1951

Apprenticeship information for teachers and counselors

Halzel, Lawrence

Boston University

http://hdl.handle.net/2144/20538

Boston University
BOSTON UNIVERSITY
SCHOOL OF EDUCATION

Service Paper

APPRENTICESHIP INFORMATION FOR
TEACHERS AND COUNSELORS

Submitted by

Lawrence Halzel
(B.S. in Education, Bridgewater Teachers College, 1936)

In partial fulfillment of requirements for
the degree of Master of Education
1951
First Reader: J. Wendell Yeo
Professor of Education

Second Reader: Worcester Warren
Professor of Education
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. SCOPE OF STUDY</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>The problem and purpose</td>
<td>1</td>
</tr>
<tr>
<td>Justification of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>II. HISTORY OF APPRENTICESHIP</td>
<td>6</td>
</tr>
<tr>
<td>Early Growth and Development</td>
<td>6</td>
</tr>
<tr>
<td>The guilds and apprenticeship</td>
<td>6</td>
</tr>
<tr>
<td>Apprenticeship in the American Colonies</td>
<td>9</td>
</tr>
<tr>
<td>American industrial expansion</td>
<td>11</td>
</tr>
<tr>
<td>The Wisconsin Plan of state supervision</td>
<td>13</td>
</tr>
<tr>
<td>Federal interest in apprenticeship</td>
<td>16</td>
</tr>
<tr>
<td>Function of the National Apprenticeship Program</td>
<td>18</td>
</tr>
<tr>
<td>The Fitzgerald Act</td>
<td>18</td>
</tr>
<tr>
<td>The Federal Committee on Apprenticeship</td>
<td>19</td>
</tr>
<tr>
<td>Bureau of Apprenticeship</td>
<td>19</td>
</tr>
<tr>
<td>Apprenticeship policy</td>
<td>20</td>
</tr>
<tr>
<td>Definition of apprentice</td>
<td>20</td>
</tr>
<tr>
<td>Basic standards</td>
<td>21</td>
</tr>
<tr>
<td>National trade joint committees</td>
<td>22</td>
</tr>
<tr>
<td>State apprenticeship councils</td>
<td>23</td>
</tr>
<tr>
<td>State apprenticeship agencies without legislation</td>
<td>24</td>
</tr>
<tr>
<td>Local Joint Trade Apprenticeship Committees</td>
<td>25</td>
</tr>
<tr>
<td>Plant joint committees</td>
<td>27</td>
</tr>
<tr>
<td>Where a joint committee is not established</td>
<td>27</td>
</tr>
<tr>
<td>Registration of apprenticeship agreements</td>
<td>28</td>
</tr>
<tr>
<td>Placement of apprentices</td>
<td>29</td>
</tr>
<tr>
<td>Apprenticeable occupations</td>
<td>29</td>
</tr>
<tr>
<td>III. A SOURCE UNIT ON APPRENTICESHIPS</td>
<td>31</td>
</tr>
<tr>
<td>General Statement of the Unit</td>
<td>31</td>
</tr>
<tr>
<td>Definition of Terms Used</td>
<td>32</td>
</tr>
<tr>
<td>The unit</td>
<td>32</td>
</tr>
<tr>
<td>Delimitation of the unit</td>
<td>32</td>
</tr>
<tr>
<td>Incidental and indirect learning products</td>
<td>33</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>The unit assignment.</td>
<td>33</td>
</tr>
<tr>
<td>Time and place of unit.</td>
<td>33</td>
</tr>
<tr>
<td>Optional related activities.</td>
<td>33</td>
</tr>
<tr>
<td>Delimitation</td>
<td>35</td>
</tr>
<tr>
<td>List of Probable Indirect and Incidental Learning Products.</td>
<td>51</td>
</tr>
<tr>
<td>The Unit Assignment.</td>
<td>53</td>
</tr>
<tr>
<td>Optional Related Activities.</td>
<td>56</td>
</tr>
<tr>
<td>Items for the Final Test.</td>
<td>60</td>
</tr>
<tr>
<td>Key for Scoring the Final Test.</td>
<td>66</td>
</tr>
</tbody>
</table>

IV. THE APPENDICES AND THE BIBLIOGRAPHY.                                  | 67   |

Appendix
A. National Apprenticeship and Training Standards for the Sheet Metal Industry. | 69   |
B. Automotive Mechanic Standards Set Up by The State Apprenticeship Council of Massachusetts. | 70   |
C. Apprentice Agreement.                                                   | 74   |
D. Daily Work Record.                                                      | 75   |
E. Monthly Record Card.                                                    | 76   |
F. Certificate of Completion of Apprenticeship.                           | 77   |
G. General Trade Classifications.                                          | 78   |
H. Apprenticeable Occupations.                                            | 81   |

The Bibliography.                                                         | 101  |
CHAPTER I

SCOPE OF STUDY

1. Statement of the Problem

The problem and purpose.-- This study will attempt to make available to teachers and counselors information regarding the history, growth, functions, benefits and importance of apprenticeship training as a necessary unit in any occupational information program. It is the intent of this paper to organize from various sources, data which will show the teacher and counselor the importance of apprentice training to our youth, community, nation and industry and to develop a unit to be used in teaching about apprenticeships.

Although much literature exists today with respect to apprenticeship programs, to the best knowledge of this writer there does not exist a single source that presents the most pertinent information concerning apprenticeships in a form that will be valuable for both counseling and teaching situations. This paper has been written in an effort to provide (1) a single source of general information about apprenticeships to which the busy counselor may refer, and (2) a source unit on apprenticeship for use in teaching.

2. Justification of the Problem

Education for the democratic way of life recognizes the
right of every boy and girl to an educational program which is appropriate to his ability, skill and energy. To enable our youth to achieve a place for themselves in society, guidance programs have been accepted as a basic necessity in most schools.

According to Dunsmoor and Miller\(^1\)

"Guidance is a means of helping individuals to discover and use wisely the educational and vocational abilities and opportunities which they have or can develop."

The United States Office of Education recognizing the need for guidance in our schools established an Occupational Information and Guidance Service in 1939 and the Commissioner of Education in describing this Service said

"The emphasis of the Service will be placed upon cooperation with the state and local authorities in making occupational information and guidance really function in the education of boys and girls, youth and adults, in city and country. The Office of Education hopes thereby to render an important service in the further development of a movement which the laws of economics and sociology seem to indicate can no longer be denied as one of the essentials in any modern program of education."

The young person confronted with a complexity of choice not only of occupations and of jobs within an occupation, but also of future training will seek various kinds of information.


Dunsmoor and Miller point out

"The counselor or teacher-adviser who imparts occupational information may expect to receive requests for a wide variety of information related to occupations and job getting. It is thus necessary to keep abreast of trends in occupational opportunities; to know where current and accurate descriptions of occupations be secured; to have means for making occupational information readily accessible; to be able to keep pupils informed on labor union requirements as these affect certain occupations; and to provide information which will assist students in finding, preparing for and progressing in a job."

Helping a student to evaluate and select employment opportunities and a place of training is one of the most critical duties that falls to a counselor. Among these students are: Drop-outs who seek aid in securing employment or specialized training; graduates who seek employment, including those who have or have not completed terminal courses; and those who plan to continue their education or training in different institutions.

Erickson states

"One of the very important services of the guidance program is that of providing adequate, timely and effective occupational information. ...The guidance program must help provide a plan for regularly providing all pupils with adequate information about job trends, major fields of work, requirements, opportunities, rewards, local opportunities, information about specific occupations, and other types of pertinent data."


More than two million young men and women each year face the problems involved in entering wage earning occupations. Until recently altogether too much emphasis was laid on preparing students for white collar jobs in the professions or in the secretarial and commercial fields. The trade schools were considered as dumping grounds for students with unfortunate behavior patterns or of low ability. The last decade has demonstrated the need for more and more skilled workers in our industrially expanding country.

This country looked to Europe in the past for its skilled tradesmen. We received our machinists more or less from Belgium and Germany, our stone cutters from Italy and France, and our carpenters and cabinetmakers from Scandinavia and Scotland. With European immigration greatly restricted, we must fall back on ourselves and train our own young people to be skilled tradesmen.

Kahler and Hamburger state that "our schools are not turning out a sufficient number of trained workers to keep the American economy adequately manned at the key technical and manual levels." They further point out that "a good many of the craftsmen in the United States are more than forty-five years old. For every twelve of those soon to be replaced in each of the following categories, replacements are being trained for eight electrical workers, four sheet-

metal workers, three machinists, not quite one building-trades worker, and one-fifth of one tool-and-die maker."
CHAPTER II
HISTORY OF APPRENTICESHIP

1. Early Growth and Development

To better understand the present system of apprentice training, a review of the history of apprenticeship would be of value.

Almost since the beginning of recorded history apprenticeship training has provided society with a means of developing skilled craftsmen in nearly every trade essential to the civilized world. Evidences of apprenticeship are found in the Babylonian code of Hammurabi in 2100 B.C. which made explicit provision that artisans teach their crafts to youth. The records of Egypt, Greece, and Rome in earliest time also reveal this passing on of skills from generation to generation through some form of apprenticeship.

The guilds and apprenticeship. -- During the Middle Ages in England the only method of training and regulating the employment of children was that provided by the system of apprenticeship. By the fifteenth century almost all the trades were under the control of associations of workmen known as guilds; and as part of their system of monopoly and to insure a standard of work, the guilds developed a program for super-

vising the training of young workers by master craftsmen. A system of enrolling all learners, of requiring a fixed period of training, usually seven years, fees during training, and admission to the guilds after completion of apprenticeship was well developed in towns and cities. Those who went through the apprenticeship system were firemen, an inherited status carrying industrial, social and political privileges. The Statute of Artificers adopted under Queen Elizabeth in 1562 made the system of apprenticeship compulsory, and what had been a system of private training became a national system with detailed regulation of the conditions of employment. It was, however, largely enforced by the guilds and depended for its effectiveness upon the strength of the guilds.

Apprenticeship was the instrument of the guilds, devised by them, and developed by them as a means to train novices in the skill, duties, and responsibilities of membership in the brotherhood of the craft. The master craftsman was the chief factor in the technical work in his shop. He not only directed the work of his employees, the journeymen, and guided the efforts of the apprentice, but he performed a large part of the work himself. He was also a teacher, charged with the important duty of teaching others to perform the many duties which he himself faced. He was bound under the clauses of indentures to instruct his apprentices well in all the arts.

of his trade and he was subject to penalties if he failed in his duties as an educator.

The guild was a brotherhood of master craftsmen who united to protect themselves and their craft. They established regulations regarding quality of work, wages, and apprenticeship. Definite rules were planned to guide the conduct of the apprentice, to regulate his morals, and to form his character in such a way that he would be fitted for his complicated task. The apprentice was as strictly bound by the regulations pertaining to his behavior as he was by those pertaining to his work. The relationship of master and apprentice outside of the shop was of such a character as to effect the most desirable education for the apprentice, both in business and social contacts. The master was bound to feed, clothe and house the apprentice. The younger man ate at his master's table, slept under his roof, aided the wife and family of the guildsman in their home, and was in a sense one of the family.

LaCroixates lists the following as rules laid down in an effort to inculcate morality and good feeling into the guild:

1. Youths were denied admission who could not prove legitimacy by baptismal record.

2. To obtain freedom the candidates must have irre-

\[1/\]

proachable character.

3. Artisans exposed themselves to reprimand and chastisement for associating or working or drinking with those who had been expelled.

4. Licentiousness and misconduct rendered them liable to be deprived of membership.

Frequently apprentices were forbidden to marry until they had become one of the craft, or if allowed to marry, the permission of the master was necessary. The master who was contracted to teach his trade to an apprentice was required by the guild regulations to pay strict attention to his moral and social education.

For two centuries this system prevented exploitation of children and insured their employment in a skilled trade in adult life. Its advantages were limited to the children under guild supervision, and large numbers of other children employed in unskilled trades were entirely unprotected and untrained.

Later it became the practice of apprenticing pauper children. As work was generally considered the best type of training for children of the working class and it was popularly believed that poverty was the result of shiftlessness, it was not surprising that it seemed in the public interest to apprentice poor children and especially those who were dependent upon public relief.

Apprenticeship in the American Colonies.-- Young appren-
tices were among the earliest settlers in the western hemisphere. Large numbers of children recruited from the almshouse population and poor of London were sent to Virginia in the seventeenth century under apprenticeship contracts. Workmen were greatly needed in the new country, and young children who worked during their minority without pay were cheap and useful. But it was not only these London children who were apprenticed in the colonies. Apprenticeship was the usual method of learning a skilled trade in the colonies, and it soon became the accepted method of enabling poor children to earn their way and not to become a burden on the community. Laws were passed by the Colony of New Plymouth in 1641 and by the Massachusetts Bay Colony in 1642 providing for the apprenticeship of poor children when parents were incompetent or neglected to teach their children to work. The first public schools in America grew out of apprentice training. These were set up in Pennsylvania, designed to provide certain instruction for poor children.

While most of the poor children seemed to have been apprenticed for house and farm work, there was a demand for promising boys as apprentices for the trades. As young men pushed the frontier farther west, the local supply continued inadequate, and apprentices were sought from abroad in the latter part of the eighteenth century. In an agricultural country where home manufacture supplied clothes, fur, tools, leather goods, soap candles and many other articles there
were many trades to be taught in which slaves and indentured servants were used and the supply of free workers was inadequate, the employment of children was not challenged and apprenticeship seemed to have certain advantages, among them the fact that apprentices lived in the master's family.

American industrial expansion. — As mills and factories began to appear, there was also a demand for training schools or workhouses where the poor children could be taught spinning and weaving and a few other trades. Such schools were established in a number of colonies, the forerunners of the textile institutes of a later period.

With the growth of the factory system industrial apprenticeship began to disappear, and, parents appreciating only their immediate necessities, desired to move their children from factory to factory to secure higher wages rather than have them spend several years in learning a trade.

Apprenticeship however survived as a method of directing boys into the skilled trades but, unsupervised, the apprentices were often poorly trained and generally exploited by the masters. In more recent years provision for training had been left to voluntary and often haphazard arrangements between employers, unions and vocational schools, with the result that there had often been a shortage of skilled workmen in the United States.

With the expansion of industry in this country and abroad, following the industrial revolution, the apprentice-
ship system was revolutionized for application to the new machine age. The custom of domiciling apprentices with masters disappeared with the increasing size and impersonality of industry. The previous compensation with board and lodging was changed by employers to payment of wages, though insignificant compared with those of today, were graduated in accordance with a predetermined scale. The term "master" which originated during the days of "domestic apprenticeship" as it has been appropriately called, has been carried on.

It is only in very recent years that an effort has been made to bring order out of this training chaos and give the young apprentices adequate training at reasonable wages during the learning period. Thirty years ago it was generally agreed that apprenticeship system was archaic, and that training for work should be given in trade schools.

Until 1908, pressure for the development of apprenticeship—for definite agreements or arrangements that would insure orderly and progressive training in the skilled occupations—had come from two sources: namely, from certain enlightened trade unions and from certain enlightened employers. Its chief sponsors were the highly skilled trade unions and the large scale manufacturers. A limited number of these employers set up a kind of apprentice training, employed special instructors to supervise the work of the apprentices in the shops, and gave apprentices regular classroom instruction in subjects essential to the industries concerned. These were
called corporation schools. Some apprentices were also sent to public or private schools for supplementary training. Some apprentices were also sent to public or private schools for supplementary training. Some of the trade associations developed apprenticeship systems of their own which included standards for the employment of apprentices, and provided textbooks to cover their related instruction. These lacked administrative machinery for joint labor management supervision and follow-up. During this period, however, several of the larger trade unions—the Pressmen's Union and the International Typographical Union—began to develop their apprenticeship systems which included correspondence-course lesson material and necessary regulations.

