of the Mason Craft . . ."

One of the oldest \_\_\_\_\_ American unions, the BAC \_\_\_\_\_ the inheritor of the craft \_\_\_\_\_ tradition which stretches back \_\_\_\_\_ the Middle Ages in \_\_\_\_\_ to the ancient civilizations \_\_\_\_\_ Rome, Greece, and Egypt. Bricklayers \_\_\_\_\_ this guild tradition \_\_\_\_\_ North America. As the new nation \_\_\_\_\_ and prospered, they began to \_\_\_\_\_ for their common good.

Early organizing \_\_\_\_\_ trade unions in the U.S. \_\_\_\_\_ Canada was difficult \_\_\_\_\_ common law at that time \_\_\_\_\_ that organizing workers to obtain \_\_\_\_\_ wages was illegal. A number of persons \_\_\_\_\_ convicted before this legal \_\_\_\_\_ began to crumble in \_\_\_\_\_ early 1800's. By the 1830's, \_\_\_\_\_ in the United States were \_\_\_\_\_ free to organize, and bricklayers \_\_\_\_\_ other building craftworkers \_\_\_\_\_ trade unions in a number of \_\_\_\_\_. Through their efforts, the 10-hour \_\_\_\_\_ became common for the \_\_\_\_\_ trades in most cities.

The victory was \_\_\_\_\_, however, by the financial \_\_\_\_\_ of 1837. During the 12 \_\_\_\_\_ of depression which \_\_\_\_\_, trade unions were \_\_\_\_\_ non-existent. This taught the American labor movement one of its first great lessons — that the craftworkers and their unions are hurt the most by economic disasters.

- 45) What is the specified minimum rating of the floor slab concrete on the following print?
- a) 3,000 p.s.i.
  - b) 3,500 p.s.i.
  - c) 2,500 p.s.i.
  - d) 3,000 p.s.f.
- 46) What size concrete block is used on the larger room of the structure for the following print.
- a) 10"
  - b) 8"
  - c) 12"
  - d) 16"
- 47) What is the inside dimension of the longest side of the building on the following print?
- a) 68' 8"
  - b) 81' 0"
  - c) 77' 0"
  - d) 71' 8"





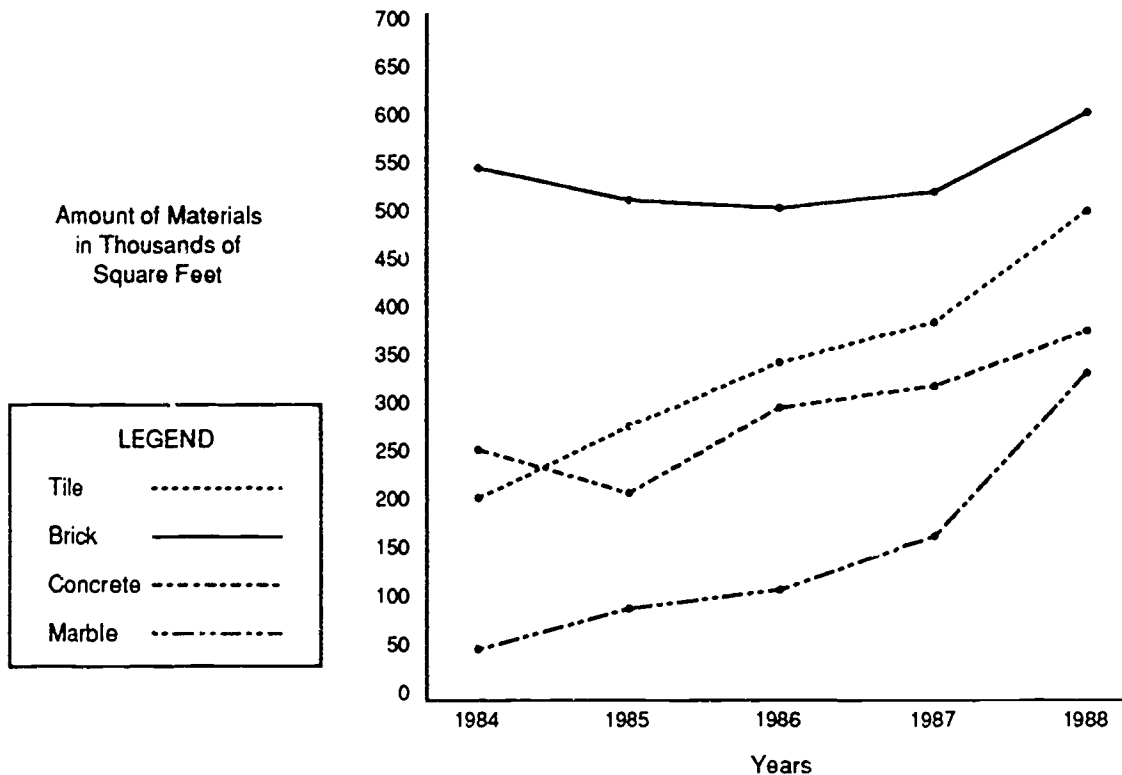
- 48) From the following chart, what is the performance range of ultraglaze 4000?
- 80F to +190F
  - 80F to +400F
  - 80F to +300F
  - 62F to +88F
  - 62F to +204F
- 49) If you had to complete the job for the building to be used within the least available time, which material would you use?
- ultraglaze 4200
  - ultraglaze 4000
  - construction 1200
  - cannot be determined from the chart

