The career exploration program for grades 9 through 10, as part of a comprehensive K through 10 career development program, attempts to develop an awareness of and appreciation for work, extend knowledge of the variety of career opportunities, and provide experiences in career areas of individual interest. The document, a collection of materials consisting of student learning experience packets, instructional materials, and resources, is designed to introduce the students to building and plant maintenance occupations. The introduction defines the career area, and discusses the course objectives, course strategy, and a suggested time table. The activities, organized into objectives, procedures, and resources, cover the areas of: building frames, electrical systems, heating and cooling systems, enclosing exterior and interior walls, maintaining both outdoor and indoor surfaces, individual units for related career exploration, and self-evaluation of career maturity. The appendix contains: suggestions and procedures for both field and exploration trips, forms for exploration trips, and wage rates for construction workers. (JB)
CAREER EXPLORATION
9 - 10

EXPLORING CAREERS
IN
BUILDING AND PLANT MAINTENANCE

First Edition - 1973

CAREER DEVELOPMENT K - 10
CINCINNATI PUBLIC SCHOOLS
CAREER EXPLORATION
CINCINNATI PUBLIC SCHOOLS
Grades 9 - 10

EXPLORING CAREERS
IN
BUILDING AND PLANT MAINTENANCE
(Tentative Copy)

First Edition
1973
CAREER DEVELOPMENT

The Career Development Program responds to the needs of students, taxpayers, and employers for the public schools to provide personal, social, and economic relevance in the educational process. It is an integral part of the educational process essential to the development of all students.

The Career Development components, which are Career Motivation (K-6), Career Orientation (7-8) and Career Exploration (9-10), develop an awareness and appreciation for work, extend knowledge of the variety of career opportunities, and provide experiences in career areas of individual interest. These goals are accomplished through a curriculum based on pupil activities involving simulation, role playing, and individual investigation. These activities require that administrators and teachers develop a new level of working relationships with community resources such as public institutions, business, labor, and industry.

Every individual’s right to learn what he or she needs in order to be a producing, participating member of society is a fundamental responsibility of education. Each individual also has a right to self-fulfillment. Career Development, presented as inseparable elements inherent within every level and subject area of the school curriculum, provides each student with the skills and insights to recognize and pursue goals of personal significance. As a result of this program students will increase their abilities to make well-informed and experience-based decisions related to their personal life, school program, and career selection.

Donald R. Waldrip, Superintendent
Cincinnati Public Schools
CAREER EXPLORATION

Career Exploration is the 9th and 10th grade component of the Career Development Program. Its primary goal is to provide experiences related to career areas chosen by the student. Focus is on the student's perception of himself or herself in relation to the real world of career opportunities. Emphasis is on individualized and personalized activities and experiences.

The student chooses and studies a specific career area using skills and insights gained in earlier parts of the Career Development Program. Students explore occupations within the chosen area with particular attention to those most closely related to their own needs, interests, and abilities. They will experience some of the satisfactions, opportunities, limitations and frustrations peculiar to the various occupations.

Career Exploration is planned as the culmination of the Career Development Program. Successful exploratory experiences will enable the student to formulate and refine realistic and personally meaningful career goals. These experiences will also provide a basis for planning a course of studies in the 11th and 12th grades (and beyond) pursuing career goals.

Stanley A. Marsh
Administrative Assistant to the Superintendent
FOREWORD

This manual is one of a series produced by the Cincinnati Public Schools as a part of a project designed to provide Career Exploration for students in grades 9 and 10.

It is designed to provide activities and information about an occupational area that will provide a more in-depth study than presented in Career Orientation in grades 7 and 8.

This is a tentative guide and has been developed for the purpose of field testing and revising based upon feedback from participating teachers.

This manual was developed by Jack R. Bongey, an industrial arts teacher at Schwab Junior High School; Jack D. Ford, an instructional consultant, conducted the curriculum project under the general supervision of Ralph E. Shauck, Coordinator of Instructional Services.
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</tbody>
</table>
I. INTRODUCTION

A. Definition of Career Area

The building trades constitute our nation's largest industry. Construction work provides one out of every ten jobs in the United States, which represents about one-sixth of all our industrial workers. As in all industries, careers in construction include occupations in management, personnel, production and maintenance.

B. Course Objectives

The Building and Plant Maintenance Exploration Course should help the student attain:

1. An identity with a variety of careers in construction and maintenance.
2. Basic manipulative skills and desirable work habits.
3. The ability to cooperate with fellow workers, employers or customers.
4. An appreciation of quality workmanship and a positive, healthy attitude toward the world of work.
5. Knowledge of the importance of performing jobs in an orderly, organized fashion.
7. The ability to evaluate this career in terms of its appeal to the student.

A very wise and successful man once said, "A person who has a trade has an estate." Many people think of an estate as an accumulation of considerable property and wealth. However, the most valuable possession most people will gain are the skills and knowledge they acquire in their trade or profession.

There are many possibilities for careers in the construction industry and at all levels of ability and training. This guide will be concerned with fifty-one roles ranging from a janitor to a contractor. To work with your hands and your mind is perhaps the prime requisite to success in the construction field.

C. Course Strategy

Building and Plant Maintenance careers which are to be explored by the students are organized into activities. These activities are arranged systematically so the end result will be a finished project, namely, a utility shed.

The student will explore individually, by group, or by class in certain activities. This course will mainly be of a shop nature with
the many roles portrayed as are found in the construction industry. However, films and other teaching aids will be used as supplements to assist the teacher in presenting various facets of the vocations. The guide encourages the use of many resources, but the teacher, based on his own experiences, will want to make use of other sources and other media for planning and instruction.

A special experience being planned for students in every career is a small group exploration trip. Effort has been made to make this as simple as possible for the classroom teacher. See Appendix B.

The last exploration activity in this course will ask each student to participate in a "Self Evaluation of Career Maturity" and will provide each student an opportunity to analyze and discuss their career-related experiences.

D. Suggested Time Schedule

<table>
<thead>
<tr>
<th>No.</th>
<th>EXPLORATION ACTIVITY</th>
<th>DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction to the Course</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Use of D.O.T.</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Building Frames</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>Electrical Systems</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Plumbing Systems</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Heating and Cooling Systems</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>Enclosing Exterior Walls</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>Enclosing Interior Walls</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Maintaining Outdoor Surfaces</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>Maintaining Indoor Surfaces</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>Conclusion of Building and Maintenance Activities</td>
<td>1</td>
</tr>
<tr>
<td>12.</td>
<td>Individual Exploration of Related Careers</td>
<td>variable</td>
</tr>
<tr>
<td>13.</td>
<td>Self Evaluation of Career Maturity</td>
<td>2</td>
</tr>
</tbody>
</table>
II. Career Exploration Activities

A. Where to Begin --

1. Resources essential to pupil activities: Many resources listed on the following pupil activity sheets must be made available in the classroom before the students can begin the activities noted. These essential resources are specified IN WORDS on each exploration activity worksheet. THEY MUST BE OBTAINED BY THE TEACHER IN ADVANCE OF THE CLASS MEETING.

Examples:

a. Films

If ... the worksheet reads:

<table>
<thead>
<tr>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film: Code Blue (C-7)</td>
</tr>
</tbody>
</table>

Then ... The teacher must look in Appendix C, Item 7 for catalog information so that this film can be ordered in time for this activity.

b. Material to be duplicated by the teacher for use in class.

If ... the worksheet reads:

<table>
<thead>
<tr>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Analysis Quiz (B-4,5,6)</td>
</tr>
</tbody>
</table>

Then ... The teacher must duplicate a class set of this item which is found in Appendix B as items 4, 5, and 6. Duplication can be achieved by Xeroxing, generating a ditto master via photocopying with IBM 107 and Thermofax or retyping onto a ditto master.

2. Optional resources to be used for enrichment, supplements and student or teacher reference are described only in the Appendix.

