IN FOR A CHANGE

A Curriculum Guide for Pre-Apprenticeship Training

by
Eileen Kreutz
Training Coordinator

CHICAGO WOMEN IN TRADES

2444 W. 16th Street
Suite 3E
Chicago, IL 60608
312.944.1444

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Overview Introduction

The existing U.S. labor force is in for a change.

It has been known by tradeswomen's organizations for some time now that there was need for such a change. Women in particular knew that the labor force was long overdue for opening its doors to a more diverse work force. Now, at last, the numbers in the selection pool are changing and employers will move more and more to the available women to fill the bill. Employers are beginning to see that a diversified work force will bring the best workers, and that a diverse work force is what new entrants into the work force represent.

During the 1990's, according to the Department of Labor study, Work force 2000, the general pool of people entering the work force will be 28% women of color and 21% white women, with an additional 9% comprised of immigrant women. This 58% figure represents far more than a mere majority of those entering the work force. It represents sweeping changes in industry, construction, and the way in which women are viewed in the skilled trades.

In addition to these changing demographics, it is a known fact that the nation has an aging trades and technological work force. The majority of jobs in the trades are currently held by near-retirement-age white males. As more and more of those men move ahead with retirement plans, their positions become available for the first time in nearly fifty years. Women will make up 60% of the work force who will be available to fill the vacancies.

By the year 2000, nearly two out of every three new workers will be women. Minority males and immigrants will account for an additional 30% of those entering the work force. Only 9% of the new workers will fit the long-lived stereotype of the white male construction worker. (Time Magazine, Fall, 1990, "Get Set: Here They Come!")

Over the past ten to fifteen years, we have seen the birth of organizations whose purpose has been to rally for jobs for tradeswomen and to advocate on their behalf. Although the number of women in the skilled trades is growing, it has grown at a very slow rate, with many new tradeswomen leaving the field after a few years.

Women's participation in non-traditional blue collar fields is at a nationwide average of 8-9%. The figure has a very real chance of steadily increasing now. From the pioneering efforts of tradeswomen's groups, it is much easier to find role models of women working in the trades.

Persistent stereotypes, discrimination and resistance to change within the trade and technological arena still limit opportunities. Women's organizations do much to help change the image of acceptable occupations for women, advocating for women's full equality in all occupations.

An individual woman's transition from a traditional role (homemaker, secretary) into a skilled trade does not take place overnight either. Much preparation is needed, as this manual will show. It can take a year for a woman (after she has made her decision to enter the trades) to actually be accepted into one, and then two to five years as an apprentice to reach journey level status in her trade.

Over the past ten to fifteen years, tradeswomen's organizations laid a very critical groundwork for women desiring to enter the skilled trades. These organizations now must directly confront conditions in the industry which are contributing to women dropping out of the field. Changing the environment, by ridding it of the reasons around which women leave, will have a profound effect on the statistics and quality of life revolving around work in the trades.

A new challenge faces the tradeswomen's and similar movements as affirmative action programs now, in the mid-1990's, face serious challenge in both the courts and with new congressional measures. Regulations at the federal and local level are being threatened substantially. Federal resources and regulations to support training and equity in vocational education are also being challenged.

These regulations and resources have been critical to groups that assist women interested in entering the construction or manufacturing fields. Training programs of the type detailed in this manual have evolved throughout the country. Pre-apprenticeship training programs have filled a void, offering to

participants an opportunity to gain "hands-on" and classroom skills experience necessary to enter and survive in the trades.

Chicago Women In Trades offers one such program, responding to needs of women who are working days or part-time, but who have Saturdays and evenings free. This training is available to women on public assistance and to women who are unemployed, as well as to those who have present occupations but are planning to make a career change.

The training offers women an overview of the skilled trades, teaches math and physical conditioning skills, introduces hands-on activities in a number of trades and assists in following the procedures necessary for gaining entrance into the trade of their choice. Upon completion of the program, women are prepared to pass entrance exams for union apprenticeships, and after working for 3 to 4 years as apprentices, achieve journey level status.

A second goal of the program, that of teaching safe work habits and safe use of tools is incorporated into the hands-on training segment. Tool recognition skills have stood as a major impediment to women trying to pass entrance exams. Recognition of tools and their safe use is a critical body of knowledge in any such training program. Safety is a major focus throughout the course. It helps to keep the class participants safe in their work and, more importantly, it helps move the construction industry as a whole toward a stronger emphasis on safety.

Equally important to gaining entrance into the trades, however, is developing the inner strength to persevere in a work world primarily occupied by males. The support group component of the training offered by Chicago Women in Trades focuses on the realities of day-to-day work on construction sites. Long conversations and interview sessions with working tradeswomen give a realistic view and help applicants develop their own strategies for encounters with everything from bad weather to sexual harassment. One goal of each class sequence is that the students will form an ongoing support group, calling on one another to talk over difficulties as well as successes.

Be it the strengthening of mathematical knowledge or new insights into self-esteem and inner confidence, this is a course sequence built around empowerment. It begins on a very individual level, working intensively with each program participant to improve skills necessary to entering the trades. In the end, though, the goal is not individualistic at all, but rather one which sees large numbers of women entering and continuing to work successfully in the skilled trade of their choice.

This manual is the curriculum guide for the pre-apprenticeship training program run by Chicago Women In Trades (CWIT). The guide is meant to be used to direct the training sequence for the twelve-week training program run by the organization. This training is designed to reach out to women who are interested in the skilled trades and to help them prepare for the mental, physical and psychological demands of working in the trades.

This manual describes the entire sequence followed by the training and counseling staff in the execution of the course. It is hoped that this guide could be of use to new training programs in their program design, as well as being the teacher's guide for additional sites should the CWIT program expand its schedule to offer more than one sequence at a time.

At a local level, a curriculum of this type could one day be institutionalized into Community College programs, part of the regularly offered course of studies. Along the same lines, the construction and technical industries might make use of some of the material herein in their training programs. Or perhaps a collaboration between tradeswomen's organizations and employers could bring about jointly-run training programs of this type.

An additional possibility for the use of this manual is that the content may be helpful to those working with special groups of women; for instance, the self-esteem exercises might be adapted for exercises with women recently incarcerated, with displaced homemakers, or with high school age women interested in non-traditional occupations. At whatever level and with whatever group this manual comes to be used, it is hoped that it may act as a vehicle for empowerment for women, and help open new vistas wherever it goes.

Overview History of the organization

Chicago Women In Trades is the only organization in Chicago composed exclusively of tradeswomen. Members work in the construction and manufacturing fields as electricians, machinists, carpenters, auto mechanics, elevator constructors, painters, and laborers.

The organization dates back to 1980, when a small group of women working in the trades met each month for a potluck dinner. The goal of these early meetings was to provide support for women persevering in non-traditional professions, commonly defined as those occupations in which fewer than 25% of the jobs are held by workers of one sex. CWIT has specifically focused its activities and programs on non-traditional careers in the blue collar industrial, service and construction fields.

Often, women at the early support group meetings were faced with the daily reality of being the only woman on a worksite. Before long, these pioneers began to look for answers to the problems of discrimination that were coming up again and again. Efforts were begun to change unfair conditions and to increase the ranks of women in the skilled trades.

For several years, volunteer energy and small donations supported a wide range of energetic programs, including monthly support group meetings, movies, slide shows, counseling and/or tutoring sessions with tradeswomen "aspirants," and advocacy efforts around tradeswomen's concerns in the private and public sectors. The organization instituted a regularly published newsletter and worked on gathering information for a slide show on women in the trades.

Advocacy efforts began early on, working to stop the Reagan administration revisions to the affirmative action laws in the 1980s. In addition to the national focus, these tradeswomen also focused on state and city issues, working for local ordinances requiring that publicly-funded contractors hire women and minorities. At times, charges of discrimination were pursued through legal actions.

Successful efforts over the years include working with a major developer to create a model project to recruit, place and retain women on commercial high-rise construction. This sort of collaboration has resulted in high percentage numbers of women on "model" worksites.

Currently CWIT is working for change in all sectors of the construction industry through its WORKSITE 2000 recommendations. These recommendations provide guidelines to employers, unions, apprenticeship programs and public agencies that will make the industry more equitable for women. To bring these ideals closer to reality, CWIT has contractual arrangements to monitor certain worksites in the metropolitan area and to assist with support services and special training sessions on those sites.

Since 1986, CWIT has functioned with a gradually increasing number of paid staff, and some early efforts have developed into full-time pursuits, such as ongoing research and policy initiatives. The primary goal remains to support women working in the trades and to increase their numbers. Tutoring has evolved into formalized pre-apprenticeship training classes, offered each spring and fall.

A job hotline now provides job referrals and assists contractors in locating women for work. Advocacy efforts continue to increase, including class action suits on behalf of women contesting age limitations for entrance to union programs. Informal counseling has expanded to include quarterly orientations for women interested in the trades, periodic mini-orientations, and the annual Women in Trades Career Fair.

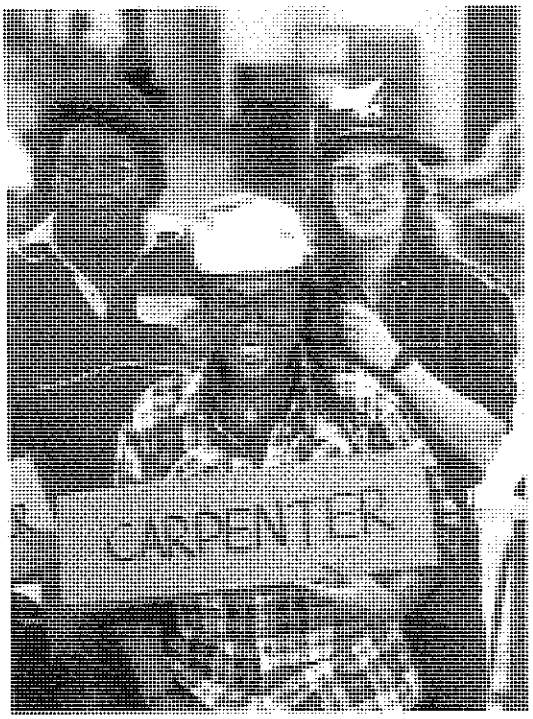
The organization continues to build on its earliest foundations, as monthly support group meetings are set up by the job counselor on topics that provide new information to tradeswomen. Now full-time counselors provide assistance on work-related issues to women already in the trades and those interested in entering them. In addition, CWIT helped sponsor a National Tradeswomens' Conference in Chicago in 1989.

The pre-apprenticeship training offered by CWIT has grown with each new semester, and is now enjoying the fruits of its labor as more and more past graduates achieve entry into apprenticeships or complete those apprenticeships to gain journey level status. During one recent semester at Carpentry Apprenticeship classes, one of the only two A students (out of 200 students in all) was a graduate of CWIT's program.

Graduates of the program, having gone on to enter and complete an apprenticeship, report back that the CWIT program offered everything they needed to get ready for apprenticeship training. Some have stated that the physical conditioning was most important to them; for others it was the math or measurements; for all, the esteem exercises proved critical.

In follow-up phone calls and surveys, CWIT is currently registering over 40% placement of prior class graduates entering skilled trade jobs or apprenticeships. In addition to this survey method, a retention study has been carried out to assess the length of time women continue in the trades and the needs, if met, which would increase those statistics. CWIT publications Breaking New Ground: WORKSITE 2000 and Tools for Success, A Manual for Tradeswomen are the result of that retention study.

CWIT is moving into its 15th year of offering advocacy and services for tradeswomen. The organization continues to grow and evolve, expanding programs to serve more women and girls, developing policy to improve equitable working conditions on jobsites and in unions, offering leadership and career advancement for our members and providing technical assistance to help others replicate our initiatives and implement our policy recommendations.



Overview Pre-Apprenticeship Training

Chicago Women in Trades has, in a sense, been running a Pre-Apprenticeship Training Program since its inception. In the early years, tutoring took place on an informal one-to-one basis with women enrolled and experiencing difficulty in area trade schools. In 1987, the limits of this style of teaching became clear when the organization was asked to place fifteen women in the apprenticeship program run by the Electrical Workers Union. Eleven women successfully entered the program but required consistent tutoring throughout their training period.

Seeing a much greater need for this type of training, an Advisory Committee was set up to determine objectives and construct a curriculum for a training program. Goals were expanded and an effort was made to reach out to women considering work in the trades, but who had not yet filed applications or taken entrance exams to join the fields of their choice. In addition, tutoring was continued for those already enrolled in other programs.

In the fall of 1987, CWIT formalized course content and training objectives, preparing the initial curriculum for its spring training class. That class met during eight weeks in the spring of 1988. Development of the program and its first two sessions were funded by the Women's Bureau of the U.S. Department of Labor and the City Colleges of Chicago. Subsequent years were funded by the Illinois State Board of Education and Commonwealth Edison. The training curriculum described within this book involves 144 hours of class time, about half of which consists of hands-on training. The other half represents classroom instruction focusing on academic skills, support group resources, and physical conditioning.

The success of this program can be measured in a number of ways. First and foremost, large numbers of women are being exposed to the option of a well-paying career in the trades. Orientations have often been attended by as many as 100 women, with one such meeting addressing 300 prospective tradeswomen. Classes have ranged in size from 14 to 50, with a current goal of placing no more than 25 women in any one class.

Another measurement of success lies in the increased earning power of the students. Many women began the course while still unemployed or holding subsistence minimal wage positions. Their beginning wages as apprentices (electrical, carpentry, pipefitting, crane operating, cabinet making, etc.) ranged from $8.55 to $9.92 per hour, and pay increases occur on the average of once a year. Upon reaching journey level, they have progressed to a skill level with earnings in the range of $20 an hour or more.

The final measurement involves the response of the students themselves. Even though some do not go on to pursue a career in the skilled trades, all of them leave the course with an enhanced view of the strength of women and the possibilities open to them. On a more individual level, each student gains a renewed sense of personal goals and vision, a new push to achieve, an enhanced sense of self-esteem, and, in a way, a new dream.

In evaluations filled out by participants at the end of each class sequence, women have referred repeatedly to an increased sense of confidence and motivation. In addition, pre-test and final test scores demonstrate that students are learning to master the subject matter critical to their entrance into and survival within the trades.

The supportive network that classmates are building with one another as they participate in a training sequence has already come into play. Individual class members who have experienced difficult interviews have been encouraged and sent out to try again by their peers. Those completing successful application processes and gaining positions within the trades are cheered and congratulated by the women with whom they trained.

Perhaps of key importance is the amount of hands-on training that women receive during the course. All of them report huge gains in tool recognition. Everyone learns how to safely handle and care for power tools. Skills improve in the use of small hand tools for all class participants. All students convey a keen interest in this part of the course, and since every Saturday offers an introduction to a new trade, they learn new tools and skills with each passing week.

The Training Sequence

Recruitment and Interview

During the months between the starting dates of any two training sequences, more than a hundred phone calls of inquiry will come into the office at Chicago Women In Trades. These names will be given priority for notification of the next orientation and training dates, and invited to weekly information sessions. A mailing is sent out containing the organization's hrochure, a flyer advertising the dates of the upcoming orientation, and information on how to apply for entrance into the course.

In addition, general notification is given to the public through the use of public service announcements and press releases. A mailing of posters is sent to social service centers, welfare organizations, job counseling offices and women's organizations. If needed, posters are placed at transportation centers, (El and bus stops), unemployment offices, park district facilities, libraries, and bookstores.

Publicity about the organization, in periodicals or on the radio, bring in numerous calls from women wanting to register for the training sequence. In addition to these public relations activities, the organization engages in presentations at job fairs and school career days.

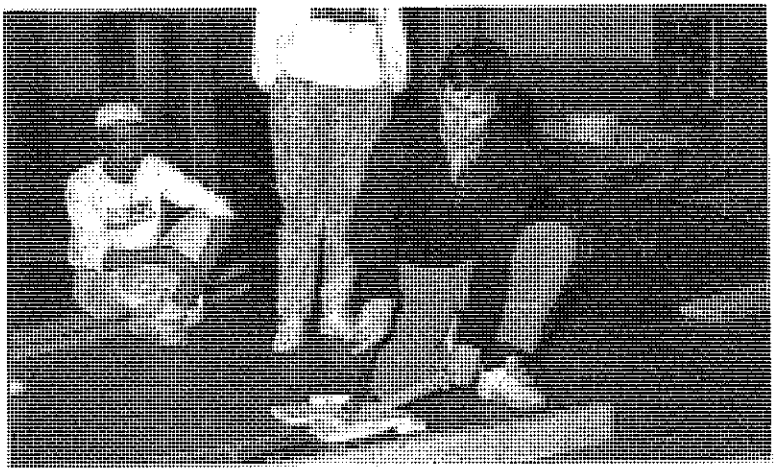
Women who then call or write that they are interested in participating in the program are given an appointment for a personal interview. At this meeting, the applicant is given a form to fill out and an individual interview with a counselor takes place.

The purpose of the interview is to help the woman assess her readiness to make the commitment to the twelve-week course. Questions center around whether she has any schedule conflicts or commitments, such as young children, which could prevent her from attending classes. Childcare and back-up childcare, transportation to and from class meetings, and Saturday all-day sessions are all discussed in detail. Furthermore, the meeting offers an opportunity to discuss the woman's prior employment history, why she is drawn to non-traditional employment, and what specific trade choice she may be considering.

At the end of the interview, the applicant is given a math pre-test which helps determine math class groupings for initial classes. All other pre-tests, in measurement, tool recognition and reading comprehension, are given during the first week of classes.

Requirements for admission to the course include a G.E.D. Certificate or a High School Diploma, a valid driver's license, and a commitment to attend all classes. In addition, those without public aid waivers pay a nominal fee, most of which goes to the City Colleges. Each student is provided with notebooks, math and blueprint reading texts, and measuring tools once classes begin.

Copies of recruitment notices, a brochure and sample interview questions are contained in the Appendix section of this manual.



The Training Sequence

Orientation

It is expected that every applicant will attend an orientation program sponsored by the organization as part of the start-up of any training sequence. The day functions in such a way as to give those who attend an introductory understanding of the skilled trades. Every orientation day includes presentations like those listed below:

- A General Introduction to CWIT's organization
- Tradeswomen's Testimonies Regarding Their Work
- Special Presentation by a Union or Trade School
- An Overview of the Training Program, Schedule and Content.

In addition, there are displays, small group discussions, and video presentations before and after the formal program. Among them are:

- Individual tradeswomen with their tools and portfolios of their work
- Small group meetings of women interested in taking the course
- Videos such as "Trade Secrets" or recordings of hands-on training done in previous classes
- Special group information tables, such as the Electrician's Womens' Committee, the Apprenticeship Information Center, potential employers, and union representatives
- A table staffed by CWIT at which new members are accepted and questions about the organization are answered
- A photo table displaying the work of prior classes at which applicants may meet with the Training Program Coordinator to ask specific questions.

It should be noted that the Orientation Days scheduled several times a year are much more than simply a great kick-off for each training session. Since the events are so well attended, the Orientation Days serve as a mechanism for change in and of themselves. At these events, many women come in contact for the first time with other women in tool belts and hard hats, wearing safety equipment, and talking about what they do on the job.