### Typical Properties

PROPERTY	ULTRAGLAZE®4200 TWO-PART SEALANT	ULTRAGLAZE®4000 TWO-PART SEALANT	CONSTRUCTION 1200™ SEALANT
SUBSTRATE ADHESION	GE must perform substrate tests to confirm optimum adhesion for each structurally glazed project	GE must perform substrate tests to confirm optimum adhesion for each structurally glazed project	GE must perform substrate tests to confirm optimum adhesion for each structurally glazed project
DYNAMIC JOINT MOVEMENT	±25%	±50%	±25%
TOOLING TIME	10 Minutes	45 Minutes	2 - 3 Minutes
TACK-FREE TIME (Per Fed Spec TT-S-001543A)	1 1/2 Hours	2 1/2 Hours	1 Hour
CURE TIME (2" x 1/4" bead @ 75F)	3 1/4 Hours	5 - 7 days	5 - 7 days
COLOR	Black	Black	Black
APPLICATION TEMPERATURE (Minimum)	+40F (4C)	+40F (4C)	+40F (4C)
PERFORMANCE RANGE	-80F to +300F (-62C to +149C)	-80F to +190F (-62C to +88C)	-80F to +400F (-62C to +204C)
HARDNESS (Shore A) (ASTM D2240)	45	35	35
TENSILE ADHESION (H-Section)	120 psi	100 psi	120 psi
SAG/SLUMP (ASTM C639)	0.2"	(maximum)	0.1"
SPECIFIC GRAVITY	1.36 (mixed compound)	1.38	1.07
STORAGE LIFE (Below 80F)	6 Months	12 Months	12 Months
CURE METHOD	Neutral	Neutral	Acetoxy
PACKAGING	50-gallon Drum Kits (570 lbs)	10.3 fl oz Cartridges 2-gallon Pails 5-gallon Pails	10.3 fl oz Cartridges 5-gallon Pails 50-gallon Drums

- 50) What general trend may be inferred from the following graph?
- a) demand has increased for all masonry materials in the last three years
  - b) flat periods of demand are typical in the construction trades
  - c) demand for concrete will never again equal demand for tile
  - d) marble is the greatest area of growth in the industry
- 51) Based on the following graph, approximately how much marble was specified for 1987?
- a) 100,000 square feet
  - b) 400,000 square feet
  - c) 325,000 square feet
  - d) 175,000 square feet
  - e) 150,000 square feet
- 52) According to the following graph, what material showed the greatest increase in materials use for the period from 1986 to 1987?
- a) tile
  - b) brick
  - c) concrete
  - d) marble

**Exhibit 1: Demand for Masonry Materials**



- 53) According to the following Table of Contents, on what page does "Layout of Solid Brick Walls" begin? \_\_\_\_\_
- 54) According to the following Table of Contents, on what page would the best information on how to remove paint from brick begin? \_\_\_\_\_

**Table of Contents**  
Section 5.0: Walls

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**UNIT 5.2 LAYOUT OF SOLID BRICK WALLS**

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- Single Wythe Walls, American Bond
- 8" American Bond
- 8" American Bond, Header Course
- 8" English Bond
- 8" Flemish Bond
- 12" American Bond
- 12" English Bond
- 16" American Bond
- 16" English and Flemish Bond

