

INDUSTRIAL ARTS IN OKLAHOMA JUNIOR HIGH SCHOOLS

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By

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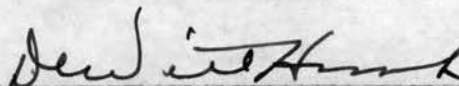
INDUSTRIAL ARTS IN OKLAHOMA JUNIOR HIGH SCHOOLS

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TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
I. THE SCOPE AND ORGANIZATION OF THE STUDY	1
Part A. Organization of the Study	2
Statement of the Problem.	2
Divisions of the Study.	2
Need for this Study	3
Purpose of this Study	3
Delimitations of the Study.	3
The Worksheet	4
Part B. Method Used in Collecting the Information	5
Documentary Information	5
II. HISTORY OF THE JUNIOR HIGH SCHOOL	6
Part A. Early American Education.	6
The Colonial Period	7
The National Period	8
The Modern Period	9
The Reorganization Movement	9
Growth of the Junior High School	11
Part B. Purposes and Recent Developments	11
Aims	12
Industrial Arts in the Junior High School	13
The Junior High School of 1950	15
III. PROPOSED PHILOSOPHY OF INDUSTRIAL ARTS FOR OKLAHOMA JUNIOR HIGH SCHOOLS.	17
Part A. The Background For Industrial Art in American Schools	17
History	18
Definitions	19
Objectives for Industrial Arts	22
Industrial Arts in American Secondary Schools in 1950	24
Part B. Controlling Purposes of Industrial Arts in Oklahoma Junior High School	25
Industrial Arts Placed in the Junior High School.	25
Definitions	26
Objectives	29
How Objectives May be Realized.	29
IV. INDUSTRIAL ARTS GENERAL SHOP.	32
Part A. Origin and Aims	32
History	33
Purposes	34
Part B. Organization.	38
Types of Organization	39
Criteria for Selecting Units	41
Class Organization.	42

<u>Chapter</u>	<u>Page</u>
Shop Planning	43
Teaching Problems	43
V. STATUS OF INDUSTRIAL ARTS IN OKLAHOMA JUNIOR HIGH SCHOOLS. .	46
Part A. Approved Junior High Schools	46
Industrial Arts in The Junior High Schools	47
Statistical Data	48
Part B. Curriculum	53
Junior High School Program of Studies For	
Oklahoma	54
Size of Industrial Arts Classes.	57
Class Period	58
Course Duration	58
Shop Activities	59
Part C. Oklahoma Junior High School	60
Industrial Arts Teachers	60
Teaching Fields	61
Qualification of Teachers	62
Teachers Salaries	62
VI. SUMMARY AND RECOMMENDATIONS	65
Part A. Summary	65
Part B. Recommendations	65
APPENDICES.	70
A. Alphabetical Directory of Industrial Arts Teachers in	
Oklahoma Junior High Schools.	70
B. An Outline on "Organizing and Equipping the Industrial	
Arts Shop."	77
C. A Selected Bibliography	88

LIST OF TABLES

<u>Table Number</u>		<u>Page</u>
I.	A List of the Approved Junior High Schools in Oklahoma in the School Year 1949-50	49
II.	Junior High School Program of Studies for Oklahoma	55
III.	Industrial Arts Courses Offered or Required	56
IV.	Size and Number of Industrial Arts Classes	57
V.	Length of Class Period	58
VI.	Course Duration	59
VII.	Industrial Arts Activities	60
VIII.	Teaching Combinations	61
IX.	Educational Preparation of Industrial Arts Teachers	62
X.	Salaries of Industrial Arts Teachers	63

CHAPTER I

THE SCOPE AND ORGANIZATION OF THE STUDY

A great deal of progress has been made in the junior high school program since this type of school organization was introduced in America. Educators must cope with many problems as they strive to further develop the junior high school into the dynamic force that it should be in modern secondary education. [The problem of industrial arts and its place in the school curriculum is of great importance.] The writer hopes that this study will reveal some of the deficiencies in the present program and stimulate the improvement of the present program. Because of the way the junior high school has grown and especially the industrial arts program, it is difficult for the teachers of Oklahoma to know the existing conditions around them.

With these points in mind, the study was organized with the use of an outline. Chapter I acquaints the reader with the scope and organization of the study and the research method that were used in obtaining information for the study. Chapter II gives a brief history of the junior high school that will contribute to a better understanding of present junior high schools. Chapter III consists of a number of definitions, aims, and past and present philosophy that will aid in avoiding any confusion that may develop. In Chapter IV, a definition of the general shop is given along with a discussion of the aims and organization of a general shop program. Chapter V deals with data concerning the approved junior high schools of Oklahoma. Chapter VI includes a summary of the preceding chapters and recommendations for the improvement of industrial arts in Oklahoma junior high schools.

Part A

Organization of the Study

The problem was organized to include only the information pertaining to the status of industrial arts in Oklahoma junior high schools. Only information about the teachers and the schools which include industrial arts in its curriculum will be discussed at length in this study. No attempt was made to establish a course of study or determine what was in the course of study now being used in the schools.

Statement of Problem. The survey of industrial arts in Oklahoma junior high schools is a study of the approved junior high schools having industrial arts in the curriculum. In dealing with this subject the writer has attempted to show the extent of the industrial arts program in Oklahoma junior high schools as to (1) the schools in which industrial arts is taught; (2) type of industrial arts courses; (3) courses required or elective; (4) length of class period; (5) size and number of industrial arts classes; (6) course duration; (7) shop activities; (8) teaching combinations; (9) qualifications of teachers; and (10) salaries paid to industrial arts teachers.

Division of the Study. This study is divided into four parts. The first is a study of history and development of the junior high school in the United States. The second part is a study of beginning, philosophy, and objectives of the industrial arts phase of secondary education. The third division is a study of purposes and organization of the general shop. The fourth part deals with the approved junior high schools in Oklahoma which have industrial arts in the school curriculum. The study is concerned with the junior high schools that are now approved in the

state of Oklahoma.

Need for this Study. Status surveys are needed periodically in all fields to show trends, provide statistical summaries and to furnish information on which predictions for future developments may be based. This study of the status of "Industrial Arts in Oklahoma Junior High Schools" is needed to indicate what is being done in the field during the school year 1949-50 and to determine current conditions of industrial arts in the junior high schools.

Purpose of This Study. The purpose of compiling and presenting this information is to answer many questions concerning the junior high school industrial arts program which have been asked by school board members, superintendents, and industrial arts teachers. Some of these questions are: (1) How many schools offer courses in industrial arts? (2) What courses are included in the industrial arts program? (3) What type of industrial arts shops are needed? (4) What is the salary of the industrial arts teacher? (5) How does industrial arts contribute to the junior high school curriculum? It is hoped, through the efforts of this study, that these questions and many others regarding industrial arts in junior high schools may be answered.

Delimitations of the Study. This study is limited to industrial arts in approved junior high schools of Oklahoma. This survey does not include vocational agriculture, home economics, or trade and industrial education. The major portion of this study is concerned with the junior high schools having industrial arts in the curriculum. No attempt has been made to compare the Oklahoma junior high school industrial arts program with junior high school industrial arts programs of other states.

The foregoing limitations may suggest topics for further research

in industrial arts for junior high schools. There are many research studies that could be made more extensive concerning industrial arts in the junior high schools as this study is limited only to the status of industrial arts in the junior high schools of the state.

Part B

Method Used in Collecting the Information

The method used in the collection of information for this study was the securing of all available information from reports filed in the office of the State Department of Education in Oklahoma City.

Documentary Information. "Applications for Junior High School Approval Forms" are sent in by the principal or superintendent of each school and are on file in the office of the State Department of Education, Capitol Building, Oklahoma City, Oklahoma. These forms must be received at the State Department before November 15th of each year. The writer secured the permission from the officials of this office to search the files and copy information pertinent to this report. This information was gathered from the files in the capitol building during Easter holidays and on Tuesdays. The writer spent five days there gathering data relevant to this report.

The Worksheet. The writer planned the worksheet which was mimeographed and used to collect the information for this study. The worksheet is included as page four of this thesis. The worksheet was designed to include all information available from the applications filed in the State Department of Education. Abbreviations are used in this form because lack of space will not permit the use of the entire word. The following abbreviations were used: No. of students is for number of students; min. per week, minutes per week; No. of weeks, number of weeks; and Req. or El. stands for required

or elective.

This study covers the approved junior high schools that have industrial arts in the present school curriculum. It deals only with the status of those schools. The method of research may be designated as documentary. Information was secured from the records at the State Department of Education. It is hope that the divisions of this study will simplify the data whereby teachers who are interested in industrial arts in the junior high school will be able to locate the information of interest with little difficulty.

CHAPTER II

HISTORY OF THE JUNIOR HIGH SCHOOL

Before one can enter into an intelligent study of industrial arts in Oklahoma junior high schools, it is advantageous to survey briefly the factors which have influenced its present development. About fifty years ago certain educators became convinced that the 8-4 form of organization was not as effective as it should be; and administrators in a few pioneer schools began experimenting with new school units which brought under one roof children of the early adolescent age and offered differentiated courses of study. The brief history of early American education that follows will help the reader to understand the present form of organization for secondary education and the evolution of the junior high school.

Part A

Early American Education

The public school system in the United States, like many American institutions, has had a relatively brief history. It is largely the product of one and one-half centuries of growth and evolution. Elementary and secondary schools in America originated in the second quarter of nineteenth century. There is evidence of European influence upon the origin of the first secondary schools in the United States. The Latin grammar school is an example of European educational philosophy transplanted into the new country. Many of the early schools, elementary, secondary and higher, were patterned after European schools. By the close of the nineteenth century the eight-year elementary school and the four-year high school had become the accepted plan of organization for our public schools throughout the

United States.

The junior high school movement is the result of an older and a much more comprehensive educational movement. Viewed in this way, it may be traced far back into the past. Comenius (1592-1670) and Rousseau (1712-1788) both advocated reforms that embodied elements which find support in the reorganization plans of the present day, Comenius, on the side of external forms; Rousseau, on the side of internal practices and spirit. The influence of Rousseau on modern education centers in his demand for the development of individuality and naturalness in pupils; the recognition of individual differences in capacities, tastes, and achievements among them. The development of secondary education in America may be described by reviewing these periods of transition.

The Colonial Period. Several types of education which involved pupils of adolescent age were found in early colonial time. The most extensive practiced of these was that known as apprenticeship training. Throughout the colonies during the seventeenth century it was the custom for boys and girls of modest means or less to be bound out to some master for a period of years to learn a vocation. This practice was known as the "indenture" system. During the seven year period of indenture the master was responsible for the education of the youth.

Another form of education popular in the colonial period was that of tutorial instruction. It was customary for the upper classes of the South to be prepared for college by tutors. The most famous of the forms of secondary education in early colonial period was the Latin grammar school. Primarily it trained youth for college and the ministry. The first Latin grammar school was established in Boston in 1635 and it became the mode of secondary education for nearly all of the thirteen colonies.

Dame schools were at first purely private schools conducted by women usually in their homes. They were the most prominent means of elementary education. A person who had the rudiments of learning conducted these schools where education in the fundamentals--reading, writing, and arithmetic was provided. Parochial schools were also common during this period. The minister occasionally taught the elementary studies. Pupils in these colonial schools attended very irregularly and there was little or no classification of pupils. The curriculum was unorganized and there were few if any instructional aids and materials. This lack of organization was prevalent throughout the colonial period.

The National Period. The early National Period is from the Revolution to the Civil War. In this period the monitorial system which was brought to America from England was popular from 1810 to 1830. A large number of pupils, perhaps several hundred or even a thousand were taught by one teacher with the help of more capable students who were designated as monitors. The entire school was divided into small groups of pupils. These pupils were taught by the monitors who had previously studied under the teacher.

During this period more city district schools were organized and there was an increase in number of graded schools. The first step toward the modern graded system was taken when the elementary period was divided into three levels, designated quite commonly as the primary, the intermediate, and the grammar divisions. The second step toward the modern graded system was taken when the several divisions came to be informally subdivided into classes or grades on the basis of age and achievement. One of the significant developments during the national period was the academy. This was an early form of the private high school. Franklin's Academy opened in Philadelphia in 1751 and following its success other academies were organized

and became the paramount means of secondary education.

The Modern Period. During the time 1862 to 1900, the so called free public high schools supplanted the academies. According to Smith the first high school was established in Boston in 1821. (20, page 31) Progress of the high school was slow at first but after the famous decision of the supreme court of the state of Michigan in the Kalamazoo case in 1872, in which the right of the community and the state to tax themselves for the support of public high schools was upheld, the transmutation from the academy to the high school was rapid. It was during this epoch that the secondary schools became state supported and publically controlled. The standard four-year high school became primarily a college preparatory education institution, and it was generally regarded as an extension of the graded elementary school. ✓

The Reorganization Movement. There were two periods in the reorganization movement. In the first period the attention of American educators was directed toward the need for reform and the second began with the establishment of the first junior high school preceded the action or reorganization. There is no evidence that the eight-year elementary school and the four-year high school were influenced in their origin and early development by any recognition of the nature of the physical and psychological growth of children. The elementary and secondary schools began as two entirely separate institutions; furthermore, throughout much of their early history there was little or no attempt to bring about satisfactory articulation between them. These two conditions were significant in initiating the reorganization movement in upper elementary and secondary education that culminated in the development of the junior high school.

After 1910, the standing "Committee on Six-Year Courses" and the various

"Committees on Economy of Time in Education" were exceedingly influential in developing a philosophy for the reorganized schools and in suggesting many of the educational practices that were later introduced into those schools. However, the plan of grade reorganization which included the junior high school was not a direct outcome of the recommendations of any of the committees on reorganization. According to Gruhn and Douglass a plan of grade organization was already in use before mention was made by any of the committees. (8, page 33)

The first mention by any of the committees on educational reform of a plan of grade organization that would include an intermediate unit like the junior high school was therefore not made until after a number of school systems had already introduced such plan. Consequently we must conclude that the plan of grade reorganization which included the junior high school was not a direct outcome of the recommendations of any of the committees of reorganization.