The Wisconsin Plan of state supervision.—The State of Wisconsin led in developing a new apprenticeship system by being the first state to place upon its statute books a law dealing with the subject of apprenticeship. For this country it was a new step in government participation in industry and an innovation in the development of industrial education. One of the first functions of the state apprenticeship was to explain the plan or law and its import to the people of the state. This procedure was accomplished by talks before members of


labor organizations, employers, parents and apprentices. It was also felt advisable to acquaint educators, who were in a capacity to advise young people in their life work, with the nature and opportunity of a state supervised apprenticeship system.

The first principle of the law required that all learners of any trade, craft or business who are minors sixteen years or over shall be placed under a written apprenticeship agreement. It did not compel employers to have apprentices. It merely provided that those employers who do have apprentices must have them under specified conditions. Neither did it establish apprenticeship wages. It merely gave the administrative commission power to annul or disapprove any individual agreement if that agreement was deemed to be inimical to the interests of the apprentice.

The Industrial Commission of Wisconsin was charged with the administration of the law. In order to carry out the principle of the statute and at the same time make the application of these principles practical, the Industrial Commission arranged for the appointment of a State Advisory Board which was made up of three employer members, three representatives of labor and a representative of the schools. Since apprenticeship dealt with many varieties of trades and occupations, it was found that one state advisory committee could not adequately consider the peculiar requirements and conditions of individual trades. This state committee could ad-
vise on general matters of policy in which the point of view or the interests of either labor or management might be concerned, but not the technical conditions of any particular crafts. There next followed the organization of advisory committees in the different trades and occupations in which it was desired to establish apprenticeship training.

The decade starting in 1920 saw the first concerted move for a national system of apprenticeship, and the American Construction Council's program of 1923 foreshadowed many of today's objectives. All through the 1920's, the effort to develop apprenticeship persisted and gained some ground especially in the construction industry and particularly after the recruiting of large numbers of our skilled workers abroad. In 1920, the American Construction Council appointed a General Apprenticeship Committee. The Council was a national body representative of all elements in the construction industry, including architects, engineers, construction labor, general contractors, sub-contractors, material and equipment dealers, financial, bond, insurance, real estate, building and loan, chambers of commerce and boards of trade, construction departments of public utilities, officials of federal, state, municipal and county departments identified in any way with construction, national associations of builders' exchanges and of building trades' employers and similar associations of federations of building interests and the public.

The Council felt that in order to promote in a broad and
effective manner the idea of apprenticeship among all elements affecting the construction industry, and to secure the active and widespread support required to insure permanent results, national action would be required. It also agreed that an adequate and efficient labor supply for the industry must be based upon national as well as individual local needs and resources. The late Franklin D. Roosevelt, who at that time was President of the Council, emphasized the council's duty of arousing the country to the need of placing skilled manual labor on a par with the clerical and non-manual occupations in public esteem, and the necessity for more appreciation of the dignity of craftsmanship. Thus it will be seen that in foreshadowing of the idea of national apprenticeship standards for the various trades, the American Construction's program of 1923 pointed to the need for a governmental agency to promote apprenticeship on a national basis and was a forerunner of the federal apprenticeship law enacted in 1937.

Federal interest in apprenticeship.— In 1928, the Bureau of Labor Statistics surveyed the situation in the construction industry in nineteen cities, and the facts brought out in the survey high-lighted the need for action on apprenticeship which would be national in scope.

1/ Patterson, William F., "Twenty-Five Years of Apprenticeship in America--1913-1938," Industrial Arts and Vocational Education 28:10-12, January 1939.

The Federal Committee on Apprentice Training was set up by the N.R.A. in August, 1934 by the Secretary of Labor under authority of an Executive Order issued by the President. Its purpose was to permit the employment of apprentices under the N.R.A. codes, and to insure rounded development of skilled workers. When the N.R.A. was declared unconstitutional in August, 1935, apprenticeship was felt to be of sufficient importance to justify the continuance of the Federal Committee, and the President transferred the Apprenticeship Committee functions to the National Youth Administration. At no time, did the National Youth Administration assume any administrative supervision of the Federal Committee on Apprentice Training but only provided funds for its continuance. Among the first instructions sent to State directors by the Executive Director of the National Youth Administration was a definition of apprenticeship and a statement of the policies which had been established by the Federal Committee with regard to apprenticeship.

State directors of the National Youth Administration were requested to assist in promoting the services of the State apprentice committee in the following ways:

1. By regular attendance at State committee meetings.
2. In talks with civic, educational, employer, and employee groups by stressing the desirability of

cooperating with the State apprentice committees.

3. By helping impress the youth of the State with the vital importance of having all trade-learning arrangements approved by the State committee on apprentice training.

4. By frequent conferences with members of State committees to ascertain activities which can be undertaken in the interest of apprentice training.

5. By interpreting the needs of the youth of the State to the apprentice committees.

2. Function of the National Apprenticeship Program

The Fitzgerald Act. — In the meantime, it was becoming increasingly evident that the apprenticeship problem was not merely an emergency one, but involved a long-time problem having important bearing on the future industrial picture. In August, 1937, Congress passed without a dissenting vote the Fitzgerald Act which authorized and directed the Secretary of Labor

"...to formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices, to extend the application of such standards by encouraging the inclusion thereof in contracts of apprenticeship, to bring together employers and labor for the formulation of programs of apprenticeship, to cooperate with State agencies engaged in the formulation and promotion of standards of apprenticeship, and to cooperate with the National Youth Administration and with the Office of Education of the Department of the Interior."

1/ United States Public Law No. 308, 75th Congress, Chapter 633, 1st Session, August 16, 1937.
The Federal Committee on Apprenticeship.-- The furtherance of labor standards of apprenticeship was made a permanent responsibility of the United States Department of Labor and the Federal Committee on Apprenticeship made up of representatives of management, labor, and vocational education was appointed by the Secretary of Labor to carry out the functions of the Fitzgerald Act in all trades and industries. The General Committee on Apprenticeship for the Construction Industry consisting of leading representatives of contractor and labor organizations, also appointed by the Secretary of Labor, acts as a coordinating body for apprentice training in all branches of the construction industry. These committees act in an advisory capacity on all major policies relating to apprenticeship, through the various industries; while the Bureau of Apprenticeship performs the administrative work in carrying out these policies.

Bureau of Apprenticeship.-- The functions of the Bureau of Apprenticeship are:

1. To promote a better national understanding of apprenticeship standards; and to develop and recommend minimum standards of apprenticeship for various trades;

2. To act in a technical, consulting, and advisory capacity to all agencies concerned with labor

standards of apprenticeship;

3. To cooperate with State apprenticeship councils and with local trade apprenticeship committees;

4. To act as a central agency for the collection and distribution of information on progress, methods, and procedures useful in promoting labor standards of apprenticeship.

The Bureau of Apprenticeship had been called the Apprentice Training Service until 1948.

Apprenticeship policy.— The basic policy of the Bureau of Apprenticeship is that programs for the employment and training of apprentices should be jointly developed and mutually satisfactory to the employers and to the employees. Since apprentices are employed in a wide variety and constantly growing number of trades, the standards recommended by the Federal Committee on Apprenticeship are general in scope. Following are the standards which guide the staff of the Bureau of Apprenticeship in assisting industry to set up systems for the training of apprentices:

Definition of Apprentice.—

"The term 'apprentice' shall mean a person at least 16 years of age who is covered by a written agreement registered with a State Apprenticeship Council, (where no such Council exists registration is with the Federal Committee on Apprenticeship—


2/ Ibid.
ship) providing for not less than 4,000 hours of reasonably continuous employment for such person, and for his participation in an approved schedule of work experience through employment, which should be supplemented by 144 hours per year of related classroom instruction."

Basic standards.

1. An apprenticeable occupation is considered one which requires 4,000 or more hours to learn.

2. A schedule of the work processes to be learned on the job.

3. A progressively increasing scale of wages for the apprentice that should average approximately 50 percent of the journeymen's rate over the period of apprenticeship.

4. Provision for related classroom instruction (144 hours per year of such instruction is normally considered necessary).

5. The terms and conditions of the employment and training of each apprentice to be stated in a written agreement and registered with the State Apprenticeship Council (in states in which no Council is established, review and registration is performed by the Bureau of Apprenticeship).


7. Apprenticeship should be jointly established by

1/ Ibid.
the employer and the employees.

8. Adequate supervision and the keeping of records should be required for all apprenticeship programs.

National trade joint committees.— The promotion of apprenticeship on a national basis was encouraged and to date national joint committees are established in the following fifteen skilled trades: Plumbing; steamfitting, carpentry; plastering; cement, asphalt and composition finishing; roofing; tile setting; terrazzo work; photo-engraving; machinist and tool and die making; electrical; painting and decorating; sheet metal work; bricklaying; and stained glass work. The standards developed by these committees represent a trade's judgment and experience as to what constitutes the best preparation for its future skilled workers. They have been carefully worked out through negotiations between the national employers' and the national workers' organizations covering the particular trade or industry, and have been endorsed by the respective organizations at their annual conventions. The adoption of these standards and their application to apprenticeship in local communities should ultimately result in making future journeymen in a trade or industry uniformly competent in every section of the country. (See——

Appendix A for the National standards for the Sheet Metal—

State apprenticeship councils.—It was recognized that a successful national apprenticeship program would require active participation by the states. To conform to accepted relationships between the Federal Government and the States as well as to secure the cooperation of interested State agencies and State associations, State Departments of Labor were requested to establish Apprenticeship Councils. These State Councils are made up of an equal number of representatives of employers and employees and usually a representative of the State Board of Vocational Education and a representative of the State Department of Labor. Using the apprenticeship standards recommended by the Federal Committee on Apprenticeship as a guide, the State Councils set up their own standards (see Appendix B), and procedures which industry will be asked to follow in employing and training apprentices. After a State Council has been appointed and has prepared its standards and procedures it becomes a part of the national apprenticeship by securing recognition from the Bureau of Apprenticeship.

In general, the state functions within its confines in almost the same way that the Bureau of Apprenticeship functions over the whole country. It aims to provide the state with an adequate skilled worker force in all the recognized crafts. It endeavors to bring all the interested agencies, organizations and factions together with the objective of
getting a unified attack upon the apprenticeship problem. By bringing divergent groups together and with them mapping out programs, plans and activities, it removes obstacles in the way of results. It watches all legislation in order that skilled-worker training in the state can prosper. There is hardly a duty assumed by the national apprenticeship program which cannot be duplicated by the state.

State apprenticeship agencies without legislation.-- It is by all means preferable that state agencies derive authority through an apprenticeship law enacted by the legislature. However, ten states without laws have approved state apprenticeship councils. Those councils are appointed and recognized by appropriate officials, and they carry on in almost identical fashion with the councils supported by state legislation. They have legal derivation because state officials in appointing them usually use the authority of some organic act for establishing such department.

Such councils, however, are in a sense a stop-gap until specific legislation can be obtained. They are an excellent device through which to prepare the state for legislation and to rally apprenticeship advocates round a common program. In fact, states with that type of council have achieved results comparable with those of states having councils through benefit of legislation.

To achieve maximum results and smoother operations, the state should utilize to the utmost educational campaigns and
statistical and clearing-house information emanating from national sources. It should look to the Bureau of Apprenticeship for leadership, advice, technical service, assistance, and encouragement, with the realization that the economic future of the country demands a uniform apprenticeship system rather than 48 independent and differing systems.

The state has just as much to give the federal government as the federal government has to contribute to the state. By making its own program effective, the state helps the national program to achieve its aim of equal coverage in every state and locality. By supplying apprenticeship statistics and information, it helps to make the national figures truly representative and factual. By sending its representatives, it helps to strengthen the activities of every other state.

**Local Joint Trade Apprenticeship Committees**—Since the actual employment and training of apprentices takes place in local communities, it is apparent that all of the work of national and State apprenticeship groups is directed toward securing interest and action on the part of local employers and employees.

In those trades where both employers and employees maintain local organizations the objective is to secure the appointment of a local joint apprenticeship committee for the particular trade. This committee is given the responsibility by the appointing organizations to develop standards to govern the employment and training of all apprentices in the
trade by all employers in the group and by other employers who may not be members of the employers' organization but who are willing to subscribe to the written apprentice training system.

Included in the written program, besides the standards of employment and training are procedures for the supervision and examination of the apprentices.

The employment standards establish qualifications for employment such as the amount of required education, aptitude, age limitations, wages, hours of work, and any other particulars which concern the apprentice as a worker. The training standards establish the term of apprenticeship, the schedule of job processes in which the apprentice is to be provided practical work experience through his employment, and the amount of time the apprentice will be required to attend classes to receive instruction in subjects related to his trade.

Responsibility for providing the related trade instruction rests in the local and State vocational schools. The joint apprenticeship committee usually is appointed by the school to act in an advisory capacity to it in developing the program of classroom instruction to be given the apprentices and to provide such continuing advisory service as is needed to assure a well-rounded training program.

The procedures prescribe the manner in which written apprenticeship agreements are executed and registered with the State Apprenticeship Council; they outline the way in
which apprentices will be supervised at work and at school and such other operating particulars as agreed upon by the employers and employees.

In the final apprenticeship system the continuing responsibility of joint committees will be defined. Usually in the building trades the employer and employee groups give the joint committee a continuing operating responsibility. In the manufacturing industries the joint committee is given a continuing advisory responsibility; it exercises a review function rather than a direct supervisory function. (See Appendix C for apprentice agreement.)

**Plant Joint Committees.**—Where it is not practicable for an employer to participate in a trade wide apprenticeship program, the employer and his employees, if the latter have an organization, are encouraged to set up a plant joint committee to prepare in writing an apprenticeship program defining the conditions of employment and training for apprentices in the plant. The plant program usually contains a provision for a full or part-time supervisor of apprentices, as well as an outline of the supervisor's functions in relation to those of the committee. (See Appendix D for daily work record and Appendix E for the monthly record card.)

Where a joint committee is not established.—Where employees in a plant do not have an organization or where the existing employee organization is not particularly concerned with the training of skilled workers, the employer establishes
his own apprenticeship system and registers it with the State Council.

Since the State Council is made up of equal employer and labor representation and has agreed upon basic standards for the training of apprentices, its review and registration of the employers' apprenticeship system is construed as meeting the basic policy of the national apprenticeship program.

Registration of apprenticeship agreements.-- Local apprenticeship programs provide for the registration of individual agreements between apprentices and their employers with the State Apprenticeship Council. This registration serves to safeguard the interests of the apprentices in several respects and at the same time establishes a national inventory of the total number of apprentices in training by trade classifications and the approximate number of apprentices in each period of the term of apprenticeship.

The review and registration of the individual agreements makes a public record of the fact that the apprentice is being employed and trained in an occupation and under standards recognized by industry and public agencies as being adequate to produce a qualified all-round skilled worker; it provides a record against which the apprentice and future employers in later years can establish facts regarding the worker's training; it serves as a check against the hiring of an apprentice who is under contract to another employer or of the employment of a worker as an apprentice without adequate credit for
his previous experience; and it provides the basis for the issuance by the State Council of Certificates of Completion of Apprenticeship. (See Appendix F for copy of this certificate.)

Placement of apprentices.-- The local trade or plant written apprenticeship program specifies the way in which applicants will be selected and employed. Usually, there are more applicants for employment as apprentices than there are openings to be filled. First opportunities are in many instances offered the sons or daughters of workers in the particular industry providing they can meet the standards established for entrance into the trade as apprentices. Other apprentices are selected from registers of the local office of the U. S. Employment Service. With respect to placement of applicants, close cooperation should be established between the local joint committee, the local vocational school and the local office of the U. S. Employment Service.