In a similar manner, the videos and the presentations from the podium do much to convey the realities of working in the trades. The entire program serves as a vivid and proud display of women working in their career of choice, and all facets come together to make a strong impact on those attending such an event for the first time.

Once a year, CWIT co-sponsors a similar mechanism for change, the Women in Trades Career Fair, which is not a formal part of this training sequence. However, women attending become interested in taking the course as a means of reaching their career goals. Also attending such a Job Fair are prospective employers who have a chance to experience first-hand the seriousness of tradeswomen and the enthusiasm and energy of new applicants.

Course Content

The curriculum for Chicago Women in Trades Technical Opportunities Program includes the following:

Math

- Whole number review
- Order of operations with whole numbers
- Fractions, all operations and order of operations
- Decimals, all operations and order of operations
- Percentages, including practical problems, i.e., taxes, discounts
- Ratio and Proportion problems
- Exponents and square root
- Graphs, tables and charts

Geometry

- Measurement Pre and post tests
- Cooperative learning practice sessions
- Ruler constructions, work down to 16th, with an understanding to 32nd
- Metric conversion work
- Work with micrometer

Algebra

- Introduction to signed numbers
- Basic rules of algebra
- Solving equations, solving for unknowns
- Shortcuts for solving formulas
- Set up and apply equations to simple problems

Blueprint reading

- Basic concepts of communication in architectural drawings
- Definition and recognition of plans, elevations, and detailed drawings
- Plan, diagram and assemble an electric circuit board
- Preliminary drawings
- Concept of scale and ability to do material quantity take-offs for estimation
- Architectural symbols, electrical, plumbing, building materials

Interviewing and job search

- Career goal-setting
- Understanding of apprenticeship process and procedures
- Time management, budget planning
- Body language and communication skills
- Interview skills and role plays
- Resume writing
- Job application practice
- Problem solving and harassment role plays
- Personal interview with job counselor
- Research trade of choice, trip to training facility
- Map reading

Physical conditioning

- Half-hour aerobic workout each class
- Half-hour free weights conditioning, each class
- Nutrition lessons and planning
- Balance beam and climbing work
- Proper lifting techniques with bar weights

Hands-on training

- Mechanical concepts including leverage, fulcrum, inclined plane, force and motion
- Tool recognition, including pre and post tests
- Use of prying tools, hammers, hand saws
- Material handling and lifting techniques
- Power tools, safe set-up, procedures and clean-up for mitre saws, circular saws and screw guns
- Plumbing and pipefitting assemblies
- Basic water pressure and plumbing concepts
- Electrical tools, conduit and circuitry
- Work with metal assembly, welding and machining
- Basic electron theory and flow of energy
- Field trips to power plant, manufacturing training program and job sites

Mechanical reasoning and spatial relations testing

- Aptitude test strategies and study skills
- Number series and letter series reasoning
- Vocabulary and perceptual aptitude
- Mechanical reasoning and tool tests

Mathematics classes make up 12% of total class time, and basic math is stressed in a way that emphasizes how it would be used in the skilled trades. Practical application problems and word problems are key to this learning process. Students use math and measurement during the hands-on sessions as well, helping them gain in overall proficiency.

Geometry lessons make up 8% of class time, and cover a full review of all formulas that would be used in the trades, up to and including work with angles and circles. Much attention is given to spatial configurations, and spatial relations tests, so that the students may gain familiarity with general aptitude test procedures as well.

Algebra is reviewed during the final 3-4 weeks, receiving 5% of overall class time. Generally, students respond to it very well, enjoying the challenge, and they work at their own pace through simple operations with signed numbers into multiple variable equations. Again, the use of algebra in the trades is explained, and various formulas are solved for unknown variables. Those interested in the electrical trades are encouraged to continue to study and gain more skill with algebra after the course ends, since algebra is part of the course of study for apprentice electricians.

Blueprints and mechanical symbols make up another 5% of classroom study, and large sets of blueprints are examined during hands-on sessions as well. At times, students work from drawings they have sketched to attempt a class building project. The goal is to help the students become less fearful of blueprints, and to begin to recognize various types of working drawings and what they communicate. This knowledge will be built upon in any apprenticeship program through a formal blueprint reading course.

Techniques of Interviewing and Job Search refers to what is actually a much larger focus for the program, that of the Support Services Component. Women spend as much as 13% of program time in exercises that will help them build self-esteem, set realistic goals, and make successful application to the trade of their choice. This component also includes legal, job resource, budgeting and other special presentations.

The Physical Conditioning component includes both weight training and aerobic conditioning. It comprises 12% of the total class time, and the class activities are varied to bring about a well-rounded program.

Hands-on Trade Specific classes are led by skilled tradeswomen on Saturdays and some evenings. Since the Saturday sessions typically last six hours, this segment of study makes up 45-50% of class time. Tool recognition and actual experience in handling them are two criteria that prospective employers will be looking for in applicants. Hands-on sessions help the women see where their own natural abilities lie, help them find which materials they prefer to work with, and teach them to recognize and know the safe use of many hand and power tools. As previously mentioned, measuring and blueprint reading activities take place on these Saturdays as well.

To help the students form realistic expectations of what they may find in the field, various trips to construction sites, millwork shops or training schools are scheduled during the sequence.

In preparation for entrance tests to training programs, practice time and attention are given to mechanical and aptitude test materials. Timed tests are offered to help students address test anxiety.

Each of the course areas above require a series of class presentations in order to cover all the material, and that sequence is described in the Lesson Plans Section of this manual. Additional information on the rationale for including each of the areas in the curriculum is described at the heginning of each of those units.

Course Competencies:

Upon successful completion of this course the student will be able to:

1. Demonstrate accurate linear measurement of materials down to 1/16th of an inch, with understanding of 32nds, 64ths, and metric division
2. Know what to expect regarding aptitude tests on apprenticeship entry exams, and have materials on which to develop proficiency.
3. Understand scale drawings, principles of blueprints, symbol usage, and how to read sketches and working drawings, floor plans and elevations.
4. Demonstrate improvement in basic tool recognition, proper identification, and safe handling and usage of both tools and materials.
5. Show a marked improvement in math skills as related to the building trades. Whole number operations; fractions; decimals; percentages; ratios; interest and discounts; estimating methods and dimensions.
6. Regain ability to apply geometric formulas and principles, to recognize various geometric figures, angle relationships, hypotenuse measurement and use of the Pythagorean theorem and square roots
7. Learn the functions of individual trades and their scope of work through trade specific seminars with hands-on learning from tradeswomen.
8. Show a marked increase in physical stamina, strength and endurance through an intensive physical conditioning program.
9. Learn basics of physical science applications as they relate to the mechanics of the physical world and affect work in the trades.

Course Requirements:

1. Attendance, active participation in class, completion of all reading and weekly assignments in preparation for class.
2. Creation of a personal "survival kit" that will include:
   - Documents required for entry to skilled trades;
   - Personal responses to common interview questions
   - A list of safety equipment to assemble for use on the job
   - Categories of tools needed for each of the various trades
   - File of stretching and conditioning exercises with which to stay in shape
   - Support network among classmates and tradeswomen in the organization by which to sustain one's perseverance

   This notebook should record any information which the student hopes to use in her work, such as wood sizes, blueprint terminologies and symbols, use of journal entries, and personal goals for work in the trades. This unit of work is a graduation requirement.
3. Midterm Exam: Testing math and measurement proficiency, fractions and decimals, word problems, formula usage, and safety.
4. Final Exam: Math, measurement, safety, tool recognition, blueprint reading, geometry, physical conditioning.

The Training Sequence Course Schedule

Week 1

Tuesday

Physical conditioning start-up tests
Introductions, including goals
Introduction to course - Syllabus
Tool pre-test
Measurement pre-test
Organize travel teams for safety
Personal empowerment role plays

Thursday

Introduction to Weight room
Half hour aerobics
Goal exercise - basketball
Setting goals and objectives
Apprenticeships, structure and application process
Math: Whole number review
Fractions and measurement

Saturday — Hands-on

Contracts and waivers
Stretching and muscle tone exercises
Esteem Exercise: Introduce your partner
Mechanical principles, leverage, force, and motion
Use of prying tools, measurement, hand tools
Material handling, proper lifting techniques

Week 2

Tuesday

Weights and aerobics
Geometry - perimeter of rooms
Fractions, add and subtract review
Measurement to $\frac{1}{8}$th and practice
Test strategies and study skills
Spatial relations exercise

Thursday

Nutrition and workout
Fractions: divide and multiply
Geometry: area of rectangles
Perimeter and area of complex figures
Measurement to $\frac{1}{16}$th, full ruler comprehension

Saturday — Hands-on

"The physics of fluids"
Water pressure experiments
Quantities of pressure under water
Bernoulli's equation and Pascal's principles
Measurement of flow
Basic plumbing concepts
Small board work, sweating copper pipe connections
Soldering metal connections

Week 3

Tuesday

Weights and aerobics
Beginning job interview session
Self-esteem exercises
Body language and communication skills
Begin journal writing (to be done throughout)

Thursday

Balance and climbing exercises
Area of complex figures, review test
Geometry: volume
Blueprint work sheets
Tables, graphs, charts
Introduction to electricity

Saturday — Hands-on

"Theory of electrons"
Flow of electricity
Energy and its uses
Diagram electric circuit with switch
Assemble electric circuitry board

Week 4

Tuesday

Weights and aerobics
Geometry: triangles
Order of operations with fractions
Fraction review with drill bits
Final fractions test

Thursday

Stair exercises and weights
Assignment of trades research projects
Decimals: general concepts
Decimals: add and subtract
Strengths and weaknesses assignment for interview preparation

Saturday — Hands-on

Electricians - skilled trades presentation
Bending conduit
Cutting and reaming conduit

Making connections
Pulling wire
Complete circuitry board assembly

Week 5

Tuesday

Abdominal focus week
Nutrition review
Review of electricity, test
Decimals and spark plug gauge computations
Multiplication and division of decimals

Thursday

Weights and aerobics
Complete midway lifting charts
Positive messages: affirmations
Spatial relations: hole punch test
Concepts of energy, power plants, generators

Saturday — Hands-on

Crawford Power plant field trip
Afternoon: Review for midterm

Week 6

Tuesday

Weight and aerobics tests
Test taking strategies
Math and geometry midterms

Thursday

Goal review
Time management skills
Trade research reports
Angles, terms and functions

Saturday — Hands-on

Introduction to construction
Safety and power tools
Sawing, nailing, mitre saws
Construction of personal mitre box

Week 7

Tuesday

Weights and aerobics, upper body focus week
Trade research reports
Support group meeting, budget planning
Math: square root and exponents
Introduction to circle formulas

Thursday

Stair exercises with weights
Percentage formulas
General harassment role plays
Problem solving strategies
Rehabilitation slide show

Saturday — Hands-on

Chicago Manufacturing Institute field trip

Week 8

Tuesday

Abdomen and back workouts
Percentages review and quiz
Pythagorean theorem
Use of 3-4-5 right triangle, pulling diagonals
Hypotenuse use, stairs and rafters
Sexual harassment presentation
Sexual harassment roleplays

Thursday

Stair exercises and weights
Algebra: Introduction to equations
Math-word problems, setting up equations
Ratio and proportion

Saturday — Hands-on

Auto mechanics or trade selection by group

Week 9

Tuesday

Weights and aerobics
Trades reports - final
Algebra: Introduction to signed numbers
Spatial relations or math work in teams

Thursday

Balance beam exercises
Esteem exercises
Temperature and heat
Conversion formulas for Celsius, Fahrenheit, meters, feet, inches

Saturday — Hands-on

Building a tape measure
Measurement tests
Conversion work with measurement and scale
Building engineer presentation

Week 10

Tuesday

Weight lifting and aerobics
Aptitude test strategies
Perceptual ability and vocabulary tests
Letter and number series reasoning
Assertiveness training exercise

Thursday

Weights and aerobics
Algebra and word problems
Map reading exercise

Saturday — Hands-on

Metal Construction shop trip
Welding, metal construction, blacksmithing
Spot welding and machining
Measurement with micrometers

Week 11

Tuesday

Construction jobsite field trip

Thursday

Weights and aerobics
Nutrition check-in
Review for finals
Journal writing

Saturday — Hands-on

Post-tests
Project Wrap-up day

Week 12

Tuesday

Finals in physical conditioning
Math, geometry and blueprint finals
Appreciation of fellow students exercise

Thursday

Graduation ceremony

Life Skills and Support Component — Philosophy

Fear of differences and of trying new and different things abound in our society, but are especially strong among women. The noise of a power tool alone intimidates a great many of us. Yet, for some growing number, motivation to join the trades, to be a carpenter, an electrician, a sprinkler fitter, enables a woman to step past the fears of the noise and strenuous conditions and to learn the skills involved. A fair number of odds must be overcome before a woman can see herself working at a job that has been traditionally held by a man. Likewise, she must grow in the areas of self-knowledge, self-esteem and self-confidence.

Preparing women to enter the skilled trades must of necessity mean introducing them to certain assumptions that they are likely to encounter on the job. These assumptions, held by many co-workers and employers alike, have a way of surfacing at a woman's first interview for construction work or apprenticeship training. Here are a few quotes from actual encounters:

"Why would you want to do this type of work?"
"Are you sure you can work out in the cold or the wet?"
"Aren't you more needed at home?"
"Women don't have enough strength to do this kind of work."
"Women don't have the spatial aptitude needed for this work."
"You'll just be distracting my men; they'll be looking at you all day long."

Confronting these assumptions must be at the base of any training program which hopes to help women gain entrance into the trades. The confrontations must deal not only with what's "out there," but also with the unspoken fears and inner self-esteem issues of the woman about to enter the trades.

What are her responses to those questions?
How deeply does she believe in her own response?
Can she hold on to that belief in the face of harassment and loneliness?
Has she support among family and friends to help offset the early possible sense of isolation?
What inner strengths and external support group systems does she need to learn to draw on for perseverance?

In order to succeed in the end, in a personal way for each woman, the content as well as the style of training must offer a strong response to societal conditioning. Exercises which help a woman begin to look inward at her own assumptions form a good starting point. Throughout this process, individual support and positive feedback will be essential.

The need for pre-apprenticeship training programs, run by and for women can easily be seen, for until the 1970's, young women in secondary schools were often not even allowed to take shop or mechanics classes, and were discouraged from taking advanced math or physics classes.

Even though such classes are now open to young women (although not entirely without costs of stigma or harassment by classmates or relatives), there is more than just some "lost time" to be made up in our training programs for the skilled trades. Women in North American society, as a whole, are not encouraged to set separate goals for themselves. They are taught to focus on family needs. Career women are still, for the most part, seen as superwomen who defy real parameters of possibility for the female gender.

To further complicate matters, women in this society are not conditioned to take themselves seriously. It is possible to see among young women some effects of recent changes in this area of psychological growth, but not so for most women in their late twenties and thirties. A comprehensive training program must help the women begin to see their "rights" and assist them in perceiving the validity and promise of the career change they are considering.

The training being done throughout the country in this field needs to be innovative in its approach and optimistic toward what it seeks to accomplish. That optimism needs to spread to each and every participant in the program if she is to gain a full sense of what she deserves, what she can do, and what career vistas are open to her.

Thus it is clear that empowerment must be an underlying principle of any training of this type. The instructors must be, above all, respectful of the women and the career transitions they are considering. Encouragement should be given often: the women should feel comfortable to ask questions, explore new options, try new tools and take new risks. Along with these concepts, the student is fundamentally encouraged to take responsibility for herself, which is empowering in and of itself.

A course of this type, giving the trainees exposure to many trades and an opportunity to meet many different tradeswomen, offers a multitude of role models. Positive feedback comes from all Hands-on teachers as well as the general instructor to effect an atmosphere in which women feel willing to try.

Women are strongly encouraged to attempt new challenges and to take a positive attitude toward those tasks. A woman saying "I can't do it" is asked to rephrase her sentence, take a more positive approach with "I can do it!" Problem solving is taught throughout the course in a way which helps women take a team approach and see their collective as well as individual strengths.

After all, the challenge of opening up non-traditional careers to women is a task which will take a multitude of approaches, both individual and collective. A woman will persevere all the longer in her field if she sees not just her own individual job and its conditions, but rather the condition of women everywhere and her place in the struggle for improvement and empowerment.

The Lesson Plans Networking Exercises

In the early weeks of the course, special emphasis is given to the development of the friendships, network, and support groups that can eventually be critical in sustaining the individual woman in a male-dominated workplace.

In tandem with that slow-growing process of trust and networking, the students are also moving forward with their personal goals regarding a career transition into non-traditional work. Much of the network-building is done in short exercises at the beginning or end of class, and the discussion material is often directed around the sharing of goals and objectives. Exercises relating specifically to goal-setting will be presented immediately following this section.

Each student is strongly encouraged to meet and get to know each of her classmates, not just those who seem most like her, or most interesting to her. In this way, students will come to share with and learn from each other. The hope is that the class will bond as a unit, and those women completing the course will continue on their own to meet for such purposes as ongoing study sessions and support group meetings.

Over the years, it has been seen that women entering the trades in the 1970s and 1980s managed best if they had solid support groups and good friends to call on after a particularly hard day. It is the women with good support networks that are best able to sustain themselves in the construction atmosphere, and they are the ones who to this day continue to work and grow in the skilled trades.

> *Having a network of tradeswomen is...invaluable. Any woman involved in a trade or occupation where she is isolated can benefit from the camaraderie and strength of networking with other women in her field.*
>
> Nina Saltman
>
> *Hard-Hatted Women*

1. SELF INTRODUCTIONS

Set-up: Round Table Discussion. Chairs are organized in a circle for first night discussion. This often takes place after the syllabus has been covered.

Time: Approximately one hour.

Task: Going around the circle, each woman is to share her name, where she lives, what she does. Then she is to share briefly with the class her goal regarding the course. She also is to describe briefly: her present job and planned career transition; her trade choice; how she was influenced to choose that trade (does she know anyone in that field; has she seen the work done?); and what appeals to her about that trade.

If undecided, she should list her top interests in the same way, describing what she hopes to accomplish during the CWIT training program.

2. SAFE TRAVEL TEAMS

Set-up: As part of the round table exercise, women shared their place of residence. As each new person introduces herself, women in the class are encouraged to listen for those who live near their area, or travel in the same directions.

Time: 15-20 minutes.

Task: During a short in-class break after the round table women are to meet with those from their area and set up safe travel teams and carpool arrangements.

Coordinator is to stress importance of personal empowerment regarding GOALS. Taking power around travel in the city involves drawing on each others' resources: the group leaves the college building as a whole, goes to the parking lot together. Those traveling by train or bus are encouraged to form teams for safe travel.

Taking control, positive action, and setting up safe situations represents a good, productive use of energy and strength in numbers. Women are to reflect and comment on how much energy "being fearful" takes from our lives and how together we can use that energy to accomplish other goals.

3. ACTIVE LISTENING INTRODUCTIONS

Set-up: In pairs.

Time: Five minutes each; then full group introduction takes about 15 additional minutes; about a half-hour for all.

Task: *Part A*
Each woman is to "interview" her partner for five minutes, collecting some information that she would like to present to the group. She will watch for things that will help her remember this woman; what they might work together on; what they have in common; goals they might share. At the five minute "call," they are to switch roles and then the other woman does the interviewing.