The movement for the reorganization of the 8-4 plan was influenced considerably by the proposals of Charles W. Eliot. President Eliot of Harvard first made his proposal to shorten the period of elementary and secondary education in addresses to the National Education Association in 1888 and 1892. The influence of these addresses in showing the designated as the beginning of the reorganization movement. Because of their great influence in directing the attention of American educators toward the need of reform and in initiating the reorganization movement President Eliot's appeal ultimately had a significant bearing on the development of the junior high school.

"The Committee of Ten" appointed in 1892 by officers of the National Education Society, the "Committee of Fifteen" appointed by officers of the Department of Secondary Education of the National Educational Association in 1895, did much to emphasize the weakness in the upper elementary and secondary schools. The recommendations of the "Committee of Ten" subscribed to the principle of an enriched program of studies for secondary schools;

the reduction of the elementary school to six years and the extension of the secondary school to six years; the recognition of individual interests and ambitions among pupils.

Growth of The Junior High School. It is debatable as to which city was first to introduce an intermediate school corresponding to a junior high school organization. Richmond, Indiana, with the introduction in 1896 of an intermediate school for grades 7 and 8, apparently was the first city where such a school was established for these grades. Claims are made that the earliest three-year intermediate school was established in Columbus, Ohio in September, 1909, and it was here that the new organization was first called a junior high school. Two introductory high schools were established in Berkeley, California, in January, 1910, which were considered the first three-year intermediate schools to introduce a modified program especially designed to meet the needs of early adolescents. None of these schools were organized to the extent of the junior high schools of today, but these pioneer examples and others of the same period pointed the way toward a functional reorganization of the school system, a reorganization in harmony with the educational philosophy and practices that were stressed by leaders in the reform movement during the two decades before 1910. In the following two decades the junior high school educational program became accepted as a method of education that would best meet the needs of the adolescent.

Part B

PURPOSES AND RECENT DEVELOPMENTS

If the junior high school is worthy of being maintained as a separate

unit in the American public school program, distinct from the elementary and senior high schools, it must have distinct purposes and definite functions, difficult of realization in the plan of eight elementary and four high school years. What are the purposes of the junior high school? What is it supposed to do that is different from the work accomplished by the elementary school or the senior high school? What are some of the recent developments in the junior high school? An understanding of the nature and purpose of the junior high school may be provided by a discussion of the aims and trends.

Aims. The aim of the junior high school is to present an organization of life experiences that will enable the pupil to arrange life situations that are of vital concern, and to provide opportunities appropriate to serve the needs of each pupil. The seven cardinal principles govern, to a great extent, the aims of any public school system. The emphasis on the seven cardinal principles is evident in aims given for the junior high school. In Pringle's statement of the aims of this unit of education the influence of the objectives as included in the seven cardinal principles is very evident. (16, page 72)

To develop and train to the highest capacity the physical, mental, social, moral, and aesthetic powers of the immature, maturing, and matured pupils of the seventh, eighth, and ninth grades.

Modern condition of living have placed greater responsibilities on the schools and in order to meet this task the schools must supply the instruction necessary to enable the youth to make adjustments and preparations for life. This means that the school must provide a general education. A general education has been defined as follows:

The purpose of a general education is to provide rich and meaningful experiences in the basic aspects of living, so directed as to promote the fullest possible realization of personal potentialities, and

the most effective participation in a democratic society. (18, page 23)

To be valid, the purpose of the junior high school must coincide with the purposes of a general education. In the following major purposes of the junior high school, as listed by Smith, the congruency is evident.

(20, page 190)

1. To provide a suitable educational environment for children twelve to sixteen years of age.
2. To explore pupils interests, aptitudes, and capacities.
3. To provide for individual differences.
4. To provide for a gradual transition to higher schools.
5. To retain pupils in school longer.
6. To provide vocational curricula for pupils who must assuredly leave school early.
7. To enable pupils to explore by means of materials in themselves worth while the major academic subjects and certain industries.
8. To provide earlier direct preparation for the high education of pupils likely to continue in school.

The junior high school program should be primarily an orientation program. For pupils of junior high school age, there is general agreement that good practice includes provision for developmental and exploratory experiences in various human activities; that these experiences be on the interest and accomplishment level of the pupils; that they provide for individual differences by means of enriched and differentiated curricula and methods of instruction; and that in addition to their immediate educational values, they may serve for the discovery of interests and aptitudes that will contribute toward stimulation of life interests. The aims of the junior high school may be realized to a great extent through an industrial arts program as a phase of the curriculum.

Industrial Arts in The Junior High School. On the junior high school level industrial arts should be largely explorational. In the sense that vocational education means preparation for an immediate wage-earning occupation, any motive of this nature that is present among junior-high pupils is apt to be vague and transitory. This is especially true in the light of

present conditions which place the entrance into occupational life beyond the junior-high school age. But interest in industrial affairs in general is pronounced in boys and girls of junior high school age because they are beginning to realize their individuality and importance or desirability of associating themselves with recognized enterprises of social significance. School communities can no longer be content with woodwork, and mechanical drawing courses inherited from the "manual training" era in their attempt to achieve the functions of industrial arts. Trends in the junior high school programs of today are toward a wide range of industrial-arts subjects in the curriculum.

Woodworking and mechanical drawing are no longer thought of as constituting a complete industrial arts program, but rather as only two phases or areas which, along with others such as printing, metals, electricity, ceramics, automotives, and plastics, go to make up a total program. A balanced program of industrial arts of today will include opportunities with a wide variety of materials, tools, machines, and processes. These are the factors which determine and condition to a great extent the nature of the social-economic order, its personal and social relationship. Because of the nature of the problems involved in modern industrial development, pupil experiences in industrial arts should be closely related to those in social studies and science. The following quotation from a recent article by Ludington indicates the extent and aims of industrial arts being taught in school programs.

(11, page 11)

Conservative estimates now indicate that more than in two and one-half million pupils are enrolled in industrial arts courses taught by approximately 30,000 industrial arts teachers. One goal of these teachers is to give industrial arts, as a phase of the school program a place in education commensurate with the importance of industry in community life outside the school. Here, learning experiences are not only related to the meeting of certain practical needs and problems of the consumer and worker-citizen in daily life, but to an understanding and appreciation

of common social and economic problems in an industrial age.

For at least 50 years good schools have included more and more guided opportunities for pupils to think in terms of the reality of life in addition to abstractions and symbols. This tendency to emphasize direct-pupils experiences, such as sharing and participation in real-life activities while seeking solutions to individual, social, and economic problems industrial in origin gave rise to industrial arts as an area of school experience. The junior high school of 1950 provides such a program designed to meet these needs of the adolescent.

The Junior High School of 1950. The students enrolled in the junior high schools of 1950, which are slightly fewer in number than in 1947-48, receive training in programs well organized in accordance with recognized functions of the junior high school. Scientific investigation, research, and experimentation to improve the junior high school curriculum have resulted in a program that goes far in achieving the aims of general education. This program provides a great many media through which a wide variety of pupil experiences may be realized. Teachers in 1950 have more professional preparation and receive higher salaries than ever before in the history of the junior high school. The standard requirements for certification have been raised requiring teachers entering the profession to become better qualified. Teachers training institutions are preparing more teachers than are leaving the field, thus insuring an adequate supply of trained teachers. This being the case, there is a bright future for the junior high school.

This desire of educators, parents, and other citizens for an educational program which would best meet the needs of adolescent youth in America, together with recent legislation, created an educational system in the new world never before paralleled in history. In the years since 1910, much

progress has been made in developing an effective program for the junior high school. But since this is still a relatively new unit in our educational system a great deal remains to be done. Furthermore, any educational institution must be constantly evolving to meet the needs of youth in a changing society. If the program of an educational institution should crystallize and strongly resist change, it soon would stagnate and its usefulness would end. A balanced junior high school program provides industrial arts experiences. Enthusiastic, intelligent, and continuous study is essential to build the most effective educational program for the junior high school.

CHAPTER III,

A PROPOSED PHILOSOPHY OF INDUSTRIAL ARTS FOR OKLAHOMA JUNIOR HIGH SCHOOLS

The philosophy of industrial arts may be thought of as a growing and evolving group of carefully evaluated judgments or goals. The present program of industrial arts has evolved over a period of years through the work of administrators and teachers. Before an industrial arts teacher can hope to do his share of further development and improvement in this field, he must familiarize himself with the history and philosophy of industrial arts and education. Only those principles of industrial arts that have made contributions to the educative process and have practical application, should be introduced in the junior high school industrial arts program.

Part A

The Background For Industrial Arts In American Schools

"In the beginning God created the heaven and the earth." (Genesis 1-1)
Everything has a beginning; evident or obscure, dramatic or insignificant, known or unknown. An individual's life is an example of something with a definite beginning. The beginning of that life is ascertainable by referring to the data recorded at the time of his birth. But many are the things that have no specific beginning dates; no certain time that can be designated as the date of birth. Industrial arts is an example of such a thing. Anderson describes the origin of industrial arts as follows: (1, page 4)

The theory and practice of school education in the industries assumes form in a manner so elusive and by ways so devious that it is difficult, if not impossible to locate definitely its origin.

There are, however, records of movements, philosophies, and persons

that have influenced the development of the industrial arts as it is known today.

History. Some activities that are included in the industrial arts curriculum were performed by primitive man and sporadic examples of systematic or school education in industries occur in theory and practice in Greek and Roman antiquity and during the middle ages, yet the earliest definite suggestions that it should form part of the general education of the youth date from the Renaissance. This brief history will begin with Comenius who lived in the seventeenth century. In his book, Methods of The Arts, Comenius mentioned the importance of teaching handicrafts, but did not include the handicrafts in his teaching. In the eighteenth century, Rousseau recognized the fact that the manual arts might be a means of mental training. Then Pestalozzi, impressed by the writings of Comenius and Rousseau, put into practice many of the ideas of manual training for the first time in Stanz, Switzerland, in 1798. This philosophy marked a new era in education and Pestalozzi became known as the "Father of Manual Training."

Manual training in the United States was influenced by the European developments, particularly by the Russian system and the Sloyd system. Della Voss was the great originator of the Russian system which was adopted in this country primarily because it seemed to afford a solution to the problem of providing in college that part of the vocational training of the mechanical engineer, involving the use of tools and machinery. At the same time it was seized upon by Woodward as a system which would make it practicable to give in school that training in the use of tools so long advocated as a most desirable if not essential feature of a well-rounded general education. The Sloyd system in the Scandinavian countries was an attempt to give instruction through the school in such crafts as carpentry, turning, wood

carving, brush making, book binding, coppering, and wheelwrighting.

Two important figures in the development and evolution of manual training in America during the latter part of the eighteenth century were Runkle and Woodward. Runkle's recommendations were responsible for the establishment of the school of "Mechanics Arts" in Boston in 1876. Woodward is usually credited with the introduction of manual training in the secondary schools as early as 1880 at the "Washington University Manual Training School," in the city of St. Louis.

In 1894, Bennett referred to the movement of manual training as "Manual Arts." Bennett did much as a teacher, author, and editor to broaden the concept of manual training. A more recent influence was exerted by Richards, Russell, and Bonser of Teachers College, Columbia University. Their efforts did much to further broaden and modernize manual training and manual arts. In October, 1904, in an editorial in the Manual Training Magazine, Richards suggested the term "industrial arts" be substituted for the term manual training. (2, page 453) This is the beginning and evolution of industrial arts.

Definitions. A clear conception of industrial arts is a prerequisite to establishing an industrial arts philosophy. Careful and intelligent consideration of the definitions given for industrial arts by recognized authorities will provide the means for a complete understanding of the term.

Industrial arts as a school study has to do with the preparation and development of an individual with reference to the industrial world in which he lives. This education must give him an understanding and a degree of insight as to the operation, function, and meaning of the things and events rising in rapid succession in an industrialized society. This is apparent in the following definition by Walber. (25, page 2)

Industrial arts may be defined as those phases of general education which deal with industry; its organization, materials, occupations, processes, and products; and with the problems resulting from the industrial and technological nature of society.

Industrial arts is an essential part of a general education and a necessary part of a junior high school curriculum if the junior high school is to prepare well-rounded individuals. The interests of the adolescent in grades seven, eight, and nine are varied. It is difficult for him to give long-continued attention to any one thing. Accordingly, an industrial arts program should afford the adolescent opportunities to satisfy his many and varied interests through a wide range of subject matter. There is proof in the following definition by Proffit which appeared in United States Office of Education bulletin that valuable learning is achieved through the study of tools and materials. (17, page 1)

Industrial arts is a phase of general education that concerns itself with the materials, processes, and products of manufacture, and with the contributions of those engaged in industry. The learning comes through the pupil's experiences with tools and materials and through his study of resultant conditions of life. It is a curriculum area rather than a subject or a course being comparable in this respect to the language arts.

Young people should be given opportunities to become familiar with the basic materials, processes, and methods of industrial production and distribution through shops, laboratories, observations, and first-hand experiences. These experiences should not be planned as specialized training but should be provided as a part of the common learning that all must have if they are to live intelligently in an age when man's power of adjustment is being taxed to the limit by technology and the machine. Social and economic aspects are very prominent in most of the definitions given for industrial arts. Bonser's definition that follows, stressed the economic and social significance of industrial arts. (3, page 1)

Industrial arts is a study of the changes made by man in the

forms of materials to increase their values, and of the problems of life related to those changes.

A more recent definition of industrial arts by Sotzin indicates its significance as a part of general education. (21, page 5)

Industrial arts is that part of general education concerned with satisfying man's innate desire to construct with concrete materials, and the development of an intelligent understanding of our modern industrial civilization and the problems which have resulted from it through contacts and experiences with a wide variety of industrial materials, processes, and tools of manufacture.