Apprenticeable occupations.-- Listed in Appendix G are over a hundred general trade classifications, each of which includes one or more skilled occupations in which apprenticeship programs have been established by industry and registered with the Bureau of State Apprenticeship Agencies. The customary term of apprenticeship in years is indicated with each occupation (see Appendix H). Where a range of years is shown, it represents varying practices in different industries or localities.
The classification system covers broad trade or industry groupings. In some cases the classification covers occupations found in more than one industry. Other classifications cover occupations peculiar to only one industry. A general description of the occupations itemized may be found in the Dictionary of Occupational Titles (Parts I and II and Supplement, Edition III).

The mere fact that an occupation is listed as apprenticeable does not mean that every proposal for employment or training in it should be considered as apprenticeable. It is the recommendation of the Federal Committee on Apprenticeship that programs proposing training in any apprenticeable occupations should meet the Basic Standards as listed earlier in this paper.

CHAPTER III
A SOURCE UNIT ON APPRENTICESHIPS

General Statement of the Unit

Every year approximately two million high school youth must decide whether to continue their education and training or to enter some kind of occupation. As a result of the industrialization of our society, each student is faced with the task of choosing his vocational career from hundreds of different types of vocations. The tremendous expansion of production, the keen competition of modern business and the great need of professional and other services resulting from social legislation require specialized training of large numbers of people. Our industrial expansion has raised the need for great numbers of skilled workmen and youth is faced with the challenge of meeting these demands. The traditional high school courses do not prepare youth for the occupations most in need of additional labor.

The system of apprentice training which is a carefully planned comprehensive program and which includes on-the-job experience under adequate supervision and related instruction in the theoretical aspects of the work, receives very little attention in the high schools. Accordingly many students who would have found this method of training most practical have
drifted into overcrowded and less desirable occupations. The successful choice of an occupation by the majority of students is not only of importance to the individual but to the productivity and efficiency of our national economy.

It is therefore extremely important that every guidance program provide adequate information to help each student select that form of training which is most closely related to his interests and capacities.

Definition of Terms Used

The terminology of this service paper, with reference to this unit, is based on that used by Roy O. Billett in his book on unit organization in the secondary school.

The unit is a series of complete declarative sentences which are the counselor's aims stated in knowledge, skills, ideals, and attitudes which the students should have acquired at the end of this unit.

Delimitation of the unit is the reduction of the unit to more specific statements in order to definitely define the limits or boundaries of the unit. This best describes the objectives of the instruction which is to follow for a certain period of time. The vocabulary employed is that which high school students may be expected to use.

2/ Ibid., p. 505.
3/ Ibid., p. 506.
Incidental and indirect learning products.\(^1\) The incidental learning products are the accidental extrinsic values derived by the student while participating in this type of unit work. The indirect products appear in the form of habits, attitudes, and skills contributed by the unit through its various individual and group activities.

The unit assignment is a guide which the teacher or counselor uses to introduce the unit by means of instructions, written or oral or otherwise. It is intended to put the students into an interrogative frame of mind and is also intended to stimulate problem-solving activity.

Time and place of unit will depend to a great extent upon the total time allotted for group guidance activity. It is felt that this unit should be included in a program of occupational information whereby students learn where and how to obtain certain data to help them select their life's work. It is hoped that sufficient emphasis will be placed upon this so that students may recognize that preparation for a skilled occupation is just as important and as long as it is for the professional jobs.

Optional related activities\(^3\) are those activities which are not required, but which provide for the area of individual differences. These activities related to the desired

2/ Ibid., p. 506.
3/ Ibid., p. 507.
goals are usually performed by students desiring higher grades or students who are interested in knowing more about the subject for personal vocational use. These activities should be selected with the advice and approval of the teacher.
Delimitation

1. Apprenticeship is a system of learning in which a learner, usually a minor, enters employment for a definite period of time under a contract to learn a trade or craft.

2. History records reveal that the first crude craftsmanship was passed down from generation to generation through apprenticeship and later was a means by which artisans taught their crafts to youths.

The Guilds and Apprenticeship in England

3. During the Middle Ages in England, the only method of training and regulating the employment of children was through a system of apprenticeship.

4. The guilds which were brotherhoods of craftsmen used apprenticeship as a means of training boys in the skill, duties and responsibilities of membership in the brotherhood of craft.

5. The Statute of Artificers adopted in England in 1562 made the system of apprenticeship compulsory.

6. The master craftsman not only directed the work of his employees but guided the efforts of the apprentice.

7. He was bound under the clauses of indentures to teach his apprentices in all the arts of his trade and he was subject to penalties if he failed in his duties as an educator.
8. The guilds established regulations regarding quality of work, wages and training of apprentices.

9. In learning a trade, the apprentice was strictly bound by regulations pertaining to his behavior as he was by those pertaining to his work.

10. The master was bound to feed, clothe and house the apprentice.

11. The young apprentice ate at his master's table, slept under his roof, aided the wife and family of the guilds-man in their home and was in a sense one of the family.

12. Frequently apprentices were not allowed to marry until they had become one of the craft, and if allowed to marry, the permission of the master was necessary.

13. The master who contracted to teach his trade to an apprentice was required by guild regulation to pay strict attention to his moral and social education.

14. This system of apprenticeship prevented exploitation of children for two centuries and insured their employment in a skilled trade in adult life.

15. These advantages were limited to apprentices under guild supervision, and large numbers of other children employed in unskilled trades were entirely unprotected and untrained.

16. Only townspeople could enter apprenticeship and country people were excluded.

17. Apprenticeships were confined to such occupations as the
butcher, the baker, the blacksmith, the saddler, the shoe repairer and the tailor.

18. The English apprenticeship system authorized justices of the peace to apprentice children of paupers since work was considered the best type of training.

19. In 1601 this authority was extended to children of large families who might become a burden on the state at a later date.

20. Frequently apprenticeship was used by public authorities as a method of poor relief which took the responsibility of caring for poor children off the state and placed it on a group of citizens.

Apprenticeship in the American Colonies

21. Young apprentices were among the earliest settlers in the western hemisphere.

22. Large numbers of children who were recruited from the almshouse population and poor of London were sent to Virginia in the seventeenth century under apprenticeship contracts.

23. Workers were badly needed in the new country and the young children who worked during their minority were cheap and useful.

24. Apprenticeship in early America had all the characteristics of the English system and closely resembled the uses to which apprenticeship was put in England.
25. Laws were passed by the Colony of New Plymouth in 1641 and by the Massachusetts Bay Colony in 1642 providing for the apprenticeship of poor children whose parents were incompetent or neglected to teach their children to work.

26. Many apprentices were trained for house and farm work as well as the trades.

27. Besides being a method of education and of poor relief, apprenticeship was frequently used as a penalty for idleness or as a punishment for debt.

28. Previous to 1700, free public schools as we have them now did not exist, and apprenticeship was used by all who could not afford to educate their children by other methods.

29. In colonial America most apprenticeship existed in the North, which developed early as the industrial section of the country.

30. The master provided board, lodging and clothing and was responsible for giving the apprentice trade and general information.

31. Frequently, the general information involved teaching the apprentice how to read and write and providing religious instruction.

32. In many cases colonial apprentices were required to be a general household servant on the side.

33. Unrelated duties were often the reason for an extended
apprenticeship because the apprentice could not be learning his trade while he was doing housework for the master's wife or tending the master's garden.

34. Apprenticeship training existed as a method of directing boys into skilled trades but because of lack of supervision, the apprentices were often poorly trained and exploited.

35. As a result shortages of skilled workmen existed in our country.

Changes in Apprenticeship Training
As a Result of Industrial Expansion

36. With the coming of mass production following the industrial revolution, the apprenticeship system was adapted for application to the machine age.

37. The custom of domiciling apprentices with their masters disappeared with the growth and impersonality of industry.

38. Compensation with board and room was changed to payment of wages and were on a graduated level in accordance with a predetermined scale.

39. Restrictions were no longer placed upon the private life of apprentices.

40. Special instructors were employed to supervise the work of apprentices in the shops and classroom instruction was given in subjects essential to the industries concerned.
The Wisconsin Plan of State Supervision

41. The state of Wisconsin was the first state to place upon its statute books laws dealing with the subject of apprenticeship.

42. This was a new step in government participation in industry and an innovation in the development of industrial education.

43. The Wisconsin laws brought uniformity to the system of apprenticeship.

44. All learners of any trade, craft or business who were minors were to be placed under a written apprenticeship agreement.

45. Employers who had apprentices were to have them under specific conditions.

46. The administrative commission had the power to annul or disapprove any individual agreement if that agreement was found not to be in the interests of the apprentice.

National Interest in Apprenticeship Training

47. In 1920 the construction industry recognized the need for a national system of apprenticeship.

48. The Bureau of Labor Statistics in a survey of the construction industry in nineteen cities in 1928 pointed out the need for action on apprenticeship on a national level.

49. Normal losses occurred among skilled workers as a result
of advancement into supervisory positions, changes to other occupations, sickness, death and retirement.

50. The losses were continuous, and it was necessary to obtain well-trained workers to replace them.

51. The Federal Committee on Apprentice Training was set up by the N.R.A. in 1934 by the Secretary of Labor.

52. Its purpose was to allow the employment of apprentices under the N.R.A. codes and to insure the development of skilled workers.

53. When the N.R.A. was declared unconstitutional in 1935, the President of the United States transferred the Apprenticeship Committee functions to the National Youth Administration.

Federal Government Legislation Regarding Apprenticeships

54. Recognizing that the apprenticeship problem had an important bearing on the future of our country, Congress in 1937 passed the Fitzgerald Act which authorized the Federal Government to formulate and promote apprenticeship standards throughout the country.

55. The Federal Committee on Apprenticeship made up of representatives of management, labor and vocational education was set up in the United States Department of Labor to act in an advisory capacity on all major policies relating to apprenticeship.

56. The Bureau of Apprenticeship, called the Apprentice
Training Service until 1948 has twelve regional offices throughout the country and performs the administrative work in carrying out the policies of the Federal Committee on Apprenticeship.

Apprenticeship Standards

57. The standards which guide the Bureau of Apprenticeship in assisting industry in setting up apprenticeships are:
   
a. An apprenticeable occupation requires 4,000 or more hours to learn.

b. A schedule of work processes to be learned on the job is set forth.

c. A progressively increasing wage scale should average not less than 50 percent of the journeyman's rate over the apprenticeship period.

d. Provision for related classroom instruction (144 hours per year).

e. The terms of employment and training of each apprentice are stated in a written agreement and registered with a State Apprenticeship Council, or where no such council exists, with the Federal Committee.

f. Local apprenticeship programs are reviewed by a State Apprenticeship Council.

g. Programs are jointly established by the employer and the employees.

h. There is adequate supervision and record-keeping.
58. National Trade Joint Committees composed of employer and employee organizations have established standards for application to apprenticeship in local communities in order to provide a uniform training program throughout the country.

59. State Apprenticeship Councils were established in many states to coordinate and adopt federal and state apprenticeship in local communities in order to provide a uniform training program throughout the country.

60. Local Joint Trade Apprenticeship Committees composed of local employer and employee organizations have the responsibility of developing standards governing the employment and training of all apprentices in the trade.

61. The apprenticeship program should be deliberately conceived, planned in detail, and preferably expressed in written form.

62. The employment standards establish qualifications for employment such as required education, aptitude, and age limitations.

63. A guaranteed minimum wage scale and hours of work should be included in detail.

64. The training standards establish the following:
   a. The term of apprenticeship and duration of the probationary period should be definitely stated.
   b. The training program should specify the types
of machine or operation the apprentice is to
learn, how long he will be given training on
each type of machine or operation, and in
what sequence such experiences may be expected
to occur.

c. Provision should be made for attendance at
classes in related instruction for a specified
proportion of the total time.

65. Plant Joint Committees composed of employer and employ-
ees of a plant, where it is not practicable to partici-
pate in a trade-wide apprenticeship program, set up a
joint committee to prepare in writing an apprenticeship
program.

66. An employer may establish his own apprenticeship system
if the employees do not have an organization or where
the existing employee organization is not particularly
concerned with the training of skilled workers.

67. Local apprenticeship programs provide for the registra-
tion of apprenticeship agreements with the State Appren-
ticeship Council.

68. This registration safeguards the interests of the ap-
prentices.

69. It also establishes a national inventory of the total
number of apprentices in training by trade classifica-
tions and the approximate number of apprentices in each
period of the term of apprenticeship.
70. The review and registration of individual apprenticeship agreements makes a public record of the fact that the apprentice is being employed and trained in an occupation and under standards recognized by industry and public agencies as being adequate to produce a qualified all-round skilled worker.

71. The written apprenticeship program specifies the way in which applicants will be selected and employed.

Selection of Apprentices

72. There are more applicants for employment as apprentices than there are openings and accordingly, opportunities for apprentice training are very much sought for.

73. Opportunities are usually offered to the sons and daughters of workers in the particular industry, providing they can meet the standards established for entrance into the trade as apprentices.

74. Other apprentices are selected from registers of the local office of the United States Employment Service.

75. In the selection of apprentices the following qualifications serve as a guide:

   a. A candidate should be a high school graduate or the equivalent.

   b. Each candidate should submit an official transcript of his high school record.

   c. The candidate should be between seventeen and twenty years of age.
d. Aptitude tests should be used to determine applicant's aptitude for trade work.
e. The candidate should show interest in learning a trade.
f. The candidate should be physically fit for the particular trade.
g. The candidate for apprenticeship should be morally sound.

Method of Training

76. The apprentice learns the techniques of his trade from many different sources—-from the employer, either directly or through his shop foreman, from journeymen employed in the shop, from other apprentices in the same line of work, from instructors in the vocational school, from technical books the apprentice reads, and through his own native ability.

77. Most apprenticeship arrangements provide for a probationary period during which employer and apprentice decide whether or not to carry the training through to its scheduled termination.

78. General custom favors a probationary period of approximately one-twelfth of the total period of apprenticeship.

79. The apprentice receives regular wage increments and in many cases a bonus upon the completion of the course.
80. Advanced standing is sometimes offered to candidates who are eligible.

81. Competent journeymen provide constant supervision.

82. The apprentice works and learns on actual jobs as he moves through the various steps of his training program.

83. Related instruction in basic theory is also correlated with shop instruction.

84. A careful system of records and progress reports in shop work and related instruction is maintained.

Benefits Resulting from Apprenticeship Training

85. The apprenticeship method of learning a trade not only benefits young people but also industry and our country.

86. The all-round training the apprentice receives qualifies him to perform many jobs and operations and he can be easily shifted from one position to another within the concern employing him.

87. The thorough and broad training which the apprentice receives will provide an escape from the dull monotony which falls to the lot of a worker skilled in only one operation.

88. With a diploma of graduation from a genuine apprenticeship course, the applicant for a position can more easily secure employment with any firm even in a different city or state.

89. The well and broadly trained worker is the last one to
be laid off when times are dull in business.

90. Apprenticeship training is a satisfactory way of maintaining a supply of adequately skilled workmen by training young workers not only to replace losses from the existing total but also to provide for adaptation to the increasingly stringent requirements of an advancing technology.

91. Employers train apprentices as their own future workmen and expect them to stay after graduation or return to their plants after a few years of post-graduate experience elsewhere.

92. The proportion of apprentices to be trained can best be determined in local areas in numbers and programs agreed upon in joint conferences between management and interested groups of employers.

93. A ratio of apprentices to journeymen is maintained to protect the journeymen from an oversupply of skilled workers in the particular craft.

94. This ratio also provides a constant flow of qualified craftsmen during the various phases of the business cycle, to provide proper replacements in the plants due to normal trade mortality, and to ensure proper instruction of apprentices by having a sufficient number of qualified journeymen to act as instructors.