Part B
In a full circle, each woman then introduces her partner to the class, giving as much information from memory as she can. The group welcomes each new person introduced, and she then shares an exercise or work-out stretch to help prepare the group for the work and lifting of the day ahead.

4. NAME RECOGNITION GAMES

Set-up: This is a quick stretching period challenge game. One person starts off showing a stretch that the group does, following her lead. Then she is to name someone in the group whose name she can recall. That person, in turn, give a new stretch exercise, and names the person to follow her — until everyone has had a turn.

Time: Ten minutes.

Task: This exercise is used on repeated occasions until, over a period of a few weeks, everyone in the group knows every name.

5. COOPERATIVE LEARNING GROUPS

Set-up: In pairs or groups of three for most activities.

Time: Varies with particular assignment.

Task: Many of the skills critical to the trades are best practiced in small groupings of twos or threes. Measurement is an example of this. It is necessary not only to be able to read the tape measure, but to read it accurately and with certainty and speed. By encouraging the idea that we ALL need lots of practice to do this correctly, the competitive approach is removed over time. Women work in smaller settings, measuring items back and forth, and checking one another's work. It is possible to have women who are strong in an area work together with one or two who require more practice, and over the course of the exercise period all participants become more proficient in the task at hand.

6. PRACTICE WORK IN PAIRS

Set-up: During hands-on training of any type, students are asked to work in pairs, with the team combinations changing every week.
Purposes of this set-up are as follows:
Half as many tools are needed.
Safety is monitored by the teammate as well as by trainers.
Each woman lends her memory of the instructions to her partner, who may have forgotten something. More is accomplished by the work of the team.

Time: All day sessions.

Task: The hands-on training sessions utilize time before or after the trade specific presentation so that women may team up with a class mate to have extra work time for practice in troublsome areas. Once again, the principles of cooperative learning come into play. Women tutor and work with each other on math problems, measurement of objects in the room, figuring areas and perimeters, doing estimates of work, reading blueprints. During these exercise periods, classmates are getting to know each other better, forming the friendships that will be the basis of a strong support network.

7. SUPPORT GROUP MEETING

Set-up: The class joins a scheduled Chicago Women in Trades support group meeting at the office.

This will be done on two occasions during the training sequence. The purpose is to help the women understand that this network and group support is available to them on a regular basis, and that they first should seek out their peers for ideas and help when needed.

Time: Average of two hours.

Task: This evening's presentation revolves around budget planning. Seasonal work and lay-offs make financial planning extremely critical to career survival in the skilled trades.
Homework — With the new information and forms, prepare your own budget plan to be reviewed at the next evening class.
Other sample support group topics:

- Affirmative Action
- Sexual Harassment
- Long range retirement planning
- Union involvement
- Problem solving around job training
- Video night — non-traditional workers on the job
- Health and safety issues
- Work clothing for women: survival tips

8. NOON DISCUSSION OF JOB REALITIES

Set-up: A formal discussion takes place during the noon break of every Saturday hands-on training day. After women get their lunches (which they are assigned to bring as part of their preparation for the day, and for work in the trades) the group settles around the presenters of the day.

Time: 40 to 45 minute period.

Task: The group is free to ask questions of the day's tradeswomen. Questions will generally focus on:

- Apprenticeship requirements for that field
- Time period and location of training
- What preparation is needed
- Course of study during pre-apprenticeship
- What tools are best to buy in advance
- Clothing appropriate to the trade
- How presenter handles childcare, commitments
- Types of work performed during apprenticeship
- Jobs at journey level, expectations

On one or two Saturdays, the discussion will be guided to explore difficult situations the workers have run into, especially in the areas of harassment:

- Incidents that have come up; sexual harassment
- Treatment by co-workers; foreman; other trades people
- How situations were resolved
- Role of the union; places to seek support
- Use of CWIT support group meetings; legal and counseling support through CWIT
- How tradeswomen use their journals on the job
- Problem solving on the job
- Inadequate training on the job

9. PROBLEM SOLVING SUPPORT GROUP MEETING

Set-up: Group meets with the support group meeting at the CWIT office. Tonight's focus is on general job problem-solving.

Time: Two hours.

Task: Work with tradeswomen in attendance at the meeting to arrive at good solid problem-solving practices. Issues to be addressed:

- Trusting intuition
- Not remaining passive in bad situations
- Being firm and consistent
- Working within the chain of command
- Working with union stewards and foremen
- Use of journals

The problem situations (actual, supplied by the tradeswomen present) and role plays provided by the teacher and counselor are to focus on work situations (not sexual harassment only, for this is covered in a separate series of meetings). For instance, the group might address issues of being asked to do unsafe work or carry too much weight, how to work with dangerous partners and how to deal with racism on the jobsite.

The Lesson Plans Goal-Setting Exercises

Most people have trouble setting goals, except in the simplest of matters. Five and ten year plans elude most of us, and set new students' minds to spinning. Goal exercises work best if broken down into tiny segments, simple exercises which build upon one another until the final structure takes shape.

It appears that women share their hopes and dreams fairly easily, and thus small group discussions and one-to-one exercises serve the purposes of goal-setting very well. Occasionally there will be a written assignment, but for the most part, the work of goal-setting is done in informal, class sharing sessions which keep the group enjoyment and motivation high.

The following exercises have proved helpful to groups of students who are forming an ongoing support network. These lesson plans suggest a style of learning and teaching which helps the class see itself as a built-in resource of strength and support. Individual goals become defined over time, and the class as a whole moves forward to forming an intact support network, capable to sustaining itself after graduation.

1. GOAL RECOGNITION

Set-up: In pairs.

Time: Ten minutes, five minutes each person.

Task: Each woman is to share with her partner the story of a goal she feels she once set in her life and tried to accomplish. What was the goal; what steps did she take to reach it; what got in the way; what was the final result?

Wrap-up — Outline on the chalkboard one or two volunteer examples from the group, showing goal, objectives, outcome.

Homework — A goal worksheet is passed out on which each student is to think about and list three short-term goals that they would like to accomplish during the course. Possible ideas include: areas of new learning, physical strength/stamina, skills, change of residence, career change, weight loss, math confidence and skills improvement. Then they are to list ONE way to get started on each goal and how achievement will be measured.

2. PERSONAL GOAL-SETTING

Set-up: Round Table Discussion

Time: One half hour, about six minutes per task

Task: *Part A*

Coordinator presents importance of goals:

- how they give us a starting point;
- how they help us set direction to an end;
- how they keep us motivated;
- how they determine how we will use time;
- how they help us measure our progress;
- how they can be broken down into objectives, and measured that way;
- how we can gain strength from successes.

Part B — Each woman is to share with a partner to her left a goal she once set, but did not reach, and what she felt got in the way. Then switch.

Part C — Full group shares some of the pitfalls they have experienced and what came up for them in task B.

Part D — Each woman shares her homework from prior class: Three short-term goals she hopes to accomplish during the training program and one chosen starting objective for each one.

Homework — Begin to set a measurable objective, to be looked at the end of each week, for each goal.

Example — Goal: To become proficient in math
Objective — To cover ten pages in math book each week, working ten problems correctly before moving to next page. (Self-scoring, and correcting mistakes)

3. LIFE VALUES AND GOALS

Set-up: Class assignment only

Time: Not applicable

Task: **Homework** — Write your own obituary. Read a few obituaries in the Sunday paper, and make a list of what things are mentioned (especially in the longer ones). Then, in your journal, write out a list of what you would like to be remembered for. Concentrate on values clarification in this exercise, answering the following questions.

- Do you want to be remembered
  — for creating beautiful things?
  — for starting and owning a company?
  — for restoring old buildings or furniture?
  — for inventing something?
- List special skills you see yourself as having developed.
- List your children and other relatives that you want to mention and what you will have imparted to them.

4. SHARING OBJECTIVES

Set-up: In pairs, at start of morning introductions.

Time: 20 minutes, along with stretching exercises.

Task: Partners work for six minutes on setting a very precise objective for the upcoming week. The objective should come out of the goal that they are working on (i.e., a weight-loss goal-setter may set an objective of eating fruits and vegetables instead of sugars or fats in the upcoming week, or making the better of two choices when possible for the makeup of a given meal). Back in the large group, each woman shares her specific objective for the week with the group. These will be reviewed after the following week.

5. DEMONSTRATING GOOD WORK HABITS

Set-up: This is a normal hands-on class, but students are told in advance that they are to set a goal and concentrate throughout the day on personal focus and the task at hand, demonstrating:

- timeliness, promptness, preparedness;
- follow-through on projects;
- self-direction around assigned tasks;
- watching for what needs to be done;
- set-up and clean-up;
- safety procedures and keeping site safe;
- cooperation with co-workers;
- staying busy; practicing skills; reading tapes;
- cooperative learning of new tasks;
- interest and participation level;
- seriousness of intention and drive.

Time: Full Saturday training day.

6. PLANNING POST-CLASS ACTIVITIES

Set-up: Round table discussion. Group participates in discussion of how they see themselves relating to CWIT, Support group meetings, planned activities, and volunteer work.

Time: 20 minutes

Task: After discussion of existing CWIT activities and their planned level of participation, they are to explore what additional things they would like to see and do. Some women have offered to join in with speakers' bureau activities, plan class reunions, volunteer to work together at Habitat for humanity sites or serve on a fund-raising committee for the School Fund. Everyone should set a personal goal for some continued involvement with the organization or other place to use their new skills.

7. CLASS BUILDING PROJECT

Support and solidarity are further facilitated through planning and carrying out a group building or decorating project. For instance, building a simple room partition, painting an office space, or constructing storage shelves are past group projects which brought about a real sense of accomplishment in the class, as well as having helped the whole class bond around the task at hand. Instructors and trade specific presenters take pride in the work of the class as a whole.

Set-up: The group holds an open forum on project ideas. Suggestions are taken regarding Habitat for Humanity projects, classroom needs projects, and neighborhood clean-ups.

Time: Approximately 40 minutes

Task: Together the group narrows down the brainstorming list until it can arrive on a decision together. From this group goal, individual objectives and timelines are drawn up and then the group goes to work.

8. ADDITIONAL GOAL QUESTIONS

Set-up: Additional session time is given to women working in twos or threes on the following questions, which lend insight and clarity to their career goal formation.

Time: These questions are done one or two at a time, allowing 15 minute periods for each pair to discuss the ideas being raised.

- Choose three trades of interest and state why they are preferences.
- List any life or skill experience that you feel relates to the three trades of choice. If you have no relevant experience, tell what makes you think you would like to work in the trade full-time.
- What were the sources of employment of adults in your family while growing up? What were their prevailing attitudes about work? Would you say that they took pride in their jobs?
- Did women in your family (mother, older sisters, aunts) work outside the home? What types of attitudes did you pick up about that?
- What types of jobs were you led to believe were possible to you as a woman? Recall any particular early childhood or grade school experiences that led to this belief.
- When you were younger, what did you expect to be doing as an adult? Have any of those expectations come true yet? Which expectations would you say you still hold today? If things are turning out differently, do you look on those differences as good or less than good?
- Do you have plans to have children during the first years of your apprenticeship? If you had to postpone having children during that period in order to concentrate on your training, how much of an issue would that postponement be?
- How much does your paid work/career reflect on your self-esteem? Pick five different things you did in the past week (i.e. helping a friend, buying new shoes, completing a task at work) and list them in order of priority of how good they made you feel about yourself.
- What are some things, besides money, that you expect from a job in the trades?
- List at least five ways in which you think about your work and whether it is worthwhile: i.e., what you produce and how necessary it is; the challenges on your jobsite; your relations with co-workers, and more.
- Now look back over the information compiled by the questions above and set two realistic goals, one job related and the other a personal choice, that you hope to accomplish in the next two years.

9. ADJUSTING GOALS

Set-up: Gymnasium or basketball court.

Time: 45 minutes.

Task: Group is to first decide abstractly on how many baskets they can put through the basketball hoop.

Follow-up — As a practice session for realistic goal-setting, the class does an exercise during physical conditioning time that involves setting a goal of a certain number of "baskets" they can make on the basketball court. After a first try at achieving their set number of baskets, they then adjust the number until it becomes possible to reach it. The exercise takes about half an hour, and helps to bring about a more concrete understanding of the goal-setting process.

Often, this exercise is used both early in the course, and then again mid-way and at the end. The time can be shortened later in the course, as the group gets the concept and can move through the exercise faster.

The Lesson Plans Self Esteem Exercises

Lack of confidence is often the biggest hurdle a woman has to jump in order to feel comfortable applying for and performing in the macho world of the skilled trades. In an effort to lay a new foundation for personal confidence and self esteem, a number of esteem building techniques and exercises are used throughout the duration of the course. Some are described below and others spontaneously present themselves on occasion:

1. CLASS CONTRACT ON LEARNING STYLES

Set-up: As part of the first night's round table, the group is asked to participate in an open forum on learning. This is an attempt to get a picture of the types of esteem issues at play, and what will help individuals move past personal blocks into full and joyful learning.

Time: One half hour.

Task: Individuals share what works for them in terms of teaching styles, group encouragement, seeing the work first before trying, kinesthetic learning, etc.

The following sample group contract was drawn up in one class as the group asked for these points. We learn:

— by doing
— in smaller groups
— by seeing work first, then by trying it
— in situations where mistakes are okay
— through tutoring
— when new material comes at moderate rate
— when there is verbal support
— when we cooperate
— when feedback is positive
— through group projects
— by designing and making a plan first
— when questions are all right to ask
— when we are not afraid of criticism

2. INITIAL JOB INTERVIEW ROLE PLAY

Set-up: During the first week of classes, students team up in groups of three for roleplay exercises.

Time: About five minutes per interview.

Task: Using a page of sample job interview questions, one woman interviews another for a job in the trade of her choice. The third woman observes silently during the interview, then gives feedback afterward. The members of each team rotate positions until everyone has done a full interview as Employer, Applicant, and Observer. If possible, segments of each woman's interview are recorded on video or tape recorder, to be reviewed at the end of the course.

3. LAST WEEK JOB INTERVIEWS

Set-up: The same exercise is repeated in the final week of class, and often the growth of confidence will be dramatic. For one thing, each woman brings her "Job Readiness Kit" (described later in this chapter) which helps her to present all the required documents (H.S. Diploma, Personal References, her past skill experiences) in a forceful, organized manner.

Time: About five minutes per interview.

Task: Women are asked the same questions as in the initial interview along with a few more, and once again the interviews are videotaped or recorded if possible. The before/after interviews are then watched by the entire group on the last day of class.

4. PERSONAL PROGRESS CHARTS

Grades are not emphasized in the course, however, each student is expected to make steady progress in relation to her own pre-test measurement. Homework and test materials are returned to the student emphasizing such progress and also what areas need more concentration. Students are encouraged to talk with classmates and instructors about why they think they did "well" or "poorly" on a particular exercise. They are asked to look back at past homework pages or tests (or physical conditioning progress charts) to gain perspective. Often, when that performance is measured against their starting point, they actually made more progress than they realized. Approaching subject matter this way builds self-esteem and confidence.

Set-up: At the start of any new subject matter, hand out or suggest a chart which would help to map personal progress. These records are then kept by the student, and early scores and skills are compared to those at the end of the unit.

Time: Varies with unit of study.

Part A — Along with the information above, women in the class are asked not to judge their own work by comparing it to that of someone else. It is important that a non-competitive atmosphere give the students a chance to develop their own self-esteem based firmly on individual performance and progress.

Part B — As practice for entry exams, students are regularly given timed tests for practice. Most tests are given twice, once in the first six weeks, and then again closer to the end of the course. Students are to compare their starting scores with their scores later on, and are asked to try to better their time record as well. Again, score comparisons occur only within a student's own work.

5. INTERRUPTING PERSONAL "PUT-DOWNS"

Set-up: This is a general classroom style which helps in the building of esteem and cancellation of negative messages. It is used whenever the subject matter comes up, and shared with the group early on in the training sequence.

Time: Not applicable.

Task: Students who say "I Can't" in regards to a task or problem are interrupted in this statement and encouraged to give themselves a different, more positive message. Often if the problem is broken down into parts, it will turn out that they can do at least one of those parts. Affirmation is given for this, countering the "I Can't" or "I'm No Good" message in their mind.

Racist, sexist or homophobic comments made during class time are interrupted as well. This contract is set up during the first week of class so that students know that bias will be confronted directly.

6. APPLAUSE AND CONGRATULATIONS

While not an exercise as such, a tone is set from the first class forward in which the group is encouraged to support one another after difficult tasks with applause or positive comments. A woman afraid of heights may be verbally encouraged while climbing a scaffold system or a woman struggling with math anxiety may get a big round of applause after coming up with a correct answer.

7. ADDRESSING MATH ANXIETY

Set-up: The bulk of this evening's class deals with review of the tape measure and the use of fractions; the two lessons are presented together. After the presentation and several practice exercises, the following activity is recommended:

Time: Paired conversation for five minutes overall; then cooperative learning exercise for 15 minutes.

Part A — In pairs, each woman spends a few minutes talking about her "relationship" with math. Is it one of fear, enjoyment, challenge, immobility, lack of confidence? After explaining what happens when a difficult problem comes up, each person should make a verbal picture of how they would like this to change.

Part B — After each woman has finished, they are then to take a math problem that raises a moderate degree of difficulty for at least one of them, and work it along with their partner. They can call for the coordinator's assistance if necessary. At the conclusion of solving the prohlem, they are then to spend a few moments reflecting on what it feels like to solve problems together.

8. RECOGNIZING OLD MESSAGES

Set-up: In pairs.

Time: Five minutes per partner.

Task: Each woman is to take a turn at exploring her memories of early childhood messages. She is to look at some of the following questions:

- Were you most often told "You can do it" or "You could never do that" when learning new things?
- What kinds of things were you most often encouraged to learn or try?
- What types of tasks or hobbies were you told "weren't" for you?
- Who gave you encouragement? What did they say? Do you remember the way they said those phrases?
- Who most often discouraged you? Who was indifferent? How did these messages affect what you were willing to try?

Homework — Choose an old positive message or rewrite an old message that you want to use for yourself as a symbol of inner strength and affirmation. For instance, a woman may decide to keep her grandmother's message of "You can be whatever you want." But she may choose to rewrite her uncle's message of "Girls are not strong" into "I am building my strength."

Women are encouraged to link this exercise with one of their goals so that when they run into difficulty, they can say the new message out loud to draw strength from it. (i.e.: old message: "You are no good at math" becomes "I have confidence in my math skills" as they strive to reach a goal of math proficiency.

9. SHARING NEW MESSAGES

Set-up: Full circle, doing stretches before hands-on training.

Time: About 20 minutes.

Task: Each person is to share from her homework assignment page what she has chosen as her "new message." She can also share how she arrived at that affirmation, how it relates to a goal she is working on, and how she plans to use it. She then introduces a new stretch to the group, before they go on to doing hands-on training.

10. SHARING STRENGTHS

Set-up: Written work with partner.

Time: 15 minutes.

Task: Working with a partner, each woman is to talk through and then make a list of what she feels are her personal strengths, skills, and abilities. **Homework** — Find a quiet space to sit and think for ten minutes. Go through the list above and try to see how your personal strengths can help you reach your goals. Add any new strengths that come to mind.