If ... the worksheet reads:

<table>
<thead>
<tr>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-8</td>
</tr>
</tbody>
</table>

Then ... This indicates that for this activity there is a potentially useful reference described in Appendix C, Item 8. This reference item is not essential to the completion of the student activity.
### EXPLORATION ACTIVITY (INTRODUCTORY)

#### (2 day)

<table>
<thead>
<tr>
<th><strong>INTRODUCTION TO COURSE</strong></th>
<th><strong>OBJECTIVES</strong></th>
<th><strong>ACTIVITIES</strong></th>
<th><strong>RESOURCES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will be able to:</td>
<td>1. Discuss critically the objectives of the course.</td>
<td>1. The student will be informed of the purpose of this course, what is hoped to be accomplished, and will be led into a discussion of activities involved in Career Exploration.</td>
<td>Class set of &quot;Self-Analysis Quiz&quot; (attached)</td>
</tr>
<tr>
<td>2. Question people's attitude at work under various conditions as illustrated in a film.</td>
<td>2. The student will defend or reject by role playing, the position of maintaining good personal appearance, attitude and conduct on the job.</td>
<td>Class set of &quot;Job Performance Rating Sheet&quot; (attached)</td>
<td></td>
</tr>
<tr>
<td>3. Form a general understanding of the course outline and procedure.</td>
<td>3. Explain to students the relation of the course and the &quot;Self-Analysis Quiz&quot; to their career selection. Students will participate in this self-analysis quiz.</td>
<td>&quot;What Do We Look Like To Others&quot; 16 mm film, 10 min., Sandler Instructional Films, Inc. Board of Education.</td>
<td></td>
</tr>
<tr>
<td>4. Form some basic conclusions through the &quot;self-analysis quiz.&quot;</td>
<td>4. Hand out and discuss a &quot;Job-Performance Rating Sheet&quot; which will be administered and discussed as part of the last exploration activity in this course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. List and discuss at least 4 important factors of good on-the-job performance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Describe a wide variety of skills needed for specific jobs in this occupational area.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SELF-ANALYSIS QUIZ

Directions: Check the line closest to the statement that identifies you. If you are uncertain, check the middle space.

<table>
<thead>
<tr>
<th>Make at least average grades</th>
<th>...</th>
<th>Make below average grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn quickly</td>
<td>...</td>
<td>Learn slowly</td>
</tr>
<tr>
<td>Enjoy reading books, magazines, etc.</td>
<td>...</td>
<td>Enjoy reading comics</td>
</tr>
<tr>
<td>Like school and do extra work</td>
<td>...</td>
<td>Do only schoolwork that is necessary</td>
</tr>
<tr>
<td>Talk and write well</td>
<td>...</td>
<td>Talk and write poorly</td>
</tr>
<tr>
<td>Good planner and organizer</td>
<td>...</td>
<td>Poor planner and organizer</td>
</tr>
<tr>
<td>Like children</td>
<td>...</td>
<td>Dislike children</td>
</tr>
<tr>
<td>Patient with children's questions</td>
<td>...</td>
<td>Impatient with children's questions</td>
</tr>
<tr>
<td>Outgoing</td>
<td>...</td>
<td>Withdrawn</td>
</tr>
<tr>
<td>Popular</td>
<td>...</td>
<td>Not popular</td>
</tr>
<tr>
<td>Have large group of friends</td>
<td>...</td>
<td>A few close friends</td>
</tr>
<tr>
<td>Have confidence</td>
<td>...</td>
<td>Unsure around others</td>
</tr>
<tr>
<td>Give advice</td>
<td>...</td>
<td>Not asked for advice</td>
</tr>
<tr>
<td>Outspoken</td>
<td>...</td>
<td>Quiet</td>
</tr>
<tr>
<td>Sensitive to others</td>
<td>...</td>
<td>Insensitive to others</td>
</tr>
<tr>
<td>Trust people</td>
<td>...</td>
<td>Do not trust people</td>
</tr>
<tr>
<td>Volunteer</td>
<td>...</td>
<td>Do not volunteer</td>
</tr>
<tr>
<td>Pleasant personality</td>
<td>...</td>
<td>Do not have pleasant personality</td>
</tr>
<tr>
<td>Have a sense of humor</td>
<td>...</td>
<td>&quot;Touchy&quot;</td>
</tr>
<tr>
<td>Not prejudiced</td>
<td>...</td>
<td>Prejudiced</td>
</tr>
</tbody>
</table>
JOB PERFORMANCE RATING SHEET

| NAME: ______________________________ | DATE: ______________________________ |
| DEPT. ______________________________ | OPERATION: ________________________ |

<table>
<thead>
<tr>
<th></th>
<th>EXCELLENT</th>
<th>GOOD</th>
<th>FAIR</th>
<th>POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance &amp; Punctuality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperation with instructor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperation with other students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest in job</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meets industrial quality standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the student rates "poor" on any factor
or
If the student rates "fair" on more than three factors:

Discuss with the student the areas in which he or she will need to improve, before he can attain success in his chosen field.

Remarks: __________________________________________

__________________________________________________

__________________________________________________
EXPLORATION ACTIVITY #2

Use of the D.O.T. (Dictionary of Occupational Titles)

The D.O.T. lists 35,550 jobs with a code number for each. The last three digits of this code refer to the relationship of that job to data, people and things. This exploration activity provides the students some experience in using this information to identify jobs which match their interests.

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>The teacher will conduct a classroom discussion on the D.O.T. code number in identifying the data, people, things orientation of jobs. (See the attached page for examples.)</td>
<td>Dictionary of Occupational Titles, Volumes I and II</td>
</tr>
<tr>
<td>Compare their knowledge about the data, people, things content of jobs to factual information listed in the D.O.T. for five jobs of personal interest.</td>
<td>Following this discussion each student is to complete the &quot;D.O.T. Worksheet&quot; which compares the student's estimate of the data, people, things job content to that listed in the D.O.T.</td>
<td>Make a class set of &quot;Examples of D.O.T. Code Usage.&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make a class set of the &quot;D.O.T. Worksheet&quot;</td>
</tr>
</tbody>
</table>
D.O.T. WORKSHEET

STEP 1. In table I at the bottom of this page, write the names of five jobs which are interesting to you.

STEP 2. Use the handout sheet titled "Examples of D.O.T. Code Usage" and make an estimate of the correct code to describe this job. Record this estimate in Table I.

STEP 3. Use Volume I or II of the D.O.T. and look up the D.O.T. code designation for each job. Compare these designations to your estimate.

<table>
<thead>
<tr>
<th>NAME OF JOB</th>
<th>STUDENT'S ESTIMATE OF THE CORRECT CODE</th>
<th>D.O.T. CODE DESIGNATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>XXX_. _ _</td>
<td>_______________________</td>
</tr>
<tr>
<td>2.</td>
<td>XXX_. _ _</td>
<td>_______________________</td>
</tr>
<tr>
<td>3.</td>
<td>XXX_. _ _</td>
<td>_______________________</td>
</tr>
<tr>
<td>4.</td>
<td>XXX_. _ _</td>
<td>_______________________</td>
</tr>
<tr>
<td>5.</td>
<td>XXX_. _ _</td>
<td>_______________________</td>
</tr>
</tbody>
</table>
## Examples of D.O.T. Code Usage

<table>
<thead>
<tr>
<th>Job Title</th>
<th>DOT Code</th>
<th>DOT Code Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Teacher</td>
<td>091.228</td>
<td>(Things) 8 - No significant relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(People) 2 - Instructing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Data) 2 - Coordinating</td>
</tr>
<tr>
<td>Waitress</td>
<td>311.878</td>
<td>(Things) 8 - No significant relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(People) 7 - Serving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Data) 8 - No significant relationship</td>
</tr>
<tr>
<td>Stock Clerk</td>
<td>223.387</td>
<td>(Things) 7 - Handling Things</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(People) 8 - No significant relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Data) 3 - Compiling</td>
</tr>
<tr>
<td>Auto Mechanic</td>
<td>620.261</td>
<td>(Things) 1 - Precision working</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(People) 8 - No significant relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Data) 2 - Analyzing data</td>
</tr>
</tbody>
</table>

### Data (4th digit)
- 0: Synthesizing
- 1: Coordinating
- 2: Analyzing
- 3: Compiling
- 4: Computing
- 5: Copying
- 6: Comparing
- 7: No significant relationship
- 8: No significant relationship

### People (5th digit)
- 0: Mentoring (Counseling)
- 1: Negotiating
- 2: Instructing
- 3: Supervising
- 4: Diverting
- 5: Persuading
- 6: Speaking-Signaling
- 7: Serving
- 8: No significant relationship

### Things (6th digit)
- 0: Setting-Up
- 1: Precision Working
- 2: Operating-Controlling
- 3: Driving-Operating
- 4: Manipulating
- 5: Tending
- 6: Feeding-Offbearing
- 7: Handling
- 8: No significant relationship

For a definition of the above see pages 649 and 650 in Appendix A of the Dictionary of Occupational Titles Volume II.
# EXPLORATION ACTIVITY #3

## Building Frames (9 days)

### OBJECTIVES

The student will be able to:

1. **Name and identify 5 tools needed to construct a framed section.**
2. **List and describe the roles of selected persons in the building construction industry.**
3. **Compute lumber and materials cost to determine the cost of a wooden framed unit.**
4. **Upon being given a visual media the student will question people's attitudes at work under various conditions.**
5. **Identify those tasks related to steel framing, when given a list of 10 construction tasks related to both wood and steel framing.**

### ACTIVITIES

1. **Given tools and materials along with a demonstration and lecture, students will build a framed section in 9 assigned periods.**

   **Suggested Activity:**
   Divide class into six groups and build a 6' x 8' x 8' "Little Red School House Utility Shed". (This unit could be sold at a PTA meeting as another activity.)