95. Planning an apprenticeship applies with equal pertinence to the small job shop, the employer of vast numbers of
men, and an industry as a whole.

96. Reason for wanting to learn an apprenticeable trade:
   a. To satisfy one's needs.
   b. To give service to others.
   c. To develop one's talent.
   d. To strengthen one's character.
   e. To enable our country to maintain and further our technological growth.

97. Rewards in learning an apprenticeable trade:
   a. Adequate financial return.
   b. Pride that comes from doing one's job well.
   c. Satisfaction that comes from serving our country by practicing the skills of various craftsmen.

98. Traits of the well-adjusted worker in an apprenticeship program.
   a. Skill
   b. Perseverence
   c. Practical sense
   d. Training
   e. Skill
   f. Willingness
   g. Cooperation
   h. Good judgment
   i. Dependability
   j. Punctuality
k. Resourcefulness
l. Neatness
m. Follows directions well
n. Gives and takes criticism
o. Tactfulness
p. Always looks out for self-improvement
List of Probable Indirect and Incidental Learning Products

1. An appreciation of apprenticeship training as one of the oldest methods of learning a trade.

2. A clearer understanding of the work of skilled craftsmen and their place in present day production.

3. An increased respect for the occupations requiring a knowledge of manual skills and a recognition of the dignity of all socially useful work.

4. An appreciation of the fact that the choice of a life career needs thorough consideration.

5. A better understanding of the opportunities and advantages of apprentice training as a means of preparing for one's life occupation.

6. A knowledge of apprenticeable occupations and where to obtain training for them.

7. An increased skill in weighing the advantages and disadvantages of any training plan.

8. An understanding that the completion of an apprenticeship tends to develop such desirable attitudes, habits, and traits as:

   a. Ability to get along with people
   b. Ability to lead other people
   c. Cheerfulness
   d. Courtesy
   e. Ideals of honesty and loyalty
f. Responsibility

g. Ideals of service and usefulness

h. Initiative.

9. An understanding that opportunity for advancement is open to all who are willing to spend the effort in acquiring skills.

10. A willingness to place personal qualifications for work above the social prestige rating of occupations in making a vocational choice.

11. An appreciation of the occupation one is to choose and an awareness of job satisfaction or dissatisfaction.

12. Realization of our obligation to our country to learn certain occupational skills.

13. An increasing awareness of the number and kinds of workers who make up the labor force.

14. An increased desire for apprenticeship training.
The Unit Assignment:

A. Introductory activities:

1. Introduce the major occupational groups and divisions as given in the Dictionary of Occupational Titles and ask for examples of jobs for the various groups and divisions.

a. Professional and managerial occupations.
   1. Professional occupations.
   2. Semiprofessional occupations.
   3. Managerial and official occupations.

b. Clerical and sales occupations.
   1. Clerical and kindred occupations.
   2. Sales and kindred occupations.

c. Service occupations.
   1. Domestic service occupations.
   2. Personal service occupations.
   3. Protective service occupations.

d. Agricultural, fishery, forestry and kindred occupations.
   1. Agricultural, horticultural and kindred occupations.
   2. Fishery occupations.

3. Forestry and hunting and trapping occupations.
e. Skilled occupations.
f. Semiskilled occupations.
g. Unskilled occupations.

2. Discuss the training and preparation needed to qualify for each of the occupational groups.

3. Review the courses in your school and show which course would be most helpful for the various occupational groups.

4. Make a survey of students' vocational choices and list their reasons for each choice. Use the data to show the possible limited scope of students' preferences and the need for better reasons for choosing vocations.

5. List the advantages and disadvantages there might be in a boy going into his father's occupation.

6. From the help wanted section of a large daily newspaper, list the apprenticeable occupations.

7. With an expanding technological trend in our nation's industries, in what particular group of occupations is opportunity increasing.

8. Discuss the need for maintaining a constant supply of skilled workers in relation to our defense needs and national economy.

9. Compare the advantages, opportunities, benefits,
working conditions and financial reward of a journeyman's job as related to a professional or a clerical job.

10. Point out the importance of knowing and understanding the educational opportunities outside the school and the mechanics for using these opportunities.
Optional Related Activities

1. Interview a journeyman and find out his attitude regarding his apprenticeship training and whether he would recommend apprentice training as a means of learning a trade.

2. Visit a factory in your city and ascertain management's attitude on apprenticeship training.

3. Make an appointment with the union official in charge of apprentices and find out the local requirements and demands for apprentice training.

4. Interview a local apprentice and find out his reaction to apprentice training.

5. Make a list of apprenticeable trades which are represented in your city.

6. Write a letter to the State Apprenticeship Council and find out how many apprentice training programs there are in the state and in your city, the types of apprenticeship by trade and how many apprentices are in training in each trade.

7. Visit the nearest State Employment Office and find out whether there is a greater need for skilled workers or for semiskilled workers, and the approximate percentage of each.

8. List twenty occupations which you know and rank them according to their relative essentiality in time of war with a sentence or two justifying each.
9. From the list of apprenticeable occupations prepare a study of a single occupation showing:

   a. Definition of occupation.
   b. Background of the occupation—development, present importance, social need.
   c. Employment trends—need for workers, turnover, future possibilities.
   d. Qualifications—sex, physical, mental, personal, educational, technical, special skills, union affiliation, license.
   e. Preparation—what preparation is needed and available?
   f. Methods of entering.
   g. Upgrading procedures and possibilities.
   h. Related occupations.
   i. Earnings.
   j. Working conditions—hours, type of fellow worker, health and safety factors, regularity of employment, location of employment.
   k. Organizational aspects—union influence.

10. Comment on the following quotations:

    "He who works with his hands only is a mechanic;
    "He who works with his hands and head is an artisan;
    "He who works with his hands, head, and heart is an artist."

    John Ruskin
11. Make a list of apprenticeable occupations in which women could readily be trained.

12. Prepare a debate on the topic, "Apprentice Training Provides Better Training Than the Vocational Schools."

13. Make a career book of pictures illustrating the apprenticeable occupations according to the major occupational groups and divisions as listed in the Dictionary of Occupational Titles.

14. Prepare an exhibit of newspaper clippings showing the need of skilled workers in the various trades.

15. Write a paper on the subject, "A System of Apprenticeship Training Leads to a Higher Standard of Living."

16. Read the biography of a famous American who completed an apprenticeship and report the highlights of his success in life.

17. Make a graph illustrating the number of apprentices now in training in the various trades and the number of journeymen needed because of promotions, retirements and deaths.

18. Prepare a radio talk on why young people should consider training for an apprenticeable occupation.

19. In chart form list all the journeymen represented in the manufacture of any of the following products: Automobile, house, radio, ship, bicycle, refrigerator, book.

20. List your reasons for or against federal supervision of apprentice training programs.
21. Interview five persons employed in different occupational levels and find out how they chose their present occupations.

22. Collect some photographs from magazines which show the various apprenticeable trades.

23. Choose an apprenticeable occupation and show how it has continued and adapted to such changing industries as the automobile, airplane and shipbuilding industries.

24. Contact the nearest State Employment Office and find out in what apprenticeable occupation there is the greatest need for skilled workers.

25. Write an article for the local newspaper showing the importance of an adequate supply of skilled workmen to our nation's economy and defense needs.
Items for the Final Test

PART I

DIRECTIONS: Study each statement below. Circle T if the statement is true; circle F if the statement is false. If any part of the statement is false, circle F.

1. T F Apprentice training is a new method of training skilled workers.

2. T F Apprenticeship training is a means of training skilled craftsmen.

3. T F The guilds were associations of doctors, teachers, and mathematicians.


5. T F The morals and habits of apprentices were the direct concern of the master craftsmen instructors.

6. T F Rich children as well as poor children were welcome for Apprenticeship training in the American colonies.

7. T F The industrial revolution in America created a demand for many apprentices.

8. T F The State of Wisconsin was the first state in the United States to regulate apprenticeship.

9. T F The Congress of the United States passed in 1937 the Fitzgerald Act which provided for federal supervision of apprentice training.
10. T F An apprenticeable occupation is one which can be learned in high school.

11. T F Most apprentice training programs do not require a high school diploma.

12. T F Related classroom instruction is optional in many modern apprenticeships.

13. T F An apprenticeship agreement is usually registered with the State Apprenticeship Council.

14. T F Apprenticeship training opportunities are limited only to boys.

15. T F Apprentices do not receive any wages until one-half of the training program has been completed.

16. T F Apprentice training produces an oversupply of craftsmen and therefore tends to lower wages.

17. T F Retirements, promotions, and deaths among skilled craftsmen require continuous apprentice training in order to fill these vacancies.

18. T F A system of apprenticeship training is very essential in an expanding industrial nation.

19. T F Craftsmen who have completed an apprentice training program often advance to such jobs as foremen and supervisors because of their superior training.

20. T F Related classroom instruction provides training in public speaking, history, and language.
21. T  F  An apprentice spends a specified time working on every machine or process in order to learn the skills required of a skilled craftsman.

22. T  F  The enactment of federal and state apprenticeship legislation has provided for uniform standards in apprentice training and has tended to eliminate many abuses.

23. T  F  The satisfactory completion of an apprenticeship program limits the craftsman only to employment where he was trained.

24. T  F  Learning by doing is a fundamental principle in any apprenticeship.

25. T  F  All the workers in large plants are full-fledged craftsmen.

26. T  F  The skills and knowledge that come from an apprentice training program produce well-qualified craftsmen.

27. T  F  Apprenticeship is an example of how labor, management, and the government cooperate to develop manpower skills to the fullest possible degree.

28. T  F  Training in which a trainee learns to operate only a limited number of machines or operations in a trade is classified as apprenticeship.

29. T  F  Through an apprenticeship, the apprentice's pay averages at least 50 percent of the current
journeyman's rate.

30. T F Related classroom instruction also includes such subjects as labor and safety laws and regulations, workmen's compensation, and industrial relations.

**PART II**

**DIRECTIONS:** Select the proper phrase from Column II and place the corresponding letter in the blank to the left of Column I.

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Journeyman</td>
<td>a. Group of tasks performed by one person.</td>
</tr>
<tr>
<td>2. Occupation</td>
<td>b. Training of short duration to provide skill in specific operations.</td>
</tr>
<tr>
<td>3. Apprentice</td>
<td>c. An all-round skilled worker who has completed an apprenticeship.</td>
</tr>
<tr>
<td>4. Interest</td>
<td>d. Group of master craftsmen united to protect themselves and their craft.</td>
</tr>
<tr>
<td>5. Related instruction</td>
<td>e. Field of endeavor.</td>
</tr>
<tr>
<td>6. Aptitude</td>
<td>f. Activity of enjoyment after work hours.</td>
</tr>
<tr>
<td>7. Guild</td>
<td>g. Group of similar jobs found in several establishments.</td>
</tr>
<tr>
<td>Column I</td>
<td>Column II</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8. Foreman</td>
<td>h. An individual in the process of becoming a skilled worker.</td>
</tr>
<tr>
<td>9. Apprenticeship</td>
<td>i. Group of employees of a company united without regard to craft, trade, or occupation.</td>
</tr>
<tr>
<td>10. Vocation</td>
<td>j. Indicative of how an individual may be expected to perform in certain situations.</td>
</tr>
<tr>
<td>12. Industrial union</td>
<td>l. Tendency to become absorbed in an experience.</td>
</tr>
<tr>
<td></td>
<td>m. A system of training in which the learner is given instruction and experience in all aspects of a skilled trade.</td>
</tr>
<tr>
<td></td>
<td>n. Instruction in the theoretical aspects of a trade.</td>
</tr>
</tbody>
</table>
PART III

DIRECTIONS: Write the appropriate letter on the line at the left, indicating what method of training is usually followed for the occupations listed below:

a. College
b. Business School
c. Apprenticeship
d. On-the-Job Training
e. None of these

1. Automobile Mechanic
2. Teacher
3. Bookkeeper
4. Carpenter
5. Lathe Operator
6. Usher
7. Stenographer
8. Bookbinder
9. Armature Winder
10. Plumber
11. Engineer
12. Punch Press Operator
13. Tool Stamper
14. Sheet Metal Worker
15. Tool and Die Maker
Key for Scoring the Final Test

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>16</td>
<td>F</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>17</td>
<td>T</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>18</td>
<td>T</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>19</td>
<td>T</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
<td>20</td>
<td>F</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>21</td>
<td>T</td>
</tr>
<tr>
<td>7</td>
<td>T</td>
<td>22</td>
<td>T</td>
</tr>
<tr>
<td>8</td>
<td>T</td>
<td>23</td>
<td>F</td>
</tr>
<tr>
<td>9</td>
<td>T</td>
<td>24</td>
<td>T</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>25</td>
<td>F</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>26</td>
<td>T</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>27</td>
<td>T</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>28</td>
<td>F</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>29</td>
<td>T</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>30</td>
<td>T</td>
</tr>
</tbody>
</table>
CHAPTER IV

THE APPENDICES AND THE BIBLIOGRAPHY
The Appendices
National Apprenticeship and Training Standards for the SHEET METAL INDUSTRY

DEVELOPED AND APPROVED JOINTLY BY SHEET METAL CONTRACTORS' NATIONAL ASSOCIATION, INC., AND THE SHEET METAL WORKERS' INTERNATIONAL ASSOCIATION, IN COOPERATION WITH

Bureau of Apprenticeship - U. S. Department of Labor - Washington, D. C.
SHOP TRAINING

The apprentice will be given supervised training in the automotive mechanics' trade for the approximate hours as listed in the schedule below. The time allowed in most cases is sufficient to permit the apprentice to become proficient in every phase of the trade, but may be modified to fit individual abilities and needs.