11. TEST AFFIRMATIONS

Test-taking skills are reviewed before every test, and the class is encouraged to call out some affirmations and to take a series of deep breaths together. Students are reminded of the importance of reading quickly through the test, then working some "easy" problems to get over test anxiety, then proceeding with all problems and rechecking answers if time allows. Since many of the women in the program will go on to take entry exams at trade union offices, it is important to practice taking tests, focusing energy calmly on the tasks at hand, and staying focused until the end of the test. Timed tests are practiced as well.

Set-up: Group exercise before any test.

Time: Five minutes.

Task: Use breathing and affirmation exercise to focus energy and calmness on the test at hand. Each woman is to share her personal affirmation that is to be used during the test to stay focused.

12. SHARING SUCCESSES

Set-up: As part of the original stretching circle, each woman will take a turn.

Time: 20 minutes, one minute each.

Task: After introducing a new stretch for the group to do before the day's work, each person speaks briefly about how they did with their objective from the previous Saturday. They need to share the objective, how it went, what worked, and their overall successes from the week.

13. BREATHING AND GROUNDING

Set-up: Group will take a "walk-through" exam where different tasks and exercises are spread around the room.

Time: Ten minutes.

Task: The primary assignment is to stay grounded while taking this test.
First, breathe deeply before starting. Call up one's own positive message.
Second, stay in touch with your feet on the ground as you progress through the test.
Third, apply yourself to each problem as you approach it — as if it were the first problem in the test. Forget about the problems before it and those to come after. Focus fully.
With any remaining time, check your work.

14. ROUND TABLE DISCUSSION OF NEW MATERIAL

Set-up: Group is set in a standing circle for a sharing exercise.

Time: Half-hour.

Task: This is a review exercise regarding the previous class material. It is used after hands-on training in which a great deal of new material is imparted. As each new person presents a stretch activity to the group as a whole, she shares something new that she learned the previous class. Each person is encouraged to think of something that has not been mentioned before. The result is an excellent review of the material, done by the class, not by the instructor. A second result is that the group sees their growing knowledge and confidence level as a natural outcome of this activity.

15. ROUND TABLE DISCUSSION ON CONFIDENCE

Set-up: Group is set in a circle for a sharing exercise.

Time: Half-hour.

Task: This exercise is to get the wheels turning around how confidence levels grow. First the group shares how they think the previous Saturday went, how they did with their performance and scores. (This type of sharing about the previous Saturday takes place in a small way every Tuesday night at the beginning of class). During this exercise individuals are to share high and low ends of confidence level: what they feel they can and can't do; how they are working on that; which parts of that come from early childhood messages; what they can do to continue building their confidence level.

16. SEXUAL HARASSMENT AND SEX DISCRIMINATION

Set-up: This is a formal presentation by the director or other staff member of Chicago Women in Trades. The group is usually in a circle and this is a full participation exercise.

Time: Two hours, with additional time in following class for follow-up questions and role plays.

Task: Cover in detail regarding sexual harassment:
- the law
- the myths
- proper course of action and recourse
- demonstration role plays and observations

Each woman receives a sexual harassment packet. (A full sexual harassment prevention training guide is available from CWIT.)
The session also covers what to watch for when applying for a job, how to answer questions, what types of questions asked by the employer deserve a mental note and to be recorded after the interview, and what to notice in terms of present employees.
Homework — Each woman is to write an example of an experience of sexual harassment. This need not be a personal account but

it can be, and she can change names if she wishes. The account is to be brought to the following class in written form.

17. SEXUAL HARASSMENT ROLE PLAYS

Set-up: With the group in a circle, sample harassment situations (from the student's homework) are acted out, then observations are shared.

Time: 45 minutes, longer if needed.

Task: The group is to reach a point where they have a clear understanding of how to proceed in these situations. They are to work together to find responses that will work for them. They may make recommendations to each other, and criticisms in a supportive manner. The goal is to have a plan of action for dealing with this sort of situation by the end of the evening.

The role plays and the discussion help the class gain a clear sense of their legal rights, fair and equitable employer-employee relationships, and the legal rulings which protect them from discrimination and unjust treatment.

In addition to the laws regarding sexual harassment, sexual discrimination, the Family and Medical Leave Act, pregnancy discrimina tion and requirements regarding bathroom facilities are reviewed and discussed. Students are encouraged to keep a journal of conditions on the job, as well as treatment by any trouble some co-workers.

18. TAKE A DEEP BREATH

Set-up: Same as in prior exercise.

Time: One or two minutes.

Task: In the activities listed above and other confrontation role plays in which tension can easily build in the room, even though the action is a make-believe situation, periodic time-outs can be called. These can serve the purpose of allowing women to reflect on what they are feeling, and to come up with possible verbal responses and insight into inner strengths to get them through the situation. The class as a whole might be encouraged to, when needed, "Take a Deep Breath."

19. AFFIRMATIONS BEFORE FINAL EXAM

Set-up: Before the final exam is given, women are asked to bring up their "personal message" arrived at earlier in the course. In addition, a few minutes of deep breathing is done, and general affirmations said aloud to build confidence levels and reduce test and math anxiety.

Time: About 5 minutes.

Task: Exam is to be taken with the most positive mental attitude possible, using affirmations and deep breathing throughout.

20. LAST JOURNAL ENTRY

Set-up: Writing exercise.

Time: 30 minutes, more at home if needed.

Task: In addition to the final exam, a final journal entry assignment is given, to be completed by the end of the evening. This task is to write two to five pages reflecting on the course, and how it helped the individual toward her goal. This journal entry can include suggestions for future training sequences, and should definitely contain information on what steps that woman hopes to take next toward her goal.

Job Search Exercises

A review is presented for the entire class of the structure of work in the construction trades and industry. Union halls, hiring halls, union stewards, job representatives, and typical hiring procedures and practices are covered.

Women are encouraged to go in pairs or small groups to seek work at construction sites. Often parking is hard to find, and one woman can circle the area while the other goes to find the foreman. If an interview is granted, then they can switch places, and the driver can go in to seek work.

In the construction industry, one can sometimes be hired on the spot; thus, women should go dressed for work, taking along hand tools, hard hat, safety equipment, and a lunch. Being unprepared to stay for the day can potentially cost one a job. In addition to these items, they will be best prepared if they carry along their Job Readiness Kit and a survival notebook (both of these are described in following sections) for recording important information or directions.

At times, the foreman will request that the woman return the next morning. This is often a type of test, but showing up early the following day may mean she will be given work at the site.

Additional information on jobs in the trades should include pay scale structures, health and insurance benefits, and similar pertinent information. It will often bring up questions about budget planning, what to wear, how to respond to questions on applications and so forth.

1. JOB APPLICATIONS

Set-up: Class participants are encouraged to go together to make job or training applications if two or three students hold a particular trade interest in common.

Task: The students are to work on application forms together after class, with instructor or counselor assistance as needed. Going to the job sight together to turn in their applications helps counter the insecure feelings that might come up, and gives the women an immediate place and partner with whom to process those feelings.

Time: Several hours.

Homework — Report back to the class on their experience and on the trade research that they have done as part of the application process.

2. COMMUNICATION AND INTERVIEW ROLE PLAYS

Set-up: A panel review board will be "interviewing" the students, who are applying for jobs or apprenticeship training positions. Choose a team to do the first set of interviews. They are encouraged to be cold, strict, and rather conservative in their attitudes about women working in the trades.

Time: This process, with the questions that follow, takes about five minutes per applicant. After each interview, the group critiques the process for a few additional minutes. Then roles are switched.

Task: Arrange to have as many interviews take place as possible, looking for improvements in each one. This process should build on itself, from the observations, and each new interviewee should incorporate what she is learning. The exercise needs to point out information about all of the following:

- Communicating confidence
- Promptness
- Body language
- Learning names of employers
- Addressing people properly
- Answering appropriate questions
- Politely withholding inappropriate information
- Legal and illegal questions
- Proper dress for jobs in the trades
- Working in personal strengths
- Listing skills and showing abilities
- Staying strong in unsupportive situations
- Breathing, smiling, keeping calm
- Use of appropriate humor

3. CONSTRUCTION SITE FIELD TRIP

Set-up: Group is taken by counselor to a pre-arranged construction site visit. Hard hats and appropriate clothing are arranged in advance. Group brings its lunch, as usual.

Time: Full day or evening visit, with some hands-on activity if possible.

Task: Experience the realities of that site: working up high; working in the elements; workers ogling the group as it passes; temporary elevators and catwalks; importance of watching where one walks; lack of facilities and time of start-up.

4. LEADERSHIP SKILLS; ASSISTING IN COOPERATIVE LEARNING

Set-up: At the start of the day, this exercise is a focus on quality work experience throughout the full day. The class is told that they are to grade themselves on their follow-through with tasks, on keeping busy and watching for jobs that need to be done. In short, they are told to act as if they are in an employment situation throughout the full day.

Time: Full day, with review period at the end of day.

Task: In partner situation, women are to go through the tasks of the day as if they were on a jobsite. If they or their partner are learning something new, they are to go ahead with problem solving and assist one another in learning as far as they are able. Review at the end of the day will focus on assertiveness, creativity, seriousness, and cooperation between co-workers.

5. JOB READINESS FOLDER REVIEWS

Set-up: Students bring their job readiness packets to be reviewed by the teacher and counselor.

Time: 30 to 40 minutes. Individual or other cooperative learning work can be going on simultaneously.

Task: Folders are put in final order, helping the woman be fully prepared for upcoming job interviews or apprentice application processes. Contents of this folder are listed under Job Readiness Kit Exercise.

6. PERSONAL BUDGET

Set-up: A monthly budget plan is explained and presented in detail, stressing the lay-offs which are common in the skilled trades and industry. A budget form is then passed out and students are asked to fill in personal information regarding their monthly costs.

Time: One and a half hours.

Task: Collect bills from one sample month and create an annual budget based on those bills and income.
Homework — Save the applicable receipts and complete the form.

7. SAVINGS PLAN

Set-up: Follow-up lesson to Exercise 6.

Time: 45 minutes.

Task: As part of job readiness, create a savings plan based on first-year apprentice wages in one's trade of choice. It will be important to have such a plan, especially if one's work is conditional on fair weather.

8. RESEARCH TOOLS & EQUIPMENT

Set-up: This is an assignment given on the first evening, during the syllabus discussion. It alerts women to watch for information in every presentation that will be applicable to their trade interest, collecting a list of needs, tools, survival tips, and so forth.

Time: Not applicable.

Task: Keep a running list of tools, safety equipment, boots, and clothing suitable for work in the trade of your choice. This can be done over time, but a plan can be begun in which the woman will purchase an item each month.

9. TRADE RESEARCH

Set-up: Through phone call or apprentice school visit, and through talking with tradeswomen.

Time: 15 minute presentation.

Task: *Part A* — Research the trade of your choice and prepare for a presentation to the full group.

Give information on type and length of pre-apprenticeship, work conditions, types of work done, tools and special conditions.
Part B — Do formal group presentation of ten minutes or more on the trade and its work.

10. CONSTRUCTION COMPANY RESEARCH

Task: After centering on a trade, begin to research construction companies you may want to work for. Find someone who has worked for them. Seek out companies that tend to hire more women and minorities. Do "homework" to find the employer that is best for your needs. Much of this information can be acquired during the hands-on training noon discussions with tradeswomen.

11. INTERVIEW QUESTIONS TO EMPLOYERS

Task: Students are to prepare their own questions to employee for the interview process. These might include information on the pay periods, the company benefits, any health risks, tuition scholarships for dependents, or how soon the job will be available. Before actual job interviews, it is recommended that research be done on the prospective employer, and specific questions be formed based on those findings.

12. INTERVIEW REHEARSALS

Task: In front of a mirror, at home, students are to rehearse some responses to typical interview questions. Concentration should be focused on not fidgeting, looking into the (imagined) questioner's eyes, communicating confidence, conveying enthusiasm and willingness to learn the work.

13. APPRENTICESHIP INFORMATION CENTER REGISTRATION

Set-up: Women may go alone or in teams to local AIC office.
Required identification includes High School Diploma or G.E.D. and Birth Certificate.

Time: Allow two hours.

Task: *Part A* — Assignment is given to call ahead, make sure the AIC representative is in, and then report to the office to register for notification of openings in three trade choice areas and three counties.
Task B — A follow-up task is to report to the class as mailings begin to come announcing trade openings or test dates.

14. MAP READING

Set-up: Students work in small teams with a map and are asked to locate certain areas, especially those containing industrial complexes or current construction projects.
Supplies:

- A detailed metropolitan map showing city and suburbs.
- A yellow pages. Special attention is given to how this book is organized, the importance of calling for appointments, and what information to record (the person spoken with, etc.). In addition, the center section is studied since it contains CTA maps, zip codes, and street locations. Also in this book are detailed Transit Authority maps and the CTA number for route connections by public transportation.
- Expressway map. This map shows interconnection between highways. It is important to point out symbols for tollways and fee areas (i.e. Chicago Skyway).

Time: One hour.

Task: Students are given addresses. They must plan a route to the jobsite from their home.

15. SURVIVAL SKILLS NOTEBOOK

Set-up: Each women is given a notebook for class work. A section is to be blocked out for job search and employment readiness notes.

Time: Class time during each new presentation, time varies with lesson.

Task: Keep records that seem useful on subjects related to survival in your chosen field
— Safety equipment list
— Tool care and maintenance
— Procedures for complicated installations
— List of skills, order of work.

The Lesson Plans Journal Writing Exercises

Women entering the skilled trades,the world of manufacturing and other male-dominated work sites must be prepared for the possibility of finding discrimination, isolation, and/or sexual harassment in its many forms. Women are encouraged from the Orientation Day on to keep a journal of interactions relevant to their career change and job search. Such record-keeping assignments form the habits needed later on in the field, when what seems like an isolated comment can lead to a series of harassments, verbal and otherwise.

By learning to be alert to early danger signals, be they from co-workers or supervisors, a tradeswoman can record instances in a manner that can hold up as evidence in hearings. In the end, these records can often save her job and her reputation, and win promotions and respect. As the construction world becomes more aware of this simple self-defense skill being utilized by more and more women in the trades, the impetus for real change will be radically affected.

The following assignments are given at various points during the class for homework or at the end of a class period. The purpose is to help the women gain skills in quickly and accurately recording various types of interchange. These assignments are collected and read by the instructor, and then reviewed individually with the student. The following are sample assignments and not all of them are assigned during any one training sequence.

1. SELF - APPRECIATION

Set-up: This is a journal writing exercise. Women may talk briefly with their partners to get some ideas generated; then they are to write alone.

Time: One half-hour, to be completed at home.

Task: Each student is to answer the following questions.
- What have I done in the past to bring myself to a stronger place? (How do I muster up strength for the task at hand?)
- What do I MOST appreciate about myself?
- List three strengths (to be put in Job Readiness packet for review before interviews.)

2. RECORDING A CONVERSATION

Set-up: Homework assignment.

Time: 20 minutes.

Task: Write a paragraph recording a short convers tion with an adult male person: your husband, a friend, or someone at work. Use direct quotes where possible. This exercise is to concentrate on accuracy, and clarity in written work.

3. RECORDING NEW INFORMATION

Set-up: End of class exercise.

Time: Ten minutes.

Task: Student is to record in journal form some item learned during the evening's class which may be useful later. This section of writing is evaluated for clarity, and it also communicates the degree of learning taking place.

4. PRACTICE INTERVIEW SESSIO RECORDS

Set-up: Journal writing.

Time: One-half hour.

Task:
- What kinds of feelings did the interview process (in a prior class) bring up for you?
- What are you doing to resolve those feelings?
- Make a plan for practicing interviews (in front of a mirror, with a friend, etc.)

5. ACTUAL INTERVIEW RECORDING

Task: After a job interview, record the questions asked. Note especially questions (implied or expressed) having to do with marital status, and whether you have children or plan to have children.

6. SEXUAL HARASSMENT INFORMATION SESSION

Set-up: After Sexual Harassment Session.

Task: After sexual harassment session presentation, write in note form the information that you would like to have in your notebook for easy referral regarding:
QUID PRO QUO
Hostile environment
Affirmative Action cases
Legislation

7. PRESENTATIONS AT GRADUATION

Set-up: As part of the presentation on graduation night, students are asked to read a pre-selected section of their final journal entry. This serves to explain the course for the sake of guests present at the event.

Time: Five to ten minutes.

Task: Sections are read by students in an order that helps the anthology come together. This is the groups' presentation at the graduation ceremony.

Job Readiness Kit Exercises

Along with the cultivation of recording and writing skills is a special assignment given on the first night to run the length of the course. This task is the creation of the woman's own Job Readiness Kit which she will take on job interviews, and in which she will record information she deems important at each new job placement.

For job interviewing, the Kit should include the following:

1. The woman's High School Diploma or G.E.D. Certificate.
2. Her Birth Certificate, original.
3. Original and an extra copy of her Social Security card.
4. Her doctor's letter of good health. If a letter is not given to her after her physical exam, she should still include in her notebook the name, address and phone number of the doctor who examined her.
5. Tbree personal references, including current addresses, zip codes, phone numbers, and the relationship of these persons to her. As part of her preparation for the job search, she should also contact those persons to ask permission to list them as referrals.
6. Past job experience, beginning with the most recent job and going all the way back to when last in school. Again, complete addresses and phone numbers should be included, dates should be rechecked, and the name of a person at the place of employment should be included as a reference.
7. Her driver's license number and its classification.
8. A list of skills she feels she has (being realistic about actually having some experience in each of these areas).
9. A list of achievements, involvements, and hobbies. This could include groups with which she works, church or school committees, or any activities which would convey her energy level and commitment.
10. In addition, the survival kit should include two other notebook sections:

    a. A section of blank pages on which to record information which she obtains during the interview or any orientation process. This section could also include directions to the site, the location of entryway, any special safety equipment required, and so forth. She can use this blank writing space to note questions which might come up for her during the interview.

    b. A second section for recording personal interactions after the interview. She could use this notebook as her "Journal," recording any conversation that was either very positive or perhaps brought up questions regarding discrimination or harassment. As much as possible, these interactions, especially the latter, should be recorded verbatim. If this is not possible since the woman will be recording them after the incident, she should note their content as fully as she can, and also note whether there were any witnesses.

11. In another part of this notebook, the woman might include some personal sources of strength or some favorite responses to possible tense job situations.

    Under the last section, a woman may choose to place a picture of her child, a prayer, an affirmation, or some words of encouragement from a friend under the source of strength section. This one page might prove to be her source of determination in a particularly intimidating situation.

    In the same section, she might want to record typical male comments which come up on job sites, even when a woman first interviews. She may have thought of a particular "comeback" that she likes, or a joke or story that exemplifies the fact that women can do "men's" work. Perhaps she can reuse a good response that she heard or read somewhere and wants to keep it handy.

    A tradeswoman, teaching a bricklaying trade specific session, recently told a class how she handles sexual advances or "date requests" on the jobsite. "I can't cook to save my soul," she said, "and furthermore, I have eight kids at home that go where I go. So now, what are you asking me for?"