- 55) Given the following directions, how long must the coat be kept damp for curing purposes?
- a) 12 hours
  - b) 24 hours
  - c) 36 hours
  - d) 48 hours
- 56) According to the following directions, after applying the first coat, what operation should you next perform?
- a) scratch or roughen the surface
  - b) wet the surface
  - c) allow the coat to sit for a period of time
  - d) apply the second coat
  - e) clean the surface

#### Steps Used to Apply Mortar Coats

- a) Excavate earth to provide a work area.
- b) Brace earth to prevent accidental slides, if necessary.
- c) Brace the walls if they are not anchored to the floor above or may be damaged by the pressure used applying coats.
- d) Fill cracks, voids and irregularities larger than 1/4".
- e) Clean the surface of substances that might reduce bonding.
- f) Fog spray the surface to dampen the wall as work progresses.
- g) Apply a 1/4" thick coat of material, forcing it onto the surface as a compacted coat.
- h) Scratch or roughen the surface with a wire brush or other tool as the first coat sets to provide a mechanical key for the second coat.
- i) Allow the first coat to set, usually between 12 to 24 hours.
- j) Fog spray the surface with water as the work progresses.
- k) Apply a second coat.
- l) Keep the coat damp until it cures, usually 48 hours.

- 57) If you completed and submitted the following form on 10 April 1990, when is the first possible month you might receive a check?
- a) April
  - b) May
  - c) July
  - d) August
- 58) Why do you think that a copy of both your marriage license and proof of your wife's age is required?
- a) because you get more money if you are married
  - b) because your wife also gets a check
  - c) because the amount of pension you draw is based on your age and that of your wife
  - d) because your wife also has rights under the pension law
- 59) Since the pension plan is available only to those BAC members who no longer work, what do you suppose would happen if you went back to work part-time in the industry?
- a) nothing
  - b) benefits would be suspended
  - c) benefits received to date would have to be paid back
  - d) additional contributions would be added on my behalf

## PENSION APPLICATION

Please read the Bricklayers & Trowel Trades International Pension Fund/Canada Booklet before completing this application. This form must be submitted at least two months in advance of the first month for which pension benefits are payable.

LAST NAME _____	FIRST NAME _____	MIDDLE NAME _____	SOCIAL INSURANCE NUMBER _____
STREET ADDRESS _____	CITY _____	PROVINCE _____	POSTAL CODE _____ (AREA CODE) TELEPHONE NO. _____
DATE OF BIRTH (MO DAY YR) _____	CITY AND PROVINCE OF BIRTH _____	U.I. MEMBERSHIP NUMBER _____	LOCAL UNION NO. AND PROVINCE _____
NAME OF LAST EMPLOYER _____	BAC REGISTRATION OR APPRENTICESHIP REGISTRATION MONTH AND YEAR _____		
BENEFICIARY LAST NAME _____	FIRST NAME _____	MIDDLE NAME _____	SOI INSURANCE NUMBER _____
BENEFICIARY STREET ADDRESS _____	CITY _____	PROVINCE _____	POSTAL _____ LAST DATE YOU WORKED _____

Date contributions to this Pension Fund were first made on your behalf: \_\_\_\_\_ POSTAL \_\_\_\_\_ YEAR \_\_\_\_\_

To be eligible for a pension you must have at least ten years of credited service and contributions for 1200 hours or more, must have been made on your behalf. Indicate below the type of pension for which you're applying.

<p>1 <input type="checkbox"/> Normal Pension (You must be at least 65 years old)</p> <p>2 <input type="checkbox"/> Early Retirement (You must be at least 55 years old)</p>	<p>3 <input type="checkbox"/> Disability Pension (You must be totally and permanently disabled and your doctor's statement to that effect must accompany this application along with a copy of your Canada Pension Plan award)</p>
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**IMPORTANT - Normal or Early Applicants:** Indicate below the form of pension you desire. (See the Pension Plan Booklet for a description of these options.)

Regular Pension  
 Ten or 15 year certain   
 Joint and Survivor Option - 50%  60%  75%  100%   
*(What are all the above?)*

proof of your wife's age and a copy of your marriage license must be submitted with this application. Complete the blanks below:

Wife's Name \_\_\_\_\_  
 Wife's Date of Birth \_\_\_\_\_  
 Wife's Social Security No. \_\_\_\_\_

I hereby apply for a pension in the Bricklayers and Trowel Trades International Pension Fund/Canada. I certify that I have read the Pension Plan Booklet and understand in general the Pension Fund Rules and Regulations. I also certify that the foregoing statements are true to the best of my knowledge and belief. I understand that a false statement may disqualify me from pension benefits and that the Trustees have the right to recover any payments made to me because of a false statement. I also understand that the Trustees may require additional information before acting on this application.