Approximate hours

1. MOTOR .................................................. 900 hours
   - Remove head
   - Refacing valve seats and valves
   - Clean carbon - grind valves
   - Adjust tappets
   - Testing tappet spring pressure
   - Fitting bearings
   - Fitting pistons
   - Fitting wrist pins
   - Align connecting rods and pistons
   - Installing and fitting timing gears
   - Timing Motor
   - Installing cylinder heads and gaskets
   - Checking crankcase vacuum
   - Checking cylinder compression
   - Checking intake manifold vacuum
   - Changing oil
   - Changing oil filter

2. CARBURETOR ............................................. 400 hours
   - Rebuilding carburetor
   - Installing floats and jets
   - Changing jet for gas mixture
   - Changing jet for air mixture
   - Idling motor
   - Installing carburetor

3. IGNITION .................................................. 400 hours
   - Rebuilding distributor
   - Installing ignition points
   - Testing and installing condenser
   - Testing and installing coil
   - Testing, cleaning and installing spark plugs
   - Timing ignition
4. FUEL SYSTEMS ......................................................... 400 hours

- Rebuilding fuel pump
- Installing diaphragm and spring
- Testing fuel line and pump pressure
- Testing gas tanks for proper venting
- Testing vacuum tanks

5. GENERATORS .......................................................... 400 hours

- Rebuilding generator
- Turning down armature
- Installing brushes
- Installing brush rigging
- Rebuild voltage regulator
- Installing points in regulator
- Regulating generator
- Regulating voltage regulator

6. COOLING SYSTEM .................................................... 300 hours

- Replace water pump
- Overhaul water pump
- Install impellers
- Install shafts
- Install bushings
- Install packing
- Overhaul and repair thermostats
- Hose connections
- Fan and radiator

7. STORAGE BATTERIES .................................................. 200 hours

- Install
- Fill to level
- Recharging
- Testing

8. CHASSIS AND SPRINGS ............................................... 600 hours

- Changing leaves and springs
- Rebushing spring shackles
- Rebuilding spring shackles
- Replace complete spring
- Frame repairs
- Chassis lubrication

9. FRONT AXLE AND STEERING ......................................... 600 hours

- Rebushing and renewing pivot pins
- Renewing and spacing bearings
- Overhaul and repair steering gear
Reline and overhaul brakes
Wheel alignment

10. REAR WHEEL AND AXLE ASSEMBLY.................. 300 hours
   Rebuilding and repairing differential centers
   Renewing and spacing bearings
   Install axle shafts
   Overhaul and repair brakes
   Removal and replacement

11. TRANSMISSION AND CLUTCH......................... 600 hours
   Overhaul and repair clutch
   Relining installing new clutch discs
   Adjusting clutch and clutch controls
   Overhaul and repair transmission
   Removal and replacement

12. BRAKES............................................. 600 hours
   Adjusting brakes
   Master cylinder
   Reline brakes
   Overhaul and repair hydraulic brakes
   Wheel cylinders

13. DRIVE LINE........................................ 200 hours
   Overhaul and repair
   Universal joints
   Propeller shaft
   Hanger bearings

14. BODY REPAIRS..................................... 100 hours

TOTAL...... 6,000 hours

RELATED INSTRUCTION

The apprentice is required to attend classes of instruction in related trade subjects for approximately 150 hours per year each year of the term of apprenticeship at times and at hours arranged for by the employer in cooperation with the approving agency. The time spent in class instruction shall not be classed as hours of work and the apprentice will not be paid his regular rate for this time. It is recommended that related instruction be given in the following subjects:

   Theory of internal combustion motors
   Theory of brakes
Theory of clutch
Theory of transmission
Theory of steering
Theory of carburetion
Theory of electricity
Mathematics related to the automotive trade
Micrometer and gauge reading
Blueprint reading—service manual and application of same
Metallurgy as applicable to materials used in the trade
Viscosity of oils and grease
Octane rating of fuels
Welding
Safety
The Commonwealth of Massachusetts
DEPARTMENT OF LABOR AND INDUSTRIES
Division of Apprentice Training

APPRENTICE AGREEMENT
(To be executed in quadruplicate)

THIS AGREEMENT, Entered into this day of , 19 , between

(Name of apprentice) born hereinafter referred to as APPRENTICE (and if a minor) hereinafter referred to as his PARENT (or GUARDIAN), and

(Name of parent or guardian) (Name of Employer) hereinafter referred to as the EMPLOYER.

Witnesseth that the APPRENTICE, his PARENT (or GUARDIAN), and the EMPLOYER desire to enter into an agreement of apprenticeship in conformity with apprenticeship standards in the following trade as approved by the Division of Apprentice Training, and therefore, in consideration of the premises and of the mutual covenants herein contained, do hereby covenant and agree as follows:

That the EMPLOYER agrees to employ the APPRENTICE for the purpose of enabling said APPRENTICE to learn and acquire the trade or craft of upon the terms and conditions contained in the schedule on the reverse side of this agreement and made a part hereof.

That the APPRENTICE agrees to perform diligently and faithfully the work of said trade or craft during the period of apprenticeship, in conformity with the terms and conditions set forth on the reverse side of this agreement and made a part hereof.

That the PARENT (or GUARDIAN) promises that the APPRENTICE will duly perform all obligations undertaken herein.

That the apprenticeship term begins on the day of , 19 , and terminates upon the completion by the APPRENTICE of (years or hours) of employment for said EMPLOYER in said trade or craft as stipulated on the reverse side of this agreement.

That this agreement must be filed with and approved by the Division of Apprentice Training, and may be cancelled by either party during six months probationary period; that the Director of Apprenticeship may cancel this agreement, subject to hearing and appeal, upon application of either party or on his own initiative after investigation shows a just cause for such action.

(See Sec. 11K, Chap. 707, Acts of 1941).

That the apprenticeship standards referred to above are hereby made a part of this agreement with the same effect as though expressly written herein.

That either party may at any time consult with the Division of Apprentice Training concerning the interpretation of any part of this agreement over which there is a difference.

That the EMPLOYER who is unable to fulfill his obligation under this agreement may, with the approval of the Director of Apprenticeship, transfer this agreement to any other employer, provided that the apprentice consents and that such other employer agrees to assume the obligations of this agreement.

IN WITNESS WHEREOF the parties hereunto set their hands and seals:

(Apprentice) (Employer)

(Seal) (Seal)

(Address) (Officer)

(Parent or Guardian) (Address)

(Apprenticeship Committee, Approved by the

(City) ___ on ___

(Approved by the Division of Apprentice Training)

Approved by the Division of Apprentice Training ___ on ___
<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPERATION NO.</th>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
<th>SAT</th>
<th>SUN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL

APPRENTICE

FOREMAN
The Commonwealth of Massachusetts
Department of
Labor and Industries

Division of Apprentice Training

APPRENTICE MASTER RECORD CARD

<table>
<thead>
<tr>
<th>NAME OF COMPANY</th>
<th>TRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAME</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BIRTH DATE</th>
<th>PHONE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARENT OR GUARDIAN</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EDUCATION

TERM OF APPRENTICESHIP

<table>
<thead>
<tr>
<th>DATE</th>
<th>HOURS WORKED ON EACH TYPE OF OPERATION</th>
<th>RELATED INSTRUCTION RECORD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TOTAL HOURS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MONTH</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HRS EXPERIENCE GIVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CREDIT FOR PREV EXPERIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

TOTAL
The Commonwealth of Massachusetts

DEPARTMENT OF LABOR AND INDUSTRIES  
DIVISION OF APPRENTICE TRAINING

CERTIFICATE OF COMPLETION OF APPRENTICESHIP

THIS IS TO CERTIFY THAT

has served diligently and well as an Apprentice

in the employ of

under standards approved by the Massachusetts Apprenticeship Council;

He has with merit completed the practical training and the prescribed course of related instruction to qualify him as a Journeyman

Dated: Boston, Massachusetts,
General Trade Classifications

The following list includes only the basic trade classifications. The occupations included under the classifications appear in Appendix H.

AIRCRAFT FABRICATOR
AIRPLANE MECHANIC
ASBESTOS WORKER
AUTOMOTIVE-BODY BUILDER
AUTOMOBILE-BODY REPAIRMAN
AUTOMOTIVE MECHANIC
BAKER
BARBER
BLACKSMITH
BOILERMAKER
BOOKBINDER
BOOT-AND-SHOE MAKER
BREWER
BRICKLAYER
BUSINESS-MACHINES MECHANIC
BUTCHER-MEAT CUTTER
CABINET MAKER-MILLMAN
CANDY MAKER
CANVAS WORKER
CARMAN
CARPENTER
CEMENT FINISHER
COOK
COOPER
COSMETICIAN
DAIRYMAN
DENTAL TECHNICIAN
DESIGNER
DRAFTSMAN
DRY-CLEANER, SPOTTER, AND PRESSER
ELECTRICIAN
ELECTROPLATER
ELECTROTYPER
ELEVATOR MECHANIC
ENGRAVER
FABRIC CUTTER
FARM-EQUIPMENT MECHANIC
FLOOR COVERER
FURDRYMAN
FURRIER

GLASS BLOWER—BENDER
GLASSWARE WORKER
GLAZIER—GLASS WORKER
HEAT TREATER
IRON WORKER
JEWELER
JIG—AND—FIXTURE BUILDER
KNITTER, FULL FASHION
LATHER
LEAD BURNER
LEATHER WORKER
LITHOGRAPHER
LOCOMOTIVE REPAIRMAN
MACHINIST
MAILER
MAINTENANCE MECHANIC
MARKING—DEVICE MAKER
MATTRESS MAKER, CUSTOM
METAL POLISHER—AND—BUFFER
METAL SPINNER
MILLER
MILLWRIGHT
MODEL MAKER
MUSICAL—INSTRUMENT MECHANIC
OPERATING ENGINEER
OPTICAL TECHNICIAN
ORTHOPEDIC TECHNICIAN
PAINT MAKER
PAINTER—AND—DECORATOR
PAPER—GOODS MAKER
PATTERNMAKER
PHOTOENGRAVER
PHOTOGRAPHER
PLASTERER
PLATE PRINTER
PLUMBER—PIPE FITTER
POTTERY WORKER
PRINTER
PRINTING PRESSMAN
REPAIRMAN
RIGGER
ROLL TURNER
ROOFER
ROTOGRAVURE ENGRAVER
SHEET—METAL WORKER
SHIP RIGGER
SIGN—AND—PICTORIAL PAINTER
SILVERSMITH
STAINED—GLASS WORKER
STATIONARY ENGINEER
STEREOTYPER
STONE WORKER
STONEMASON
STOVE MOUNTER
TAILOR
TANNER
TELEPHONE WORKER
TERRAZZO WORKER
TEXTILE TECHNICIAN-MECHANIC
TILE SETTER
TOOL-AND-DIE MAKER
UPHOLSTERER
WALL-PAPER CRAFTSMAN
WATCHMAKER
WEAVER
WIRE WEAVER
WOOD CARVER
Apprenticeable Occupations

The occupations included in the classifications listed in Appendix G are as follows:

Accessories Mechanic (air transportation; aircraft manufacturing). See under AIRPLANE MECHANIC.

Accordion Maker (musical instruments). See under MUSICAL-INSTRUMENT MECHANIC.

AIRCRAFT FABRICATOR; final assembler (aircraft manufacturing) 3-4 years. 5-03.572; 5-03.552.

Aircraft Metalsmith (air transportation; aircraft manufacturing). See under SHEET-METAL WORKER.

Aircraft Plater (aircraft manufacturing). See under ELECTROPLATER.

AIRPLANE MECHANIC (air transportation; aircraft manufacturing) 3-4 years.

Accessories Mechanic 5-03.840; 5-80.300; 5-80.355.

Airplane Mechanic (air transportation) 5-80.120.

Electrical Mechanic 4-97.915.

Engine Mechanic 5-80.130.

Instrument Mechanic 5-83.972.

Line-Service Mechanic 5-80.120; 5-80.130.

Propeller Mechanic 5-80.130.

Radio Mechanic 5-83.447.

Airplane Woodworker (aircraft manufacturing). See under CABINET MAKER-MILLMAN.

Alteration Tailor (ret. tr.). See under TAILOR.

Architectural Draftsman (any industry). See under DRAFTSMAN.

Artificial-Limb Maker, Metal (surgical appliances). See under ORTHOPEDIC TECHNICIAN.

Artificial-Limb Maker, Wood (surgical appliances). See under ORTHOPEDIC TECHNICIAN.

Artificial Marble-Imitation Stone Worker (construction). See under PLASTERER.

ASBESTOS WORKER; Insulation Worker (construction; heat and frost insulation) 4 years. 5-33.110.

AUTOMOTIVE-BODY BUILDER (automobile manufacturing) 4 years.

Custom-Body Builder, Metal 5-81.525.

Custom-Body Builder, Wood 5-81.525.

Sample-Body Builder, Metal 5-17.110.

Sample-Body Builder, Wood 5-17.110.

AUTOMOBILE-BODY REPAIRMAN; body, fender and paint mechanic (automotive service) 3-4 years. 5-81.510.

Automobile Glazier (automotive service). See under GLAZIER-GLASS WORKER.

Automobile Machinist (automotive service). See under MACHINIST.

Automobile Mechanic (automotive service). See under AUTOMOTIVE MECHANIC.

Automobile Painter (automotive service). See under PAINTER-AND-DECORATOR.

Automobile Upholsterer (automotive service). See under UPHOLSTERER.

AUTOMOTIVE MECHANIC (automotive service) 3-4 years.
Automobile Mechanic. 5-81.010.
Bus Mechanic. 5-81.035.
Motorboat Mechanic. 5-83.643.
Motorcycle Repairman. 5-81.020.
Tractor Mechanic. 5-81.040.
Truck Mechanic. 5-81.050.

BAKER (bakery products; hotel and restaurant) 3 years.
4-01.100; 4-01.400.

Bank-Note Designer (printing and publishing). See under DESIGNER.

Bank-Note Engraver (printing and publishing). See under ENGRAVER.

BARBER (personal service) 2-3 years. 2-32.01.

Battenmaker (textile). See under CABINET MAKER-MILLMAN.

Beauty Operator (personal service). See COSMETICIAN.

Ben-Day Artist (printing and publishing). See Tint Layer.

Bench Carpenter (furniture; woodworking). See Cabinet Maker.

Bench Hand (jewelry). See Jewelry Repairman.

Benchman (optical goods). See Finisher.

Bindery Worker, Female (printing and publishing). See under BOOKBINDER.

Bindery Worker, Male (printing and publishing). See under BOOKBINDER.

BLACKSMITH (any industry) 4 years. 4-86.010.
Hammersmith 4-86.110.
Sawsmith; saw straightener-and-repairer (saw manufacturing) 3 years. 4-86.

Spring Maker, Automotive; spring fitter-repairer (automobile manufacturing; automotive service). 4-86.030.

Tool Dresser 4-86.

Boatbuilder, Wood (shipbuilding). See under CARPENTER.

Body, Fender and Paint Mechanic (automotive service). See AUTOMOBILE-BODY REPAIRMAN.

BOILERMAKER (any industry) 4 years. 4-83.100.

Mold Loftsman; template maker (shipbuilding). 5-17.210

Shipfitter (shipbuilding). 4-84.012.

BOOKBINDER (printing and publishing).

Bindery Worker, Female 2 years. 4-49.010.

Bindery Worker, Male 4 years. 4-49.010.

Ruler 3 years. 6-49.015.

BOOT-AND-SHOE MAKER (any industry) 2-3 years.

Boot Maker, Custom Made (boot and shoe manufacturing). 4-60.100.