    More humorous than her comment was the sight of the journal notebooks flying open as the students hurried to record her statement.

The Lesson Plans Mathematics Exercises

Mathematics is indispensable to working in the trades, and entrance exams to union apprenticeship programs typically cover all basic math operations up to and including some basic algebra and trigonometry. In an effort to help women pass these tests and continue through their apprenticeship with a firm groundwork on which to build more math skills, the CWIT training places a heavy emphasis on the fundamentals of math and its application on practical problems in skilled trades work.

Through cooperative learning groups, math can be presented and worked on in an amicable and relaxed setting, removing a fair amount of the anxiety and stress typically associated with it. These groups also tend toward immediate rewards and confidence-building among the women as they work out problems togetber.

The course of study is a general refresher which then incorporates new math skills related specifically to the trades. This approach helps women feel capable of thinking in mathematical terms, working word and other practical application problems, and knowing how to approach multiple-step problems. Problem solving is taught as both an individual and a group process.

The confidence gained in this one area seems to act as a mortar for other aspects of the course. Students assess their progress in the overall course with a heavy emphasis on how they do in the area of math, and without a doubt, apprenticeship programs will do the same through the first year.

Math lessons begin with a very basic review, which is outlined below. Lessons progress through grade school math, then secondary school math. Often a short quiz reviews tbe material from prior class sessions to help students build an ongoing repertoire of math skills. The level of math skill to which the course aspires is a high degree of ability with any math problem up to and including senior level of high school. Algebra is covered in the final weeks and those lesson plans can be found later in this guide. Most of the lessons in the math sequence require two or more class periods for presentation and practice, after which a test is given to measure skill level progression.

CWIT classes are currently having much success with The Number Power series of workbooks published by Contemporary Books, Inc., Chicago. As these are self-guided workbooks, the students may advance at their own pace.

The lesson plans whicb follow begin with *Number Power Book 1* for a review of whole number operations (if needed), *Number Power Book 2* for fractions, decimals, and percents, *Number Power Book 3* for Algebra work, and *Number Power Book 4* for Geometry.

1. WHOLE NUMBERS

Objectives:

By the end of this unit, the student will be able to:

- Read and write small and large whole numbers
- Arrange and add whole numbers
- Arrange and subtract whole numbers
- Arrange and multiply whole numbers
- Arrange and divide whole numbers
- Apply the use of whole numbers to skilled trades problems
- Solve problems by combining operations of addition, subtraction, multiplication, and division

Class presentation:

Cover in sequence *Number Book 1* chapters, teaching and giving special emphasis to:

- Place values
- Procedure for aligning and adding numbers
- Dimension Lines
- Procedure for aligning and subtracting numbers
- Borrowing in detail, with much practice
- Subtraction problems containing zeros
- Procedure for short multiplication
- Location of multiplication table and need to memorize the table
- Procedure for long multiplication
- Multiplication with zero in the multiplier
- Multiplying three or more factors
- Procedure for dividing whole number
- Zero as a dividend; zero as a divisor

Homework — Choose ten problems to do in each unit review for further practice. Those needing more practice will be tutored prior to the next class period, and assigned further practice until they achieve proficiency in the area.

2. ORDER OF OPERATIONS

Objectives:

By the end of this unit, the student will be able to:

- Perform combined operation problems involving several steps
- Apply the proper order of operations in a problem
- Solve problems using formulas by applying the proper order of operations

Materials:

Power Book I Exercises

Class Presentation:

- Order of Operations
- Concept of powers, and working with exponents first
- Concept of grouping symbols, brackets, braces, parentheses
- Importance of performing operations within any symbols as a second operation
- Next removing brackets through the designated operation
- Doing any multiplication or division from left to right
- Last, doing addition and subtraction from left to right
- Mnemonic device with which to remember the above sequence:

Please Pity My Days At School (Powers, Parentheses, Multiplication, Division, Addition, Subtraction).

Homework — Progress through book at own pace to solve and self-score problems.

3. COMMON FRACTIONS

Objectives:

By the end of this unit, the student will be able to:

- Understand fractional divisions of an object
- See connection between fractional parts and parts of an inch
- Express fractions as equivalent fractions
- Reduce fractions to their lowest terms
- Recognize improper fractions
- Express mixed numbers as fractions
- Determine lowest common denominators
- Add fractions and mixed numbers
- Subtract fractions from other fractions
- Subtract fractions and mixed numbers from whole numbers
- Multiply fractions, including problems with three or more factors
- Multiply combinations of fractions, mixed and whole numbers
- Divide one fraction by another fraction, by inverting
- Divide combinations of fractions, mixed and whole numbers
- Do cancellations to reduce in multiplication and division
- Express answers in lowest terms

Materials:

Ruler or tape measure, as introduction to fractions is combined with presentation of fractional divisions of an inch. Equivalent fractions are demonstrated on the ruler as well, (i.e., two quarter-inches equal one half-inch, etc.)

Class presentation:

This section of study takes two weeks of math classes, along with further review at end of course. After general concepts and tape measure are introduced, the material is best broken into several classes on addition and subtraction, followed by a class or two on multiplication and division.

The following tasks are taught in detail, and accuracy is emphasized in each area:

- Recognizing fractional parts of a whole
- Seeing a fraction as an indicated division
- Determining equivalent fractions
- Dividing by the number 1
- Expressing fractions in lowest terms as correct answer
- Expressing mixed numbers as fractions
- Converting fractions to mixed number for final answer
- Finding lowest common denominators
- Factoring, recognizing prime factors
- Adding and subtracting fractions from fractions
- Subtracting fractions and mixed numbers from whole numbers
- Subtracting fractions and mixed numbers from mixed numbers
- Multiplying fractions

- Multiplying combinations of fractions, mixed and whole numbers
- Cancelling; dividing by common factors
- Dividing fractions; process of inverting the divisor
- Dividing combinations of fractions, mixed, and whole numbers

Homework Assignments after Each Class:

Choose ten problems in each unit review for further practice. Do several word problems of interest after each unit.

4. COMBINED OPERATIONS WITH COMMON FRACTIONS

Objectives:

By the end of this unit, the student will be able to:

- Solve math problems involving a series steps.
- Apply the proper order of operations learned in Section 2 to problems involving fractions and mixed numbers.
- Solve practical word problems found in the skilled trades which involve use of whole numbers, mixed numbers, and fractions.

Materials:

Power Book 2

Class presentation:

Special emphasis is given to the following items, enabling the student to:

- Recognize fractional symbols as brackets within a problem
- Do work within parentheses or fractional expression first
- First, work within innermost parentheses when more than one set of symbols exist in a problem
- Second, work from left to right, doing multiplication and division (getting rid of brackets)
- Lastly, do addition and subtraction in order from left to right
- Work multi-part practical application problems as they exist in the skilled trades

Homework — Choose 4 problems of interest to do from Word Problem sections.

5. DECIMALS

Objectives:

By the end of this unit, the student will be able to:

- Make connection between fractional parts of a whole and decimal parts of a whole
- Round off decimals to any indicated number of places
- Express common fractions as decimals
- Express decimals as common fractions
- Align decimals and add problems involving decimals
- Align decimals and subtract problems involving decimals
- Multiply decimals and correctly place decimal in answer
- Divide decimals, with correct placement of decimal point

Materials:

Power Book 2

Class Presentation:

Cover decimal information giving special emphasis to enabling the student to:

- See the meaning of fractional parts, regardless of expression
- Read decimals
- Round off decimals to a designated place
- Express common fractions as decimals
- Express decimals as common fractions
- Move back and forth easily between fractions and decimals
- Do addition and subtraction of numbers involving decimals
- Multiply decimals and know where to place decimal point
- Multiply by powers of 10
- Divide decimals and know where to place decimal point
- Divide by powers of 10
- Do combined operations with decimal problems
- Work practical application problems relating to their trade

Homework — Work five problems of each type in each decimal chapter.

6. EXPONENTS AND SQUARE ROOTS

Objectives:

By the end of this unit, the student will be able to:

- Recognize exponential symbols and the radical sign
- Raise numbers to indicated powers
- Know common square root multiples
- Solve practical problems involving powers and roots
- See where square roots are used in the skilled trades
- Find square roots in problems using the Pythagorean theorem

Materials:

Hand-outs of triangle problems involving Pythagorean theorem.

Class Presentation:

Teach the following, giving special attention to enabling the student to:

- Know the meaning of powers, and recognize exponents
- Recognize the radical sign, and know its meaning
- Combine root operations with other math operations
- Compute combined operations with decimal fractions, including those involving square roots and powers

Homework — Solve problems on hand-out sheets.

7. Percentage Problems in the trades

Objectives:

By the end of this unit, the student will be able to:

- Express decimal fractions and common fractions as percents
- Express percents as decimal fractions
- Determine the percentage, given the base and rate
- Find the base, given the rate and percentage
- Find the rate, given the percentage and base

Materials:

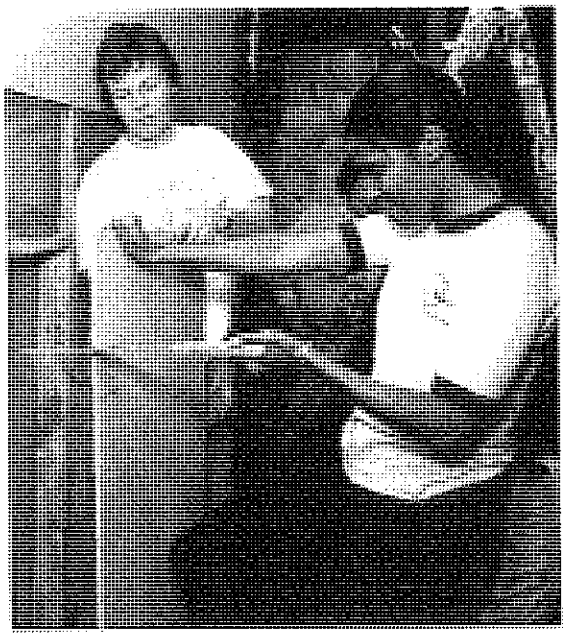
Power Book 2.

Class Presentation:

Teach the following, enabling the student to be able to work with percentages in the following ways:

- Recognize the percent sign symbol and understand its meaning
- Know how to recognize the base in a word problem
- Know how to recognize percentage and rate in problems
- Work the pie formula for Percentage = Base x Rate
- Express decimals as percents
- Express common fractions and mixed numbers as percents
- Express percents as both fractions and decimals
- Solve a problem for either its base, percentage or rate
- Work problems that students may have regarding pay raises, discounts, loans or interest on their savings

Homework — Work a selection of problems in each chapter until the concepts in percent problems are fully grasped.



The Lesson Plans Measurement and Geometry

As measurement is used to some extent in all of the skilled trades, it must be given a clear and thorough presentation early in the course. Further review lessons are often necessary in the second and third week, after which students have enough basis to practice together until proficiency is achieved.

It is impossible to work in most trades without being able to read a tape measure to the sixteenth of an inch. Some students, who begin with a firm understanding, work toward being able to read to the thirty-secondth of an inch. Students work individually and in pairs, helping one another advance in understanding of all marks on the tape measure and develop speed in reading the ruler. Knowledge of the tape measure should be firmly established before completion of the course.

Measurement continues to be practiced as the course content moves into Plane Geometry and then into square and cubic measurement. As each new formula is introduced, students practice with real objects (sometimes rooms and hallways) to work each formula based on a real setting. This is how the knowledge would be applied in the trades and it is of key importance that students make the connection and come to see how formulas would be used in the workplace.

1. LINEAR MEASUREMENT

Objectives:

By the end of this unit of study, the student will be able to:

- Readily recognize the different length lines of division on a ruler or tape measure
- Read a ruler to within $1/16$ th of an inch
- Draw a line to an assigned length to within $1/16$ th of an inch
- Understand divisions up to 32nds of an inch
- Know that for three dimensional objects, it is important to measure for length, width, and thickness (or depth)

Materials:

Each student has her ruler for practice. Additional 25- and 30-foot tape measures are available. Pieces of wood, metal, and laminate in varying sizes for practice measurement are also supplied.

Class Presentation:

- In studying a one inch diagram, attention is first given to the lengths of each dividing line
- Demonstrate how to quickly recognize the $1/2$ inch mark and use it as a guide for smaller marks located near it
- Show correlation between reducing fractions to lowest terms and the name each line between any two inch marks
- Do practice measurements
- Over a two week period, review the above, having students call out the name of each dividing line
- Have students measure objects in the room, text books, etc.

Homework — Measure five objects, giving length, width, and depth. Additional worksheets are supplied to those requiring extra practice.

2. PERIMETER AND AREA

Objectives:

By the end of this unit, the student will be able to:

- Distinguish between perimeter and area
- Know the formulas for finding perimeters and areas of squares and rectangles
- Be able to take assignments to measure room dimensions and then calculate for perimeter of floor/ceiling area
- Be able to use formulas for a missing length or width when given the area
- Be able to take more complex figures and calculate missing measurements before figuring length or area
- Explain the difference between linear and square measurement
- Label answers correctly as to square or linear feet, inches or other units.
- Give examples of why one would calculate perimeter in building
- Give examples of where one would need to figure area
- Explain square footage

Materials:

The classroom itself is used in an exercise of measuring walls, floor and ceiling area. Individual walls are used in calculations of baseboard needed, casings around doors and windows, amount of paint needed, and similar exercises.

Class Presentation:

- Describe perimeter
- Ask first to see who remembers it
- Solicit examples of where perimeter is used: fences, baseboard
- Show formulas for perimeters of squares and rectangles
- Work samples on board; have students work examples
- Describe area
- Ask for examples of where it is used.
- Show section of floor to describe square feet, vinyl tile
- Give formulas for finding areas of squares and rectangles
- Work samples on board
- Have students work examples
- Show a parallelogram
- Superimpose a rectangle over it
- Illustrate how the same formula is used to find the area of a parallelogram or a rectangle and why
- Do some sample problems

Homework — At home, measure three rooms, list their length and width to the next foot (round up to the nearest foot), and then calculate the perimeter and area for each of those rooms.

3. TRIANGLES

Objectives:

By the end of this unit, the student will be able to:

- Recognize right triangles and understand 90 degree angles.
- See that triangles take up half the area of a rectangle of the same width and length.
- Be able to see base and altitude as measurements in a triangle.
- Know the formula for finding the area of a triangle.
- Be able to work problems relating to the trades involving triangular surfaces

Materials:

Sample problems only.

Class Presentation:

- Show a circle, describe degrees, show 360 degrees in a circle
- Divide circle in half, show 180 degrees in semi-circle
- Further divide into fourths, show concept of 90 degrees
- Take one quarter and superimpose a triangle Show right angle
- Describe terms in triangles, base, altitude, hypotenuse
- Give formula for area of a triangle
- Work sample problems
- Show triangle outlined within a square or rectangle to illustrate that it takes up one half of the area.
- Have students work sample problems on board
- Give examples in which triangular shapes would be figured at worksite and have class figure for area or perimeter when the sides are given

Homework — Work additional problems involving the areas of triangles.

4. VOLUME

Objectives:

By the end of this unit, the student will be able to:

- Describe the concept of volume in a square or rectangular room
- Give the formula for finding volume
- Relate examples of where one might need to calculate volume
- Calculate the volume for the classroom and solve other sample problems

Materials:

Sample objects on which to calculate volume.

Class Presentation:

- Solicit from the group the meaning of volume
- Solicit examples and descriptions, volumes of air, storage
- Give formula and work sample problems
- Have students work problems for the group

Homework — Do a selection of word problems from trade related examples, involving perimeter, area, and volume of rooms and buildings.

5. FORMULAS INVOLVING CIRCLES

Objectives:

By the end of this unit, the student will be able to:

- Draw a circle and label its radius, diameter, circumference
- See the connection between the perimeter of objects and the circumference of a circle

- Know the formula for finding radius from diameter and vice versa
- Know the formula for finding the circumference of a circle
- Give the value for pi and explain its usage in the formulas
- Work problems involving circles, solving for various parts
- Find the area of a semicircle, after finding the full circle area
- Understand volume of a cylinder as an extension of the concepts of volume in rectangular solids
- Know how to use the formula for finding the volume of a cylinder

Materials:

A pencil with a string attached to illustrate one way to do a large circular layout. A compass for drawing smaller circles. Sample problems.

Class Presentation:

- Draw a circle on the board and define the terms radius and diameter
- Show the circumference of a circle as a border or perimeter
- Give the formula for finding the circumference of a circle
- Define pi as a constant in the formula, giving a ratio of circumference to diameter, no matter the size of circle
- Work problems involving both expressions of pi
- Show how answers are slightly different since pi is an infinite, non-repeating decimal, which is rounded off to 3.1416 or $^{22}/_{7}$ ths
- Give the formula for the area of circle and work samples
- Use a pencil and string to design a round room or house
- Measure off a radius and compute the area for that room or house
- Have students solve problems for the group
- Show the formula for finding cylindrical volume
- Relate circles to boxes, to see height as a third factor
- Work problems using the formula to find the volume of cylinders

Homework — Do assigned problems involving circumference and area of circles.

6. USE OF THE PYTHAGOREAN THEOREM

This formula and its use are taught along with the Math Lessons in MATH SECTION 6 on Square Roots. It gives practical use to the study of square roots, and shows how this information is critical in the trades.

Objectives:

By the end of this unit, the student will be able to:

- Recognize the Pythagorean theorem and use its formulas
- Find the hypotenuse in a right triangle, given its sides
- Find an ungiven side in a right triangle, given its hypotenuse and other side
- Be able to list calculations in which the above information would be used, such as rafter lengths or stairs
- Use the principle of the 3-4-5 Right Triangle in doing square corner layout, or checking to see if an object is square to itself
- Be able to apply the term "Pulling Diagonals" and relate the principles involved to the concepts involving right triangles

Materials:

Tape measures, a carpenter's square, or drywall square. Also, a large wooden frame or small piece of furniture (bookcase) that can be pushed out of square.

Class Presentation:

- Present a triangle on the board, review definitions
- Review concepts of angles covered earlier, point out the right angle
- Have students point out the hypotenuse
- Give the formula for finding the hypotenuse of a right triangle
- Work several examples, incorporating square root knowledge
- Have students solve problems
- Work with the same formula for a different unknown side
- Work a fair number of problems until information is clear
- In a hands-on session, use tape measures to see if classroom is square to itself, using 3-4-5 Layout

- Show formula again, proving that hypotenuse must be 5' if sides are 3' and 4'
- Do a different corner of room, using multiples of 3-4-5, perhaps 9-12-15, if room is large enough
- Show formula again, using two of those length to find the third
- Pull diagonals on a square object to illustrate concept
- Recheck corner of object with a square
- Do 3-4-5 again
- At end, show how large walls or decks would be squared by pulling diagonals
- Discuss ways to hold them square
- Explain use of braces and diagonals

7. ANGLES

Objectives:

By the end of this unit, the student will be able to:

- Tell how many degrees are in a circle, semi-circle, right angle
- Recognize adjacent angles and opposite angles
- Utilize known information and givens in angular figure to solve for unknowns
- Describe the meaning of perpendicular and horizontal, and what it means to bisect an angle

Materials:

Sample problems.