There is a need to develop the abilities of pupils to construct, to explore, to invent, to investigate, and to learn through those activities in which they can engage with success and satisfaction. For all types of pupils, from the very superior to the very inferior in academic ability, a better balance is needed between learning situations in which abstract symbols predominate and those in which the reality of life predominates. According to the definition in the "Oklahoma Advisory Committee" report of 1940, industrial arts affords the opportunity to meet the needs just mentioned. This definition is probably quoted more extensively in Oklahoma industrial arts literature than any of the other quoted definitions of industrial arts. (22, page 1)

Industrial Arts, as a school subject, may be defined as a study of the processes, tools, and machines by means of which the forces of nature are utilized and the raw materials of nature are changed by man to make them more valuable and pleasing. It includes an understanding of the native qualities of raw materials and of the natural forces, together with a knowledge of the methods and practices of utilizing and changing these materials and forces. It is also concerned with the social and economic problems incident to these changes.

From these authoritative definitions, the reader should be able to understand more clearly the meaning of the term "Industrial Arts", but in addition to the definitions, a review of the objectives is necessary in order to establish a sound and rational philosophy of industrial arts.

Objectives for Industrial Arts. The aim of industrial arts is to give each student a balanced, sane and intelligent development in relation to common problems of life. If art work is separated from the situations in which art purposes in life are included, it will function little if any at all in life problems. Industrial arts is a pathway that helps to reduce the remoteness of schoolwork from life and problems that develop the attitudes, knowledges, and skills that are needed for a better social order. Industrial arts, because it springs from practical interest, because of the natural content, and because it furthers life career motives has something worth while to contribute toward enriching life. It contributes toward enriching life. It contributes toward wholesome, creative, happy family life; makes directly for thought-provoking, healthful, and socially essential patterns of life; through skills, knowledges, and habits that function effectively. A balanced program of secondary education should provide experiences designed to achieve the things mentioned above. If the objectives of industrial arts, as listed by Iudington, are achieved industrial arts will provide the necessary experiences for a balanced junior high school program. (11, pages 11,12)

1. Orientation and Common Understanding. Experiences in industrial arts should help youth become better oriented in an industrial society by exploring many types of tools, materials, processes, products, and occupations.

2. Technical Competency. Industrial arts programs should provide as many opportunities as possible for pupils to spend at least a year in a phase of work where initial orientation and exploration may help define specialized interests that can be pursued with profit.

3. Consumer Education. Industrial arts experiences can help pupils develop intelligent attitudes, understandings, and skills involved in the selection and use of the products of industry.

4. Avocational Interests. Many pupils are interested in creative activities which involve the use of tools, simple machines, and materials as leisure-time pursuits or hobbies. Industrial arts

facilities in modern schools are used to provide a wide variety of useful and enduring recreational and avocational interests.

5. Social Responsibility. Because of the nature of industrial arts shop and laboratory activities, desirable social habits can be developed.

6. Not Isolated. Any consideration of learning experiences such as those mentioned in attaining the functions described here draws attention to the integrating relationship which industrial arts has with other areas in the school. In a very real sense industrial arts is closely related to the physical sciences, art, homemaking, the social studies, language, and economics and cannot function effectively as an isolated subject or course.

7. Contributions. Largely manipulative in character, yet affording content which is informative, technical, and social, industrial arts contributes to adjustment and complete living because it meets needs that are real and satisfies interests that are desirable.

The value of industrial arts in general education may be stated in such terms as developing neatness, accuracy, patience, persistence, love and of labor, manipulative skill, honesty, and character. All-around growth of the individual is the significant concept in the foregoing declaration. Complete development of the individual is impossible without cultivation of three sides of his nature; physical, intellectual, and emotional. Wilber analyzed the following objectives of industrial arts in terms of behavior changes based on a program for the junior high school level. (25, page 42)

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes and operations, products, and occupations.
2. To develop recreational and avocational activities.
3. To increase an appreciation for good craftsmanship and design, both in the products of modern industry and in artifacts from the material cultures of the past.
4. To increase consumer knowledges to a point where students can select, buy, use, and maintain the products of industry intelligently.
5. To provide information about, and; in so far as possible; experiences in, the basic processes of many industries, in order that students may be more competent to choose a future vocation.
6. To encourage creative expression in terms of industrial materials.
7. To develop desirable social relationships, such as cooperation, tolerance, leadership and followship, and tact.
8. To develop a certain amount of skill in a number of basic industrial processes.

The industrial arts program by its very nature, is unique for the contribution it makes to the individuals particular needs. The industrial arts curriculum gives recognition to physical and mental changes taking place in the child at every stage of school life and experience. It also recognized individual differences, meeting demands for educational and social development and providing opportunities for exploration essential to guidance. To all students industrial arts offers an added means of expression and to many the most natural means. Instances of record show an appreciation and understanding of some of the abstract subjects have been developed. Through the opportunity for natural expression in industrial arts activities, pupils have found a real reason to delve deeper into subjects which might otherwise prove uninteresting.

The selecting of the major field of industrial arts in the junior high school has been made from existing industrial activities adapted to the individual needs and interests of boys and girls in the seventh, eighth, and ninth grades. It therefore is apparent that industrial arts is but one phase of general education with its major contributions lying in the area dealing with industrial economic life. Obviously, it cannot fail to contribute to the development of the industrial, not only personally, but also in relation to his home and social life.

Industrial Arts in American Secondary Schools in 1950. When industrial arts was first introduced into the junior high school, vocational preparation was held to be one of the major objectives of this school unit. Boys were leaving school in large numbers at the end of the eighth or ninth grade. The curriculum of the junior high school, and especially the industrial arts program, was supposed to give these boys some preparation for earning a living. But the situation has changed greatly. Almost 100% of all boys

are continuing in school beyond the junior high school grades. The teaching of industrial arts subjects primarily to give vocational training is no longer recognized as a sound educational practice. In 1950, greater significance is attached to the prevocational values of the industrial arts through their contribution as exploratory activities and as background for later vocational training. As Moore said, "a few persons have the mistaken idea that industrial arts is only for certain types of pupils, subnormals for example, when facts and the subject matter itself testify to an infinitely broader application." (14, page 27) The present industrial arts program is designed to meet the needs of the boys and girls from "both sides of the track," and for all types of pupils.

Part B

Controlling Purposes of Industrial Arts In Oklahoma Junior High School

The objectives of industrial arts are almost synonymous with the controlling purposes of industrial arts in Oklahoma junior high schools. Industries of a community, individual differences, and the aims of industrial arts in secondary schools govern to a great extent the industrial arts program in the junior high schools. Other factors are the prevention of boys of junior high school age from dropping out of school by utilizing the creative zeal in the youth, the opportunity to learn how to get along with others, and the development of useful habits. Few other phases of education provide more promise for these developmental factors and recognition of individual differences which exist in students.

Industrial Arts Placed in the Junior High School. Through an examination of the physiological and psychological development of boys from twelve to fifteen years old, educators found that boys of this age are passing through

extreme changes. There is rapid muscular and organic growth and development; a marked degree of restlessness, and the beginning of social consciousness in the adolescent period. Even before the organization of the junior high school as such and while industrial arts was known as "manual arts", educators realized that the restlessness must have an intelligent outlet and included manual arts in general education. Freise recognized this fact when he wrote: (7, page 29)

Historically, we find manual arts taught in schools to boys from twelve to fourteen or fifteen years of age, where the subject was taught as a part of general education. This was true to a limited degree of the manual labor movement in America. It was wholly true of the Swedish sloyd whose great leader was Otto Salomon. The same may be said of the sloyd introduction into Danish schools by Ansel Mikkelson when he first opened sloyd classes for his apprentices and other children, thirteen and fourteen years old, for general culture.

The foregoing quotation constitutes a brief historical preview of industrial arts being introduced in school to boys of junior high school age. When junior high schools were established, industrial arts instruction was generally accepted as a logical part of a general education and contributed much to the success and rapid growth of the junior high school. The aims of industrial arts and the aims of the junior high school are homogeneous; exploratory education to meet the needs of the youth being the primary purpose of both. The correlation may be more clearly understood by reviewing authoritative definitions and aims of the junior high school.

Definitions. The brief historical sketch of the junior high school in Chapter II had for its purpose the focusing of attention on that phase of secondary education about which this survey is concerned. It is necessary to present definitions of the junior high school, at this point, to augment the reader's concept of the junior high school. The following statement contains Pringle's definition which is quoted frequently in literature on the junior high school. (16, page 67)

In 1918, an attempt was made to define it by committees of the North Central Association. It was the unanimous opinion of this body of college and high school men, "That the term Junior High School, as used by this association, shall be understood to apply only to schools including the ninth grade combined with the eighth grade, or with the eighth and seventh grades, in an organization distinct from the grades above and the grades below." This definition is interesting because of its simplicity. At this time, it would seem, agreement was possible on only two things, namely; (1) the inclusion of the ninth grade, and (2) a definite demarcation from the grades above and below.

The following definition by Pringle discusses the junior high school in relation to purposes. (16, page 68)

The junior high school is an organization of the seventh, eighth, and ninth grades into an administrative unit for the purpose of providing instruction and training suitable to the varied and changing physical, mental, and social natures and needs of immature, maturing and mature pupils.

The following quoted material taken from a recent state bulletin is a more comprehensive and detailed definition of the junior high school organization in Oklahoma. (23, pages 31,32)

CLASSIFICATION AND DEFINITIONS

For the purpose of classifying various types of organizations in which the junior high school may exist, two classes are recognized: "Class A" and "Class B." "Class A" Junior High Schools are further divided into two groups representing segregated and non-segregated units. Organizations which have combined and departmentalized class work in the seventh and eighth grades with the upper four grades without meeting the other requirements for approval are not eligible for classification as approved junior high schools.

"CLASS A" SEGREGATED JUNIOR HIGH SCHOOLS

Definition. This class shall consist of approved segregated junior high school units, including grades seven, eight, and nine, adequately organized and administered with separate housing facilities and teaching staffs, and providing suitable curricula involving courses exploratory, as well as integrating and differentiating in nature.

Requirements to Be Met for Approval. The Regulations and Standards for Approval of Junior High Schools in Oklahoma Shall be met. Only such schools as produce positive evidence of the spirit and characteristics of the junior high school will be approved as "Class A" Junior High Schools.

"CLASS A" COMBINED JUNIOR HIGH SCHOOL

Definition. A "Class A" Combined Junior High School shall consist of grades seven, eight, and nine, organized and administered as a separate unit, except that other units or grades may be located in the same building. This class will include the junior high school divisions of larger units, such as six-year high schools, etc., where such divisions are conducted according to the standards and regulations for approval of junior high schools. For the medium-sized and smaller towns and cities, the 6-6 organization offers great possibilities.

Approval as a "Class A" Combined Junior High School does not signify that it belongs to a lower classification than does the "Class A" Segregated Junior High School. For many communities this is the better type of organization.

Requirements to Be Met for Approval. All the standards and regulations shall be met by units expecting approval as "Class A" Combined Junior High Schools, except that other units may be housed in the same building with the junior high school. Departmentalized teaching will not entitle junior high school divisions of larger units to be approved as junior high schools unless accompanied by other recognized characteristics of the desirable junior high school organization.

"CLASS B" JUNIOR HIGH SCHOOLS

Definition. "Class B" Junior High Schools shall consist of grades seven and eight or grades eight and nine, organized and administered as separate units. Two-year junior high schools which make special attempts to realize the objectives and functions of the junior high school, but which, on account of building or organization difficulties are unable to organize on the 6-3-3 or 6-6 plans, may be given temporary approval. This type of junior high school is recognized as a step in the direction of a desirable reorganization on the basis of a "Class A" Junior High School.

Requirements to be met for approval. The "Class B" Junior High School is expected to comply with all the standards except Standard XI, Section 31, of the Regulations and Standards for Approval of Junior High Schools in Oklahoma.* Two years each of English, social studies, and mathematics; one year each of science, geography and agriculture; homemaking for girls and industrial arts for boys; and a definite training program in physical and health education shall be required of all pupils in "Class B" schools.

*"The number and variety of elective courses shall correspond to the ability of the school to provide adequate buildings and instructional facilities. Appropriate elective courses include: music, art, vocational information, foreign languages, speech arts, commercial subjects, and practical arts, for both boys and girls."

Since the American way of life is essentially democratic and industrial

the aims of general education should be based on these two headings. In order to meet these aims industrial arts should be included in the curriculum of the junior high schools in Oklahoma. Adolescents in grades seven, eight, or nine should be given experiences in real-life situations that develops leadership and followership abilities and will do much to develop and equip the student for future life. Industrial arts in the junior high schools of Oklahoma modified to meet the needs of youths of this age gives the student opportunities to prepare for future participation in the complex society.

Objectives. The distinctive characteristic of the junior high school is the exploratory aspect. Most educators are agreed upon this major function of the junior high school and upon other objectives. Koos, in The Junior High School, shows what the objectives of this type of school are thought to be by representative school administrators and educational leaders. He believes in realizing a democratic school system by means of following practices: (10, page 17)

1. Retention of pupils; economizing the time of pupils; the exploration of subject matter for the sake of guidance of pupils; and vocational education.
2. Recognizing the nature of the child.
3. Providing conditions for better teaching.
4. Securing better scholarship.
5. Improving the disciplinary situation and socializing opportunities.
6. Effecting financial economy.
7. Relieving the building situation.
8. Continuing the influence of the home.
9. Hastening reforms in grades above and below.
10. Normalizing size classes.
11. Relieving teachers.

These objectives are the statements of the main objectives by educational leaders. Unless the junior high school can produce results superior to those of the traditional school, there is no excuse for the reorganization of the school system.