Bottomer, Custom Made (boot and shoe manufacturing). 6-61.333.
Cutter-Patternmaker (boot and shoe manufacturing). 4-61.872.
Fitter, Custom Made (boot and shoe manufacturing). 4-61.217.
Shoe Repairman (personal service). 4-60.100.
Boot Maker, Custom Made (boot and shoe manufacturing). See under BOOT-AND-SHOE MAKER.
Bottomer, Custom Made (boot and shoe manufacturing). See under BOOT-AND-SHOE MAKER.
Brace Maker (surgical appliances). See under ORTHOPEDIC TECHNICIAN.
BREWER (malt liquors) 2-3 years. 4-03.260; 4-03.280; 4-03.250.
BRICKLAYER; Brickmason (construction) 3 years. 5-24.010.
Brickmason (construction). See BRICKLAYER.
Bridge-and-Structural Steel Erector (construction). See under IRON WORKER.
Brillianderer (jewelry). See Lapidary.
Bus Electrician (transportation). See under ELECTRICIAN.
Bus Mechanic (automotive-service). See under AUTOMOTIVE MECHANIC.
Bushelman (retail trade). See Alteration Tailor.
BUSINESS-MACHINES MECHANIC; Office-Machines Mechanic (any industry) 3-4 years. 5-83.111.
Butcher (slaughtering and meat packing). See under BUTCHER-MEAT CUTTER.
BUTCHER-MEAT CUTTER (retail trade; slaughtering and meat packing).
Butcher 3 years. 4-09.205.
Meat Cutter 3 years. 5-58.100.
Cabinet Maker (furniture; woodworking). See under CABINET MAKER-MILLMAN.
CABINET MAKER-MILLMAN (any industry).
Airplane Woodworker (aircraft manufacturing) 3-4 years. 4-33.916.
Battenmaker (textile) 3 years. 4-33.363.
Cabinet Maker; bench carpenter (furniture; woodworking) 3-4 years. 4-32.100.
Gasket Maker (mortician goods) 2-3 years. 4-39.321.
Furniture Maker-Repairman (furniture) 3-4 years. 4-32.100.
Millman; shop carpenter (woodworking) 3-4 years. 4-33.914.
Shuttlemaker (textile) 3 years. 4-33.363.
Spindle Carver (furniture) 3 years. 4-33.362.
Cable Splicer (construction; light and power). See under ELECTRICIAN.
Cable Splicer (telephone and telegraph). See under TELEPHONE WORKER.
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Experience (years)</th>
<th>Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera Man (printing and publishing)</td>
<td>See under LITHOGRAPHER.</td>
<td></td>
</tr>
<tr>
<td>Camera Repairman (any industry)</td>
<td>See under REPAIRMAN.</td>
<td></td>
</tr>
<tr>
<td>CANDY MAKER (confection)</td>
<td>3-4</td>
<td>4-05.211.</td>
</tr>
<tr>
<td>CANVAS WORKER (any industry)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Sailmaker (shipbuilding)</td>
<td>4-27.811.</td>
<td></td>
</tr>
<tr>
<td>Tent-Awning Maker (canvas goods)</td>
<td>6-27.504.</td>
<td></td>
</tr>
<tr>
<td>Card-Room Mechanic (textile)</td>
<td>See under TEXTILE TECHNICIAN-MECHANIC.</td>
<td></td>
</tr>
<tr>
<td>CARMAN (locomotive and car building and repairing)</td>
<td>4</td>
<td>5-79.020.</td>
</tr>
<tr>
<td>CARPENTER (any industry)</td>
<td>4</td>
<td>5-25.610.</td>
</tr>
<tr>
<td>Boatbuilder, Wood (shipbuilding)</td>
<td>5-25.110.</td>
<td></td>
</tr>
<tr>
<td>Carpenter, Maintenance (any industry)</td>
<td>5-25.830.</td>
<td></td>
</tr>
<tr>
<td>Joiner (shipbuilding)</td>
<td>5-25.650.</td>
<td></td>
</tr>
<tr>
<td>Loftsmen (shipbuilding)</td>
<td>5-17.220.</td>
<td></td>
</tr>
<tr>
<td>Mold Maker, Wood (brick and tile)</td>
<td>4-66.911.</td>
<td></td>
</tr>
<tr>
<td>Shipwright (shipbuilding)</td>
<td>5-25.640.</td>
<td></td>
</tr>
<tr>
<td>Carpenter (construction)</td>
<td>See under CARPENTER.</td>
<td></td>
</tr>
<tr>
<td>Carpenter, Maintenance (any industry)</td>
<td>See under CARPENTER.</td>
<td></td>
</tr>
<tr>
<td>Casket Maker (mortician goods)</td>
<td>See under CABINET MAKER-MILLMAN.</td>
<td></td>
</tr>
<tr>
<td>Caster (construction)</td>
<td>See under PLASTERER.</td>
<td></td>
</tr>
<tr>
<td>Caster (pottery and porcelain)</td>
<td>See under POTTERY WORKER.</td>
<td></td>
</tr>
<tr>
<td>Caster-Mold Maker (jewelry)</td>
<td>See under JEWELER.</td>
<td></td>
</tr>
<tr>
<td>CEMENT FINISHER (construction)</td>
<td>3-4</td>
<td>5-26.100.</td>
</tr>
<tr>
<td>Central-Office Installer (telephone and telegraph)</td>
<td>See under TELEPHONE WORKER.</td>
<td></td>
</tr>
<tr>
<td>Chaser-Engraver (jewelry)</td>
<td>See Engraver-Chaser.</td>
<td></td>
</tr>
<tr>
<td>Cigar-Making-Machine Mechanic (cigar manufacturing)</td>
<td>See under MAINTENANCE MECHANIC.</td>
<td></td>
</tr>
<tr>
<td>Color Mixer (wall paper)</td>
<td>See under WALL-PAPER CRAFTSMAN.</td>
<td></td>
</tr>
<tr>
<td>Comb Fixer (textile)</td>
<td>See under TEXTILE TECHNICIAN-MECHANIC.</td>
<td></td>
</tr>
<tr>
<td>Combination Man (telephone and telegraph)</td>
<td>See under TELEPHONE WORKER.</td>
<td></td>
</tr>
<tr>
<td>Commercial Photographer (any industry)</td>
<td>See under PHOTOGRAPHER.</td>
<td></td>
</tr>
<tr>
<td>Composition Roofer (construction)</td>
<td>See under ROOFER.</td>
<td></td>
</tr>
<tr>
<td>Compositor (printing and publishing)</td>
<td>See PRINTER.</td>
<td></td>
</tr>
<tr>
<td>Construction-Equipment Mechanic (construction)</td>
<td>See under MAINTENANCE MECHANIC.</td>
<td></td>
</tr>
<tr>
<td>COOK (hotel and restaurant)</td>
<td>3</td>
<td>2-26.32.</td>
</tr>
<tr>
<td>Pastry Cook</td>
<td>2-26.18.</td>
<td></td>
</tr>
<tr>
<td>COOPER (cooperage)</td>
<td>4-38.010.</td>
<td></td>
</tr>
<tr>
<td>Copper Etcher (printing and publishing)</td>
<td>See under PHOTOENGRAVER.</td>
<td></td>
</tr>
<tr>
<td>Coppersmith (sheet metal; shipbuilding)</td>
<td>See under SHEET-METAL WORKER.</td>
<td></td>
</tr>
<tr>
<td>Coremoker (foundry)</td>
<td>See under FOUNDRYMAN.</td>
<td></td>
</tr>
<tr>
<td>COSMETICIAN; Beauty Operator (personal service)</td>
<td>2</td>
<td>2-32.15.</td>
</tr>
</tbody>
</table>
Custom-Body Builder, Metal (automobile manufacturing). See under AUTOMOTIVE-BODY BUILDER.
Custom-Body Builder, Wood (automobile manufacturing). See under AUTOMOTIVE-BODY BUILDER.
Custom Tailor (retail trade). See under TAILOR.
Cutter-Patternmaker (boot and shoe manufacturing). See under BOOT-AND-SHOE MAKER.
Cylinder Pressman (printing and publishing). See under PRINTING PRESSMAN.
DAIRYMAN (dairy products) 2-3 years. 4-06.
Damper-Waterproofer (construction). See under ROOFER.
Decorating-Kiln Placer (pottery and porcelain). See under POTTERY WORKER.
Dental-Plate Maker (business service). See under DENTAL TECHNICIAN.
DENTAL TECHNICIAN (business service) 3-4 years.
  Dental-Plate Maker. 0-50.06.
  Metal-Denture Maker. 0-50.06.
  Porcelain-and-Acrylie-Denture Maker. 0-50.06.
DESIGNER (any industry) 5 years.
  Bank-note Designer (printing and publishing). 0-46.87.
  Jacquard Designer (textile). 0-46.91; 4-18.020; 4-18.470.
Detailer-Draftsman (any industry). See under DRAFTSMAN.
Diamond-Die Maker (wire drawing). See under TOOL-AND-DIE MAKER.
Die Maker (jewelry). See under TOOL-AND-DIE MAKER.
Die Maker (machine shop). See under TOOL-AND-DIE MAKER.
Die Maker, Paper (paper goods). See under PAPER-GOODS MAKER.
Die Sinkcr (machine shop). See under TOOL-AND-DIE MAKER.
Die Stamper (printing and publishing). See under PLATE PRINTER.
Diesel Repairman (any industry). See under REPAIRMAN.
Dipper (pottery and porcelain). See under POTTERY WORKER.
DRAFTSMAN (any industry) 3-4 years.
  Architectural Draftsman. 0-48.05.
  Detailer-Draftsman. 0-48.01.
  Mechanical Draftsman. 0-48.18.
  Structural Draftsman. 0-48.25.
Drawing-Frame Fixer (textile). See under TEXTILE TECHNICIAN-MECHANIC.
DRY CLEANER, SPOTTER, AND PRESSER (cleaning, dyeing, and pressing) 3-4 years. 5-57.110; 5-57.310; 7-57.511.
Dyer, Master (textile). See under TEXTILE TECHNICIAN-MECHANIC.
Electrical-Instrument Mechanic (repairman) (any industry).
  See under REPAIRMAN.
Electrical Mechanic (air transportation; aircraft manufacturing). See under AIRPLANE MECHANIC.
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Experience</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Repairman (any industry)</td>
<td>See under ELECTRICIAN.</td>
<td></td>
</tr>
<tr>
<td>ELECTRICIAN (any industry)</td>
<td>3-5 years</td>
<td>5-81,420</td>
</tr>
<tr>
<td>Bus Electrician (transportation)</td>
<td></td>
<td>5-83,930</td>
</tr>
<tr>
<td>Cable Splicer (construction; light and power)</td>
<td></td>
<td>5-53,960</td>
</tr>
<tr>
<td>Electrical Repairman; maintenance electrician (any industry)</td>
<td>4-97,420</td>
<td></td>
</tr>
<tr>
<td>Electrician (construction)</td>
<td>4-97,010</td>
<td></td>
</tr>
<tr>
<td>Electronics Repairman-Serviceman; radio repairman; television repairman (radio-television service)</td>
<td>5-83,411</td>
<td></td>
</tr>
<tr>
<td>Lineman; outside electrician (light and power)</td>
<td>5-53,420</td>
<td></td>
</tr>
<tr>
<td>Meter Tester-and-Repairman; meter-relay tester (light and power)</td>
<td>5-83,451; 5-83,452</td>
<td></td>
</tr>
<tr>
<td>Power-House Electrician (light and power)</td>
<td>4-97,510</td>
<td></td>
</tr>
<tr>
<td>Radio Electrician; broadcast technician; radio-station-maintenance electrician; radio-station technician (broadcast-telecast)</td>
<td>5-83,445</td>
<td></td>
</tr>
<tr>
<td>Repairer-and-Winder (any industry)</td>
<td>5-83,432; 5-83,433</td>
<td></td>
</tr>
<tr>
<td>Ship Electrician (shipbuilding)</td>
<td>4-97,210</td>
<td></td>
</tr>
<tr>
<td>Sign Electrician (signs)</td>
<td>5-85,872; 7-13,548; 5-85,871</td>
<td></td>
</tr>
<tr>
<td>Signal-System Electrician; burglar-alarm mechanic; fire-alarm mechanic (any industry)</td>
<td>5-53,370; 4-97,420</td>
<td></td>
</tr>
<tr>
<td>Electrician (construction). See under ELECTRICIAN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronics Repairman-Serviceman (radio-television service)</td>
<td>See under ELECTRICIAN.</td>
<td></td>
</tr>
<tr>
<td>ELECTROPLATER (any industry)</td>
<td>3-4 years</td>
<td>4-74,910</td>
</tr>
<tr>
<td>Aircraft Plater (aircraft manufacturing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plater (electroplating)</td>
<td></td>
<td>4-74,010</td>
</tr>
<tr>
<td>ELECTROTYPER (printing and publishing)</td>
<td>5-6 years</td>
<td>4-73,320</td>
</tr>
<tr>
<td>Finisher</td>
<td>4-45,010</td>
<td></td>
</tr>
<tr>
<td>Molder</td>
<td>4-45,010</td>
<td></td>
</tr>
<tr>
<td>Wax Engraver</td>
<td>4-45,010</td>
<td></td>
</tr>
<tr>
<td>ELEVATOR MECHANIC (construction)</td>
<td>4 years</td>
<td>5-83,351</td>
</tr>
<tr>
<td>Enameler (jewelry)</td>
<td>See under JEWELER.</td>
<td></td>
</tr>
<tr>
<td>Engine Mechanic (air transportation; aircraft manufacturing)</td>
<td>See under AIRPLANE MECHANIC.</td>
<td></td>
</tr>
<tr>
<td>ENGRAVER (any industry).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank-Note Engraver (engraving)</td>
<td>5 years</td>
<td>4-73,510</td>
</tr>
<tr>
<td>Engraver-Chaser; chaser-engraver (jewelry)</td>
<td>4 years</td>
<td>4-73,020; 4-73,410</td>
</tr>
<tr>
<td>Etcher, Hand (printing and publishing)</td>
<td>5 years</td>
<td>4-73,320</td>
</tr>
<tr>
<td>Metal Engraver (engraving)</td>
<td>4-5 years</td>
<td>4-73,030</td>
</tr>
<tr>
<td>Pantograph Engraver (any industry)</td>
<td>4 years</td>
<td>4-73,510; 4-73,520</td>
</tr>
<tr>
<td>Siderographer (engraving)</td>
<td>5 years</td>
<td>4-73,510</td>
</tr>
<tr>
<td>Steel-and-Copper-Plate Engraver (printing and publishing)</td>
<td>4-5 years</td>
<td>4-73,510</td>
</tr>
<tr>
<td>Engraver-Chaser (jewelry). See under ENGRAVER.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engraving Pressman (printing and publishing).</td>
<td></td>
<td>See under PLATE PRINTER.</td>
</tr>
</tbody>
</table>
Etcher, Hand (printing and publishing). See under ENGRAVER.

FABRIC CUTTER (any industry).
- Garment Cutter 3-4 years. 4-27.043.
- Shirt Cutter 3-4 years. 4-27.048.
- Upholstery-and-Seat Cover Cutter 3 years. 4-35.120.

FARM-EQUIPMENT MECHANIC (automotive service) 3-4 years.
5-81.040; 7-83.325.

Film Developer-Printer, Motion Picture (any industry). See under PHOTOGRAPHER.

Final Assembler (aircraft manufacturing). See AIRCRAFT FABRICATOR.

Finisher (garment). See under TAILOR.

Finisher (optical goods). See under OPTICAL TECHNICIAN.

Finisher (printing and publishing). See under PHOTOENGRAVER OR ELECTROTYPER.


Fitter (surgical appliances). See under ORTHOPEDIC TECHNICIAN.

Fitter, Custom Made (boot and shoe manufacturing). See under BOOT-AND-SHOE MAKER.

FLOOR COVERER (construction) 3-4 years.
- Linoleum, Soft Tile, and Carpet Layer. 5-32.752.

FOUNDRYMAN (foundry).
- Coremaker 4 years. 4-82.010.
- Melter 2-3 years. 4-91.351.
- Molder 4 years. 4-81.010 through 4-81.050.

See Knitting-Machine Mechanic.

Fur Cutter (fur goods). See under FURRIER.

Fur Finisher (fur goods). See under FURRIER.

Fur-Machine Operator (fur goods). See under FURRIER.

Furniture Finisher (furniture). See under PAINTER-AND-DECORATOR.

Furniture Maker-Repairman (furniture). See under CABINET MAKER-MILLMAN.

FURRIER (fur goods) 3-4 years. 4-21.010.
- Fur Finisher 2-3 years. 4-21.110
- Fur-Machine Operator 2-3 years. 6-21.110

Gage Maker (machine shop). See under TOOL-AND-DIE MAKER.

Garment Cutter (any industry). See under FABRIC CUTTER.

Gas-Engine Repairman (any industry). See under REPAIRMAN.

Gas Fitter (any industry). See under PLUMBER-PIPE FITTER.

Glass Blower (glass manufacturing). See under GLASS BLOWER-BENDER.

GLASS BLOWER-BENDER (any industry).
- Glass Blower (glass manufacturing) 3 years. 4-65.430.
- Glass Blower, Laboratory Apparatus (instruments and apparatus) 3-4 years. 4-65.440.
- Neon-Tube Bender (signs) 3-4 years. 4-65.420; 5-13.321.
Glass Blower, Laboratory Apparatus (instruments and apparatus). See under GLASS BLOWER-BENDER.

Glass Worker, Shop (construction; glass products). See under GLAZIER--GLASS WORKER.

Glassware Engraver-Polisher (glass products). See under GLASSWARE WORKER.