Class Presentation:

- Review information introduced under Circles Unit regarding the number of degrees in circles, semi-circles and right angles
- Further bisect right angle and calculate its degrees
- Describe adjacent and opposite angles
- Solve problems involving parallel lines and bisection of angles
- Have students work problems for the group

Homework — Do further problems with angles until concepts are clear

8. MATERIAL ESTIMATION

This unit is woven into the lesson plans for mathematics, measurement and geometry, algebra, and blueprint sections. Each class presentation takes the class closer to being able to combine information to solve more complex problems, interpret drawings and word problems, and put to practical use the information gained in the course.

Objectives:

Under each component, the objectives are to enable the student to:

- See how the information relates to the trades
- Know where and when to use a particular formula or math operation
- Be able to calculate problems with hidden information and problems involving more than one step
- Be able to express an answer with a proper label: inches, dollars, square feet, cubic yards
- Identify and explain variables in formulas, and fill in the proper value
- Take measurements, work a formula, solve for square footage or perimeter, and figure costs or amounts of material needed
- Work word problems relating to the skilled trades

Materials:

Related to the subject matter at hand, class may take measurements of classroom walls, blueprints, or small objects. In addition an assortment of word problems from various textbooks may be presented.

Class presentation:

As noted above, this theme is woven into nearly every class session, but in any problem, the following steps must be taken:

- Identify what is being asked for in the problem
- Identify what information is given
- Find any missing lengths or widths and fill in the missing information
- Choose the formula needed
- Adjust that formula through algebraic transfers to use it to solve for the unknown
- Do mathematics operations
- Label the answer, as to feet, inches, yards, or meters
- Look back to see that this is what was being asked for in the problem
- Recheck mathematics

Homework — Throughout all lessons, word or practical application problems are assigned for further practice.

The Lesson Plans Algebra and Utilization of Formulas

This unit of study is covered in the final three weeks of the course, during the math time slot of each class period. By this time, the class as a whole should be familiar with most math operations, enabling the algebra presentations to concentrate on the rules of working with signed numbers and working with variables in equations.

The information in this unit is constantly linked back to formulas learned during geometry classes to further build upon that earlier understanding.

The rationale for introducing algebra is twofold. First, it is used in a number of trades, especially by electricians, and the general principles of solving for unknowns are used when applying formulas for many types of problems. Secondly, the students tend to see it as an exciting challenge, a real energy boost near the end of the course. Many women have done little or no algebra work in school, and so for most of the them, it represents brand new and exciting material.

Taken in small steps, the women work with algebraic rules at their side until the knowledge becomes more integrated with their math skills. Both individual and group work is done, and a number of problems involving practical application of algebra are introduced so that students may see how it would be used in the trades.

I. SIGNED NUMBERS

Objectives:

By the end of this unit, the student will be able to:

- Know that every number has a sign and state that sign
- Know how to work rules for combining signed numbers
- Be able to multiply and divide and assign the correct sign
- Use correct order of operations in multiple step problems containing signed numbers

Materials:

Algebra: Rules of Combinations page, and Algebra Worksheets, *Number Power 3*: Algebra Workbooks.

Class Presentation:

- Explain that every number has a sign
- Explain understood positive signs
- Talk about continuum of + and -, giving a check book with a debit as an example
- Begin to present rules of combination: adding like signed numbers and adding unlike signed numbers
- Move into subtraction rules of combination for like signed numbers and unlike signed numbers
- Work many examples of both types of problems
- Present rules for multiplication and division of signed numbers
- Do sample problems
- Review order of operations from early math units, for both whole numbers and fractions
- Stress importance of working innermost brackets first
- Show difference between solving inside bracket and then removing bracket by multiplication or division
- Work more complex algebra problems with many steps

2. EQUATIONS

Objectives:

By the end of this unit, the student will be able to:

- Recognize an equation and name variables and constants
- Balance equations, solving for unknowns
- Work the pie method for formulas finding Area, Ohm's Law, or Percentage by covering the unknown in the pie diagram
- Transpose equations to solve for various unknowns
- Relate algebra to practical problems in which there are one or more unknowns

Materials:

Solving Equations Worksheets. List of formulas.

Class Presentation:

- Introduce variables. Solve simple problems for variables
- Introduce equations. Solve problems for unknowns
- Work practical problems involving one unknown
- Stress balancing equations
- Show formulas again, stressing how one side equals other: (i.e. Pythagorean theorem, Ohm's Law)
- Have students solve practical application problems using formulas on board
- Work equations with more than one variable
- Solve more complex word problems, assigning variables to set up algebraic formula

Homework — Assign Algebra worksheet problems and practical problems from the end of *Power Book 3* chapters. Assign timed tests of additional practice in solving simple equations.

The Lesson Plans Blueprint Reading

This unit of material is begun after the class is showing some proficiency with measurement, typically after the midterm exam in measurement. A series of lessons are presented to describe working drawings, who makes them and why, and the overall concept of how important it is to have a well prepared plan in order to do any type of building.

That plan, the blueprint, is then looked at in terms of its universal symbols, the concept of scale, and its many individual parts. Students spend some hands-on time during the last few Saturdays making measurements on sample blueprints, recognizing and naming electrical or plumbing symbols, and becoming familiar with a full set of working drawings.

This body of knowledge is approached simply as an introduction to blueprint reading, a means of taking some of the mystery out of a set of plans. A very real goal is to help the students become less intimidated by architectural drawings and to enable them to recognize certain types of plans and their use. Most apprenticeship programs will teach a course in blueprint reading which will take this introductory information to more of a working knowledge.

It is hoped that by covering blueprints in this way, the women will be more open to and less afraid of a full course in blueprint reading. From this position they may be able to perform well and get passing grades on any trade school course covering architectural drawings.

Objectives:

By the end of this unit, the student will be able to:

- Recognize the meaning of blueprints and their use
- Know the various parts to a set of working drawings
- Be able to take measurements from scale drawings
- Know how to express various architectural scales
- Recognize a number of symbols, especially related to the trade of their choice
- Know the steps to follow in reading a set of blueprints

Materials for all units:

Brown, Walter C. (1980). *Blueprint Reading for Construction.* South Holland, IL:
The Goodheart-Willcox Company, Inc.

Huth, Mark W. (1989). *Basic Construction Blueprint Reading, 2nd Edition.* Albany, N.Y.:
Delmar Publishers, Inc.

U.S. Gypsum Advisory Service. (1956). *How to Read Architectural Drawings.* Chicago, IL:
The Modern Hospital Publishing Co, Inc.

Floor plans, elevations, plot plans, several full sets of working drawings. Architectural rulers and regular rulers. Drafting paper.

Class Presentation:

- Introduction includes meaning of working drawings and their use
- Cover measuring tools and the concept of drawing to scale
- Review math related to measurement, conversions, etc.
- Go over lines and symbols used in plans
- Explain orientation to each type of plan, above, ahead, vertical, horizontal
- Have students draw elevations of complex objects
- Explain role of architect, general contractor, developer
- Cover plot plans, foundations, elevations, and floor plans
- Work with drawings in small groups and answer questions
- Study mechanical drawings; point out electrical, plumbing and heating system symbols
- Do architectural worksheets converting feet and inches
- Have students draw to scale a small room containing cabinets
- Design object for woodworking project, showing three views, with scaled measurements

Homework — Design object for woodworking project, showing three views, with scaled

The Lesson Plans Techniques of Interviewing and Job Search

The exercises for this unit of study are listed earlier under Job Search Exercises. Often they are done in small groups, to practice interview skills, but some information is first given to the group as a whole.

This material relates to a primary goal of the program, that of empowering each individual woman with the skills and confidence required to attain the job of her choice. It begins at the level of helping her set realistic goals and understand the difference between short and long range goals.

From this starting point, the woman then goes on to formulate specific objectives around her goals, prepare a resumé and Job Readiness Packet, and prepare herself to make a confident and thorough application for the job or training program she desires. A successful interview is the final part of this process.

Objectives:

By the end of this unit, the student will be better able to:

- Deal with test anxiety and anxiety regarding interviews
- Have prepared personal information for application forms
- Complete an application form neatly and correctly
- Know what questions to expect in an interview
- Know what to expect on entry exams to union trade schools
- Have practice in vocabulary, reading comprehension and manual dexterity tests
- Know how to proceed with any exam, how to check work
- Use study time well

Materials:

Study skills materials, Arco Test Books.

Class presentations:

- Study Skills
- Test-Taking Skills and Pointers
- Application Forms, References, Past Job Experience
- Why People Aren't Hired Information
- Apprenticeship Screening Questions for Interviews
- Reading Comprehension Tests
- Synonym Antonym Tests
- Sentence Completion Tests

Homework — Bring G.E.D. Certificate or H.S. Diploma for Interview Role plays at beginning and end of course. Prepare Job Readiness folder containing all information requested on typical application. Work practice tests at home. Fill in several application forms for jobs.

The Lesson Plans Mechanical and Aptitude Test Training

In addition to the vocabulary tests studies in the previous section, a second type of aptitude test is often given during a job interview and application process. This type of test includes mechanical problems or spatial relations problems. Due to the popular use of such testing materials, this curriculum offers to its students an array of timed test materials on which they may practice these types of problems.

A typical lesson involves a period of time set aside (10 to 15 minutes) in which the students do a dry run of the full test. At the end of this time period answers are set on the board and each person grades her own work. The next activity is an open discussion in which any incorrect answers are analyzed and correct solutions are explained. This discussion can be supplemented with demonstrations, using tools, pulleys and other mechanical devices until the concepts are fully understood by the group.

Principles of Applied Science are relied upon heavily in this section of learning. Small science experiments are done if a particular problem raises conceptual difficulty. Understanding will often come with a simple display of a fulcrum, the principle of leverage, etc. At other times a particular tool or pulley system may bring clarity. The group works together until the full test has been covered. Later in the sequence a post-test on similar material is given.

Objectives:

By the end of this unit, the student will be better able to:

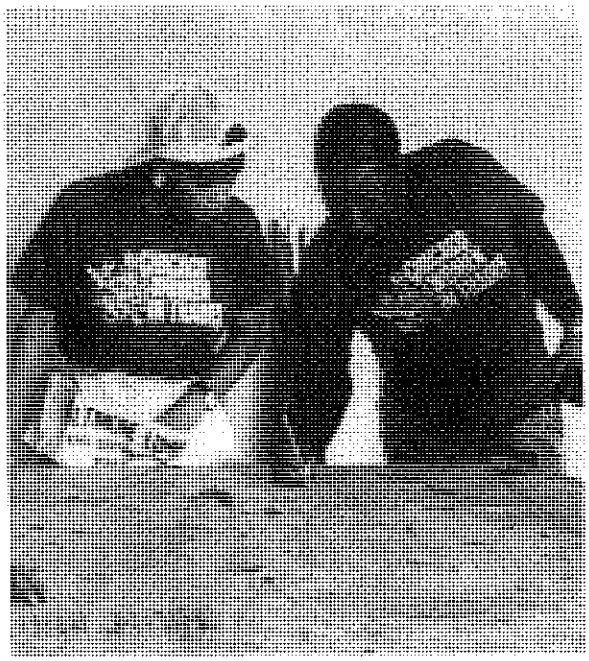
- Deal with test anxiety regarding aptitude tests
- Take instructions well regarding mechanical and spatial test materials
- Mark answer sheets correctly
- Work with speed and accuracy on aptitude tests
- Know the mechanical principles to use regarding gravity, water pressure, electricity, pulleys and fulcrums
- Know how to proceed with exams and how to check work
- Be able to move ahead under timed test conditions

Materials:

ARCO books of spatial relations tests, sample mechanical test problems

Class presentations:

- All materials from previous lesson as background
- Timed tests regarding cube counting
- Number and letter series sequence testing materials
- Mechanical problem test samples
- Relationship between objects tests
- Algebraic equations timed tests
- Conversion problems
- Folding objects tests
- Mazes and matching shapes and figures tests
- Charts and graphs for practice reading
- Timed tests in math and mechanical work
- Perceptual ability tests
- Differences between objects tests
- Hidden figures tests
- Figure turning tests



The Lesson Plans Physical Conditioning and Nutrition

The physical conditioning component of the program has been expanded to give each student an hour of exercise on both evenings of weekday classes, along with an additional period of stretching and muscle tone exercises on Saturday mornings. This amount of focus is designed to help the student develop a regular routine of exercise which they can then make part of their life. It is also necessary since new muscle strength begins to deteriorate after two days of not being used.

A skilled Aerobics/Weight Trainer teaches this component of the course. In order for everyone to have good access to the weight training machines, the class is divided into two groups. One group has a thirty-minute upper body aerobic exercise, coached by the instructor, while the other group works out on the equipment, under supervision of the program coordinator. Then the groups switch places for the second half of the hour.

Keeping up with the pace is critical on a construction site. Strength is required, but equally important is stamina, and this section of the program helps the students build up both of these.

Objectives:

By the end of the course, the student will be able to:

- Show gains in strength, muscle tone, and balance
- Learn to use proper muscles to lift, carry, and do heavy work
- Be able to track her own progress on a progress chart
- Recognize the importance of nutrition and gain insights into a healthy diet
- See the importance of food intake and stress management
- Know simple, fast exercises for stretching to prevent injury
- Know the use of ice and heat for injuries
- Have a selection of exercises to use to keep in shape, and with which to stretch out before a day's work.

Materials:

Weight room equipment includes the following:

Free weights
Weight Bars
Exercise Mats
Step Aerobics Equipment

Classroom presentation:

- Each piece of equipment is presented as to its use and safety
- Students use equipment and record number of repetitions at each training station
- Nutrition lessons are given to review food groups
- Stress management and food intake are covered
- Proper body position is practiced for lifting heavy objects
- Upper body aerobic exercises are done as a group
- New games are utilized to build speed and group spirit
- Eye-hand coordination exercises are practiced
- Balance and climbing exercises are practiced
- Additional activities are built in for speed, balance:

Balance Beam Work	Stair Exercises
Running Exercises	Aerobic Tag
Quarter Tag Football	Basketball

The sample course schedule contains a more detailed account of the activities done on each evening, and the gradual building of the exercises can be seen in this schedule.

Homework — First week assignment: record everything eaten during the week. This information is then studied in discussion of nutrition during second week. End of term diet assessment is done to study change made in dietary habits.

The Lesson Plans Hands-On Training

Trade specific programs, which comprise nearly 50% of training time, offer direct hands-on training time to the students. The Saturday programs are run by skilled tradeswomen and supervised by the program director. Hands-on training is given a strong emphasis for many reasons, including:

- Women begin the course with few, if any, tool recognition skills. Hands-on work with tools results in dramatic improvement.
- The tradeswomen who come each Saturday to present the Trade Specific program in their area offer a role model to the students. Often students go on to make their own trade choice based on what they learned during these presentations.
- Individual concepts about what a particular trade may be like are directly confronted during hands-on training. The apprentice may describe how much of her work is broom-pushing or the student may find she hates sawing conduit with a hacksaw. In either case, a more realistic view of each trade comes into play.
- Feedback from the students cite this component repeatedly as the most involving and exciting part of the program. The Saturday presentations put to practical use the classroom learning of the prior week.
- Safety on the jobsite is best taught in a job setting, with hands-on practice with the tools. This enables the woman to start forming habits of safe handling and care of tools, proper use of her own body in lifting and carrying, and care and consideration for those working around her.

Class meets in an open workshop area from 9 a.m. until 3:00 p.m. Activities begin with stretching and muscle toning exercises to supplement the physical conditioning of the weekday classes. This activity helps everyone prepare for the lifting and physical work that will make up the day's activities.

The tradeswomen of the day then begin to present their tools and the scope of the work they do on a construction site. This will include the conditions under which they work. Safe handling of each tool is covered in detail. Students handle the tools, examine them, and record information on their proper care and safe use.

After a short presentation, the hands-on activities of the day begin. For the duration of the work day, women go to various "stations" to do practice activities (i.e., bending conduit to an assigned degree bend) and work with the tools of the trade being studied.

The question-answer period of each Trade Specific presentation is a major source of current information on the ever-changing procedures for gaining access to each trade. Often a tradeswoman knows whether her Local is accepting applications, or when an upcoming entry test will be given. She relates how many years the training will take, and what the course of study will involve. Students interested in that particular trade can form their own personal career change plan around information given out at this time.

The purpose of hands-on training is to introduce the students to a fair number of skilled trades. This one-day introduction is by no means to be interpreted as learning" to be a carpenter or a plumber." More hands-on practice with particular tools can be scheduled if a number of students request it. For the most part, however, this format enables women to get a sense of what is involved in each of the trades covered.

The following are samples of hands-on training outlines for all day training sessions.

a. Auto Mechanics

Present in detail the tools of the trade, safe use and care, and their application:

Spark plug gauge	Spark plug wrench
Oil filter wrench	Gap setter
Wrenches, open and closed	Nut driver
Oil pan	Socket set

1. After presenting the tools, have mechanics share their experience of a typical day on the job, the types of work they would be engaged in.
2. Take a list of projects from the students as to which types of repairs and maintenance will be tackled during the day.
3. Begin with several simple maintenance routines: changing oil, changing spark plugs, a full tune-up, tire rotation, and so forth.
4. Demonstrate on one vehicle, then send the students off to work in small teams on the other vehicles.
5. At the noon discussion, check in on any trouble spots and put more assistance in that area so that everything is completed by the end of the day.

6. In the afternoon, trouble shoot some more complicated problems and explain how they should be treated.

b. Carpentry: Rough-in Framing

Present in detail the tools of the trade, safe use and care, and their application:

Circular saw	Worm-drive saw
Hammers	Catspaw
Levels	Framing square
Speed square	Chalk line
Tinsnips	Screwguns and drills
Utility knife	Cords and gang plugs
Sawzall	Ladders and planks

Demonstrate with full group the following procedures:

1. Proper layout, measurement and planning for new walls
2. Safe set-up and use of power tools, especially saws
3. Cutting and installation of 2x4s and steel studs for walls
4. Finishing of wall with proper sheathing

Group proceeds as a whole, laying out wall, marking placement of studs and of top and bottom plates. Use 3,4,5 right triangle to check project for square. Then students take on the measurement and placement of several studs, nailing and completing installation.

After lunch discussion, wall needs to be checked for plumb. Recheck door and window openings for level, plumb and square, covering each concept fully. Proceed to afternoon activities.

Afternoon projects include insulating and sheathing.

1. Show proper clothing and equipment used in insulating.
2. Insulate wall and then sheathe both sides of new framing.
3. Additional nailing and screwing practice takes place during sheathing.

c. Drywall installation

Present in detail the tools of the trade, safe use and care, and their application:

Drywall T square	Drywall screwgun
Utility knife	3/8 " drill
Chalk line	1/2 " drill
Drywall rasp	Extension cords
Circle cutter	Tape measure

Demonstrate with full group the following procedures:

1. Lift and carry 4 x 8 x 5/8" sheets of drywall, showing how to find center point of weight, and how to shift to balanced position to carry. Then demonstrate steps in cutting drywall.
2. Measure, mark studs, cut wall piece and hang in enclosed area, showing subtraction of 1/4" rule, and use of rasp for exact cuts.
3. Hang wild over a doorway or window; complete cuts in place.
4. Install ceiling drywall on joists, marked on the wall. Demonstrate factory edge alignment and how to measure properly for reversal of drywall upon installation on ceiling.