   The group could break down and work on the sides, front, back, floor and roof; however, it should be kept in mind the unit will be dismantled into sections.

2. **Given the size and amount of lumber needed to construct the back of the framed section, the student will calculate the cost of the lumber in that unit.**

   **Note:** This activity is related to the work of the contractor.

3. **The students will defend or reject, by role playing, the position of maintaining good personal appearance, attitude, and conduct on the job using the attached job description.**

4. **Given a film on steel framing, the student will distinguish between wood and steel framing.**

   **Suggested Activity:**
   Suggest four students to be out of class each day.

### RESOURCES

- Suggested sketches for a utility shed follow the roles.
- Mr. Kerry Rice
  Allied Construction Indus.
  221-8020
- "Exploration Trip Report" and "Exploration Trip Permission Forms" (Appendix B, C, and D)
- Illustrations of house construction details and roofing details follow the roles.
- "What Do We Look Like to Others" 16 mm film, 10 min. Sandler Instructional Films, Inc. Resource Services
- "Erecting Steel" Modern Talking Picture. 16 mm film.
1. **Role:** Contractor, Construction (182.168) page 161.
   **Job Description:**
   Contracts to perform construction work. Makes own estimate of cost of work and submits bid. Makes arrangement with banks or other parties to provide financial assistance. Purchases materials for construction. Supervises work directly or delegates authority to foremen.

2. **Role:** Carpenter Foreman (860.131) page 101.
   **Job Description:**
   Supervises and coordinates activities of workers engaged in construction, installation and repair of wooden structures and fixtures. Examines blue prints, selects materials, and determines sequence of activities concerned with fabrication, assembly and erection of structure. Assigns workers to such tasks as cutting material to size, erecting framework, and laying floors.

3. **Role:** Rough Carpenter (860.781) page 102.
   **Job Description:**
   Builds rough wooden structures, such as concrete forms, scaffolds, tunnel and sewer supports, and temporary frame shelters, according to sketches or oral instructions.

4. **Role:** Finishing Carpenter (860.381) page 101.
   **Job Description:**
   Constructs, erects, installs and repairs structures and fixtures of wood, plywood, and wallboard. Uses carpenter's hand tools and power tools, conforming to local building codes. Often specializes in installing interior and exterior trim, building stairs and laying hardwood floors. Studies blueprints, sketches, or building plans for information pertaining to types of material required.

5. **Role:** Carpenter Helper (860.887) page 405.
   **Job Description:**
   May be referred to as carpenter apprentice. Assists carpenter to build wooden structures. Selects and saws new and used lumber to specific size. Holds lumber in position for nailing by carpenter. Nails sheathing to studs after structure has been framed.

6. **Role:** Laborer, Carpentry (860.887) page 405.
   **Job Description:**
   Cleans used lumber and wooden and metal forms. Removes shoring and bracing from forms. Conveys materials and tools about job site. Digs shallow
holes or trenches to support posts.

7. **Role:** Carpenter Inspector (860.281) page 101.

**Job Description:**

Inspects buildings, desks, cabinets, tables, and other wooden structures to insure specified standards of maintenance. Reports nature and extent of repairs needs or directs maintenance carpenter to make repairs.

8. **Role:** Maintenance Carpenter (860.281) page 101.

**Job Description:**

Repairs structural woodwork and equipment in an establishment, working from blue prints, drawings or oral instructions. Replaces damaged ceiling tile, floor tile and sheet plastic wall covering. May build cabinets and other wooden equipment in carpenter shop, using woodworking machines, such as circular saw, bandsaw, and jointer.
SIMPLE METHOD OF FINDING THE TWO CUTS ON ALL COMMON RAFTERS

1. **MARK UPPER END FOR PLUMB CUT TO BUTT RIDGE BOARD**
   - Ridge height must be known or erected first!
   - Plate
   - Tail

2. **SAW LINE JUST ABOUT 1/8" SLANTED AWAY FROM PLUMB (BECAUSE TAIL IS NOT YET CUT)**
   - Saw line
   - Ridge board
   - Plate
   - Tail

3. **NAIL LIGHTLY TO RIDGE**
   - Plate
   - Tail

4. **WITH RAFTER ON PLATE, RUN LINE DOWN TO BACK OF PLATE**
   - Wall plate

5. **FROM THIS LINE DRAW A LINE INCLINED SLIGHTLY UPWARD, FOR HEEL CUT**
   - Line
   - Slanted

6. **AND A LINE DOWN JUST PAST PLATE**
   - Line
   - Down

7. **THEN SAW THE NOTCH MADE. RAFTER WILL THEN SEAT FLAT ON PLATE TOP**
   - Notch
   - Rafter

8. **PLUMB WILL NOW BUTT RIDGE SQUARELY**
   - Plate
   - Tail

9. **BEFORE NAILING, CUT OFF TAIL TO FORM YOUR CHOICE OF EAVE (SEE BELOW)**
   - Tail
   - Eave

10. **THEN NAIL BOTH ENDS SECURELY**
    - Plate
    - Tail

   **IF FIRST TRIAL CUTS ARE OFF A BIT, CORRECT ON NEXT RAFTER AND USE THAT AS PATTERN FOR OTHERS**

---

HANK CLARK

**Rise**

**Run**

Gutters
TWO NAILS PER BOARD INTO JOISTS

1" x 3" OAK OR OTHER HARDWOOD FOR FINISHING FLOOR

2" x 6" JOISTS 16" ON CENTERS

2" x 6" SILL

WOODEN OR METAL BRIDGING PREVENTS JOISTS FROM TWISTING

FLOOR CONSTRUCTION IN AVERAGE WOOD FRAME DWELLING
Architects' Plans For Storage

Storage for garden tools, etc., or a playhouse, this nice little colonial is easy to build. 10' x 12'. Sidewalls 6'-4" and 4'-4". Door width 42'. Plywood siding. Wood floor framing is above ground, anchored for wind, also conc. slab details. Plans are for the amateur, including nail sizes and location, full size rafter patterns, material list & instructions. Plan No. C1012. $2.50 a set.

C. E. Handloser, Dept. WB, 2032 W. Needle Drive Traverse City, Mich. 49684.

SUGGESTED DESIGNS FOR THE FRAMED SECTION
<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>RESOURCES</th>
</tr>
</thead>
</table>
1. Role: Electrical Engineer (003.087) Pg. 237

Job Description:

Plans construction and coordinates operation of power stations, transmission lines, and distribution systems. Prepares drawings and specifies type of equipment and material to be used. Computes power rates and assists others in evaluating properties and developing utility systems in new territories.

2. Role: Electrical Foreman (829.131) Pg. 238

Job Description:

Supervises and coordinates activities of electrical repairmen and electricians engaged in construction, maintenance, and repair of electrical power, lighting, and communication systems of buildings.

3. Role: Electrical Lineman (821.381) Pg. 424

Job Description:

Erects wood poles and prefabricated light duty metal towers, cable and related equipment to construct transmission and distribution powerlines used to conduct electrical energy between generating stations, substations and consumers.

4. Role: Electrician, Wireman (824.281) Pg. 240

Job Description:

Plans layout and installs and repairs wiring, electrical fixtures, apparatus and control equipment. Prepares sketches or follows diagrams or blueprints prepared by others, insuring that concealed wiring is installed before completion of future walls, ceilings, and flooring.