How Objectives May Be Realized. The junior high school attendance must be made an interesting and pleasant experience if it is to keep adolescents

content in school, since they go partly under protest. The subjects must be analyzed to discover those phases which will interest the pupils. It is particularly desirable that the usefulness of a subject be stressed at the beginning of the work. When these aims are achieved pupils will stay in school who otherwise would drop out of school. The following statements by Davis, provides a very good summary of how the objectives of the junior high school may be realized. (5 page 10)

1. To check the withdrawal of pupils from the seventh, eighth, and ninth grades by providing school work that is both more interesting and educationally more valuable than that furnished by the traditional school; and by organizing and administering this work through methods that more in keeping with the nature of adolescent pupils than are the methods commonly employed in the traditional elementary schools and senior high schools.
2. To encourage and assist pupils to discover their own permanent interests, their own reaches and limits of capacities, and their own best modes of self-expression, and then to assist them to choose life careers in which (so far as enlightened human judgment is able to forecast) they can be most happy and contented and at the same time most socially effective and serviceable.
3. To remove, or at least to minimize, the personal and social dangers which inhere in the instincts of the adolescence, and to convert raw potentialities into habits that make for good citizenship, workmanship, sportsmanship.
4. To shorten the period of training for some few individuals who have before them a long course of systematic schooling, by permitting them to begin their differentiated education at an earlier age than has been customary in the past.
5. To provide a truly realistic education for all youths between the ages of twelve and sixteen, and, while adapting this training to individual needs and interest, so to administer it that each shall come to possess at least an appreciative knowledge of all the major activities of humanity and shall develop a tolerance and a sympathy for individuals outside his own social group.
6. To interweave pre-vocational instruction and liberal culture so artfully that each shall have the effect of clarifying, deepening, and making truly significant and effective the elements of learning contributed by the other.

Because industrial arts subject matter is a body of material which finds its real source in the experiences of life, it contributes greatly to achieving the aims of the junior high school. When the aims of the junior high

school. When the aims of the junior high school are compared with aims of industrial arts, their correlation is evident, and since industrial arts furnished the exploratory, broadening, and prevocational experiences which are major purposes of the junior high school it is a very necessary part of the junior high school curriculum.

From the dawn of history, there have been two kinds of education; the education of the manual laborer through practice with tools, implements, and machines in shop, field, ship or other work place, and education of brain workers and members of the leisure class in the school largely with the aid of books. One of the purposes of industrial arts instruction in the secondary schools is to create an appreciation of the laboring people and an appreciation of the products of the laborer. Industrial arts is well adapted to the exploratory character of the junior high school organization and course work. Industrial arts affords manipulative explorations and studies about occupations related to the ones represented in the school shops.

CHAPTER IV

INDUSTRIAL ARTS GENERAL SHOP

This chapter has been included to acquaint the reader with the general shop idea in preparation for a better interpretation of the following chapter on the "Status of Industrial Arts in Oklahoma Junior High Schools." This chapter deals with the general shop nationally and no mention is made of the general shop in Oklahoma which will be discussed in the following chapter along with data secured.

Part A

Origin and Aims

Although a degree of appreciation may result by simply reading about a material, an experience, or a resulting product, it is generally agreed that lasting appreciations can most effectively be built through actual experiences. Experimentation with materials, processes, and their application should be encouraged all through the junior high school shop program. The modern industrial arts shop provides for a broad range of activities, these activities should involve individual and group activity. The type of shop generally accepted as making the most adequate provision for a general education emphasis of industrial arts content is the general shop.

The junior high school movement brought about a great many changes in the organization and content of the work for grades seven, eight, and nine. Teachers of each subject were forced to reorganize the content of their subjects in accordance with the aims and objectives of the new type school. The general shop seems to be the answer of teachers of industrial arts to the demands of the junior high school. The general shop has already passed

through three or four rather distinct stages of development. Beyond a doubt, it has passed far beyond the experimental stage but its wide acceptance and rapid growth have, in many respects, been handicapped.

History. Although that phase of industrial arts which is commonly referred to as the "General Shop" had its beginning thirty years ago, it has developed rather slowly. This is due largely to a lack of teacher education courses and, consequently, a lack of trained teachers. The beginning of the general shop has an intimate relation to the beginning of the junior high school. It seems clear that originally the general shop was little more than the industrial education phase of junior high school movement. The educational theories that brought about the birth of the junior high school also produced the demand for some kind of program of diversified shop experiences for junior high school pupils. The exploration concept stressed for boys of the seventh, eighth, and ninth grades made it apparent to many educational leaders that the prevailing wood and metal shops of the large schools and the single woodshop of the smaller schools were inadequate. As a result of the expressed need for experiences with numerous materials and processes, the industrial arts general shop was developed.

Theoretically, the history of the general shop may be considered to extend back as far as the history of industrial arts. European schools as well as the early American schools had a form of general shop and just as industrial arts underwent gradual improvement, the general shop has advanced in keeping with the progress of education. The term "General Shop" seems to have come into general use only gradually. It is extremely difficult to discover its first use. The first of "general Shop" in the title of an article recorded by the Readers' Guide is that of Earl L. Bedell's, "Household Mechanics and the General Shop," in the July issue of the magazine Industrial

Arts and Vocational Journal in 1923. In August of the same year, Bedell published an article entitled, "Methods of Teaching in a General Shop." The term appeared frequently after 1923 and probably had been used by many persons much earlier than 1923. Newkirk has defined the general shop as follows: "Shops that are planned and equipped to teach two or more distinct types of shopwork at the same time under one teacher are general shops." (15, page 15) There are other published definitions of the general shop by they do not vary enough from the one quoted above to justify inclusion.

Purposes. The general shop has become generally accepted as a special phase of the junior high school scheme of school organization and as an appropriate means of achieving the functions of the junior high school.

Friese presents proof of this statement in the following quotation. (7, page 326)

The general shop is decidedly of the junior high school level. It has been advocated and tried out in cities of all sizes. Because of its diversity of activities, it possesses advantages over other types for small communities which can provide but one or possibly two teachers. It provides experiences with a variety of common tools; gives boys an opportunity to make things they like to; is admirably adapted to the project method; and provides exploratory manipulative experiences with several materials in a number of trades, where under the regime of the former manual training shop, there was but one. As previously noted, it is characterized as extensive rather than intensive.

A quotation from an article by Mays, which appeared in the April issue of the 1950, Industrial Education and Vocational Education magazine offers further proof that the general shop has demonstrated its worth in the junior high school organization. (13, page 139)

The general shop is clearly a special phase of the junior high school scheme of school organization. The traditional manual-training unit shop did not seem to be an appropriate means of achieving the "peculiar functions" of the junior high school. The emphasis of that school upon individual differences among pupils, acquaintance with a wide range of industrial materials and products for their consumer values, and particularly upon exploratory experiences for guidance purposes, all implied a shop, or shops, providing a diversified program

of offerings. The desirability of making a variety of experiences available to pupils in the small schools that could not have more than one shop, suggested inevitably a shop in which one teacher taught pupils work in several media in a single room at the same time. The frequent insistence upon learning something about numerous important industrial materials, processes, and products but with no special emphasis upon the acquisition of skill in one kind of industrial work also suggested the general shop scheme of providing industrial arts instruction as a phase of general education.

Since a general education is the ultimate goal of all phases of secondary education, it is advantageous to refer to the National Education Association and the "Committee on the Reorganization of Secondary Education", through which the educational creed was formulated when considering any one phase of education. The objectives of secondary education have been generally accepted by educators and laymen alike. These objectives are commonly known as the "The Seven Cardinal Principles of Education" and are as follows:

(4, page 5)

1. Health. Provide such forms of training that will enable the individual to engage in physical activities without any unnecessary handicaps.
2. Command of Fundamental Processes. This includes the acquirement of skills in certain fundamentals as reading, writing, arithmetic, etc.
3. Worthy Home Membership. This objective involves training in obedience, reverence, courtesy, respect for elders, cooperation, etc.
4. Vocation. This objective necessitates such facilities as will permit instruction of a vocational nature. Under this heading are included the various phases of industrial arts, plus instruction in some specific trades.
5. Citizenship. As education is a function of the State, to train for better citizenship is an objective of prime importance.
6. Worthy Use of Leisure. This objective has for its purpose the making of better citizens by creating interest in worth-while avocational activities.
7. Ethical Character. The result of this objective is development of youth with high standards of relationship with fellow associates.

When the purposes of the general shop are compared with the aims of secondary education and the junior high school, it is easily understood why the general shop was accepted as a means of achieving the purposes of the junior high school. The purposes of this type of shop is explained quite

clearly by Warner in the following discussion: (24, pages 288,290)

It is not conceivable that anyone would equip for general shop work without making a careful study of its possibilities, functions, many of them with little thought back of their establishment. People seem to be content with the generalizations and glibly stated truisms of purposes, and many of the objectives now held for general-shop work are equally vague to teachers and school officials because their relationship to practice is not well seen. An examination of some acceptable objectives may not be remiss at this point.

1. Avocational Interests often times lead rather pointedly to the discovery of aptitude traits particularly in adolescent boys and girls. The general shop affords a splendid opportunity for the development of these interests. Such interests are not confined, however, to the general-shop environment alone, as a teacher soon learns to foster their establishment and growth using the school-shop situation as a center for wider interests than can be provided there.

2. Consumer Knowledge and Appreciations for industrial products is of significant importance to the general shop's program. The educational principles of wisely choosing and using an ice box, automobile, vacuum cleaner, lawn mower, cedar chest, mohair davenport, tweed topcoat, silk socks, balanced meal, worth-while book, baseball bat, domestic rug, or any other one of many hundred articles seen today should be apparent. A study of the many aspects concerning the purchase and intelligent use of these products of industry can and should be developed daily through a properly taught general-shop course.

3. Exploration is a badly misused objective commonly mentioned as the most important of all for general-shop courses. Schoolshop work is too frequently confined to the manipulation of tools, machines, and materials in a narrow range of industrial representations. There is scant likelihood that "exploration" will be achieved in such a situation as effectively as would be possible in an actual industrial or trade environment. Resort to motion pictures, student investigations, excursions into industry, actual participation on a job for wages, studying about industry from specially selected literature, and inquiring into the romance of invention and inventors, must be made if the outcomes of educational exploration are to be achieved in any marked degree. Surely no shop teacher will think for a minute that he is achieving the exploration objective merely by equipping for two or more phases of shopwork and trusting to luck for "transfer" of appreciation to trades like baking and watch repairing. It is certain that the social and industrial atmosphere of production mingling with actual labor, competition, wages, seasonal uncertainty, and unusual machine specialization will never be experienced in any exploratory way within the walls of a school shop alone.

4. Guidance will function when exploration is properly conceived and developed, as the two objectives are mutually interactive. An instance of this is seen in a general-shop situation being taught by a professionally trained teacher who diagnoses his pupils from as many angles as possible for the purpose of helping them better to discover

their interests and capacities for industrial work. Both exploration and guidance then go hand in hand. One helps to achieve the other, and the certain outcome of guidance may be determined by the simple expedient of checking up at five year intervals on the "prognostications" held for individual pupils in times past.

5. Specific Abilities, largely of a "handy-man" nature, compose an objective typical of home-mechanics courses in many schools. This is a very specific and somewhat limited purpose and deals first of all with a careful job analysis of the things that a boy should be able to do about the home, in woodwork, in metal work, in general mechanics, and the like. Its sole emphasis is narrowing to the extent that other objectives and functions of general-shop work are likely to be ignored and that its operations usually controlled by adult dictates.

6. Social Habits and Attitudes regarding the work of the general shop and industrial phases of life, are essential to promotion and happiness of individuals living in an industrial society. The latter part of Bonser's definition of industrial arts, "Industrial arts as a study of the changes made by man in the forms of materials to increase their values, and of the problems of life related to these changes" is an example of the place and emphasis given to this phase of the general-shop experience. The plastic nature of an adolescent boy or girl as he or she is found in the general-shop situation, make the development of social growth possible in connection with any technical experience gained therein.

7. Sneed's Developmental Concept for industrial arts refers in part to the teachings of Dewey and others regarding the relationship between experience and growth. Youngsters learn best in situations that are real to them. The broad range of experiences made possible through a general-shop arrangement should normally make for a more effective development of young adolescents than that usually provided by a more specialized, nonvocational type of experience seen in the more obsolete forms of manual training. Any youngster who can develop the habit of inventiveness or creativeness and makes an effort to achieve his desire for such action, will grow in a freer and more natural manner than another youngster who must follow the dictates of some more practical man who foists the results of his trade analysis upon the boy when the youngster is in all probability not ready for such specialized training.

8. Specific Vocational Training should always be available to students who are either to drop out before completing high school, or who have chosen a specific occupation. The applications of this objective will vary as widely as individuals vary. Some will not come under its influences until they are well past 20 years of age. Others will be controlled by it before they are 5 years of age, as is seen in the case of the natural-born musical genius. Whatever single or combination of industrial arts objective, apply in any specific teaching situation or to any individual pupil, it is assumed that a ninth and final objective will be of importance.

9. Curricular Integration is a broader notion of the older

objective relating to "coordination" of school subjects. The idea of integration is broader than any statement of "subject as may be seen in the general shop's attempt to relate as closely as possible to the boy, to his life, to industry, as well as to the school". This constitutes integration.

There is a very close correlation between the aims of the junior high school, industrial arts, and the general shop. As was stated in foregoing discussion, the emphasis of the general shop are upon a relatively large number of diversified industrial experiences. This is in accordance with the exploration aims of the junior high school and the orientation aims of industrial arts. The industrial arts general shop has made many contributions to the development and success of the junior high school. In the small schools that have only one shop in which one teacher teaches the general shop, makes it possible to offer work in several media in a single room at the same time. As Silvius has written, "we are fortunate in industrial arts to be able to maintain a program on an individual basis, where every member of the class moves ahead, solving his own problems, at his own rate." (19, page 47) Probably no other phase of secondary education has an opportunity commensurate with that of the industrial arts general shop in providing for individual differences. There are justification for concluding that the general shop would be the best agency to achieve the objectives of the junior high school.

Part B

Organization

It should be understood that there is no definite relation between the number of activities offered and the objective to be attained in order to have a general shop. Much confusion has resulted because of the association of the general shop idea with a certain number of industrial

activities. The objectives sought through establishing of a general shop would best be attained by continually adding more activities. For example, if a general shop had been started with four activities the addition of two or three or even four other activities must be separated from the remainder of the activities; for example, drawing should be separated from foundry and forging, but this separation does not prevent the shop from being classified as a general shop.