By mid-morning, break into smaller teams, having each group work in separate area.

After lunch discussion, walk through with full group to see what the smaller teams have done and to problem solve difficulties that arose.

Hang additional ceiling areas, using circle cutter for light fixture plaster ring openings.

Have small groups complete closet areas, beginning with ceiling and completing all walls.

Hang at least one kitchen or bathroom wall with multiple measurements and cuts involved.

d. Painters: taping and plastering

Present in detail the tools of the trade, safe use and care, and their application:

Drywall taping knives	Mesh tape
6" knife	Paper tape
10 and 12" knives	Taping compound
Corner trowel	Mud box

Demonstrate with full group the following procedures:

1. Tape out both an upper corner and a corner wall in a room, demonstrate full coverage of area to be taped, proper application of tape, feathering, and covering over for first coat.
2. Explain in full how bubbles occur in improper taping. Show additional examples of taping flat seams.
3. Show how screw holes are treated, as well as damaged sections of drywall, and the proper pulling of corner bead.
4. Bring full class to knowledge of what needs to be accomplished for the first of three coats in proper drywall taping.

By mid-morning, break into partnered groups, having each group work in separate closet area. Teachers move through the rooms.

After lunch discussion, walk through with full group to see what the smaller teams have done and to problem solve difficulties that arose.

Afternoon teaching includes demonstrations and practice on:

1. Demonstrate second coat in a room that is dry. Show additional coverage of screw holes, plastering areas with wider damage, and second coat on corner bead. Students do more feathering.
2. Finally, show use of corner trowel in third coat. Stress widening of seams as taping process progresses to completion.
3. Show wet sanding and dry sanding at end of day.

e. Electrician

Present in brief the tools of the trades, safe use and care, and their application:

Channel locks	Straight rule
Pliers	Reamer
Hack saw	Wirestrippers
Pipe benders	Kleins
Holding screwdrivers	Magnetic torpedo level
Chain link wrench	Diagonal cutters
Tin snips	Compass level
Plumb bob	Utility knife

Demonstrate and explain with full group the following procedures:

1. How to measure, cut, and ream conduit for electrical installation
2. How to make 90 and 45 degree bends. Group works on bending.
3. How to install 1900 boxes, pipe to them, and use connectors between boxes and conduit.
4. Set up installations to be worked on, use blueprint drawings to mark and plan installation, and have partnered teams tackle one area each to be completed by noon.

Lunch discussion: entry into electricians' program, schooling, algebra, apprenticeship, union, proper clothing, childcare, etc.

Afternoon work includes additional rough-in installations. A circuitry station is set up and women rotate through it doing simple wiring of receptacles and switches, then some three-way switches and multiple lines of circuitry.

End of day concludes with trimming out one unit if space is conducive to that exercise. Otherwise it is done in the circuitry station.

f. Elevator construction

Presentation takes place in high-rise building under construction where elevator shafts can be viewed, and control room can be observed.

Present in detail the tools of the trade, safe use and care, and their application:

Cutting torch	Hydraulic hole punch
Rail gauges	Cable cutters
Drill press	Hilty drill
Impact wrench	Hacksaws
Come-along tool	Pallet truck
Elevator parts	Counterweights

Demonstrate with full group the following procedures and areas of work:

1. Use of levels, terminology of plumb and level, setting of vertical rails. Also site bracket locations and fishplates.
2. Demonstration of cartop, including use of shackles, location of the crosshead.
3. Site the door assembly and motor, show roller guides along rails.
4. Have class conduct practice exercises in cutting with hacksaw, using level to show plumb installations of sample rails, and work with hilty drill in practice area.
5. Proceed to machine room to explain setting of machine beams, controller, back-up generator, hoist machine, governor and brakes.
6. Conduct demonstration of chainfall hoisting counterweights.
7. Proceed to below ground level, to view the pit and the car bottom. Show buffer, governor sheave, pit switches, travelers and safeties.
8. Have class view the finished inside of elevator cars, observe and list various types of finished and point out how the union does all these types of different work to trim out the car: glazing, trim carpentry, carpet installation and so forth.

Lunch discussion: describe variety of areas in industry including new construction, service and repair, maintenance and renovations. Identify new electronic computer technology in the elevator industry.

g. Pipefitter, plumber

Present, in brief, the tools of the trades; safe use, care and application:

Open wrenches	Closed wrenches
Soldering torches	Pliers
Adjustable wrench	Pipe wrenches
Channel locks	Straight rule
Pipe & tubing cutter	Reamer

Demonstrate and explain with full group the following procedures:

1. Difference between pipefitter and sprinkler fitter is based on thread — left-hand thread for sprinkler fitter, right-hand for pipefitter.
2. Move around the room having class pick out installations done by each trade, based on who does which type of work.
3. Have everyone open and close pipe joints with various types of wrenches. Teach rightie-tightie, leftie-loosie general rule.
4. Set up soldering station where work can be supported. Have each person cut copper pipe, ream it, sand and add flux, and then solder it into place.

By mid-morning, break into smaller teams, having each group work in separate area.

During lunch discussion, point out distinctions between the work divisions of plumbers, pipefitters and sprinkler fitters.

In the afternoon session, review the methods of connecting pipe and have everyone do some of each: soldering, screwing, welding, braking, and pipe joints.

Test for general safety principles learned. Explain briefly the concepts behind hydronics and steam systems.

h. Trim carpentry: Door and trim installation

Present in detail the tools of the trade, safe use and care and their application:

Levels, 2' 4' and 6'	Framing square
Circular saw	Worm-drive saw
Speed square	Finish nails and nail set
Sawzall	Shims

Demonstrate with full group the following procedures:

Proper installation of pre-hung unit, following these steps in order:

- Check rough opening height, width and thickness of wall
- Check opening for level at top and bottom, plumb at sides
- Mark walls to indicate where starter shims will be needed
- Make adjustments to opening with sawzall as needed
- Mark and cut bottom of one side jamb if floor is not level
- Set door into opening, check header for level.
- Once header is set level, proceed to hinge side, set plumb
- Check to see that door is square in the opening.
- Set door frame flush to the finish wall surface on both sides
- Place temporary nails only until unit is working.
- Set last side, check for square, and level unit once again
- Place all nails, in sets of two, to secure door, adjusting shims
- Set nails with nail set. Break off shim ends, clean area

Group then begins to work in pairs following the above steps (on hand-out).

Each pair works on a door, assisting one another with steadying the door as the process takes place.

After lunch discussion, all doors are to be checked for level one last time. Recheck door clearances ($1/16$ th to $1/8$ th). Proceed with finishing and doing additional door installations as time permits.

Set all nails and clean up as each installation is completed.

Demonstrate one lock installation at end of day.

i. Plastering, patching of open holes

This is a follow-up training to the painter's presentation of wall repair. It addresses a more severe damage situation where actual large holes have occurred in walls (for instance, holes caused by door knobs or toys thrown through walls that students need to repair). This lesson does not require a full day, and can be treated separately during an evening class time framework.

Present the tools needed, many of which have been used prior to this lesson.

Drywall jab saw	Drywall utility knife
Screwgun and screws	Drywall materials
Circular saw	Taping knives and tape

Demonstrate with the full group the following procedures:

1. Open the damaged area to a reasonable size rectangle or square opening by using the jab saw
2. Take measurements of the new opening being readied for repair, and cut a matching size of drywall material to be inserted at step 5
3. Cut two pieces of wood, preferable 1 x 2 or 1 x 3, to a length that can easily be slipped into and behind the new hole
4. Place new framing (in the form of blocking) into the cavity, hold in place, and screw on through the existing drywall
5. Once blocking is in place, insert the drywall piece, already cut to the size of the opening, and screw it into place using the blocks
6. Proceed to tape the repaired area, reviewing the use of paper drywall tape and mesh tape and show how the first coat would be applied
7. Allow time for class to take turns practicing the steps above, while other students are doing math or spatial relations exercises during the evening

j. Steel stud framing

Present in detail the tools of the trade, safe use and care, and their application:

Tinsnips	C-clamps
Screwguns	Magnetic bits and apex parts
Tape measure	Felt tip marker
Layout square	Level - magnetic
Torpedo level	Hilti gun, if available

Demonstrate with the full group the following procedures:

1. Proper layout as applied to steel stud work, marking with marker on 16" centers, and backing up half the thickness of the stud to show location of framing members
2. Layout a matching top and bottom track for practice work.
3. Show safe use of handling sharp materials, and demonstrate first cuts with the tinsnips.
4. Have volunteers assist with cutting steel stud pieces for the assembly.
5. Set in studs over layout marks, clamp in place, and use mini-screws to assemble.
6. Level plates and plumb wall, set into place, screw off all studs in place.
7. During remaining time, have class work in pairs to take wall apart and reassemble at new layout marks until everyone has been able to practice the layout and assembly work.

k. Welding and machining

Present in detail the tools of the trade, safe use and care, and their application:

Band Saw	Welding torches
Arc welding set-up	Stick welding set-up
Bench vice	Hammers
Vice grips	C clamps
Welding hoods	Drill press
Micrometer	Machine tools
Tapping tools	Fasteners

1. Begin the day with a safety lesson specific to welding and flares. Stress safety and eye conditions associated with looking directly into the flare. Make sure every one knows to cover their eyes and look away.
2. In groups of 4, have the teams join the welding instructor to work with the various set-ups and learn some basic welding procedures.
3. Other groups will work with the band saw, cutting pieces for the figures to be welded. The skills at this station involve simple shaping and blacksmithing skills.
4. Once the pieces are cut, the students shape them by using the bench vice or various vice grip set-ups. Each student attempts to cut and shape several pieces.
5. Overflow groups work at the drill press and machine operations. They learn how to drill and then tap a drilled opening.
6. Other events of the field trip include a tour of the current rehab site and a study of different types of metal and concrete fasteners and their uses.

Safety lessons begin with the first Saturday Hands-on session and continue with each subsequent lesson. Instructions are approached under these general areas: Personal protective equipment, safe use of the body, safe use of tools, safety procedures, and OSHA regulations.

1. Personal Protective Equipment

The importance of safety equipment comes up during every hands-on session. Safety gloves and glasses are available, as are ear protectors and knee pads. Women are required to wear safe and substantial shoes, although not all of them have obtained work boots at this point. Hard hats, dust masks and respirators are available.

In addition to wearing this and other safety equipment during class, students are asked to keep a running list in their survival kit notebooks so that they may begin to purchase these items for themselves. Likewise, students are tested on their knowledge of safety equipment and safe use of tools on both the midterm and final. With emphasis, the use of safety equipment becomes clear to them.

2. Safe use of the body

A material handling lesson is scheduled for early in the training session. It serves the dual purpose of acquainting the women with common construction materials, (sheathing, bundles of pipe, stacks of lumber) and instruction on how to lift and carry these materials in a safe manner.

Safe lifting involves bending the knees, using the strong quadricep muscles in the legs, not overextending the back. For long or awkward materials, (2 x 4s, or 4 x 8 sheets of plywood) safe lifting involves finding the center point of balance for the material, leaning into the material at that point, and carrying the weight balanced on this point.

Setting materials down safely is just as important as lifting. Basically this requires reversing the lifting procedures, backing away from the pivot point, and bending the knees again as the object is lowered to the ground.

In addition to lifting, students also practice with small hand tools to gain a working knowledge of the principles of leverage. Pry bars in many different sizes are available, as well as hammers and 16 penny (d) sinkers. The women nail in the spikes, then practice correct stance while pulling them back out again.

Lesson plan activities involve setting up a rotational area in which each woman continues to practice, until she gains proficiency in each of the following tasks:

- Nail in without bending at least ten 16 d nails (butt nailing)
- Pry out nails, using correct body positioning and leverage
- Toenail galvanized finish nails into tongue and groove flooring
- Set finish nails with a nail set
- End nail 2 x 4 sections of wall together, keeping safe stance
- Lift and carry a 4 x 8 sheet of $\frac{1}{2}$"plywood the length of the room
- Carry $\frac{3}{4}$" plywood or chipboard, if able. If not, work with a partner to carry the sheet the length of the room
- Safely lift and carry piles of 2 x 4s, keeping safe distance
- Lift and carry 70 lb. buckets of primer and taping compound
- Safely carry ladders and planking, set up and climb.

3. Safe use of tools

Far too many tools are introduced in the Saturday sessions to list them all, along with their proper care and safe use, in this manual. Let it suffice to say that as every tool is introduced by a tradeswoman, the introduction is accompanied with a thorough lesson in the proper handling of that tool.

This principle applies to all hand tools as well as to power tools. In the same way, it applies to construction aids such as ladders, planks, and scaffold systems. Proper set-up, body positioning, and follow through with each tool is reviewed in detail. Then, as each woman practices with the power tool being studied, an instructor is at her side to watch for, and correct any unsafe maneuvering.

Hand tools are taught keeping a number of safety principles in mind:

1. Wear all applicable safety equipment
2. Set up at a safe distance from any nearby workers
3. Position one's body in a stable and safe stance
4. Hold the tool properly, a firm but not tense grip
5. Keep tool out of line with one's own body
6. Keep hands on tool and workpiece, not in path of tool
7. Place tool back in proper place when finished with task

Power tools are introduced with the following safety procedures:

1. Unplug tools when making all adjustments and when demonstrating its parts
2. Make all adjustments to blade depth and angle before starting
3. Make sure all blades (routers, all types of saws, power planes) are secure and properly installed
4. Never have blade touching wood at start-up (with any tool)
5. Table of tool keeps in contact with material (sawzall,circular saw, wormdrive, router)
6. Use follow-through all the way across piece (laminate edger, saw)
7. ALWAYS check guard placement before setting any power tool down
8. Unplug tool when discontinuing use
9. Make sure extension cords never cross through damp areas
10. Keep hands and body clear of path of blade (table saws, all tools, hand and power)

4. Safety procedures and OSHA regulations

Finally, safe work principles are covered separately under each Trade Specific Seminar. A few important safety principles are mentioned herein:

1. Electricians cover the necessity of turning off all power to a line being worked on and then padlocking it in OFF position with personal padlock.
2. Pipefitters cover safe body positioning when using two tools simultaneously, as well as pinch points, and safe stance when in awkward positions.
3. Building maintenance persons cover special dangers of working around fan, pump, and boiler systems, safe set-up and special insulated tools for such situations.
4. Carpenters cover hand tools as well as power tools, the importance of shoring up or building temporary support walls in cases where this is required.
5. Cabinetmakers stress the importance of using sharp blades and tools which are in good work ing condition, including safe cords and neat, clean work areas.
6. Laborers stress using the right tool for the right job, not too large or too small a pry bar, using wheelbarrow correctly and balancing loads.
7. All tradeswomen, regardless of their field, stress ignoring dangerous commands given by co-workers. They see, rather, how important it is to know safety principles as listed by OSHA (Occupational Safety and Health Administration) backward and forward, and to follow them to the letter.
8. Information on OSHA regulations and resources is presented.

Finally, safety is a first and foremost focus of the entire course, with the goal in mind of keeping not only current students safe, but one day helping to make the entire construction industry a safer place in which to work.

Field Trips

Counseling Component

For many women, mention of the skilled trades evokes only a general foggy notion of men in hard hats and not much particular imagery concerning the conditions of an actual construction worksite. Thus, in addition to hands-on work with the tools of the trades in a supportive setting, it is necessary to experience construction sites and industrial workplaces as they occur in their natural state. The noise alone can be an awakening situation for a woman who has never thought of the sound of many power tools in the same place.

Class visits to construction sites are always helpful. These offer the reality check that of the many workers to be seen, often the class will be lucky to see one woman present. The noise level, the "empty spaces" through which one could fall several stories, the tied off outside edges of the building all have an impact.

On the positive side, the class gains a sense of pride and accomplishment of what is involved in building a structure from the ground up, and what it would feel like to be part of such a task as part of one's life work.

Additional trips have been made to visit the bricklayer's training school, a cabinet-making shop, engineering shops, and similar sites. Successful field trips are those which include plenty of hands-on activities. Trips to a power plant and machine shop offer introductions to welding. Chicago Manufacturing Institute allows the students to see heavy equipment and metal lathes in operation. If possible, both new construction and rehab sites are visited.

On occasions, women in the training program have learned about a whole new career which then influences their trade choice. Part of the purpose of these field trips is to widen the vistas, helping women choose from a larger selection pool the trade that feels right for them.

A counseling component has been added to provide additional support to the program and to assist students in their career transitions. In addition to working with the students on job search issues, the counselors foster liaisons with construction sites and employers. They also provide advocacy for tradeswomen who are experiencing difficulties with their employers or co-workers.

Furthermore, the counselors plan support group meetings of tradeswomen monthly at the office. They prepare public service announcements and speak to groups to announce upcoming training sequences. They help to plan and carry out the Orientation Day. Both before and after the Orientation Day program, the counselors conduct interviews with women who want to take the course.

They assist with follow-up surveys and additional counseling for class members who have graduated and are working in the trades. Women experiencing lay-offs or repeated problems are to stay in touch with counselors so that the program may monitor women's overall progress in the trades. A follow-up survey is sent out every four to six months to all former students.

It is the counselor's job to update the job hotline, the employer's hit list and to run weekly information sessions for women beginning to explore entrance into the trades or manufacturing.

Future Direction

As the program completes more and more training sequences, a larger selection of feedback returns to the organization from the women who are graduates of the course and who now work or train as apprentices in the skilled trades. This feedback is put to immediate use in adjusting the curriculum to add any content that is found to be needed as women enter the trade schools. Changes of this type are simple to put in place, and the gratification is immediate, as the next group of graduates is even better prepared than those before them.

1. ONGOING STUDY GROUPS

The training program run by Chicago Women in Trades grew out of a request for tutoring on the part of women in an apprenticeship program. At the end of each training sequence, the students resound with the same need for an ongoing study group with a qualified instructor. This program would assist them while enrolled in the trade school pre-apprenticeship program of their choice.

2. REVOLVING FUND FOR NEW PRE-APPRENTICES

A revolving loan program is now sponsored by CWIT for graduates of CWIT's program who are in need of monetary assistance during their three to four month pre-apprenticeship periods. Immediately upon completion of that program, beginning with the first pay period as an apprentice, the woman would make monthly payments to the revolving fund.

This fund will assist women who qualify for Apprenticeship programs but who are unable to financially sustain themselves through an initial study period of three to four months without pay. A fair number of women who complete the CWIT training and then wish to pursue jobs in the skilled trades are unable financially to make it through the initial non-paid training periods.

A loan is made on the basis of the graduate's needs and lack of other sources of income to sustain her. The maximum loan amount is about $2,000. Loans are based on the amount needed for the woman's anticipated costs for housing, food, medical, transportation childcare and insurance for the pre-apprenticeship period. Graduates are also encouraged to find other ways to meet some of the above costs.

It has been clear that this period of non-pay represents a major hurdle to women attempting to enter the skilled trades, and this assistance program is a major step in the right direction. If shown to be effective, it will be expanded with further fund-raising and structure.