5. Role: Electrician Helper (829.887) Pg. 241

Job Description:

Assists electrician with measuring, cutting and bending wire and conduit, using ruler, and handtools, such as pipe benders and hacksaw. Drills holes for wiring and assists in lifting, positioning, and fastening objects. Performs minor repair such as replacing fuses and light switches.

6. Role: Electrical Complaint Inspector (829.281) Pg. 239

Job Description:

Locates cause of defective electric service on customers' premises and repairs wiring and connections. May recommend new wiring arrangement to correct inadequacies.
7. **Role: Electric Meter Installer** (821.381) Pg. 242

**Job Description:**

Installs and removes electric meters on customers' premises. Sets recording mechanism, tests meters for flow of current, and reads meter after installation and before removal.
### ELECTRICAL INSPECTION

#### CHECK LIST

<table>
<thead>
<tr>
<th>ITEMS TO BE CHECKED</th>
<th>APPROVED</th>
<th>REJECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are all wires 14 gauge or larger?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the wire stapled within 8” of each outlet or receptacle?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Are all boxes in a location to be grounded?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Drilled holes should be a minimum of 1” from the edge of a stud.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Only one set of wires should pass through each hole in the studs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Conduit should be a minimum of 1/2” dia. and secured by clamps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Armored cable should be insulated on the inside.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Have the holes been drilled in the correct location?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Are junction and outlet in the proper location as shown by the drawing and specifications?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Conduit bends are free from kinks.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Basic Three Wire Power System from the street to a house. It will supply both 110 and 220 volt conveniences.
**EXPLORATION ACTIVITY #5**

**Plumbing Systems (5 days)**

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>1. Given the basic plumbing equipment, combined with a demonstration the student will:</td>
<td>&quot;The World of Construction&quot; McKnight Publish. Text, Lab Manual, and Teacher Guide, 1970.</td>
</tr>
<tr>
<td></td>
<td>b. Install a galvanized drain line, with trap on 2 x 4 framing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Cut a 2 ft. piece section off a 1/2&quot; galvanized pipe and thread the pipe 1&quot; back from each end.</td>
<td>House plans to be obtained by the teacher from:</td>
</tr>
<tr>
<td></td>
<td>d. Install with the proper copper pipe and tubing, hot and cold water lines on the 2 x 4 framing.</td>
<td>Pease Homes Pease Co., 900 Forest Hamilton, O. 45012</td>
</tr>
<tr>
<td></td>
<td>e. Install with the proper plastic pipe and hot and cold water lines on the 2 x 4 framing.</td>
<td>A typical plumbing system follows the roles.</td>
</tr>
<tr>
<td></td>
<td>2. Students will role play jobs as described on the attached pages. Each student will experience each role at least once during the simulation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Given the house plans, the student will estimate the amount of pipe, sizes and type of pipe materials to be used.</td>
<td></td>
</tr>
</tbody>
</table>
1. **Role**: Plumber Foreman (862.131) Page 544

   **Job Description**:

   Supervises and coordinates activities of workers engaged in the assembly, installation and repair of pipes, fittings and fixtures of heating, water supply and waste disposal systems for buildings.

2. **Role**: Plumber (862.381) Page 544

   **Job Description**:

   Assembles, installs and repairs pipes, fittings and fixtures of heating, water, and drainage systems. Studies building plans and working drawings to determine work aids required and sequence of installations. Assembles and installs valves, pipe fittings and pipes composed of iron, steel, brass, lead, copper and plastic using hand tools and power tools.

3. **Role**: Pipe Fitter (862.381) Page 534

   **Job Description**:

   Lays out, fabricates, assembles, installs and maintains piping and piping systems, fixtures, and equipment for steam, hot water, heating, cooling, lubricating and industrial processing system on the basis of knowledge of system operation and study of building plans or working drawings.

4. **Role**: Pipe Cutter (862.381) Page 534

   **Job Description**:

   Sometimes called plumber helper. Slips three wheel cutter over pipe, turns ratchet handle, and rotates pipe cutter around pipe until pipe is cut through. Files burr from end of pipe and cuts burr from inside of pipe using a hand reamer.
PLUMBING SUPPLY SYSTEM. A. Source of water, public or private, and piping up to house. B. Stop and waste valve should be at the low point of the whole system. C. Cold water main is any line serving two or more fixtures. D. Hot water main is any line serving two or more fixtures. E. Branch is any line serving just one fixture. F. Shut-off valve is needed in every branch line and in mains where cutoff might be needed. G. Use air chambers at every branch line before the fixture to prevent water hammer. H. Fixture supply pipe is part of the branch line that fits it to the fixture. Study the drawing.

DRAINAGE SYSTEM. 1. Fixture drain incorporates a trap and leads into the branch waste. 2. Branch waste runs between the fixture and the main drain. 3. Main drain, or soil stack, collects water from the toilet and branch wastes. 4. Vent is the upper portion of the main drain. It reaches up through the roof. 5. Revent is a bypass for air between a branch waste and the vent portion of the main drain. 6. Cleanout opening should be located wherever access to the drainage system may be needed to rod out blockage. 7. Building drain leads from the main drain to the point of final disposal. 8. Final disposal is either a public sewage plant or a private disposal system.
## EXPLORATION ACTIVITY #6

### Heating and Cooling Systems (3 days)

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>1. Given tools and material along with a demonstration, the student will:</td>
<td>&quot;The World of Construction&quot; - Textbook, Lab Manual and Teacher's Guide - McKnight Publ. 1970</td>
</tr>
<tr>
<td>2. Identify and use basic tools for installing and maintaining heating and cooling systems.</td>
<td>b. insulate one side (window side) with blanket insulation.</td>
<td>Honeywell - 821-7410 Bill Sikute or Karen Vineyard</td>
</tr>
<tr>
<td>3. Investigate and gather data from a resource man on mechanical controls, and discuss the opportunities for a career in this area.</td>
<td>2. Invite a career man in heating and cooling controls to discuss with the students facts concerning:</td>
<td>See Appendix E.</td>
</tr>
<tr>
<td>4. Identify and examine filters used in heating and cooling.</td>
<td>a. types of controls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. electrical components</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. maintenance and adjustment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. careers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. wage rates for construction workers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Students will role play jobs on the attached pages.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Demonstrate and lecture using visuals on filters. Discuss the purpose of filters and the reason for changing them.</td>
<td></td>
</tr>
</tbody>
</table>
1. **Role:** Heating Engineer (007.151) Pg. 356

   **Job Description:**
   Specializes in sale and installation of heating equipment. Analyses building properties to determine space to be heated and probable heat loss and gain under varying weather conditions.

2. **Role:** Heating Plant Superintendent (959.131) Pg. 356

   **Job Description:**
   Supervises and coordinates activities of workers engaged in producing and distributing steam heat and hot water in commercial or industrial establishments, and in maintaining mechanical equipment such as boilers, pipe systems, pumps, hot water furnaces and air-cooling units.

3. **Role:** Furnace Installer and Repairman (869.281) Pg. 370

   **Job Description:**
   Installs and repairs hot air furnaces, stoves, and similar equipment in accordance with diagrams and other specifications, using hand tools and pipe threading tools. Builds foundations; assembles and positions heating units; installs air ducts, smoke pipes, blowers and stokers.

4. **Role:** Air-conditioning Installer (827.884) Pg. 8

   **Job Description:**
   Installs domestic air-conditioning units, in private residences and business establishments. Inspects existing wiring and fuses on customer's premises to insure adequate power supply for operation.

5. **Role:** Air-conditioning Mechanic (637.281) Pg. 9

   **Job Description:**
   Services and repairs domestic air-conditioning units. Examines unit visually for defective parts. Listens to machine in operation for unusual noise. May dismantle part or whole machine and repairs or replaces such parts as: switches, relays, motors and other components. Replaces filters, lubricates unit and adjust controls.