Types of Organization. The type of organization needed is determined by the shop facilities, interest of the pupils, teaching staff, industries of the community, and other such factors. Individual needs differ and so do the needs of different schools. Laehring and Yager, in the Indiana State Teachers College Journal, discussed several types of organization being used. A brief summary of each follow. (12, page 52)

1. The Ettinger plan. In this plan the individual pupil is routed through a series of specialized shops for periods varying, as a rule, from six to twelve weeks.
2. The Bonser Plan. (Russel-Bonser) Multiple-Activity Shop) In this plan the pupil is given a variety of experiences, with industrial materials, tools, and processes in a general industrial shop.
3. The Gray Plan. In this plan the pupil gets his industrial experiences working on production work, under the direction of an experienced tradesman.
4. The Pittsburg Plan. In this plan the pupil spends the first year in a general shop (Bonser Plan), the second year in a series of special shops (Ettinger Plan), and the third year spends all of the shop time in one special shop which he has chosen "pre" to entrance upon the vocation.
5. The Laboratory Plan. In this plan, the interest of the pupil is almost the only guide in determining the nature of the work to be done. Pupils work on projects which they select, and emphasis is placed on the organization and planning of the work. A wide variety of industrial experiences is provided without resorting to trade classification in the organization of the work.

Regardless of the plan used, each has advantages and disadvantages which must be carefully considered in organizing a general shop. Features

of each of the plans mentioned may be combined in various ways in order to serve certain advantages that would not be possible if any one type of plan were adopted. Many things must be considered in determining the plan of organization for the efficient operation of a general shop. Following are quoted statements by Luehring and Yager of advantages and disadvantages of the general shop. (12, page 53)

The Advantages of the General Shop

1. Pupils can have an experience with a greater variety of materials.
2. Makes possible a contact with a greater variety of tools and processes.
3. Makes provisions for taking care of individual differences.
4. Makes possible closer connection between the school and home. (chiefly through work in home mechanics)
5. Participation in several activities requires a wider range of thinking and thus is more education.
6. Provides better opportunity for pupils to discover their own interest, aptitudes, and capacities.
7. No loss of time in the completion of a project in more than one material.
8. It makes possible the development of initiative on the part of the pupil, or stimulates individual thinking on the part of the pupil.
9. It makes for economy in both equipment and teaching force.
10. It makes possible the more extensive use of the project method of teaching.
11. It eliminates waste of time caused by a duplication of processes in the one industry shop.
12. It enables a pupil to learn to do a great many things which all men should know and be able to do without respect to their vocations.

Disadvantages of the General Shop

1. Well trained instructors are not easy yet available for teaching in the general shop.
2. Class teaching with careful demonstration and discussion is possible only when all are doing similar kinds of work.
3. Proper teaching cannot be done in a general shop without a great number of instruction sheets to explain the work. The teacher has little time to make such teaching helps with drawings, directions, etc., and have the duplicate copies made.
4. The equipment and supplies are more difficult to take care of than in the one industry shop.
5. The general shop, because of the diversified character of the work done, tends to look like a "junk shop," while the one industry shop can be kept in better order.
6. It is difficult to organize the work in order to keep everyone busy in a general shop.

7. The instruction given by the teacher, when spread out over so many groups, can only be fragmentary.
8. It is practically impossible for any man to become an expert in several unrelated industrial activities; therefore, strong teachers cannot easily be prepared for a general shop.
9. Discipline is made more difficult.

Achievement of the objectives of junior high school is definitely possible through the general shop program. A general shop program organized and conducted as it should be will promote, self-reliance, cooperation, safety, citizenship, and many other objectives of the junior high school. Teaching aids, such as instruction sheets, posters, charts, pictures, slides, and movies are necessary for maximum achievement. Acquiring of skill is not mentioned as an objective of the general shop but it is logical to conclude that the pupil will develop a degree of skill through the use of a wide variety of tools, materials and processes.

Criteria for Selecting Units. This phase of shop organization presents a problem in most schools. Because of the different needs of the pupils, the shop room available, the equipment available, the money available, and the trained teachers available, it is difficult to establish a ideal general shop program. However, it is possible to establish a maximal program, if the proper criteria are employed in selecting the units for a general shop. The following list includes the most important of these items. (12, page 54)

1. Community survey
2. Nature of school system
3. Floor space
4. Equipment
5. Amount of money available
6. Conference with community leaders
7. Conference with school officials
8. Qualifications of the teacher
9. Number of pupils to be accommodated
10. Grades to be accommodated
11. Curriculum evaluation
12. Possibilities of securing assistance from local organizations and industries
13. Program of vocational education

14. Combination of activities
15. Aims and objectives of the course
16. Occupational evaluation
17. Elements of danger involved
18. Boy interest evaluation
19. Activity evaluation
20. Availability of public utilities service
21. Location of room to be used
22. Relation to industrial arts work previously offered
23. Types or classification of general shops

There are still many problems yet unsolved concerning the general shop type of organization, but in view of the generally accepted objectives of the junior high school, a program of diversified shop experiences seems the only way to play effectively the role belonging to industrial arts in such a school.

Class Organization. Industrial arts classes are usually organized with a pupil personnel system. There are several advantages to this system. It offers valuable experiences in learning to work with people, creates a better teacher-student relationship, and relieves the teacher of many detailed duties. Heikkila, in his book Shop Organization for Industrial Arts Classes, says, "Most industrial arts instructors who have tried a pupil personnel system with classes, would not be without one today." Following is a description by Keikkila of the pupil personnel system employed in the Industrial Arts Department of the High School at Babylon, Long Island, New York, since 1934. (9, page 9)

The following officers are appointed by the instructor the first week of school each semester, to serve and hold office for a period of four weeks:

1. General Superintendent
2. Shop Secretary
3. Publicity Manager
4. Safety Engineer
5. Stock Room Clerk
6. Maintenance Foreman
7. Lumber Room Foreman
8. Finishing Room Foreman

A period of four weeks constitutes a term in office. After the first

term, all of the above named officers will be elected in open meeting, during a regular meeting of the class. A majority vote of those present will determine the winner of the office.

This plan probably should not be copied in its entirety in any one school, but it will serve as an example for organizing such a system. The plan used should be the result of a careful analysis of conditions existing in the local situation; from studies made of pupil-personnel plans used successfully in other schools and from discussions on the subject with industrial arts instructors.

Shop Planning. Another problem that faces many industrial arts teachers is planning a general shop. Many factors must be considered. The floor plan must be carefully laid out in order to provide the most convenient and efficient teaching facilities for the type of general shop course that is to be presented. To enter fully into detail in all the various branches of shop planning would require a volume of considerable size. For this reason an outline, of "Organizing and Equipping the Industrial Arts Shops," by Hill, has been included in this thesis as appendix B with the author's consent. (22, page 75) If the reader has questions about shop planning or shopshop equipment he should refer to Appendix B for possible answers to those questions.

Teaching Problems. The problem of what to teach, when, and how is another problem teachers must face. Probably no teacher should be allowed to teach a class without having a course of study at hand. Teaching aids as were previously mentioned, are necessary to effective teaching. Tool arrangement and checking, record system, class record sheet, attendance sheet, and the individual progress sheet are some of the many problems the teacher must solve. On page 44 is a proposed individual progress sheet designed to eliminate to a great extent any prejudices on the part of the

INDIVIDUAL PROGRESS SHEET

Industrial Arts Department Name of School _____ Report of Student's Progress

Student's Name _____ Grade _____ Instructor _____

INDUSTRIAL ARTS GOALS

PUPIL'S ESTIMATE

INSTRUCTOR'S ESTIMATE

Growth in:	PUPIL'S ESTIMATE			INSTRUCTOR'S ESTIMATE			
	Weeks Att'd	Normal	Good	Excellent	Weeks Att'd	Normal	Good

Control of Basic Skills

Understanding of Ideas

Creative Expression

Ability to Read

Ability to Generalize

Ability to Reason

Social Growth

Can Follow Directions

Attitude Toward Teacher

Individual Responsibility

Accuracy of Results

Systematic Study Habits

Thinks Independently

teacher that might influence his grading. Few, if any, teachers deliberately show favoritism, but unconsciously some do. By using the proposed progress sheet, the teacher can check himself by the estimates of the students, therefore, derive more nearly a fair grade for each pupil. Many of these teaching problems must be solved by the teacher on the job.

The general shop in industrial arts is the result of the evolution of industrial arts and general education down through the ages. Ericson states that "The general shop is the result of two forces." (6, page 303) One of these is the feeling that work in unit classes is too formal and confined. The general shop makes it possible to coordinate various shop and crafts activities into the production of one complete article. The other factor which brought about the general shop in schools is the fact that small schools must organize a program of this type in order to provide experience in the several different units of an industrial arts curriculum.

CHAPTER V

STATUS OF INDUSTRIAL ARTS IN OKLAHOMA JUNIOR HIGH SCHOOLS

Industrial arts has found wide acceptance in the junior high schools of Oklahoma. Leaders in the field of junior high school education have deemed this phase of the curriculum necessary to the extent that it is a required subject in Junior High school.

One year of industrial arts is required of each boy in an approved junior high school. This is a prevocational course in industrial arts, and may be either a year of general shop, including a variety of short units, or a year of elementary wood-working. One year of shop consisting of three periods each week for two years, or five periods weekly for one year, should be required of each pupil. This course is to be taught either in the seventh or in the eighth grades or both grades if spread over a period of two years. (23, page 38)

The number of courses in the program of a junior high school have been growing each year and the subject matter is being enriched. In some systems the changes are quite rapid while in other it is very slow. It seems that the industrial arts program is suitable to the objectives of the junior high school to the degree that it has been made a required portion of the curriculum.

Part A

Approved Junior High Schools

The names of the schools, names of industrial arts teachers, courses taught, grades included in the junior high schools and the classification of these schools are listed in Table I. Only nineteen of the one hundred and eighty-one accredited junior high schools fail to meet the industrial arts requirement. This indicates that in 89.5% of the accredited junior high school of Oklahoma instructions in industrial arts are provided. Of

the nineteen schools having no industrial arts, one is a "Class A" segregated school, ten are "Class A" combined schools, and eight are "Class B" schools. Towns with the largest number of accredited junior high schools are Oklahoma City and Tulsa with eight each; Enid and Muskogee are next with two each; all other towns have one each. There are twenty-two industrial arts teachers employed in the eight junior high schools of Oklahoma City, twenty in the eight junior high schools of Tulsa, and four each in the junior high schools of Enid and Ponca City. Three teachers are employed in the Muskogee junior schools, and two teachers are employed in the junior high schools of Guymon, Jay, Lawton, and Pawnee. Only one industrial arts teacher is employed in the junior high schools of each of the other towns.

Industrial Arts in The Junior High Schools. Column one of Table I includes the names of all junior high schools in the state, column two gives the names of the teachers of industrial arts in each school, column three includes the name given to the industrial arts courses taught, column four list the grade or grades in which each course is offered, and the asteriks indicate the class of school. Two asterisks denotes a "Class A" segregated junior high school, one asterisk denotes a "Class A" combined junior high school, and when no asterisk appears the school is a "Class B" junior high school.

There are one hundred and ninety-eight teachers of industrial arts subjects in the one hundred and sixty-two junior high school having industrial arts in the curriculum. Of the total number of teachers, one hundred and ninety-one are men and seven are woman. No colored teachers or schools for colored pupils are included in the foregoing figures. The records of schools for white and colored students are kept separately. This study concerns only the junior high schools for white students.

Statistical Data. The data concerning Table I and the following tables were secured from the "Applications for Junior High School Approval Forms" that are filed in the office of the State Department of Education, Capitol Building, Oklahoma City, Oklahoma. The pertinent information concerning industrial arts in junior high school was copied on the worksheet described in Chapter I and later tabulated, arranged, and included in this chapter.

TABLE I

A LIST OF THE APPROVED JUNIOR HIGH SCHOOLS IN OKLAHOMA
IN THE SCHOOL YEAR 1949-50

School	Ind. Arts Teacher	Course	Grade
Ada	Lawrence Reynolds	Shop	7-8-9 **
Afton	Samul G. Victor	Shop	7-8-9 *
Altus	William Shafer	Shop	7-8-9 **
Amber	Wm. V. Brown	Ind. Arts	7-8-9 *
Anadarko	Joseph Vaughn	Manual Tr.	7-8-9 *
Antlers	None	No Ind. Arts	7-8-9 *
Apache	Ben W. Ballard	Shop	7-8-9 **
Arapaho	None	No Ind. Arts	7-8-9 *
Ardmore	Arthur Sturdevant	Shop & Mc.Dw.	7-8-9 **
Atoka	Robert Randolph, Jr.	Shop	7-8
Bartlesville	Wayne VanLiew	Shop	7-8-9-10**
Barnsdall	J. L. Parker	Ind. Arts	7-8
Bixby	Dale R. Nuss	Ind. Arts	7-8-9 *
Blackwell	Joe B. Auld	Ind. Arts	7-8-9 **
Blanchard	Olen C. Barnes	Shop	7-8-9 *
Bowlegs	Herman Moore	Shop	7-8
Boswell	Odis Quaid	Shop	7-8-9 *
Britton	Gerold Grothe	Shop & Mc.Dw.	7-8-9 *
Bristow	Darrell Stiles	Shop	7-8-9 **
Broken Bow	None	No Ind. Arts	7-8
Broken Arrow	William H. Neese	Shop	7-8-9 **
Butler	Otto D. Smith	Shop	7-8-9
Cache	Ernest Collinger	Shop	7-8-9 *
Caddo	Kenneth Morgan	Ind. Arts	7-8-9 *
Calvin	W. L. Garrett	Shop	7-8-9
Carnegie	Robert K. Phelps	Gen. Shop	7-8-9 *
Carter	Jospeh C. Park	Shop	7-8-9 *
Catoosa	Carl Hinson	Ind. Arts	7-8-9 *
Chattanooga	Clyde Dipboye	Shop	7-8-9 *
Checotah	D. W. Merryman	Shop	7-8-9 *
Chickasha	L. L. Fritz	Shop	7-8-9 **
Clinton	Sidney Richards	Shop	7-8
Colcord	Rex Buchanan	Shop	7-8-9 *
Comanche	R. M. Park	Shop	7-8
Commerce	John Hawthorne	Ind. Arts	7-8
Cordell	Millard England	Ind. Arts	7-8-9 *
Coweta	A. J. Chandler	Shop	7-8-9
Crooked Oak	Stanley Bean	Shop	7-8-9 *
Cushing	None	No Ind. Arts	7-8
Custer City	Cetus Johnson	Shop	7-8-9 *
Cyril	George Alexander	Shop	7-8-9 *
Davis	Arnell Bazemore	Shop	7-8-9 *
Dewey	C. R. Sullivan	Shop	7-8-9 *
Dill City	LeRoy Wright	Shop	7-8-9 *
Duke	N. C. Horshler	Ind. Arts	7-8-9 *
Duncan	Ray Fulkerson	Mc. Dw.	7-8-9 **