DATE \_\_\_\_\_ AREA CODE/TELEPHONE NUMBER \_\_\_\_\_ SIGNATURE OF APPLICANT \_\_\_\_\_

**YOU MUST INCLUDE WITH THIS APPLICATION A COPY OF YOUR BIRTH CERTIFICATE, OR OTHER SATISFACTORY PROOF OF DATE OF BIRTH AND YOUR MARRIAGE LICENSE (over)**

#### IV. Problem Solving

60) List as many positive messages about masonry as you can generate, based upon the following news story.

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_
- f) \_\_\_\_\_
- g) \_\_\_\_\_

There is a widespread belief that the problem with masonry is that it's too expensive – that masonry materials cost too much up front, and that using skilled union labor drives up the cost of construction. But the truth is that masonry is not necessarily more expensive than its competitors. For example, in the commercial market, pre-cast concrete and glass are both initially more expensive than brick and block walls. But just as important, such products may be more expensive to maintain and to heat and cool. Thus, over the life of a building, masonry's advantages increase. In the residential market, where walls account for only about five percent of the cost of a house, building with wood or brick makes hardly any difference in the total cost. We can help the industry make the point that masonry is often less expensive, and is always a better value for the dollar, because of the materials used and the craftsmanship that goes into masonry installation.

- 61) A case of tiles contains 50 tiles and costs \$9.50. Each tile measures 7" square including its 1/4" grout joint. What size cut will be required at the far side of a 20' room if a whole tile is used to start the course on the near side? Show your work.

Answer: \_\_\_\_\_

- 62) Assume you make \$21.72 per hour and you work a 40 hour week. Federal taxes and social security take a combined total of 32 percent of your gross wages. Union dues, pension and health contributions take 5 percent of your gross wages. What is your take home pay each week? Show your work.

Answer: \_\_\_\_\_

- 63) Please circle the letter of the sentence (either "a" or "b") that best expresses how you feel. There is no right or wrong answer.

- a) In my case, getting what I want has little or nothing to do with luck.
- b) It is not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad luck anyhow.

- 64) What is the most positive, logical inference about successful future strategies that can be made from the following passage?
- a) We can emphasize quality, research, and new markets as a way to revitalize the industry.
  - b) If we have 6% of the market with almost no promotion, effective promotion should expand the market share to at least 7 or 8%.
  - c) Advertising costs a great deal of money.
  - d) The U.S. industry has fallen behind the industry in Europe because of neglect of public attitudes.

Masonry now has about a 70% to 80% share of the residential building market in such countries as France, West Germany, Sweden, and the Netherlands. By contrast, masonry has only about a 20% share of the residential market in the U.S. and Canada. In Europe, masonry's share of the market has been growing, while in North America it has been declining.

In Europe, builders sell quality. In North America they sell style. The emphasis on quality appears to have worked well in Europe. Although there was a period when Europeans saw masonry construction as outmoded, this is no longer the case.

In Europe there is a greater emphasis on research. The United Kingdom, The Netherlands, and France all have well-funded national masonry research centers. The French program, for example, is funded at the rate of one percent of industry pay.

Overall, masonry's share of the North American construction market is only about six percent. This is not surprising, considering the industry's lack of investment in its growth and promotion of the industry. For example, today masonry spends only about .02% of its sales volume in advertising as compared to non-masonry construction products that spend about 3% of their sales on promotion. However, promotion is very expensive. For example, a full-page color ad in *Time* magazine costs over \$17,000 and a 30 second T.V. commercial on the evening news can cost upwards of \$70,000.



65) Reading Information.

Do you read any of these?

I do this

I'd like to  
do this better

newspapers

\_\_\_\_\_

\_\_\_\_\_

books/magazines

\_\_\_\_\_

\_\_\_\_\_

signs

\_\_\_\_\_

\_\_\_\_\_

instructions

\_\_\_\_\_

\_\_\_\_\_

bulletin board

\_\_\_\_\_

\_\_\_\_\_

written materials (union/child's school)

\_\_\_\_\_

\_\_\_\_\_

dictionary/reference books

\_\_\_\_\_

\_\_\_\_\_

other (specify)

\_\_\_\_\_

\_\_\_\_\_