6. **Role:** Air-conditioning Mechanic Helper (637.887) Pg. 9

   **Job Description:**
   Assists mechanic to repair, service, or install domestic air-conditioning unit.
7. **Role**: Insulation Installer (863.884) Pg. 388

**Job Description:**

Fastens sheets, bat, blanket, and similar types of building insulation to walls, floors, ceilings, and partitions to prevent or reduce passage of heat, cold or sound.
# EXPLORATION ACTIVITY #7

## Enclosing Walls - Exterior Walls (5 days)

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>1. Given the proper equipment and supplies, the student will lay a corner and a partial brick wall. (Suggest 6 groups and dismantle and clean bricks at end of period.)</td>
<td>&quot;The World of Construction&quot; - Textbook, Lab Manual, Teacher's Guide -- McKnight Publ. 1970</td>
</tr>
<tr>
<td>1. Identify and use the basic tools in enclosing exterior walls.</td>
<td>2. Demonstrate how to stucco on a 3' x 3' panel.</td>
<td>&quot;Careers in the Building Trades&quot; Sidney H. Kasper, Henry Walck, Inc., NY, NY</td>
</tr>
<tr>
<td>2. Recognize and cite evidence for enclosing a house with brick rather than aluminum siding or vice versa.</td>
<td>3. Tour of neighborhood observing various foundations and how masonry is used. Also note different house styles.</td>
<td></td>
</tr>
<tr>
<td>4. Enclose the exterior walls of the framed section with one of the following types of siding:</td>
<td>5. Students will role play the jobs described on the attached pages. Each student will experience each role at least once during this simulation.</td>
<td></td>
</tr>
<tr>
<td>a. wood</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. **Role:** Bricklayer Foreman (861.131) Pg. 76
   
   **Job Description:**
   
   Supervises and coordinates activities of workers engaged in laying brick, tile, cinder-block, and other materials to construct or repair structures, such as walls, arches, sewers and partitions.

2. **Role:** Bricklayer (861.381) Pg. 76
   
   **Job Description:**
   
   Lays building materials, such as brick, structural tile, and concrete cinder, glass, gypsum and terra cotta block (except stone) to construct or repair walls, partitions, arches, sewers and other structures.

3. **Role:** Bricklayer Helper (861.887) Pg. 76
   
   **Job Description:**
   
   Assists bricklayer to build structures. Mixes mortar by hand or machine. Carries bricks and mortar by hand or wheelbarrow. Stacks bricks near bricklayer and moves mortar board at intervals to keep within easy reach of bricklayer.

4. **Role:** Hod Carrier (869.887) Pg. 360
   
   **Job Description:**
   
   Supplies bricklayer or stonemason with bricks, concrete or mortar using hod. Climbs ladder and walks along scaffold, when necessary, to reach workman. Cleans excess mortar from finished work; using brush or scraping tool.

5. **Role:** Stucco Mason (842.381) Pg. 706
   
   **Job Description:**
   
   Applies weatherproof, decorative covering of cement or gypsum plaster to outside building surfaces. Erects scaffolds. Decorates final or finish coat by marking it with sand or with brush and trowel, or by splattering it with small stones.

6. **Role:** Stonemason (861.781) Pg. 698
   
   **Job Description:**
   
   Builds stone structures, such as piers, walls and abutments, or lays walks, curbstones or special types of masonry. Shapes stone preparatory to setting, using chisel, hammer and other shaping tools.
JOB DESCRIPTION:

Applies asbestos, aluminum, pulpwood fiber, plastic panels, brick veneer, or porcelainized metal siding to building exteriors to provide decorative or insulating surfaces.
EXPLORATION ACTIVITY #8

Enclosing Walls - Interior Walls (4 Days)

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Student will be able to:</td>
<td>1. Given the proper equipment and supplies, the student will apply plasterboard to the interior of the Framed Section.</td>
<td>&quot;The World of Construction&quot; - Textbook, Lab Manual, Teachers' Guide, McKnight and McKnight, 1970.</td>
</tr>
<tr>
<td>1. Identify and use the basic tools in installing plasterboard.</td>
<td>2. Given the proper equipment and supplies, the student will apply a small section of tile on a simulated wall frame.</td>
<td>&quot;Manual of Home Repairs, Remodeling and Maintenance,&quot; Grosset and Dunlap Pub. Co., N.Y., N.Y. 1969</td>
</tr>
<tr>
<td>2. Compare, in activity 2 and 3, two methods of finishing bathroom walls and then justify the two methods.</td>
<td>3. Given the proper equipment and supplies, the student will apply Marlite plastic paneling on a simulated wall frame.</td>
<td>&quot;Build a Better Life&quot; 15 mm film, 14 min. Modern Talking Picture Service.</td>
</tr>
<tr>
<td>3. Classify and describe various 'roles' in the construction industry.</td>
<td>4. List the workers shown in the film. Choose one career you would like to consider for future employment and give reasons for this selection.</td>
<td>An illustration on finishing walls follows the roles.</td>
</tr>
<tr>
<td></td>
<td>5. Students will roll play the jobs described on the attached pages.</td>
<td></td>
</tr>
</tbody>
</table>
ROLES AND JOB DESCRIPTIONS RELATED TO ENCLOSING INTERIOR WALLS

1. **Role:**
   
   **Dry Wall Applicator (842.884)** Pg. 229
   
   **Job Description:**
   
   Applies plasterboard or other wallboard to ceiling and interior walls of building. Cuts and fits wallboard to studding and joists using hand tools.

2. **Role:**
   
   **Tile Setter (861.781)** Pg. 738
   
   **Job Description:**
   
   Applies tile to walls, floors, ceiling and promenade roof decks. Examines blueprints, measures and cuts metal lath, tacks lath to wall. Spreads plaster base over lath, cuts and shapes tile with tile cutters and biters.
EXPLORATION ACTIVITY #9
Maintaining and Servicing Outdoor Surfaces (5 Days)

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td></td>
<td>1. <em>Manual of Home Repairs, Remodeling and Maintenance</em>, Grosset and Dunlap, N.Y., N.Y. 1969</td>
</tr>
<tr>
<td>1. Describe the proper procedure in roofing a structure.</td>
<td>1. Given the proper equipment and supplies, the student will apply roof sheathing and shingles to the roof.</td>
<td></td>
</tr>
<tr>
<td>2. Perform tasks that are done by a landscaper or yardman.</td>
<td>2. Given the proper tools and materials the student will:</td>
<td>2. See school custodian.</td>
</tr>
<tr>
<td>4. Justify the materials used in patching an asphalt surface.</td>
<td>b. Apply fertilizer, using spreader, to certain areas of the school lawn.</td>
<td></td>
</tr>
<tr>
<td>5. List the steps in replacing a broken window.</td>
<td>c. Plant various types of grass seed.</td>
<td>4. Examples of concrete mix follows the roles.</td>
</tr>
<tr>
<td>6. Relate the role of washing windows in a skyscraper as opposed to a residence.</td>
<td>d. Resod areas of school ground.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Edge grass around sidewalks and driveways.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. Apply different types of mulching in flower beds and around shrubs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Given the proper equipment and supplies the student will:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Construct forms for a simulated 2'x2' block sidewalk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Set reinforcement wire.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Mix the concrete.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Place and finish the concrete.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Given the proper equipment and supplies, the student will patch existing holes in the parking area of school, and resurface a small portion of the lot.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Given the proper equipment and supplies, the student will wash windows in the shop.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Replace a broken window using the proper equipment and tools.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Given the proper equipment and supplies, the student will wash windows in the shop.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. The students will role play the jobs described on the attached pages.</td>
<td></td>
</tr>
</tbody>
</table>
ROLES' AND JOB DESCRIPTIONS RELATED TO MAINTAINING & SERVICING OUTDOOR SURFACES

1. Role:
   Roofer (866.381) Pg. 606

   Job Description:

   Covers roof with roofing materials, other than sheet metal, such as composition shingles or sheets, wood shingles, or asphalt and gravel, to make them waterproof.

2. Role:
   Landscape Gardener (407.181) Pg. 411

   Job Description:

   Plans and executes small scale landscaping operations and maintains grounds and landscape of private and business residences. Participates with Landscape Laborer (407.887)-(Pg. 407) in preparing and grading terrain, applying fertilizer, seeding and sodding lawns, and transplanting shrubs and plants using manual and power operated equipment.

3. Role:
   Yardman (304.887) Pg. 806

   Job Description:

   Performs any duty that has to do with keeping the grounds of a private residence in a neat and orderly condition.

4. Role:
   Concrete Mixer Operator (570.885) Pg. 156

   Job Description:

   Tends mixing machine to mix sand, gravel and water to make concrete.

5. Role:
   Cement Mason (844.884) Pg. 113

   Job Description:

   Smooths and finishes surfaces of poured concrete floors, walls, sidewalks, or curbs to specified textures, using handtools, including floats, travels, and screeds.
6. **Role:**
   Asphalt - Paving Machine Operator (853.883) Pg. 21
   **Job Description:**
   Drives machine that spreads and levels hot mix bituminous paving material on subgrade of highways, streets and driveways.