TABLE I

A LIST OF THE APPROVED JUNIOR HIGH SCHOOLS IN OKLAHOMA
IN THE SCHOOL YEAR 1949-50

School	Ind. Arts Teacher	Course	Grade
Durant	M. E. Dobbins	Ind. Arts	7-8-9 **
Eldorado	Monroe Chadwick	Shop	7-8-9 **
Elgin	Lemuel Apala	Ind. Arts	7-8-9 *
Elk City	Frank Brewer	Shop	7-8-9 *
El Reno	C. C. Kellar	Ind. Arts	7-8
Enid			
Emerson	James W. Barnes	Mc. Dw.	7-8-9 **
	James Durham	Woodwork	7-8-9 **
Longfellow	Ray Brown	Woodwork	7-8-9 **
	James McDaniel	Mc. Dw.	7-8-9 **
Erick	J. M. Gamble	Shop	7-8-9 *
Eufaula	None	No Ind. Arts	7-8
Fletcher	C. M. Ridgway	Shop	7-8-9 *
Fort Cobb	Austin Stockton	Shop	7-8-9 *
Fox	Carl Roblyer	Shop	7-8-9 *
Frederick	Thomas Little	Shop	7-8-9 **
Geary	Allen Long	Shop	7-8-9 *
Gould	Orvis Ragsby	Ind. Arts	7-8-9 *
Grandfield	None	No Ind. Arts	7-8-9
Grove	Forrest Sarp	Shop	7-8-9 *
Guthrie	Tolbert F. Brandon	Shop	7-8-9 *
Guymon	J. W. Calbert	Shop	7-8-9 **
	C. C. Lewis	Shop	7-8-9 **
Granite	Herbert McCall	Shop	7-8-9 *
Haskell	None	No Ind. Arts	7-8
Hammon	Ediger Daniel	Shop	7-8-9 *
Healdton	Joe T. Holland	Shop	7-8-9 *
Heavener	Willard Hinson	Ind. Arts	7-8-9 *
Hinton	C. H. Mains	Shop	7-8-9 *
Hobart	R. C. Kleiner	Shop	7-8-9 **
Holdenville	Robert Slavin	Shop	7-8
Hollis	Blant McGee	Shop	7-8-9 **
Hominy	Ernest L. Kinney	Shop	7-8
Hugo	None	No Ind. Arts	7-8
Idabel	None	No Ind. Arts	7-8-9 **
Indianola	Marvin Hogue	Shop	7-8-9 **
Jay	Earl Kelly	Carpentry	7-8-9 *
	Richard Lindly	Auto Mech.	7-8-9 *
Jenks	None	No Ind. Arts	7-8
Kingfisher	Geen Gilmour	Shop & Mc.Dw.	7-8-9 **
Konawa	Thomas Aldridge	Shop	7-8-9 *
Lavern	None	No Ind. Arts	7-8-9 *
Lawton	Charles B. Harrison	Mc. Dw.	7-8-9 **
	Paul Wilson	Shop	7-8-9 **
Lexington	W. R. Barnett	Shop	7-8-9 **

School	Ind. Arts Teacher	Course	Grade
Lindsay	Allen Matthews	Ind. Arts	7-8-9 *
LeFlore	R. E. Scott	Manual Arts	7-8-9 *
Luther	None	No Ind. Arts	7-8
Mangum	Clarence Turner	Shop	7-8-9 **
Marietta	Jesse J. Walla	Shop	7-8 *
Marlow	None	No Ind. Arts	7-8-9 *
Maud	Glen Rhodes	Shop	7-8
McAlester	Jack Greer	Manual Arts	7-8
McMann	Coy T. Motley	Shop	7-8-9 *
Miami	E. G. Gilbert	Ind. Arts	7-8-9 *
Midwest City	Thomas Nolen	Shop	7-8-9 *
Moore	L. E. Kelley	Shop	7-8-9 *
Mooreland	Homer B. Towns	Shop	7-8-9*
Mountain View	Kenneth Adams	Ind. Arts	7-8-9 **
Muskogee			
Alice Robertson	H. L. York	Ind. Arts	7-8-9 **
	Kyle Hobbs	Ind. Arts	7-8-9 **
West High	Joe Hacker	Ind. Arts	7-8-9 **
Noble	John Hubbard	Shop	7-8-9 *
Norman	Wm. C. Strong	Manual Arts	8-9
Nowata	Joe E. Large	Ind. Arts	7-8 *
Okema	Garvin Peck	Shop	7-8-9 *
Oklahoma City			
Capitol Hill	E. G. Arnold	Ind. Arts	7-8-9 **
	Frank Mudrak	Ind. Arts	7-8-9 **
	R. M. Sutton	Ind. Arts	7-8-9 **
	L. H. Musselman	Ind. Arts	7-8-9 **
Foster	Fred Holloway	Shop	7-8-9
Harding	Chester Ingraham	Ind. Arts	7-8-9 **
	Cecil Kelley	Woodwork	7-8-9 **
Jackson	L. G. Laundry	Shop	7-8-9 **
	Evelyn Fish	Crafts	7-8-9 **
	Rex Porter	Shop	7-8-9 **
	George Ross	Shop	7-8-9 **
Northeast	Lewis McMillan	Welding	7-8-9 *
	Ross Nichols	Upholstering	7-8-9 *
	Chester Reeves	Mc.Dw.	7-8-9 *
	J. B. Taggart	Auto Mech.	7-8-9 *
Roosevelt	Maurice Chornaley	Woodwork	7-8-9 **
	Fred W. Herford	Metal Work	7-8-9 **
	Woodrow Holbert	Mc. Dw.	7-8-9 **
Taft	Roy Conner	Woodwork	7-8-9 **
	James F. Corbett	Woodwork	7-8-9 **
Webster	Erma Snyder	Ind. Arts	7-8-9 **
	Wilson Holbert	Metal Work	7-8-9 **
Okmulgee	J. V. Rogers	Shop	7-8-9 *
Panama	O. W. Boren	Shop	7-8-9 *
Pauls Valley	D. P. Hayhurst	Shop	7-8-9 *
Pawnee	Frank J. Walquist	Shop, Farm	7-8-9 *
	Ralph Teague	Shop	7-8-9 *
Perry	A. L. Ebersole	Shop	7-8-9 *
Picher	N. C. Smith	Shop	7-8-9 *

School	Ind. Arts Teacher	Course	Grade
Ponca City	L. T. Mirman	Mc. Dw. & WW	7-8-9 *
	L. W. Parsons	Mc. Dw.	7-8-9 *
	Loren W. Smith	Metal Work	7-8-9 *
	J. A. Walker	Elec. & Radio	7-8-9 **
Prague	None	No Ind. Arts.	7-8-9 *
Pryor	Carl Lee Ford	Shop	7-8
Port, Sentinel	Don Nolen	Shop	7-8-9
Poteau	Sam Harris	Shop	7-8-9 **
Purcell	Roma T. Teel	Shop	7-8-9 *
Putman	T. J. Snyder	Ind. Arts	7-8-9 **
Quapaw	A. L. Bergman	Shop	7-8-9 *
Quinton	A. O. Beck	Ind. Arts	7-8-9 *
Red Oak	James A. Salmon	Shop	7-8
Ringling	C. D. Foster	Shop	7-8-9 *
Roosevelt	Bert E. Masier	Shop	7-8-9 *
Rush Springs	George Woodruff	Shop	7-8-9 *
Salina	None	No Ind. Arts	7-8-9 *
Sallisaw	Virgil L. Carter	Shop	7-8
Sapulpa	Fay A. Stout	Shop	7-8 *
Sayre	John M Gamble	Shop	7-8-9 **
Seiling	Robert E. Estep	Shop	7-8
Shawnee	John Frazier	Shop	8-9 **
Spiro	Carl Pollard	Shop	7-8-9 *
Snyder	Ray Beavers	Woodwork	7-8
Sterling	Edmond Franklin	Shop	7-8-9 *
Stillwater	Robert Gorner	Shop, Dw. & WW	7-8
Stilwell	Warren Rogers	Shop	7-8
Sulphur	Fay Stout	Mc. Dw.	7-8-9
Syre	Carl Jones	Shop	7-8-9 **
Talihina	Leo Treadway	Shop	7-8 *
Temple	Ray Boblyer	Ind. Arts	7-8-9 *
Thomas	Charles J. Ross	Shop	7-8-9 *
Tipton	Ralph Garnett	Shop	7-8-9 *
Tishomingo	William H. Shaw	Ind. Arts	7-8-9 **
Tulsa			
Cherokee	Ida Vernon Bates	Crafts	7-8-9
	Carl E. Rosser	Shop	7-8-9
Cleveland	H. R. Parks	Ind. Arts	7-8-9 **
	R. D. Ranson	Ind. Arts	7-8-9 **
	R. D. Rutherford	Ind. Arts	7-8-9 **
Clinton	Calire Nowatski	Mc. Dw.	7-8
	J. S. Teel	Shop	7-8
Horace Mann	E. M. Hale	Woods	7-8-9
	Oliver Kiser	Woods	7-8-9
	Oscar F. Oldham	Metals	7-8-9
Lowell	R. G. Kastendieck	Crafts	7-8-9 *
	James McFarland	Metal	7-8-9 *
	P. J. Pallissard	Wood	7-8-9 *
Roosevelt	J. W. Bollinger	Metal	7-8-9 **
	Harry McGinnis	Wood	7-8-9 **

School	Ind. Arts Teacher	Course	Grade
Wilson	B. W. Hargis	Ind. Arts	7-8-9 **
	Joe B. House	Ind. Arts	7-8-9 **
	Zelphia Layton	Ind. Arts	7-8-9 **
Carver	George Homer	Wood	7-8-9 **
	Isaac Woods	Metal	7-8-9 **
Tuttle	Charles Garter	Shop	7-8
Velma	E. O. Plante	Shop	7-8-9 *
Verden	None	No Ind. Arts	7-8-9 *
Vinita	None	No Ind. Arts	7-8-9 *
Vinson	Neil A. Johnson	Shop	7-8-9 *
Wagoner	H. M. Stout	Shop	7-8
Walters	J. D. Norton	Shop	7-8-9 *
Watonga	U. B. Stephenson	Shop	7-8-9 *
Wayne	Charles Godard	Shop	7-8-9 **
Weatherford	A. O. Lee	Shop	7-8-9 **
Webbers Falls	Eugene Flippen	Shop	7-8-9 *
Welch	None	No Ind. Arts	7-8-9 *
Wleetka	C. M. Johnson	Shop	7-8-9 *
Wellston	Ora Johnson	Shop	7-8-9 *
Westville	James Wheeler	Shop	7-8-9
Wetumka	E. J. Hodges	Shop	7-8
Wilberton	None	No Ind. Arts	7-8
Wilson	Pearl McCabe	Shop	7-8
Woodward	J. J. Wright	Ind. Arts	7-8-9 **
Wyandotte	Clyde Howerton	Shop	7-8-9 *

** "Class A" Segregated Junior High School

* "Class A" Combined Junior High School

All others are "Class B" Junior High Schools

Nineteen approved junior high schools were unable to offer industrial arts this year even though it is one of the required courses. The lack of teachers, equipment, or finance are some of the reasons for this deficiency in curriculum offerings. Some schools were accredited temporarily. A number of schools are using the same shop teacher for their junior high and senior high school and several teachers are required to teach subjects other than industrial arts.

Part B

Curriculum

To meet the accepted objectives of secondary education, the junior high school curriculum must provide a wide variety of subject areas. The

program of studies for Oklahoma junior high school makes provisions for this requirement. Table II is the program of studies for Oklahoma junior high schools taken from a recent state bulletin. (23, page 40) Industrial arts being required in the junior high school is evidence of the continued interest of school authorities in this curriculum area. (Further evidence is offered by educational leaders) since they expect teachers of industrial arts subjects to obtain special certificates in this field. The curriculum must be enriched from year to year and industrial arts plays a significant part in keeping the junior high school curriculum abreast with the educational philosophy.

Junior High School Program of Studies For Oklahoma. The required and elective subject are listed in Table II for the junior high schools of Oklahoma. In an accredited junior high school the student, in a three-year junior high school, is required three years english, three years social studies, three years mathematics, three years general science, and one year of industrial arts for boys and one year of homemaking for girls. Physical education and health training, activities, and guidance are other required courses. Many changes occur each year as attempts at up-grading are made by the superintendents and high school inspectors.

Industrial Arts Courses. The course most frequently offered or required is general shop. Several different units are taught in these general shops, such as woodwork, metalwork, crafts, electricity, radio, drawing and others.