GLASSWARE WORKER (any industry).
Glassware Engraver-Polisher (glass products) 2-3 years. 4-65.510.

GLAZIER--GLASS WORKER (any industry).
Automobile Glazier (automotive service) 2 years. 7-81.920.
Glass Worker, Shop (construction; glass products) 3-4 years. 6-65.240; 6-55.910; 6-55.285.
Glazier (construction) 3 years. 5-77.010.
Window-Glass Cutter (glass manufacturing) 3 years. 4-65.

Grazier (construction). See under GLAZIER--GLASS WORKER.
Glove Cutter (leather products). See under LEATHER WORKER.
Goldsmith (jewelry). See under JEWELER.
Granite Cutter, Sandblaster (stoneworking). See under STONE WORKER.

Granite Sawyer (stoneworking). See Stone Sawyer.
Gravure Pressman (printing and publishing). See under PRINTING PRESSMAN.

Gunsmith (any industry). See under REPAIRMAN.
Hammersmith (any industry). See under BLACKSMITH.
Handler (pottery and porcelain). See under POTTERY WORKER.
Hardwood Finisher (furniture). See Furniture Finisher.
Harness Maker (leather products). See under LEATHER WORKER.
HEAT TREATER (heat treating) 4 years. 4-87.010.

Hoisting-and-Portable Engineer (construction). See OPERATING ENGINEER.

Hub Cutter (jewelry). See Die Maker.
Hydraulic-Equipment Mechanic (any industry). See under MAINTENANCE MECHANIC.

Instrument Maker (any industry). See under MACHINIST.
Instrument Mechanic (air transportation; aircraft manufacturing). See under AIRPLANE MECHANIC.

Instrument Repairman (any industry). See under REPAIRMAN.
Insulation Worker (construction; heat and frost insulation). See ASBESTOS WORKER.

IRON WORKER (any industry).
Bridge-and-Structural-Steel Erector (construction) 2 years. 4-64.010.
Layerout-and-Template Maker (structural metals) 5-4 years. 4-64.530.
Ornamental-Iron Erector (construction) 2 years. 4-85.020.
Ornamental-Iron-Shop Worker; iron worker, shop (bronze, wire, and metal specialties) 3-4 years. 4-84.610.
Reinforcing-Iron Worker (construction) 2 years. 7-32.251.
Sheet-and-Structural-Shop Worker; iron worker, shop (structural metals) 3-4 years. 4-84.610.
Iron Worker, Shop (bronze, wire, and metal specialties; structural metals). See Sheet-and-Structural-Shop Worker or Ornamental-Iron-Shop Worker.
Jacquard Designer (textile). See under DESIGNER.
JEWELER (jewelry).
Caster-Mold Maker 3-4 years. 4-72.411; 4-76.081.
Enameler 2-3 years. 4-72.432.
Goldsmith 3-4 years. 4-71.010.
Jewelry Repairman; Bench Hand 3 years. 4-71.010.
Lapidary; brillianeer; stone cutter 3-4 years. 4-71.210.
Stone Setter 3-4 years. 4-71.020.
Jewelry Repairman (jewelry). See under JEWELER.
JIG-AND-FIXTURE BUILDER (aircraft manufacturing; automobile manufacturing) 4 years. 5-17.060.
Jiggerman (pottery and porcelain). See under POTTERY WORKER.
Joiner (shipbuilding). See under CARPENTER.
Kiln Drawer (pottery and porcelain). See under POTTERY WORKER.
Kiln Placer (pottery and porcelain). See under POTTERY WORKER.
KNITTER, FULL FASHION (hosiery) 2-3 years. 4-14.062.
Knitting-Machine Mechanic (hosiery; knit goods). See under MAINTENANCE MECHANIC.
Lapidary (jewelry). See under JEWELER.
LATHER (construction) 3-4 years. 5-32.761; 5-32.762.
Layout-and-Template Maker (structural metals). See under IRON WORKER.
Layout Man, Color (printing and publishing). See under ROTOGRAVURE ENGRAVER.
LEAD BURNER (chemical; petroleum and refining; shipbuilding) 4 years. 4-95.031.
LEATHER WORKER (leather products) 3 years.
Glove Cutter. 6-62.040.
Harness Maker. 4-62.120.
Saddle Maker. 4-62.060.
Leather Worker (surgical appliances). See under ORTHOPEDIC TECHNICIAN.
Lens Grinder (optical goods). See Surfacer.
Line-Service Mechanic (air transportation). See under AIR-PLANE MECHANIC.
Lineman (light and power). See under ELECTRICIAN.
Lineman (telegraph and telephone). See under TELEPHONE WORKER.
Liner (pottery and porcelain). See under POTTERY WORKER.
Linoleum, Soft Tile, and Carpet Layer (construction). See under FLOOR COVERER.
Linotype Machinist (printing and publishing). See under MAINTENANCE MECHANIC.
Lithoengraver (printing and publishing). See LITHOGRAPHER.
Camera Man; photolithographer. 4-46.200.
Lithographic Press Assistant. 4-48.050.
Lithographic Pressman. 4-49.050.
Platemaker. 4-46.400.
Process Artist. 0-44.07.
Stripper-and-Opaquer. 4-49.
Lithographic Press Assistant (printing and publishing). See under LITHOGRAPHER.
Lithographic Pressman (printing and publishing). See under LITHOGRAPHER.
Locksmith (any industry). See under REPAIRMAN.
LOCOMOTIVE REPAIRMAN (locomotive and car building and repairing) 4 years. 5-79.050.
Loftsmen (shipbuilding). See under CARPENTER.
Loom Fixer (textile). See Weave-Room Mechanic.
Machine Stone-Cutter (stoneworking). See under STONE WORKER.
MACHINIST (any industry) 4 years. 4-75.010.
Automobile Machinist (automotive service). 4-75.010.
Instrument Maker (any industry). 4-75.130.
Maintenance Machinist; machine repairman (any industry).
Marine Machinist (shipbuilding). 4-75.150.
Mold Maker (glass manufacturing; rubber tire; brick and tile). 4-75.010.
MAILER (printing and publishing) 4-5 years. 1-18.01.
Maintenance Electrician (any industry). See Electrical Repairman.
Maintenance Machinist (any industry). See under MACHINIST.
MAINTENANCE MECHANIC (any industry) 3-4 years.
Construction-Equipment Mechanic (construction). 5-83.641.
Hydraulic-Equipment Mechanic (any industry). 5-83.641.
Linotype Machinist (printing and publishing). 5-83.641.
Monotype Machinist (printing and publishing). 5-83.641.
Pump Mechanic (any industry). 5-83.322.
Sewing-Machine Mechanic (any industry). 5-83.641.
Marine Machinist (shipbuilding). See under MACHINIST.
MARKING-DEVICE MAKER (marking device; printing and publishing) 2-3 years. 6-57.931.
Rubber-Stamp Maker.
Masker (printing and publishing). See under PHOTOENGRAVER.
MATTRESS MAKER, CUSTOM (mattress) 2-3 years. 4-36.414.
Meat Cutter (retail trade). See under BUTCHER-MEAT CUTTER.
Mechanical Draftsman (any industry). See under DRAFTSMAN.
Melter (foundry). See under FOUNDRYMAN.
Metal-Denture Maker (business service). See under DENTAL
TECHNICIAN.
Metal Engraver (engraving). See under ENGRAVER.
Metal Patternmaker (foundry). See under PATTERNMAKER.
METAL POLISHER-AND-BUFFER (any industry) 3-4 years. 6-77.020;
6-77.060.
Polisher (jewelry) 3 years. 4-72.512.
Sandbobber (silverware; holloware) 3 years. 4-72.511.
Metal-Sign Maker (signs). See under SHEET-METAL WORKER.
METAL SPINNER (machine shop) 3-4 years. 4-94.201.
Meter-Relay Tester (light and power). See Meter Tester-and
Repairman.
Meter Tester-and-Repairman (light and power). See under
ELECTRICIAN.
MILLER (grain mill). 4 years. 4-07.100.
Millman (woodworking). See under CABINET MAKER-MILLMAN.
MILLWRIGHT (any industry) 4 years. 5-78.100.
MODEL MAKER (any industry) 4 years.
Model Maker (aircraft manufacturing). 5-17.120.
Model Maker (automobile manufacturing). 0-44.71.
Model Maker (electrical equipment). 5-17.410.
Model Maker (jewelry). 5-17.262.
Model Maker (construction). See under PLASTERER.
Modeler (construction). See under PLASTERER.
Mold Loftsman (shipbuilding). See under BOILERMAKER.
Mold Maker (glass manufacturing; rubber tire; brick and tile).
See under MACHINIST.
Mold Maker (pottery and porcelain). See under POTTERY WORKER.
Mold Maker, Wood (brick and tile). See under CARPENTER.
Molder (foundry). See under FOUNDRYMAN.
Molder (printing and publishing). See under ELECTROTYPER.
Monotype Machinist (printing and publishing). See under MAIN-
TENANCE MECHANIC.
Monument Maker (stoneworking). See under STONE WORKER.
Motorboat Mechanic (any industry). See under AUTOMOTIVE
MECHANIC.
Motorcycle Repairman (automotive service). See under AUTOMO-
TIVE MECHANIC.
Mounter (optical goods). See Finisher.
MUSICAL-INSTRUMENT MECHANIC (musical instruments) 3-4 years.
Accordion Maker. 5-13.351.
Musical-Instrument Repairman. 5-83.211; 5-13.352.
Organ Repairman. 5-12.200; 5-83.225; 5-83.211.
Piano Repairman-and-Tuner. 5-83.222; 5-12.100.
Stringed-Instrument Repairman. 5-83.223.
Violin Maker. 5-13.353.
Musical-Instrument Repairman (musical instruments). See under MUSICAL-INSTRUMENT MECHANIC.

Neon-Tube Bender (signs). See under GLASS BLOWER-BENDER.

Newspaper (web) Pressman (printing and publishing). See under PRINTING PRESSMAN.

Office-Machines Mechanic (any industry). See BUSINESS-MACHINES MECHANIC.

Offset Pressman (printing and publishing). See under PRINTING PRESSMAN.

OPERATING ENGINEER; hoisting-and-portable engineer (construction) 3-4 years. 5-23.910.

Operating Engineer, Stationary (any industry). See STATIONARY ENGINEER.

OPTICAL TECHNICIAN (optical goods) 4 years.
- Finisher; benchman; mounter. 5-09.030; 5-08.050; 5-08.045.
- Precision-lens grinder. 5-08.071.
- Surfacer; lens grinder. 5-08.070; 5-09.010; 5-08.080.

Organ Repairman (musical instruments). See under MUSICAL-INSTRUMENT MECHANIC.

Ornamental-Iron Erector (construction). See under IRON WORKER.
Ornamental-Iron-Shop Worker (bronze, wire, and metal specialties). See under IRON WORKER.

ORTHOPEDIC TECHNICIAN (surgical appliances) 3-4 years.
- Artificial-Limb Maker, Metal. 5-09.450.
- Artificial-Limb Maker, Wood. 5-09.450.
- Brace Maker. 5-09.410.
- Fitter. 5-09.442.
- Leather Worker. 5-09.454.

Outside Electrician (light and power). See Lineman.

PAINTER-AND-DECORATOR (any industry).
- Aircraft Painter-Doper (air transportation; aircraft manufacturing) 2-3 years. 5-16.930; 5-16.940.
- Automobile Painter (automotive service) 3 years. 5-16.910.
- Furniture Finisher; hardwood finisher (furniture) 2-3 years. 5-16.710.
- Painter (construction) 3 years. 5-27.010.
- Painter (shipbuilding) 3 years. 5-27.110.
- Statuary Painter (statuary and art goods) 3 years. 5-04.01.

Painter (construction). See under PAINTER-AND-DECORATOR.

Painter (shipbuilding). See under PAINTER-AND-DECORATOR.

Pantograph Engraver (any industry). See under ENGRAVER.


PAPER-GOODS MAKER (paper goods) 4 years.
- Die Maker, Paper; steel-rule die maker. 4-42.301.
- Paper-Goods-Machine Adjuster; Cutting-and-creasing pressman; envelope-machine adjuster; machine set-up man (paper goods; paper box manufacturing). 6-42.621; 6-42.644.
Pastry Cook (hotel and restaurant). See under COOK.

PATTERMAKER (foundry) 5 years.
  Metal Patternmaker. 5-17.010.
  Wood Patternmaker. 5-17.020.

PHOTOENGRAVER (printing and publishing) 5-6 years.
  Copper Etcher. 4-47.100.
  Finisher. 4-47.100.
  Masker. 4-47.100.
  Photographer. 4-47.100.
  Proofer. 6-49.510.
  Router-and-Blocker. 6-49.210; 6-49.220.
  Stripper-and-Printer. 4-47.300.
  Tint Layer; ben-day artist. 0-44.01.
  Zinc Etcher. 4-47.100.

PHOTOGRAPHER (any industry) 3 years.
  Commercial Photographer. 0-56.11.
  Film Developer-Printer, Motion Picture. 5-86.020; 5-86.030.
  Portrait Photographer. 0-56.21.

Photographer (printing and publishing). See under PHOTOENGRAVER OR ROTOGRAVURE ENGRAVER.

Photolithographer (printing and publishing). See Camera Man.

Pipe Fitter (construction). See under PLUMBER-PIPE FITTER.

PLASTERER (construction) 4 years.
  Artificial Marble-Imitation Stone Worker. 5-24.310.
  Caster. 5-29.200.
  Model Maker. 0-44.71.
  Modeler. 0-44.62.
  Plasterer. 5-29.100.
  Sculptor. 0-04.35.

PLATE PRINTER (printing and publishing) 4 years.
  Die Stamper; steel-die embosser. 4-48.080.
  Plate Printer; engraving pressman. 4-48.080.

Platen Pressman (printing and publishing). See under PRINTING PRESSMAN.

Platemaker (printing and publishing). See under LITHOGRAVER.

Plater (electroplating). See under ELECTROPLATER.

Plumber (any industry). See under PLUMBER-PIPE FITTER.

PLUMBER-PIPE FITTER (any industry) 4-5 years.
  Gas Fitter. 5-30.010.
  Pipe Fitter. 5-30.010.
  Sprinkler Fitter. 5-30.010.
  Steam Fitter. 5-30.410.

Polisher (jewelry). See under METAL-POLISHER-AND-BUFFER.

Porcelain-and-Acrylic-Denture Maker (business service). See under DENTAL TECHNICIAN.

Portrait Photographer (any industry). See under PHOTOGRAPHER.
POTTERY WORKER (pottery and porcelain) 3 years.
  Caster. 4-66.454.
  Decorating-Kiln Placer. 6-66.611.
  Dipper. 6-66.052; 6-66.511.
  Handler. 6-66.456.
  Jiggerman. 6-66.453.
  Kiln Drawer. 6-66.631.
  Kiln Placer. 6-66.623.
  Liner. 4-66.411.
  Mold Maker. 6-66.411.
  Sagger Maker. 6-66.421.
  Tinter. 4-66.511.
  Turner. 4-66.453.

Power-House Electrician (light and power). See under ELECTRICIAN.

Power-House Engineer (any industry). See under STATIONARY ENGINEER.

Precision-Lens Grinder (optical goods). See under OPTICAL TECHNICIAN.

Press Assistant (all branches) (printing and publishing). See under PRINTING PRESSMAN.

Print Cutter-Roller Router (wall paper). See under WALL-PAPER CRAFTSMAN.

PRINTER; Compositor (printing and publishing) 5-6 years.
  4-44.010.