7. **Role:**
   Glazier (865.781) Pg. 335
   **Job Description:**
   Installs glass in windows, skylights, storefronts and display cases or on surfaces such as building fronts, interior walls, ceilings, and table tops. May install metal windows and door frames into which glass panes are to be fitted.

8. **Role:**
   Window Cleaner (389.987) Pg. 797
   **Job Description:**
   Cleans windows, glass partitions, mirrors, and all other glass surfaces of building interior or exterior, using a cleanser, sponge and squeegee. May use safety belt for support.
**THE RIGHT MIX**

<table>
<thead>
<tr>
<th>Kind of Work</th>
<th>Cement (sacks)</th>
<th>Sand (cu. ft.)</th>
<th>Gravel (cu. ft.)</th>
<th>Gallons of water per sack of cement if sand is:</th>
<th>Maximum aggregate size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footings, foundation walls (not watertight), columns, chimneys, retaining walls, garden walls.</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7, 6, 5</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>1</td>
<td>2 3/4-3</td>
<td>4</td>
<td>6 1/2</td>
<td>5 1/2, 4 1/2</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>Watertight basement walls, swimming and wading pools, walls above grade, walks, driveways, terraces, tennis courts, steps, floors, septic tanks, storage tanks.</td>
<td>1</td>
<td>2-2 1/4</td>
<td>3</td>
<td>5 1/2, 5, 4 1/2</td>
<td>1&quot;</td>
</tr>
<tr>
<td>1</td>
<td>2 1/2</td>
<td>3 1/2</td>
<td>6 1/2</td>
<td>5, 4 1/2</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>Subject to severe wear, weather, or weak acid and alkali solutions.</td>
<td>1</td>
<td>2</td>
<td>2 1/4</td>
<td>4 1/2, 4</td>
<td>3 1/2&quot;</td>
</tr>
<tr>
<td>1</td>
<td>2 1/4</td>
<td>3</td>
<td>4 1/4</td>
<td>4 1/2, 4 1/4</td>
<td>3 1/4&quot;</td>
</tr>
<tr>
<td>Topping for pavement, steps, tennis courts, floors.</td>
<td>1</td>
<td>1</td>
<td>1 1/4</td>
<td>4 1/4, 4 1/2</td>
<td>3 1/2&quot;</td>
</tr>
<tr>
<td>Thin construction—2-4 inches Fence and mailbox posts, garden furniture, tanks, flower boxes, bird baths.</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4 1/2, 3 1/4</td>
<td>3 1/2&quot;</td>
</tr>
</tbody>
</table>

Footings, foundation walls (not watertight), columns, chimneys, retaining walls, garden walls.

Watertight basement walls, swimming and wading pools, walls above grade, walks, driveways, terraces, tennis courts, steps, floors, septic tanks, storage tanks.

Subject to severe wear, weather, or weak acid and alkali solutions.

Topping for pavement, steps, tennis courts, floors.

Thin construction—2-4 inches Fence and mailbox posts, garden furniture, tanks, flower boxes, bird baths.
# EXPLORATION ACTIVITY #10

## Maintaining and Servicing Indoor Surfaces (4 days)

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Student will be able to:</td>
<td>1. Given the proper equipment and materials, the student will paint the interior walls and ceiling of the framed section.</td>
<td>1. &quot;The Practical Handbook of Painting and Wall-papering,&quot; Morton Schultz, Arco Pub. Co. N.Y., N.Y. 1972</td>
</tr>
<tr>
<td>1. Discuss the advantages and disadvantages of latex paint in comparison to enamel paint.</td>
<td>2. Given floors in need of cleaning and the necessary hand and power tools, the students will scrub and wax the floors.</td>
<td>2. See Custodian</td>
</tr>
<tr>
<td>2. Demonstrate familiarity with and how to use hand and power tools in scrubbing and waxing floors.</td>
<td>3. Given a variety of lighting fixtures, the corresponding bulbs or tubes and the necessary tools, the pupil will maintain optimum lighting by replacing burned out bulbs or tubes.</td>
<td>3. &quot;Manual of Home Repairs, Remodeling and Maintenance,&quot; Grosset &amp; Dunlop, N.Y., N.Y. 1969.</td>
</tr>
<tr>
<td>3. Prepare a list of lighting fixtures that use bulbs or tubes in need of replacement.</td>
<td>4. Given wallpaper catalogs, an assortment of wallpaper tools, paste, sizing, various types and styles of wallpaper the student will practice wallpapering on practice panels.</td>
<td>4. &quot;Plastering, Skill, and Practice,&quot; Van Den Branden, Amer. Tech. Society Chicago, Ill. 1954, Pg. 45-76.</td>
</tr>
<tr>
<td>4. Describe the five steps to follow in hanging wallpaper.</td>
<td>5. Given an assortment of manufacturers material and instructions, along with the proper tools, the student will plaster a section of a simulated wall frame.</td>
<td></td>
</tr>
<tr>
<td>5. Recognize the principle ingredients of plaster and the purpose for each one.</td>
<td>6. The students will role play the jobs described on the attached pages.</td>
<td></td>
</tr>
</tbody>
</table>

---

**Morton Schultz, Arco Pub. Co. N.Y., N.Y. 1972**

**Grosset & Dunlop, N.Y., N.Y. 1969.**

**Van Den Branden, Amer. Tech. Society Chicago, Ill. 1954, Pg. 45-76.**
ROLES AND JOB DESCRIPTIONS RELATED TO MAINTAINING AND REPAIRING INDOOR SURFACES

1. Role:
   Wall Washer (389.887) Pg. 779

   Job Description:

   Cleans interior walls and ceilings of offices, apartments, and other buildings by hand, using sponge and soapy water or chemical solution.

2. Role:
   Floor Finisher (864.884) Pg. 290

   Job Description:

   Performs variety of tasks to recondition wooden floors or prepare new floors for use. Scrapes and sands floors using sanding machine. Applies filler compound to seal wood. Applies wax to floor, polishing with electrical polisher.

3. Role:
   Maintenance Foreman (891.138) Pg. 441

   Job Description:

   Supervises and coordinates activities of workers engaged in keeping buildings and grounds in clean and orderly condition and in maintaining and repairing utility systems and physical structures of buildings.

4. Role:
   Maintenance Man, Building (899.381) Pg. 441

   Job Description:

   Repairs and maintains physical structures of commercial and industrial establishments such as factories, office buildings and apartments, using hand tools and power tools. Replaces defective electrical switches and other fixtures.
5. **Role:**

**Painter** (840.781) Pg. 509

**Job Description:**

Applies coats of paint, varnish, stains, enamel, or lacquer to decorate and protect interior or exterior surfaces, trimmings, and fixtures of buildings, and other structures.

6. **Role:**

**Paperhanger** (841.781) Pg. 515

**Job Description:**

Covers interior walls and ceilings of rooms with decorative wallpaper or fabric. May remove old paper using water or chemical remover and scraper.

7. **Role:**

**Janitor** (382.884) Pg. 392

**Job Description:**

Keeps hotel, office building, apartment house, or similar building in clean and orderly condition. Sweeps and mops or scrubs hallways and stairs. Empties trash and garbage containers. Cleans snow and other debris from sidewalks.

8. **Role:**

**Plasterer** (842.781) Pg. 538

**Job Description:**

Applies coats of plaster to interior walls, ceilings and partitions of buildings to produce finished surface, according to blueprints, architect's drawings or oral instructions. Directs workers to mix plaster to desired consistency, spreads plaster, applies scratch brown or finish coats.
EXPLORATION Activity #11
Conclusion of Building and Maintenance Activities (1 day)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Activities</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>1. Given the finished product, namely the utility shed, evaluate by inspection the construction in terms of completeness, accuracy, and aesthetic qualities.</td>
<td></td>
</tr>
<tr>
<td>1. Inspect the framed section, noting good and bad features in the construction.</td>
<td>2. Given the framed section, the student will organize all data for the purpose of calculating the cost of the unit.</td>
<td></td>
</tr>
<tr>
<td>2. Devise a method to compute the cost of the framed section.</td>
<td>3. The student will devise a plan to sell the framed section.</td>
<td></td>
</tr>
<tr>
<td>3. Analyze plans for selling an item.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EXPLORATION ACTIVITY #12

Individual Student Exploration into Related Careers. Because of the multiplicity of careers in this occupational area, many have been left untouched in this curriculum guide. In this exploration activity, the students can explore a related career of their choice. There are a number of related careers which are the major subject of other curriculum guides.