Copy
TABLE II

JUNIOR HIGH SCHOOL PROGRAM OF STUDIES FOR OKLAHOMA

Seventh Year	Pe- riods Wkly.	Eighth Year	Pe- riods Wkly.	Ninth Year	Pe- riods Wkly.
Required	30	Required	25	Required	25
English Literature and Reading Composition Grammar Spelling Penmanship	7-10	English Literature & Reading Composition Grammar Spelling Penmanship	5-10	English	5
Social Studies	5	Social Studies	4-5	Social Studies	5
Mathematics	5	Mathematics	5	Mathematics	5
General Science	3-5	General Science	3-5	General Science	5
Ind. Arts--boys Homemaking--girls	3-5	Ind. Arts--boys Homemaking-- girls	3-5		
Physical and Health Edu- cation	2	Physical and Health Edu- cation	2	Physical and Health Edu- cation	3
Activities	2-3	Activities	2-3	Activities	2-3
Guidance	1	Guidance	1	Guidance	1
Music and Art	2-3				
Electives	None	Electives	5-10	Electives	10-15
		Music and Art (5) Ind. Arts (5) Homemaking (5) Foreign Lang. (5) Adjustment (5)		Music and Art (5) Ind. Arts (5) Homemaking (5) Foreign Lang. (5) Adjustment (5) Agriculture (5) Commerce (5)	
Total periods weekly	30		30		30-35

1. This program of studies is based on the lengthened period of sixty minutes.
2. Subjects listed as required are required for each pupil.

3. When two figures follow a subject, the first represents the minimum number of periods weekly if the subject is taught for two years or more. Alternation of subjects is suggested for enrichment purposes.
4. Total periods weekly represents the normal pupil load. Not to exceed 20 periods of college entrance work are recommended for the ninth grade pupils of normal ability.
5. Subjects which may be alternated by days, weeks or semesters: General Science with Industrial Arts or Homemaking; Physical Education and Health Activities.

The courses that are offered or are required in Oklahoma junior high school are listed in Table III by grades. This table also contains the frequency with which the course is offered and whether required or elective.

TABLE III

INDUSTRIAL ARTS COURSES OFFERED OR REQUIRED

Seventh Grade	Frequency	
	Required	Elective
General Shop	48	3
Woodwork	17	
Mechanical Drawing	3	
Industrial Arts	10	
Metalwork	1	
Electricity	1	
<u>Eighth Grade</u>		
General Shop	68	17
Woodwork	32	15
Mechanical Drawing	5	3
Industrial Arts		4
Metalwork	11	3
Electricity	1	
<u>Ninth Grade</u>		
General Shop	3	37
Woodwork	12	14
Mechanical Drawing	1	13
Industrial Arts	1	11
Metal Work		4
Electricity		1
Radio		1

There is a trend away from the conventional wood and metal shops but several schools of today only have woodworking or metal working. Lack of finance, facilities, or trained teachers may be some of the reasons for this lag in

the industrial arts curriculum.

Industrial arts courses for the seventh grade are almost wholly required; for the eighth required more often than elective, and for the ninth grade entirely elective. The philosophy behind this is that the seventh grade is the period of self-adjustment. Here the pupil makes the transition from the elementary school to the junior high school. The eighth grade is the period of exploration and discovery and the ninth grade is the period when the pupil is allowed to choose, to a certain extent, the courses he wishes to take.

Size of Industrial Arts Classes. Table IV shows that twenty-eight classes or 4.6 per cent of the total number of classes have nine or less in enrollment. Classes of this size are too small from an administrative point of view, however, more individual instruction is possible which is an advantage. Sixty-five and one tenth per cent of the total number of classes have an enrollment size of between ten and twenty-five which seems to be the ideal class size.

TABLE IV
SIZE AND NUMBER OF INDUSTRIAL ARTS CLASSES

Size of Class	Number of Classes	Per Cent of Total Number Classes
1-9	28	4.6
10-15	111	18.5
16-20	151	25.4
21-25	126	21.2
26-30	81	13.6
31-35	60	10
36-40	38	6.4
41-45	2	.3
TOTALS	597	100

Table IV shows that 30.3 per cent of the total number of classes have an enrollment above twenty-five. These classes are considered too large for best instruction. Large classes tend to add to the discipline problem because it is difficult for one teacher to keep the pupils busy. It is also

a disadvantage to the student to be in a large class because individual instruction is limited and his experiences with a wide variety of materials, tools, and techniques are limited to a certain extent. From the figures given in Table IV, one can see that the majority of the Oklahoma junior high school industrial arts classes have reasonable class sizes of from ten to twenty-five.

Class Period. The length of class periods were not reported for all of the schools, but Table V shows 98.2 per cent of the total number of periods reported to range between forty-five and sixty minutes in length. A thirty minute period was reported for industrial arts classes in one school, while another was reported as having 90 minute periods for industrial arts classes. The trend seems to be toward sixty minutes periods. Seventy-one and five tenths of total period lengths indicated were one hour in length.

TABLE V
LENGTH OF CLASS PERIOD

Minutes	Number of Schools	Per cent of Total Number Schools
30	1	.9
45	9	8
50	10	8.9
55	11	9.8
60	80	71.5
90	1	.9
TOTALS	112	100

The length of class periods were not reported for eighty-six schools or 43.3 per cent of the total number of accredited junior high schools in Oklahoma.

Course Duration. The number of weeks which industrial arts courses are taught in Oklahoma junior high schools are indicated in Table VI. The majority, 73.7 per cent of the total number of course, are thirty-six weeks

in duration. Courses of eighteen weeks duration were next comprising 19.1 per cent of the total number of courses. One course forty weeks in length was reported, and there were six courses nine weeks in length. Other variations in course duration were thirty-seven, thirty-five, thirteen, and twelve weeks. Some of the differences in the length of courses may be attributed to the length and division of the school year.

TABLE VI

COURSE DURATION

Weeks Taught	Frequency	Per cent of Total Number Courses
40	1	.3
37	7	2.1
36	237	73.7
35	2	.6
24	2	.6
18	61	19.1
13	1	.3
12	5	1.5
9	6	1.8
TOTALS	322	100

Shop Activities. A great diversity of terminology was used when referring to industrial arts classes. The titles of the different industrial arts activities found in the accredited junior high schools of Oklahoma are given in Table VII. The title "Shop" is referred to in describing the course 89 times. Manual training is referred to only one time while the term Manual Arts is used twice. Industrial arts is used forty times in describing the course. According to this table there is no parallelism between the different schools as to the titles given for identical work. There is a need for reorganization whereby the title referred to by two schools would mean that the students have covered identical work. Table VII shows that twenty-four different terms have been used in referring to industrial arts classes by teachers of the one hundred and eighty-one junior

high schools.

TABLE VII
INDUSTRIAL ARTS ACTIVITIES

Activity	Frequency
Auto Mechanics	2
Carpentry	1
Crafts	3
Driver Education	1
Electricity	2
Farm Shop	1
General Shop	5
Home Crafts	1
Home Mechanics	1
Industrial Arts	40
Manual Arts	2
Manual Training	1
Mechanical Drawing	11
Metalwork	6
Metals	1
Radio	2
Shop	87
Stage Craft	1
Upholstering	1
Visual Education	1
Welding	1
Wood	3
Woodwork	5
Woods	2
TOTAL	181

The general shop is required more often than any of the other industrial arts subjects. Sixty-five and one tenth per cent of the total number of classes have an enrollment between ten and twenty-five which seems to be the ideal class size. The trend is toward one hour class periods and thirty-six weeks, in duration. A wide variety of titles are given for the industrial arts classes.

Part C

Oklahoma Junior High School Industrial Arts Teachers

During the war years, 1942-1946, there was a critical shortage of trained teachers in Oklahoma, especially teachers of industrial arts subjects.

Many teachers joined the military services and still others left the field to work in factories or on defense jobs. Some school superintendents were forced to discontinue industrial arts as a part of the curriculum, while others secured untrained or poorly trained teachers. This condition has changed greatly since 1946. Many teachers have returned to teaching activities and a record number of teachers have been graduated from the teacher education institutions. More teachers are being prepared in the state than the number of vacancies occurring, therefore the problem of qualified teacher should soon be solved. The Oklahoma state salary scale is an added incentive for teachers in Oklahoma schools to seek further education and higher degrees.

Teaching Fields. Small junior high schools seldom have full-time industrial arts teachers. In these schools the industrial arts teacher teaches other subjects. Table VIII shows the different subjects that the teachers of industrial arts teaches in the Oklahoma junior high schools.

TABLE VIII
TEACHING COMBINATIONS

Teaching Combinations	Number of Teachers
Industrial Arts	84
Industrial Arts-Mathematics	31
Industrial Arts-Physical Education	24
Industrial Arts-Principal	12
Industrial Arts-History	10
Industrial Arts-History-Mathematics	8
Industrial Arts-General Science	8
Industrial Arts-Social Science	7
Industrial Arts-Trade and Industrial Courses	7
Industrial Arts-English	3
Industrial Arts-Music	1
Industrial Arts-Spanish	1
Industrial Arts-Typing	1
Industrial Arts-Visual Education	1
TOTAL	198

There are eighty-one teachers who teach only industrial arts subjects. Industrial arts is the first teaching field for one hundred and sixty-six of

the one hundred and ninety-eight junior high school teachers teaching one or more industrial arts subjects. The most frequent combination is industrial arts and mathematics. Other duties performed by these teachers include study hall, home room and lunch room supervision.

Qualification of Teachers. The training of industrial arts teachers is given in Table IX. All teachers of industrial arts subjects in Oklahoma junior high schools have college training. Only one or .5 per cent of the total number of teachers has less than ninety hours. Of the one hundred and ninety-eight teachers sixteen or 8.1 per cent have between ninety and one hundred and twenty college hours credit. Sixty-eight and seven tenths per cent of the total number of teachers have Bachelor's degrees while twenty-one and one tenth per cent have Master's degrees. Table IX indicates that the industrial arts teachers of Oklahoma have had a reasonable amount of college training, however, teachers should continue their education in order to learn the new techniques that are being developed and to better qualify themselves.

TABLE IX

EDUCATIONAL PREPARATION OF INDUSTRIAL ARTS TEACHERS

College Hours or Degrees Held	Number of Teachers	Per Cent of Total Number Teachers
Less than 90	1	.5
90 - 120	16	8.1
B.S.	124	62.7
B.A.	8	4
A.B.	7	3.5
B.M.	1	.5
M.S.	30	15.1
M.A.	10	5.1
M.E.	1	.5
TOTAL	198	100

Teachers Salaries. The salaries range for junior high school industrial arts teachers are indicated in Table X. This table discloses that most Industrial Arts teachers receive a reasonable wage for their

services. Only two of the total number of teachers under consideration receive less than \$2000 a year. Of the three teachers receiving over \$4100 two are Trade and Industrial Education teachers. A few of the other large salaries may be attributed to Vocational Education or Trade and Industrial Education teachers who also teach one or more junior high school industrial arts courses. An interesting feature of Table X is the inconsistency of the decrease in number from the most frequent salary of \$2500 - \$2700 to the range of \$4100-\$4749. The difference in the salary scale might account for this inconsistency. The average annual salary for teachers with bachelor's degrees is \$2859 and for teachers with master's degrees is \$3403.

TABLE X
SALARIES OF INDUSTRIAL ARTS TEACHERS

Amount in Dollars	Frequency	Per Cent of Total Number of Teachers
Less than 1800	None	
1800-1999	2	1
2000-2149	6	3
2150-2299	9	4.5
2300-2449	16	8.1
2500-2700	45	22.8
2750-2999	24	12.1
3000-3349	38	19.2
3350-3699	31	15.7
3700-4049	23	11.6
4050-4399	1	.5
4400-4749	3	1.5
More than 4750	None	
TOTAL	198	100

The information contained in this chapter was secured from the applications for junior high school approval for the school year 1949-50. All significant information available from the applications was recorded on the work sheet as described in chapter one, tabulated, and included in this chapter. It is hoped that the foregoing information will answer many

questions concerning industrial arts in Oklahoma junior high schools.

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

In order to facilitate the use of this study, a summary of the findings is given in this chapter. In addition to the brief summarization of the material, a few recommendations are given in this final chapter on the basis of information presented.

Part A

Summary

There are one hundred and eighty-one approved junior high schools in the state of Oklahoma. Industrial arts is included in the curriculum of one hundred and sixty-two of these schools. There are one hundred and ninety-eight teachers who teach one or more industrial arts subjects in the junior high schools having industrial arts in the curriculum. Of the total number of teachers, one hundred- and ninety-one are men and seven are women. No colored teachers or schools for colored students are included in this study.

In an accredited junior high school the student, if a three year junior high school, is required three years English, three years social studies, three years mathematics, three years general science, and one year industrial arts for boys and one year homemaking for girls.

The industrial arts course most frequently offered or required is general shop. Woodworking is the next most frequent course offering or requirement. The majority, 73.3 per cent of the total number of courses, are thirty-six weeks in duration. Sixty-five and one tenth per cent of the total number of courses have an enrollment size of between ten and twenty-five

which seems to be the ideal class size. Thirty and three tenths per cent of the total number of classes have an enrollment greater than twenty-five and 4.6 per cent have an enrollment less than ten. The length of the class periods range from thirty to ninety minutes. Seventy-one and five tenths of the total period lengths indicated were one hour in length. A great diversity of terminology was used when referring to industrial arts classes.

There are eighty-one teachers who teach only industrial arts subjects. In small junior high schools the industrial arts teacher teaches other subjects; industrial arts and mathematics being the most frequent combination. All teachers of industrial arts subjects in Oklahoma junior high schools have college preparation. Only seventeen of the one hundred and ninety-eight teachers do not have degrees. One hundred and forty of these teachers have bachelor's degrees and forty-one have master's degrees. The average annual salary for teachers with bachelor's degrees is \$2859.00 and the average annual salary for teachers with master's degrees is \$3404.00.

Part B

Recommendations

After a careful study of the status of industrial arts in Oklahoma junior high schools for the school year 1949-1950, the writer would like to present the following recommendations.

All teachers of industrial arts should be required to have a major in industrial arts or a minor in the teaching area of the field of industrial arts. Salaries should vary according to the qualifications of the individual teacher with promise for advancement in relation to the number of years teaching experiences.