PRINTING PRESSMAN (printing and publishing)
  Cylinder Pressman 4-5 years. 4-48.010.
  Gravure Pressman 4-5 years. 4-48.060.
  Newspaper (web) Pressman 4-5 years. 4-48.030.
  Offset Pressman 4-5 years. 4-48.050.
  Platen Pressman 4-5 years. 4-48.020.
  Press Assistant (all branches) 2-3 years. 4-48.010;
  4-48.030; 4-48.060.
  Rotary (magazine) Pressman 4-5 years. 4-48.030.
  Specialty Pressman; bread-wrapper-and-label pressman 4-5
  years. 4-48.

Private-Branch-Exchange Installer (PBX Installer) (telephone
  and telegraph). See under TELEPHONE WORKER.

Process Artist (printing and publishing). See under LITHOGRAPHER.

Proofer (printing and publishing). See under PHOTOENGRaver.

Propeller Mechanic (air transportation; aircraft manufactur-
  ing). See under AIRPLANE MECHANIC.

Pump Mechanic (any industry). See under MAINTENANCE MECHANIC.

Pyrometer Man (any industry). See Electrical-Instrument
  Mechanic.

Radio Electrician (broadcast-telecast). See under ELECTRICIAN.

Radio Mechanic (air transportation; aircraft manufacturing).
  See under AIRPLANE MECHANIC.

Radio Repairman (radio-television service). See Electronics
  Repairman-Serviceman.
Ready-to-Wear Tailor (retail trade). See Alteration Tailor.
Reinforcing-Iron Worker (construction). See under IRON WORKER.
Repairer-and-Winder (any industry). See under ELECTRICIAN.
REPAIRMAN (any industry).
- Camera Repairman 3 years. 5-83.901.
- Diesel Repairman 4 years. 5-83.931.
- Electrical-Instrument Mechanic (repairman); pyrometer man 4 years. 5-83.975.
- Gas-Engine Repairman 3-4 years. 5-83.552.
- Gunsmith 3-4 years. 5-83.542.
- Instrument Repairman 4 years. 5-83.971.
- Locksmith 3-4 years. 5-83.551.
- Scale Repairman 3 years. 5-83.641.
- X-Ray-Equipment Repairman 3-4 years. 5-83.420.
RIGGER (any industry) 2-3 years. 5-88.040.
ROLL TURNER (iron and steel) 4 years. 4-78.011.
ROOFER (construction) 3 years.
- Composition Roofer. 7-31.300; 7-31.100.
- Damper-and-Waterproofer. 7-32.611.
- Slate-and-Tile Roofer. 7-31.400; 7-31.500.
Rotary (magazine) Pressman (printing and publishing). See under PRINTING PRESSMAN.
Roto Etcher (printing and publishing). See under ROTOGRAVURE ENGRAVER.
Roto Plater-Grinder (printing and publishing). See under ROTOGRAVURE ENGRAVER.
Roto Printer-Transferer (printing and publishing). See under ROTOGRAVURE ENGRAVER.
Roto Retoucher (printing and publishing). See under ROTOGRAVURE ENGRAVER.
Roto Stager (printing and publishing). See under ROTOGRAVURE ENGRAVER.
ROTOPRINT (printing and publishing) 5-6 years.
- Layout Man, Color. 4-49.
- Photographer. 4-47.100.
- Roto Etcher. 4-49.
- Roto Plater-Grinder. 6-49.620.
- Roto Printer-Transferer. 6-49.610.
- Roto Retoucher. 4-49.610.
- Roto Stager. 4-49.670.
Router-and-Blocker (printing and publishing). See under PHOTOENGRAVER.
Rubber-Stamp Maker (marking devices). See under MARKING-DEVICE MAKER.
Ruler (printing and publishing). See under BOOKBINDER.
Saddie Maker (leather products). See under LEATHER WORKER.
Sagger Maker (pottery and porcelain). See under POTTERY WORKER.
Sailmaker (shipbuilding). See under CANVAS WORKER.
Sample-Body Builder, Metal (automobile manufacturing). See under AUTOMOTIVE-BODY BUILDER.
Sample-Body Builder, Wood (automobile manufacturing). See under AUTOMOTIVE-BODY BUILDER.
Sample Maker (garment). See under TAILOR.
Sandbobber (silverware; holloware). See under METAL POLISHER-AND-BUFFER.
Sawsmith (saw manufacturing). See under BLACKSMITH.
Scale Repairman (any industry). See under REPAIRMAN.
Sculptor (construction). See under PLASTERER.
Sewing-Machine Mechanic (any industry). See under MAINTENANCE MECHANIC.
Sheet-and-Structural-Shop Worker (structural metals). See under IRON WORKER.
Sheet-Metal Mechanic (sheet metal; shipbuilding; construction). See under SHEET-METAL WORKER.
SHEET-METAL WORKER (any industry).
Aircraft Metalsmith (air transportation; aircraft manufacturing) 3-4 years. 4-80.060.
Coppersmith (sheet metal; shipbuilding) 4 years. 4-80.010; 4-80.080.
Metal-Sign Maker (signs) 4 years. 4-80.010.
Sheet-Metal Worker; sheet-metal mechanic (sheet metal; shipbuilding; construction) 4 years. 4-80.010; 4-88.622.
Steel Boatbuilder (shipbuilding) 4 years. 4-80.070.
Ship Electrician (shipbuilding). See under ELECTRICIAN.
SHIP RIGGER (shipbuilding) 3-4 years. 5-05.570.
Shipfitter (shipbuilding). See under BOILERMAKER.
SHIPWRIGHT (shipbuilding). See under CARPENTER.
Shirt Cutter (any industry). See under FABRIC CUTTER.
Shoe-Last Maker, Wood (boot and shoe manufacturing). See under PATTERNMAKER.
Shoe Repairman (personal service). See under BOOT-AND-SHOE MAKER.
Shop Carpenter (woodworking). See MILLMAN.
Shuttlemaker (textile). See under CABINET MAKER-MILLMAN.
Siderographer (engraving). See under ENGRAVER.
SIGN-AND-PICTORIAL PAINTER (any industry) 3-4 years. 5-27.910.
Sign Painter, Hand. 5-27.910.
Silk-Screen-Process Printer. 5-89.561.
Sign Electrician (signs). See under ELECTRICIAN.
Sign Painter, Hand (any industry). See under SIGN-AND-PICTORIAL PAINTER.
Signal-System Electrician (any industry). See under ELECTRICIAN.
Silk-Screen-Process Printer (any industry). See under SIGN-AND-PICTORIAL PAINTER.
SILVERSMITH (silverware) 3-4 years. 4-71.310.
Solderer 3-4 years. 4-72.318.
Spinner 3-4 years. 4-72.317.
Sketch Maker (wall paper). See under WALL-PAPER CRAFTSMAN.
Slate-and-Tile Roofer (construction). See under ROOFER.
Solderer (silverware). See under SILVERSMITH.
Specialty Pressman (printing and publishing). See under PRINTING PRESSMAN.
Spindle Carver (furniture). See under CABINET MAKER-MILLMAN.
Spinner (silverware). See under SILVERSMITH.
Spinning-Room Mechanic (textile). See under TEXTILE TECHNICIAN MECHANIC.
Spring Maker, Automotive (automobile manufacturing; automotive service). See under BLACKSMITH.
Sprinkler Fitter (any industry). See under PLUMBER-PIPE FITTER.
STAINED-GLASS WORKER (glass products) 4 years.
Stained-Glass Artist. 0-04.21; 0-46.97.
Stained-Glass Glazier. 5-77.110; 5-77.120.
STATIONARY ENGINEER; Operating Engineer, Stationary (any industry) 3-4 years. 5-72.010.
Power House Engineer (light and power). 5-51.010.
Staetuary Painter (statuary and art goods). See under PAINTER-AND-DECORATOR.
Steam Fitter (construction). See under PLUMBER-PIPE FITTER.
Steel-and-Copper-Plate Engraver (printing and publishing). See under ENGRAVER.
Steel Boatbuilder (shipbuilding). See under SHEET-METAL WORKER.
Steel-Die Embosser (printing and publishing). See Die Stamper.
STEREOTYPER (printing and publishing) 5-6 years. 4-45.210.
Stone Carver (stoneworking). See Monument Maker.
Stone Cutter (jewelry). See Lapidary.
Stone Cutter (stoneworking). See under STONE WORKER.
Stone Polisher (stoneworking). See under STONE WORKER.
Stone Sawyer (stoneworking). See under STONE WORKER.
Stone Setter (construction). See under STONEMASON.
Stone Setter (jewelry). See under JEWELER.
STONE WORKER (stoneworking).
    Granite Cutter, Sandblaster 3 years. 4-69.160.
    Machine Stone-Cutter; granite-lathe operator; machine man 2-3 years. 4-69.110; 4-69.150.
    Monument Maker; stone carver 3-4 years. 4-68.100.
    Stone Cutter; granite cutter 3 years. 4-68.200.
    Stone Polisher; turner polisher 2 years. 4-69.120; 6-69.360; 6-69.160; 6-69.170.
    Stone Sawyer; granite sawyer 2 years. 6-69.010; 6-69.020.
    Tool Sharpener; granite sawyer 2 years. 5-84.010; 7-84.140.
Stone Setter; marble setter. 5-24.310.
STOVE MOUNTER (stove). 3 years. 4-93.411.
Stringed-Instrument Repairman (musical instruments). See under MUSICAL- INSTRUMENT MECH.
Stripper-and-Opaquer (printing and publishing). See under LITHOGR.
Stripper-and-Printer (printing and publishing). See under PHOTOENG.
Structural Draftsman (any industry). See under DRAFTSMAN.
Surfacer (optical goods). See under OPTICAL TECHNICIAN.
TAILOR (garment; retail trade) 4 years. 4-26.101.
Alteration Tailor; ready-to-wear tailor; bushelman (retail trade) 2 years. 4-26.201.
Custom Tailor (retail trade) 4 years. 4-26.101.
Finisher; tailorress (garment) 2 years. 4-27.261.
Sample Maker (garment) 3-4 years. 4-26.202.
Tailor (garment) 3-4 years. 4-26.201.
Tailoress (garment). See Finisher.
TANNER (leather manufacturing) 2-3 years. 4-59.011; 4-59.031; 4-59.501; 4-59.912.
TELEPHONE WORKER (telephone and telegraph) 4 years.
Cable Splicer. 5-53.950.
Central-Office Installer. 5-53.010.
Combination Man. 5-33.210.
Lineman. 5-53.410.
P-B-X Installer. 5-53.240.
Television Repairman (radio-television service). See Electronics Repairman-Serviceman.
Template Maker (shipbuilding). See Mold Loftsman.
Tent-Awning Maker (canvas goods). See under CANVAS WORKER.
TERRAZZO WORKER (construction) 3 years. 5-24.510.
Textile-Block Printer (textile). See Wood-Block Engraver.
TEXTILE TECHNICIAN-MECH (textile) 2-4 years.
Card-Room Mechanic 3-4 years. 5-83.324.
Comb Fixer 3-4 years. 5-83.324.
Drawing-Frame Fixer 3-4 years. 5-83.324.
Dyer, Master 3-4 years. 5-18.010.
Spinning-Room Mechanic 3-4 years. 5-83.324.
Twister-Frame Fixer 3-4 years. 5-83.
Warp-Preparation Mechanic 3-4 years. 5-83.324.
Weave-Room Mechanic; loom fixer 3-4 years. 4-16.010.
Wool Sorter 2-3 years. 4-19.991.
TILE SETTER (construction) 3 years. 5-24.410.
Tint Layer (printing and publishing). See under PHOTOENG.
Tinter (pottery and porcelain). See under POTTERY WORKER.
Tool-and-Die Designer (machine shop). See under DESIGNER.
TOOL-AND-DIE MAKER (machine shop).
Diamond-Die Maker (wire drawing) 4 years. 4-76.010.
Die Maker 4-5 years. 4-76.010.
Die Maker; hub cutter (jewelry) 4 years. 4-76.020.
Die Sinker; trimmer die maker-die sinker 4-7 years. 4-76.010.
Gage Maker 4-5 years. 4-76.210.
Tool Maker 4-5 years. 4-76.210.
Tool Maker (jewelry) 4 years. 4-76.210.
Tool Dresser (any industry). See under BLACKSMITH.
Tool Maker (jewelry). See under TOOL-AND-DIE MAKER.
Tool Maker (machine shop). See under TOOL-AND-DIE MAKER.
Tool Sharpener (stoneworking). See under STONE WORKER.
Topographical Draftsman (any industry). See under DRAFTSMAN.
Tractor Mechanic (automotive service). See under AUTOMOTIVE MECHANIC.
Trimmer Die Maker-Die Sinker (machine shop). See Die Sinker.
Truck Mechanic (automotive service). See under AUTOMOTIVE MECHANIC.
Turner (pottery and porcelain). See under POTTERY WORKER.
Twister-Frame Fixer (textile). See under TEXTILE TECHNICIAN-MECHANIC.
UPHOLSTERER (any industry) 3-4 years.
Automobile Upholsterer (automotive service). 4-35.610.
Upholsterer (furniture). 4-35.610.
Upholstery Repairman (any industry). 4-35.710.
Upholstery-and-Seat-Cover Cutter (any industry). See under FABRIC CUTTER.
Upholstery Repairman (any industry). See under UPHOLSTERER.
Violin Maker (musical instruments). See under MUSICAL-INSTRUMENT MECHANIC.
WALL-PAPER CRAFTSMAN (wallpaper).
Color Mixer 4 years. 6-49.855.
Print Cutter—Roller Router 4-5 years. 4-49.850.
Sketch Maker 5 years. 0-44.44.
Wall-Paper Printer 4 years. 4-48.090.
Wall-Paper Printer (wallpaper). See under WALL-PAPER CRAFTSMAN.
Warp-Preparation Mechanic (textile). See under TEXTILE TECHNICIAN-MECHANIC.
WATCHMAKER (any industry) 3-4 years. 4-71.510.
Wax Engraver (printing and publishing). See under ELECTROTYPE.
Weave-Room Mechanic (textile). See under TEXTILE TECHNICIAN-MECHANIC.
WEAVER (textile) 2-3 years. 4-15.020.
Wind-Tunnel-Maintenance Mechanic (aircraft manufacturing). See under MAINTENANCE MECHANIC.
Window-Glass Cutter (glass manufacturing). See under GLAZIER-Glass Worker.
WIRE WEAVER (wirework) 2-3 years. 6-93.184; 6-93.185.
Wood-Block Engraver (textile). See under WOOD CARVER.
Wood Carver, hand (any industry). See under WOOD CARVER.
WOOD CARVER (any industry) 4-5 years. 4-33.361; 4-33.362.
Wood-Block Engraver; textile-block engraver (textile).
Wood Carver, hand (any industry).
Wood Patternmaker (foundry). See under PATTERNMAKER.
Wood-Tool Maker (aircraft manufacturing). See under JIG-AND-
FIXTURE BUILDER.

Wool Sorter (textile). See under TEXTILE TECHNICIAN-MECHANIC.

X-Ray-Equipment Repairman (any industry). See under REPAIR-MAN.

Zinc Etcher (printing and publishing). See under PHOTOENGRAVER.
The Bibliography
Bibliography


40. __________________, "National Program of Apprenticeship," Industrial Arts and Vocational Education (April 1948), 37:142-144.


43. __________________, "Twenty-Five Years of Apprenticeship in America 1913-1938," Industrial Arts and Vocational Education (January 1939), 28:10-12.


59. ______, Apprenticeship Credit for Previous Experience.

60. ______, Apprenticeship in America.

61. ______, Apprenticeship, Past and Present.
62. ____, Evaluating Apprentices.
63. ____, Looking Ahead by Way of Apprenticeship.
64. ____, The National Apprenticeship Program.
65. ____, Occupation Statistics of Registered Apprentices.