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>Each student selects and explores a career or job which is related to both his individual interest and the occupational area described in this curriculum guide. The students are to use career information reference located in the class room, school library, public library, their homes and community as resources to complete an &quot;Individual Career Exploration Worksheet&quot; which is attached.</td>
<td>Dictionary of Occupational Titles, Volumes I &amp; II. Occupational Outlook Handbook 1972-73 Ed. Encyclopedia of Careers and Vocational Guidance Volumes I &amp; II (Doubleday) Largo or SRA Career Kits Make a class set of the &quot;Individual Career Exploration Worksheet&quot;</td>
</tr>
</tbody>
</table>
INDIVIDUAL CAREER EXPLORATION WORKSHEET

1. Student's Name: ____________________________

2. Related careers being explored:
   a. D.O.T. Number(s) ____________________________
   b. Relationship to:
      1. Data _______________________________________  
      2. People _______________________________________ 
      3. Things _______________________________________ 

3. Nature of duties or tasks performed:

   ______________________________________

   ______________________________________

4. Important qualifications
   a. Education ______________________________________
   b. Age ____________________________________________
   c. Previous experience _____________________________
   d. Other __________________________________________ 

5. Procedure for applying

   ______________________________________

6. In what occupational areas is this related career found? (If many, list 3 specific areas.)

   ______________________________________

   ______________________________________

   ______________________________________

7. What is the salary for this career?
   a. Starting ______________________________
   b. Maximum _____________________________
8. Are there chances for advancement? Name several promotional positions.

__________________________________________________________________________

__________________________________________________________________________

9. Are there places in Cincinnati where you could work in this career?

__________________________________________________________________________

__________________________________________________________________________

10. Name one or two resource people that you could write or phone for more information.

__________________________________________________________________________

__________________________________________________________________________

11. Are there places that you or a small group of students could visit to observe your career?

__________________________________________________________________________

__________________________________________________________________________

12. Are there any books in the school library on this related career?

__________________________________________________________________________

__________________________________________________________________________

13. What can you do in high school to learn about and prepare for the career of your choice?
   a. ___________________________________________  d. ___________________________________________
   b. ___________________________________________  e. ___________________________________________
   c. ___________________________________________  f. ___________________________________________
EXPLORATION ACTIVITY #13

Student Self Evaluation of Career Maturity

This activity is planned to help the students analyze and learn to value their career-related experiences and the level of their career maturity.

Seven areas of growth and development which have been identified for this use are as follows:

1. Individual and Environment (Social Awareness)
2. Economics
3. World of Work
4. Education and Training
5. Employability and Work Adjustment Skills
6. Vocational Decision Making
7. Self (Self-Awareness)

The student will be able to:

- Respond, in a purposeful and business-like manner, to one or more questions which ask the student to analyze their experiences in each of the developmental areas.

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>ACTIVITIES</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>Each student is asked to seriously consider their career related experiences. A brief class discussion and/or small group discussions may be used to introduce this topic.</td>
<td>The teacher will need to generate class sets of questions.</td>
</tr>
<tr>
<td></td>
<td>The students should view the films &quot;What Do We Look Like to Others&quot; and &quot;I Want to Work For Your Company&quot; if these films have been viewed previously they should be reviewed and discussed.</td>
<td>These two films are available from Resource Services on Iowa Street.</td>
</tr>
<tr>
<td></td>
<td>Following a review of these films each student is asked to respond to a set of self-analysis questions prepared by the teacher. To help the teacher in preparing these questions a definition of each developmental area and sample questions for each area are attached to this sheet.</td>
<td></td>
</tr>
</tbody>
</table>

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DEFINITIONS OF DEVELOPMENTAL AREAS

Individual and Environment (Social Awareness)

In this area of the student's development, the student must determine who he is and how he relates to his environment. He must be involved in experiences which will help him to determine his relative abilities to work with people, to manipulate tools, to sense his presence in his environment, and to comprehend laws of nature and the processes for behavioral advancements within his community.

The student will be involved with understanding his interests, aptitudes, achievements, temperament; his family peers, his society, and etc.

Economics

Students must learn to see themselves as a productive worker unit who supports his community through efficient positive efforts as a producer and consumer. He must learn that the money he receives for his work is an important factor in determining the behavior of his community through the way in which he spends his money; the way in which he is willing to work for his money; and how this spending gives direction to the use of raw materials for production and consumption of goods and services to be used in his community.

The student must learn what is meant by a fair day's pay for a fair day's work and the implied obligations between the consumers and producers.

World of Work

This area is concerned with the student's development of a method for collecting information about jobs. It also is concerned with the student developing an understanding of what behavior is required to do certain jobs.

Examples of job information include, in part, the following items:

- Job entry levels
- Performance activities
- Working conditions
Education and training requirements
Availability of jobs
Seasonality of jobs
Job status
Advancement possibilities

Education and Training

The student must learn what behavior modifications (education and training) will be expected of him for certain jobs. In doing so he will learn the innate abilities he has and if these abilities can be developed to the level required to perform certain jobs he chooses for his vocation.

Students must learn which educational programs will help them to acquire the experience that will help them to develop the performance behavior required for certain jobs.

Employability and Work Adjustment Skills

This section is concerned with attitude strategies and the importance of the development of successful attitude strategies which are necessary for continued economic gains.

Students must learn how good attitudes are a contribution to their own adjustment and success as well as the success of their community. People are dismissed from their jobs more often because they cannot get along with people than they are because they do not have the skills for their jobs.

Vocational Decision Making

Students must learn a method for making decisions if they are to become employable and well adjusted citizens. They must learn to gather facts about themselves, jobs, and values and how to weigh this information to reach a conclusion as to what work they are able to do and what work they want to do.

Self

In this area the Self as subject is the major focus. Self as subject requires that the person's own feelings, perceptions and beliefs are dealt
with. This requires an internal orientation to the activities as opposed to the external orientation of activities for the other areas.

Seven topics are developed in the broad area SELF. These trace self-awareness, self-acceptance and self-affirmation of the child through interests, aptitudes and abilities, achievement and values and attitudes.
SAMPLE QUESTIONS FOR CAREER MATURITY

Listed on this page are sample questions related to areas of growth and development.

1. **Self and Environment**
   - What things have I done with any degree of success?
   - What things have I done that others have commended me for doing exceptionally well?

2. **Economics**
   - How much money have I earned?

3. **World of Work**
   - What jobs have I held? Describe them in detail.

4. **Education and Training**
   - What courses have I taken that would prepare me for an entry job position?

5. **Employability and Work Adjustment Skills**
   - What were the expectations of employers concerning the job I have held?

6. **Vocational Decision Making**
   - Where could I get additional information about jobs and careers?

7. **Self**
   - What are the things I really like to do?
   - What are the things that I don't like to do?
III. APPENDIX

A. Field Trips in Career Development
B. Procedure for Exploration Trips
C. Exploration Trip Permission Form
D. Exploration Trip Report
E. Wage Rates for Construction Workers
FIELD TRIPS IN CAREER DEVELOPMENT

General Student Needs

1. Field trips commonize the background of the students so that there is a basis from which to develop a strong well-rounded instructional program.

2. Because the student is so far removed from his potential career, he needs a broad understanding and exposure to work.

3. Broad off-school-site experiences build readiness for learning by demonstrating that basic skills are essential to a productive work-life.

4. To thoroughly understand a career, the student needs to see the job first hand.

5. Students may not realize all the implications/facets of an occupation in terms of personal interests until they have an exposure to the worker in action.

6. Omission of hands-on experiences may cause a lack of credibility in those courses taught, in the upper levels.

7. While field trips benefit the student, they also benefit the teacher, who, without their assistance, is required to serve as expert on the details of many careers which are not necessarily related to his own speciality.

8. Field trips, when used correctly, can be a source of creating better communication and understanding between business, labor and industry in the community and the school.

Specific Student Needs

Field Trips will do the following:

1. Develop an appreciation/awareness that an individual’s skills, talents and senses are used in a variety of ways.

2. Develop an awareness of the importance of responsibility and attitude for one’s work.

3. Encourage the development of communication skills. Broad off-school sites experiences demonstrate need and provide motivation for skill learnings.