3. INSTITUTIONALIZATION OF CURRICULUM

A final word on future directions refers to the purpose of this manual itself. One of the hopes behind producing this guide is that it will help programs of this type spring up in more and more places and become institutionalized across many segments of society. Programs of this type could be offered in high schools, at community colleges, at vocational-technical schools, and at shipworks, millworks and large industries.

In addition, a curriculum of this type could be adapted for special groups, such as women who have recently been incarcerated, or young women who are wards of the state, or high school students who show an interest in the skilled trades. Throughout the country at this time there are programs geared to women considering career changes, especially displaced homemakers. Such programs could look to this manual for additional content for their existing programs.

CWIT is currently beginning a new training program for high school girls, in conjunction with a local vocational high school. This program is being tried as a full afternoon session program for twenty weeks, two days a week. It requires adaptations of the curriculum, but the transfer of material should be fairly straightforward.

In conclusion, it is CWIT's hope that as more and more women enter the trades, they will no longer be seen as the exception. Rather, they will begin to be seen as a standard, personifying the right of all women to pursue whatever career appeals to them. As this process occurs and more of these women become visible in the society at large, more young women will consider the trades, and the demand for programs of this type will grow. Training programs for women, stressing safety, confidence and well planned work environments will be a key to helping with the creation of a more humane and safe workplace for all.

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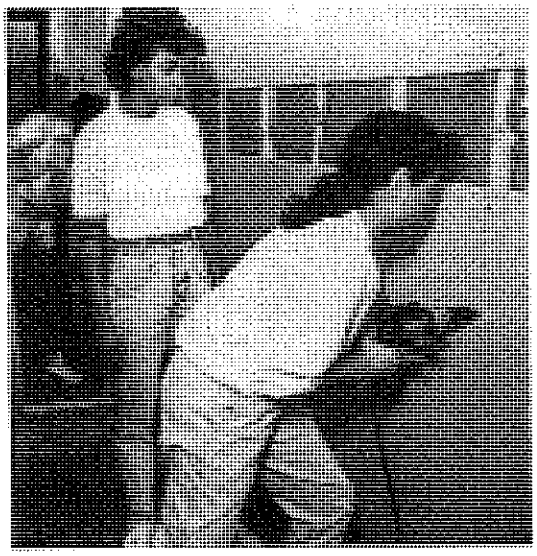
Tools for Success:
A Manual for Tradeswomen, Prepared for Chicago Women in Trades by Laurie Wessman LeBreton, 1994, Chicago, Illinois

Specific program lesson plans also are available from Chicago Women in Trades
Phone 312-942-1444 • Fax 312-942-0802



Appendices Tradeswomen's Organizations by State

CA CA Professional Fire Fighters Association
1450 Creekside Oaks Drive, Suite 200
Sacramento, CA 95833 916-648-1717

Century Freeway Women's Employment Program
1720 W. Beverly Blvd.
Los Angeles, CA 90026

Equal Rights Advocates
1663 Mission Street, Suite 550
San Francisco, CA 94103 415-621-0672

Operating Engineers Women's Support Group
335 Haddon Rd.
Oakland, CA 94612

Sacramento Tradeswomen
1551 36th Street
Sacramento, CA 95816

Tradeswomen, Inc.
2830 9th Street
Berkeley, CA 94710 510-649-6260

Women at Work
50 N. Hill Ave., Suite 300
Pasadena, CA 91106 818-796-6870

Women Empowering Women
2830 9th Street
Berkeley, CA 94710 510-649-6265

Women in Skilled Trades
695 22nd Street
Oakland, CA 94612

CT Permanent Commission on the Status of Women
90 Washington Street
Hartford, CT 06106

DC Coalition for Labor Union Women
1126 16th Street, NW
Washington, DC 20036 202-466-4610

Wider Opportunities for Women (WOW)
815 15th Street, NW
Washington, DC 20005 202-638-3143

Women's Bureau, U.S. Dept. of Labor
200 Constitution Ave., NW, Room 53312
Washington, DC 20210 202-219-6611

Women's Industrial Network (WIN, Inc.)
6933 9th Street, NW
Washington, DC 20012 202-723-6328

FL Florida Tradeswomen's Network
5166 SW 6th Street
Miami, FL 33134 305-443-1041

IA Pre-Vocational Training Program
C107 Seahorse Hall, Univ. of Iowa
Iowa City, IA 52242 319-335-0560

IL Chicago Women in Trades (CWIT)
220 S. Ashland Ave.
Chicago, IL 60607 312-942-1444

Danville Area Community College
200 E. Main Street
Danville, IL 61832 217-443-1811

Enhancing Employment for Women
C/O Kankakee Comm. Coll., P. O. Box 888
Kankakee, IL 60901 815-933-0325

Women Can
828 S. Wabash, Suite 200
Chicago, IL 60605 312-922-8530

LA Governor's Office of Women's Services
P. O. Box 94095
Baton Rouge, LA 70805 504-922-2060

MA Boston Tradeswomen's Network
62 Berkeley Street
Boston, MA 02116 617-423-1535

Women in the Building Trades
555 Amory Street
Jamaica Plain, MA 02130 617-524-3010

ME Maine Tradeswomen's Network
13 Lowell Farm Rd.
Falmouth, ME 04105 207-797-4801

Women Unlimited
280 State Street
Augusta, ME 04330

MI Detroit Tradeswomen
1106 Michelson
Rochester Hills, MI 48307

Women in Skilled Trades/Women's Resource
25 Wheldon SE, Suite 220
Grand Rapids, MI 49503 616-458-5443

MN Minnesota Women in the Trades
550 Rice Street, Women's Building
St. Paul, MN 55103 612-228-9955

Women Venture, Project Blueprint
2324 University
St. Paul, MN 55114 612-646-3808

MS Hinds Community College, Women in Trades and Technology
3925 Sunset Drive
Jackson, MS 39213 601-987-8119

MT Women's Opportunity and Resource Development (WORD)
127 N. Higgins
Missoula, MT 59802 406-543-3550

NY Access for Women, NYC Technical College
300 Jay Street, M407
Brooklyn, NY 11201 718-260-5730

Association for Union Democracy
500 State St.., 2nd Floor
Brooklyn, NY 11217 718-855-6650

New York Tradeswomen
P. O. Box 870 - Peck Slip Station
New York, NY 10272 212-227-2981

Nontraditional Employment for Women (NEW)
243 West 20th Street
New York, NY 10011 212-627-6252

OH Cleveland Hard Hatted Women
P. O. Box 93384
Cleveland, Ohio 44101-3384 216-961-4449

Ohio Department of Education, Division of Vocational and Career Education (ONOW)
65 S. Front Street, Room 907
Columbus, OH 43266-0308 614-466-2030

OR B-FIT
P. O. Box 19000
Portland, OR 97280

Oregon Tradeswomen's Network
P. O. Box 86620
Portland, OR 97286

PA TOP/WIN
2300 Alter Street
Philadelphia, PA 19146 215-545-3700

TN Women in the Trades
1044 Mississippi Blvd.
Memphis, TN 38126 901-942-4653

TX National Assoc. of Women in Construction
327 S. Adams
Fort Worth, TX 76104 817-877-5551

VA Coal Employment Project
P. O. Box 682
Tazewell, VA 24651-0682

VT Northern New England Tradeswomen
26 D Railroad Street
St. Johnsbury, VT 05819 802-748-3308

WA Apprenticeship and Nontraditional Employment for Women
P. O. Box 2490
Renton, WA 98056 206-235-2212

Women in Trades
P. O. Box 3431
Seattle, WA 98144

Women's Maritime Association National Headquarters
1916 Pike Place, #12
Box 743
Seattle, WA 98056 360-671-6478

WI Tools for Tomorrow/Employment Options, Inc.
2095 Winnebago Street
Madison, WI 53705 608-244-5181

Women in Fire Suppression-National Headquarters
P. O. Box 4556
Madison, WI 53705 608-233-4768

YWCA/NET
101 E. Pleasant
Milwaukee, WI 53212 414-224-9080

WV Center for Economic Options
601 Delaware Ave.
Charleston, WV 25302 304-345-1298

Course Evaluation

Chicago Women in Trades Technical Opportunities Program

1. Did this course help you become more motivated to achieve a career in the skilled trades?
2. Do you feel more confident as a result of taking the course?
3. What aspects of the course were most helpful to you?
4. What aspects did you find least helpful?
5. Is there any subject matter that was not mentioned in the course that you feel should have been included? If so, please mention.
6. Is there any subject matter that you feel should be eliminated?
7. On a scale of 1 to 5, with 5 as the highest, rank the learning you received in the areas of each of the following course components:

Physical Conditioning	1	2	3	4	5
Math Skills	1	2	3	4	5
Tool Recognition	1	2	3	4	5
Geometry	1	2	3	4	5
Legal Rights	1	2	3	4	5
Hands-On Training	1	2	3	4	5
Interviewing Techniques	1	2	3	4	5
Safety Precautions	1	2	3	4	5
Field Trips	1	2	3	4	5
Counseling Sessions	1	2	3	4	5
Mechanical & Science	1	2	3	4	5

8. Using the following scale, rate the instructors:

	Poor	Fair	Good	Excellent
Counselor	____	____	____	____
Aerobics Instructor	____	____	____	____
General Instructor	____	____	____	____

Please use this area to give additional feedback on the course or to comment on the performance of the Trade Specific instructors.

Appendices

Sample Job Interview Questions

1. What types of work have you done in the past?
2. Why did you leave your last job?
3. List three strengths that you would bring to this job.
4. What is your greatest weakness in terms of work ?
5. What challenges and growths would this job present to you?
6. Why would you like to work for this company?
7. Construction work can be very hot and is often dirty. How will you handle those circumstances?
8. Language on a construction site can be very raw and explicit. How will you feel having that be your work environment ?
9. Do you have children, and how will you take care of them during your work days, especially given a 7 a.m. start?
10. I see here that you have a past degree in _____.
    Why are you pursuing a career with our union instead of a job in your prior field of study?

Sample Recruitment Notice

CHICAGO WOMEN IN TRADES

TECHNICAL OPPORTUNITIES PROGRAM ORIENTATION SESSION

Career path For Women in Manufacturing and Skilled Trades

- Learn the steps to take to become apprentice carpenters, electricians, plumbers, ironworkers, automatic coiler set-up technicians, single spindle screw machine set up technicians, etc.
- Panel discussion on job opportunities and training workshops for women in the skilled trades
- Information on what it's like to work in the skilled trades by experienced Tradeswomen
- Attendance required for entrants in our Technical Opportunities Program (TOP)

Date: Saturday, September 16, 1995
Time: 9:00 AM - Noon

Place: Malcolm X College,
1900 W. Van Buren Cultural Center

For More Information call:
Chicago Women in Trades
(312) 942-1444

Sponsored by Illinois State Board of Education
and
Commonwealth Edison

Sample Brochure

The Chicago Women in Trades Pre-Apprenticeship Tutorial Workshop is a ten week program with sessions beginning in February and October of each year. Women interested in applying for the program need:

- a high school diploma. or G.E.D. certificate
- a current driver's license
- a determination and willingness to work hard
- an interest in physical work

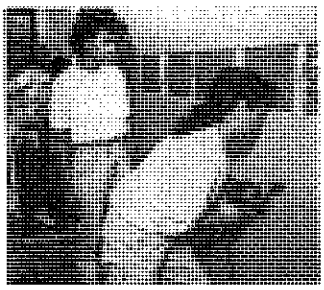
CHICAGO WOMEN IN TRADES

Pre-Apprenticeship Tutorial Workshop

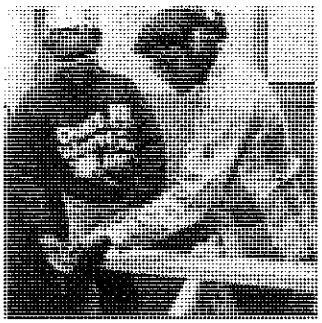
"The class helped me with every thing, it gave me the basics for all the math that I would need for my apprenticeship and introduced me to the tools and how to use them."

Persistence paid off for Dawn Gowens who wanted to be an electrician since her sophomore year in high school. She took shop classes in high school and served in the Army for three years as a radio electrician. When she returned home to Chicago she found out about the trade apprenticeship programs. Dawn explains, "They keep that information very secret, it s hard to find out about."

She applied to Electricians local #134 in 1987 and she waited two years to be called from the list. Meanwhile, she attended CWIT programs and enlisted in the Pre-Apprenticeship Tutorial Workshop. Dawn says about the class, "it was great preparation. Even with the class work in the Army, I had never been that great a student and this refreshed my math skills. I would recommend it to anyone. It s a must, especially the longer you've been out of school."



Currently Dawn is working as an electrical apprentice for an electrical contractor and she is enjoying her work.



"I would recommend it to anyone. It's a must, especially the longer you've been out of school."

Diane Kieres attended CWIT's Pre-Apprenticeship Tutorial Workshop in the Spring of 1990. She is now working as a carpenter apprentice with local #54. Diane's interest in the trades came from her family. Her father is a bricklayer and she worked with him as a teenager when he renovated their house. After working as a physical education and health instructor, Diane decided to pursue a career as a carpenter - which was her life dream.

Diane maintains that CWIT gave her the extra push and the confidence to go out there and make her dreams come true. She says, "The class helped me with everything, it gave me the basics for all the math that I would need for my apprenticeship and introduced me to tools and how to use them. I got to use a skill saw for the first time in the class. It also helped me with my body mechanics, how to pick up a piece of plywood and the importance of not getting injured."

CHICAGO WOMEN IN TRADES

Pre-Apprenticeship Tutorial Workshop

Program Goals:

- orient women to skilled trade career opportunities
- provide women with basic skill train ing
- assist women with self assessment
- provide a supportive environment for women to develop strategies for entering and remaining in non-tradi tional jobs

Curriculum:

- basic and applied math
- mechanical and spatial aptitude
- introduction to blueprint reading
- physical conditioning
- hands-on experience
- work with skilled tradeswomen
- tool recognition

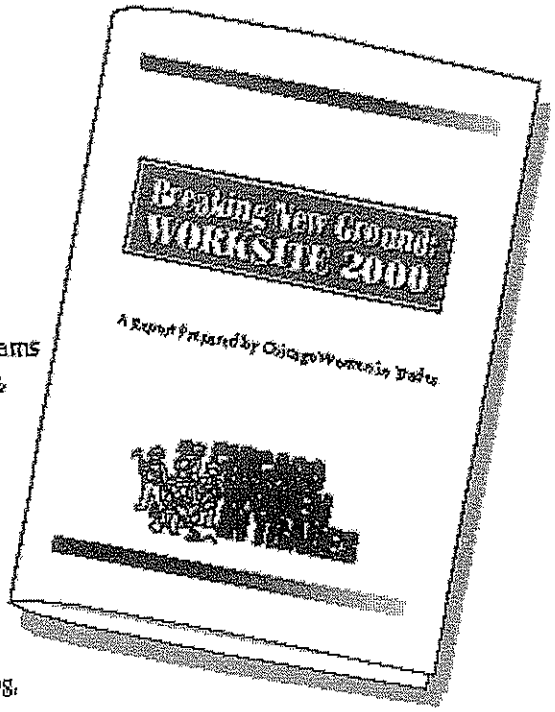
Chicago Women In Trades

announces the re-issue of

Breaking New Ground: WORKSITE 2000

an important study, cited twice in a brief before the U.S. Supreme Court, of the conditions tradeswomen face on the job. At a time of intense debate on affirmative action, **Breaking New Ground:**

- Documents the need for affirmative action. It reports the experiences of more than 200 tradeswomen with hiring, layoffs, training, sexual harassment, etc.
- Makes recommendations for effective affirmative action programs for all sectors of the construction industry — employers, unions, apprenticeship programs and government agencies. The U.S. Postal Service, the International Brotherhood of Electrical Workers Local 134, and Cook County, Illinois have already adopted some of these recommendations.



Also available from Chicago Women in Trades:

TOOLS FOR SUCCESS, the only comprehensive "how to" manual for tradeswomen, with practical suggestions for getting hired, getting good training, dealing with sexual harassment and other issues tradeswomen face in their work.

Chicago Women in Trades 220 South Ashland Avenue, Suite 101 • Chicago, IL 60607 • Phone 312-942-1444 • Fax 312-942-0002

Please send:

_____ copies of **Breaking New Ground: WORKSITE 2000** (single copy: $7, 20 or more copies: $6 per copy)

_____ copies of **TOOLS FOR SUCCESS** (single copy: $6, 20 or more copies: $5 per copy)

Name _____ Phone: _____

Organization/Union: _____ Fax: _____

Address: _____

Check or money order enclosed for $ _____

Please send to: **Chicago Women in Trades**

CHICAGO WOMEN IN TRADES

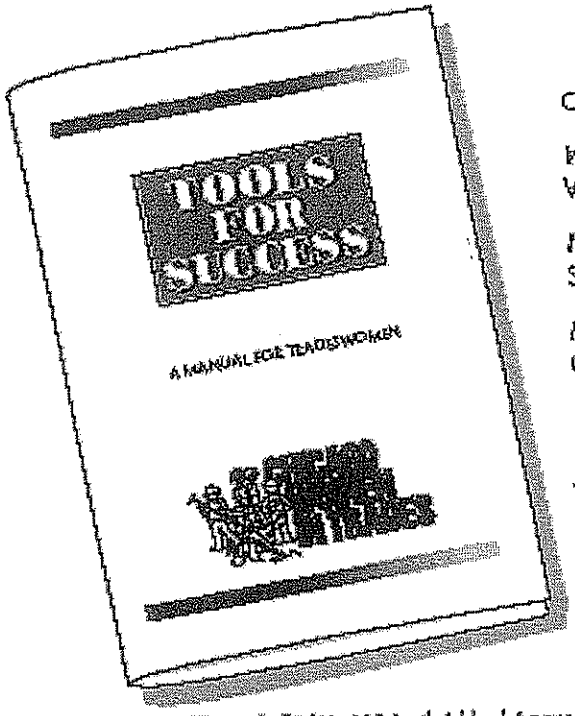
2444 W. 16th Street
Suite 3E
Chicago, IL 60608
312.944.1444

Chicago Women In Trades

announces the publication of

TOOLS FOR SUCCESS

a manual for tradeswomen — women plumbers, carpenters, electricians, ironworkers, laborers and other women working in non-traditional fields. The only comprehensive "how to" manual in the country, **Tools for Success** provides tips — practical suggestions — to help women survive and thrive as they go about their daily work.



Chapters include:

What a Nice Girl Like You Doing in a Place Like This?
WORKING IN A TRADITIONALLY MALE ENVIRONMENT

It's Not Sexy — It's Hostile, and It's Against the Law:
SEXUAL HARRASSMENT

Nice Work If You Can Get It
GETTING HIRED IN THE TRADES

Also available from Chicago Women in Trades:
Breaking New Ground: WORKSITE 2000
This groundbreaking study of the conditions tradeswomen face on the job was cited twice in a brief before the U.S. Supreme Court. It includes recommendations for employers, unions, and training and apprenticeship programs on ways to improve conditions for women workers.

Chicago Women in Trades 220 South Ashland Avenue, Suite 101 • Chicago, IL 60607 • Phone 312-942-1444 • Fax 312-942-0802

Please send:

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312.944.1444