4. Develop an awareness of the interdependence of the student and all workers.

5. Develop an awareness that there are many people who have different responsibilities in business, labor and industry.
6. Develop an awareness that workers are not necessarily associated with or limited to a specific location and an understanding that there are many kinds of work within specific sites/fields.
GUIDELINES FOR IMPLEMENTATION OF FIELD TRIPS IN CAREER DEVELOPMENT

1. The local administrator is responsible for observance of the guidelines by participating staff members.

2. The local administrator should take responsibility for appointing a person to finalize field trip arrangements.

3. There should be planning of each trip well in advance.

4. Teachers should make field trip plans in consultation with other teachers who have a teaching responsibility for the pupils.

5. For the convenience of the faculty, field trip information should be given out several days in advance including destination, length of time out of school, and students participating.

6. The teachers should be aware/appreciative of the expense of the trip to the business or industry in relation to the time spent hosting visitors.

7. Teachers should justify the trip in relation to their instructional program.

8. Teachers who desire to take a particular field trip should plan the trip together, although they may not go together.

9. The faculty of each school may prepare a list of meaningful walking trips utilizing the resources of the local community.

10. After the arrangements have been made, and before the trip, there should be communication between the teacher and the contact person at the place where they are going to clarify teacher expectations.

11. Students should be adequately supervised not only for their safety, but to minimize the interruption to business or industry.

12. There should be well planned pre- and post-activities for each trip.

13. After each trip, there should be a note of appreciation to the business or industry. The teacher may communicate the extent to which expectations were met.

14. A follow-up report concerning the value of the trip and results relating to the specific reason for the trip should be submitted to the administrator/coordinator.

15. Identify the businesses and industries of the Cincinnati community that have only one representative (i.e. the phone company) and those businesses and industries that have multiple representatives in this community (i.e. bakeries, garages).
16. To avoid overloading of limited field trip sites, and to maintain privileges, it is necessary to clear requests for these trips through a central clearing office to be designated by Jack Ford.

17. Teachers may build a list of trips and experiences that parents could provide for their children outside of school hours.
PROCEDURE FOR EXPLORATION TRIPS

SCHEDULE CONSIDERATIONS:

An opportunity is to be provided for students to visit cooperating organizations in small groups for a highly personalized and individualized experience directly related to their career interests. It is essential to minimize the burden on cooperating organizations and to distribute this burden among all community resources and throughout the school year. To accomplish this, trips must be scheduled from the beginning of the school year, and be evenly spaced during the year until every student has been accommodated. The students in a quarter length exploration class may, therefore, participate in an exploration trip prior to, during, or following the time that the course is in progress.

PROCEDURES:

Once each month, or even less frequently, the teacher will need to:

1. Place a single phone call to a cooperating organization to set the date and time for the trip.

2. Notify Mr. Jerome Cousins (Education Center, 230 East Ninth St.) of the date and time for the trip.

3. Select six students from the Career Exploration class list.

4. Send permission slips and trip report forms to the selected students via their homerooms.

Permission slips and report forms are illustrated on the following pages. These forms should be reproduced from this curriculum guide as required.

The career committee chairman or coordinator will provide you with a list of organizations which are known to be willing and able to accommodate your students. Addresses, phone numbers and names of persons to contact will be provided.
CAREER EXPLORATION TRIP PERMISSION FORM

You are schedule for ____________________________ (Career Course Title) which meets 1-2-3-4 quarter. Exploration trips will be scheduled throughout the year regardless of whether the course is in session.

A trip has been schedule for _______ (Date) _______ to _______ (Name of Company) _______. Please have this form signed and return to _______ (Teacher's Name) _______ before _______ (Room) _______ (Date) _______.

My son/daughter ____________________________ has my permission to visit ____________________________ on ____________________________ with the Career Exploration Course ____________________________. The group will return to school upon completion of the tour. There will be about six students in each group.

_________________________  ____________________________
Parent/Guardian Signature    Date

The following teachers have been informed of my absence from class. (Teachers' signatures required.)

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
6. ____________________________
EXPLORATION TRIP REPORT

1. Course Title

2. Student's Name

3. Organization or Company
   Address

4. Major Products or Service:
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
   5. ____________________________
   6. ____________________________

5. Major Types of Jobs:
   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
   5. ____________________________
   6. ____________________________

6. What did you like best about this trip?

7. Did you see any jobs that you would like to do? List them.

8. What did you learn from this tour?

Signature
Representative of Organization Visited
## Wage Rates — JOURNEYMEN and SUPERVISORY — Additive Fringe Issues — Cincinnati, Ohio

### Effective Dates of Agreements

<table>
<thead>
<tr>
<th>Name of Craft</th>
<th>From</th>
<th>To</th>
<th>Wages</th>
<th>Fringe</th>
<th>Health</th>
<th>Acc.</th>
<th>Health</th>
<th>Furlough</th>
<th>Pensions</th>
<th>Apprentice</th>
<th>Prev.</th>
<th>Prev.</th>
<th>Elective</th>
<th>Pensions</th>
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</thead>
<tbody>
<tr>
<td>Asbestos Workers</td>
<td>8-572</td>
<td>6-173</td>
<td>8.31</td>
<td></td>
<td></td>
<td>.30</td>
<td>.50</td>
<td>.02</td>
<td></td>
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<tr>
<td><strong>Boilermakers</strong></td>
<td>10-172</td>
<td>10-173</td>
<td>8.10</td>
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<td></td>
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<td>.01</td>
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</tr>
<tr>
<td>Bricklayers</td>
<td>6-1-72</td>
<td>6-173</td>
<td>9.395</td>
<td>9.645</td>
<td></td>
<td>.45</td>
<td>.03</td>
<td>.025</td>
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<tr>
<td>Carpenters</td>
<td>6-1-72</td>
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<td>.025</td>
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<tr>
<td>Cement Masons</td>
<td>7-1-72</td>
<td>6-173</td>
<td>8.845</td>
<td>9.095</td>
<td></td>
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<td>.50</td>
<td>.02</td>
<td>.025</td>
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<tr>
<td>Electricians—Local zone</td>
<td>6-5-72</td>
<td>6-173</td>
<td>8.75</td>
<td>9.83</td>
<td></td>
<td>.03</td>
<td>.1%</td>
<td>.025</td>
<td></td>
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<tr>
<td><strong>Elevator Constructors</strong></td>
<td>8-16-72</td>
<td>Indef.</td>
<td>8.68</td>
<td>9.785</td>
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<td>.345</td>
<td>.23</td>
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</tr>
<tr>
<td>Engineers—Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.42</td>
<td>.11</td>
<td>.03</td>
<td>.025</td>
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</tr>
<tr>
<td>Class A</td>
<td>5-1-72</td>
<td>5-1-74</td>
<td>8.95</td>
<td>9.47</td>
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<td>.11</td>
<td>.03</td>
<td>.025</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>5-1-72</td>
<td>5-1-74</td>
<td>8.79</td>
<td>9.47</td>
<td></td>
<td>.42</td>
<td>.60</td>
<td>.11</td>
<td>.03</td>
<td>.025</td>
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<tr>
<td>Class C</td>
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<td>8.63</td>
<td>9.47</td>
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<td>.42</td>
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<td>.11</td>
<td>.03</td>
<td>.025</td>
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</tr>
<tr>
<td>Class D</td>
<td>5-1-72</td>
<td>5-1-71</td>
<td>7.95</td>
<td>9.47</td>
<td></td>
<td>.42</td>
<td>.60</td>
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<td>.03</td>
<td>.025</td>
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<tr>
<td>Class E</td>
<td>5-1-72</td>
<td>5-1-71</td>
<td>7.62</td>
<td>9.47</td>
<td></td>
<td>.42</td>
<td>.60</td>
<td>.11</td>
<td>.03</td>
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**Notice:** For supplementary information see article headed Notice To Users Of Wage Chart on Page 10.

* Sheet Metal Contract Provides Increase effective June 1, 1973 based upon change in Cost of Living Index with minimum increase of 2.5%. Rate shown reflects 25% increase.

**Boilermakers agreement in addition to listed rates provides for a 55¢ an hour employer contribution to the Savings Fund.

***Elevator Constructors — in addition to rates listed employers pay for Vacation based on employee's wage rate 2% for men with 5 years experience, 4% for men with over 5 years, and 2% for Supplemental Vacation on all eligible employees.