Oklahoma junior high school industrial arts courses are almost universally woodwork or metal work courses. To meet the accepted objectives of secondary education, the junior high school curriculum must provide a wide variety of subject areas. Therefore, other activities should be added to the curriculum of many Oklahoma junior high schools that have only one or two subjects areas. Industrial drawing should be added to the curriculum of many more schools so that the student might be taught more of the why and how and not so much emphasis on the manipulative activity. The writer proposes the following program of industrial arts for an idealized junior high school in Oklahoma.

The ideal general shop should be designed to include facilities for teaching the following industrial arts subjects. The number following each subject indicates the maximum number of students who can be enrolled and work in each field of activity at any one time.

Hand Woodworking	12	Sheet Metal Work	6
Machine Woodworking	12	Plastics	6
Industrial Drawing	12	Electrical Work	6
Bench Metal Work	6	Printing	6
Leather	6	Automobile Mechanics	6

The following schedule of instruction will be in operation, it being assumed that one and one-half years of industrial arts will be required, and one year of this will be elective.

7th grade, 2nd semester ..5 hours per week, 18 weeks
Hand Woodworking ..9 weeks
Industrial Drawing.....9 weeks

8th grade, one year, 5 hours per week, 36 weeks
Bench Metal Work 6 weeks
Leather Work 6 weeks
Sheet Metal Work 6 weeks
Plastic Work 6 weeks
Electrical Work 6 weeks
Printing 6 weeks

9th grade elective, second semester, 5 hours per week, 16 weeks.

Machine Woodworking. 12 Students
 Advanced Drawing 12 students

9th grade elective, first semester, 5 hours per week, 18 weeks
 Choose among these, not more than six to be enrolled in any one shop-
 work subject.

Metal Work 6 students
 Printing 6 students
 Electrical Work 6 students
 Automobile Mechanic. 6 students

The general shop lends itself to the smaller schools of the state.

It takes less equipment to establish a shop of this type. The writer
 would like to emphasize the flexibility of this type of shop to fit the
 needs of the community.

A study similar to this one would be appropriate after a period of
 about five years to determine what progress has been made.

APPENDIX A

APPENDIX A

ALPHABETICAL DIRECTORY OF INDUSTRIAL ARTS
TEACHERS IN OKLAHOMA JUNIOR HIGH SCHOOLS

Teacher	Street Address	Post Office	School
Adams, Kenneth		Mountain View	Mountain View
Alexander, George		Cyril	Cyril
Apala, Lemuel		Elgin	Elgin
Arnold, E. G.	1324 South West 20th	Oklahoma City	Capitol Hill
Auld, Joe B.		Blackwell	Blackwell
England, Millard		Cordell	Cordell
Barnes, James W.	316 North Adams	Enid	Emerson
Barnes, Olen C.		Blanchard	Blanchard
Ballard, Ben W.		Apache	Apache
Barnett, W. R.		Lexington	Lexington
Bates, Ida Vernon	331 S. Victor	Tulsa	Cherokee
Bazemore, Arnell		Davis	Davis
Bean, Stanley	416 Wilson Drive	Oklahoma City	Crooked Oak
Beavers, Ray		Snyder	Snyder
Beck A. O.		Quinton	Quinton
Bergman, A. O.		Quapaw	Quapaw
Bobyler, Ray		Temple	Temple
Bollinger J. W.	1401 E. 46th	Tulsa	Roosevelt
Borin, P. W.		Panama	Panama
Brandon, Tolbert F.	1523 West Washington	Guthrie	Colleral
Brewer, Frank	Route 1, Sayre	Elk City	Elk City
Brown, Ray	918 West Pine	Enid	Longfellow
Brown, William V.		Amber	Amber
Buchanan, Rex		Colcord	Colcord
Calbert, J. W.		Guymon	Guymon
Carter, Virgil L.		Sallisaw	Sallisaw
Chadwick, Monroe		Eldorado	Eldorado
Chandler, A. J.		Coweta	Coweta
Collinger, Ernest		Cache	Cache
Conner, Roy	623 East Park	Oklahoma City	Taft
Corbett, James F.	3512 North West 16th	Oklahoma City	Taft
Daniel, Ediger		Hammon	Hammon

Teacher	Street Address	Post Office	School
Dipboye, Clyde		Chattanooga	Chattanooga
Dobbins, M. E.	402 West Walnut	Durant	Durant
Durham, James	2509 Everett Drive	Enid	Emerson
Ebersole, A. L.	721 8th	Perry	Perry
Estep, Robert E.		Seiling	Seiling
Fisk, Evelyn	2825 North West 46	Oklahoma City	Jackson
Flipper, Eugene		Webbers Falls	Webbers Falls
Foster, C. D.		Ringling	Ringling
Ford, Carl Lee		Pryor	Pryor
Franklin, Edmond		Sterling	Sterling
Frazier, John		Shawnee	Shawnee
Fritz, L. L.	1209 South 6th	Chickasha	Chickasha
Fulkerson, Ray	405 East Elm	Duncan	Duncan
Gamble, J. M.		Erick	Erick
Gamble, John M.		Sayre	Sayre
Garner, Robert		Stillwater	Stillwater
Garnett, Ralph		Tipton	Tipton
Ghormley, Maurice	136 North East 12	Oklahoma City	Roosevelt
Garrett, W. L.		Calvin	Calvin
Gilbert E. G.		Miami	Miami Public
Gilmour, Geen	819 South 7th	Kingfisher	Kingfisher
Godard, Charles		Wayen	Wayne
Gorten, Charles		Tuttle	Tuttle
Greer, Jack	410 West Cherokee	McAlester	McAlester
Grothe, G. H.	319 West Britton	Bristow	Bristow
Hacker, Joe	2125 Garland	Muskogee	West High
Hale, E. M;	3179 E. 1st	Tulsa	Horace Mann
Hargis B. W.	2259 South Rockford	Tulsa	Wilson
Harris, Sam		Poteau	Poteau
Harrison, Charles B.	1313 Ferris Avenue	Lawton	Lawton
Hawthorne, John		Commerce	Commerce
Hayhurst, D. P.	110 $\frac{1}{2}$ South Oak	Pauls Valley	Pauls Valley
Henson, Carl		Catoosa	Catoosa
Henson, Willard		Heavener	Heavener
Herford, Fred W.	1151 North East 9th	Oklahoma City	Roosevelt
Hobbs, Kyle	2415 Elliot	Muskogee	Alice Robertson

Teacher	Street Address	Post Office	School
Hodges, E. J.		Wetumka	Wetumka
Hogue, Marvin		Indianola	Indianola
Holbert, Wilson	619 Northwest 23	Oklahoma City	Webster
Holbert, Woodrow	619 Northwest 23	Oklahoma City	Roosevelt
Holland, Joe Thomas		Healdton	Healdton
Holloway, Fred	134 Southwest 29th	Oklahoma City	Foster
Homer, George	1133 East Zion	Tulsa	Carver
Horshler, N. C.		Duke	Duke
House, Joe B.	5504 South Norfolk	Tulsa	Wilson
Howerton, Clyde		Wyandotte	Wyandotte
Hubbard, John		Noble	Noble
Ingraham, Chester		Oklahoma City	Harding
Johnson, C. M.		Weleeka	Weleeka
Johnson, Cletus		Custer City	Custer
Johnson, Neil A.		Vinson	Vinson
Johnson, Ora		Wellston	Wellston
Jones, Carl		Syre	Syre
Kastendieck, R. G.	6136 E. rth	Tulsa	Lowell
Kellar, C. C.	420 South Rock Island	El Reno	El Reno
Kelley, Cecil	Northwest 15th 2420	Oklahoma City	Harding
Kelley L. E.		Moore	Moore
Kelley, Earl		Jay	Jay
Kinney, Ernest L.	112 East Fifth	Hominy	Hominy
Kiser, Olver	1155 East 39th St.	Tulsa	Horace Mann
Kleine, R. C.	429 N. Bailey	Hobart	Emerson
Large, Joe		Nowata	Nowata
Layton, Zelfhia	1603 S. Jamestown	Tulsa	Wilson
Lee, A. L.	611 West Kay	Weatherford	Weatherford
Lewis, C. C.		Guymon	Guymon
Lindly, Richard		Jay	Jay
Little, Thomas J.	208 N. 10th	Frederick	Frederick
Long, Allen		Geary	Geary
Lundy, L. G.	3925 Northwest 24	Oklahoma City	Jackson
Mains, C. H.		Hinton	Hinton
Mosier, Bert E.		Roosevelt	Roosevelt

Teacher	Street Address	Post Office	School
Matthews, Allen		Lindsay	Lindsay
McCable, Pearl		Wilson	Wilson
McCall, Herbert		Granite	Granite
McDaniel, James	R.R. #3	Enid	Longfellow
McFarland, James	1303 S. Winston	Tulsa	Lowell
McGee, Eland		Hollis	Hollis
McGinnis, Harry	571 S. Allegheny	Tulsa	Roosevelt
McMillan, Lewis	1403 Southwest 20	Oklahoma City	Northeast
Merryman, D. W.		Checotah	Checotah
Morgan, Kenneth		Caddo	Caddo
Moore, Herman		Bowlegs	Bowlegs
Motley, Coy T.		McMan	Dundee
Mudrak, Frank	3204 South Klein	Oklahoma City	Capitol Hill
Musselman, L. H.	544 Southwest 45	Oklahoma City	Capitol Hill
Neese, William H.	314 $\frac{1}{2}$ E. Broadway	Broken Arrow	Broken Arrow
Nichols, Roos	1226 Northwest 18	Oklahoma City	Northeast
Ninman, L. T.	302 N. 8	Ponca City	Ponca City
Nolen, Don		Port, Sentinel	Sentinel
Nolen, Thomas		Midwest City	Midwest City
Norton, J. D.		Walters	Walters
Nowatski, Claire	4010 S. Yukon	Tulsa	Clinton
Nuss, Dale R.	38 E. 15th Street	Bixby	Bixby
Oldham, Oscar F.	1144 S. Quebec	Tulsa	Horace Mann
Pallissard, P. J.	2527 E. 6th	Tulsa	Lowell
Park, Joseph C.		Carter	Carter
Park, R. M.		Comanche	Comanche
Parker, J. L.		Barnsdall	Barnsdall
Parks, H. R.	Routhe 1	Tulsa	Cleveland
Plante, E. O.		Velma	Velma Alma
Parsons, L. W.	2000 E. Central	Ponca City	Ponca City
Peck, Garuin	409 South 8th	Okemah	Okemah
Phelps, Robert K.		Carnegie	Carnegie
Pollard, Carl		Spiro	Spiro
Porter, Tex		Oklahoma City	Jackson
Quaid, Odis		Boswell	Boswell
Randolph, Robert Jr.		Atoka	Atoka
Ranson, R. D.	2520 E. Archer	Tulsa	Cleveland

Teacher	Street Address	Post Office	School
Reeves, Chester	1516 North West 39	Oklahoma City	Northeast
Reynolds, Lawrence	1117 Belmont	Ada	Ada
Rhodes, Glen		Maud	Maud Public
Richard, Sidney	513 North 9th	Clinton	Clinton
Ridgway, C. M.		Fletcher	Fletcher
Riggsby, Orvis		Gould	Gould
Roblyer, Carl		Fox	Fox
Rogers, J. V.	704 North Griffin	Oklmulgee	Oklmulgee
Ross, Charles J.		Thomas	Thomas
Ross, George	420 Norwest 34, Apt #1	Oklahoma City	Jackson
Rosser, Carl E.	3312 E. Easton	Tulsa	Cherokee
Rutherford, R. D.	1239 S. Winston	Tulsa	Cleveland
Salmon, James A.		Red Oak	Red Oak
Sark, Forrest		Grove	Grove
Scott, R. E.		LeFlore	LeFlore
Shafer, William	801 East Nona	Altus	Altus
Shaw, William H.		Tishomingo	Tishomingo
Slavin, Robert		Holdenville	Holdenville
Smith, Lorean W.	802 N. Elm	Ponca City	Ponca City
Smith, N. C.		Picher	Picher
Smith, Otto D.		Butler	Butler
Snyder, Erma	2501 Northeast 23	Oklahoma City	Webster
Snyder, T. J.		Putman	Putman
Stephenson, V. B.		Watonga	Watonga
Stiles, Darrell	R.R. #3, Box 15	Bristol	Bristol
Stockston, Austin		Fort Cobb	Fort Cobb
Stout, Fay A.	801 East Fifth	Sapulpa	Sapulpa
Stout, Foy	801 East Fifth	Sulphur	Sulphur
Stout, H. M.		Wagoner	Wagoner
Strong, William C.	1117 McManee	Norman	Norman
Sturdevant, Arthur G.	403 Southeast Carter	Ardmore	Ardmore
Sullivan, C. R.	906 Delaware	Dewey	Dewey
Sutton, R. M.	R. #9, Box 178	Oklahoma City	Capitol Hill
Taggart, J. B.	504 Northwest 5th	Oklahoma City	Northeast
Teague, Ralph		Pawnee	Pawnee

Teacher	Street Address	Post Office	School	
Teel, Sterling J.	1626 W. 41st Street	Tulsa	Clinton	
Teel, Roma T.		Purcell	Purcell	
Thomas, Aldridge	500 South Louisiana	Konawa	Konawa	
Tounes, Homer B.		Mooreland	Mooreland	
Treadway, Leo		Talihina	Talihina	
Turner, Clarence		Mangum	Mangum	
Tususon, N. C.		Sentinal	Sentinal	
VanLiew, Wayne		137½ North Cheyenne	Bartleville	Bartleville
Vaughn, Joseph		602 West Georgia	Anadarko	Anadarko
Victor, Samul G.		728 N. 2nd	Afton	Afton
Walker, J. A.			Ponca City	Ponca
Walls, Jesse J.			Marietta	Marietta
Walquist, Frank J.	Pawnee		Pawnee	
Warren, Rogers	Stillwell		Stillwell	
Wheeler, James	Westville		Westville	
Wilson, Paul	531 N. Detroit	Lawton	Lawton	
Woodruff, George		Rush Springs	Rush Springs	
Woods, Isaac		Tulsa	Carver	
Wright, J. J.		Woodward	Woodward	
Wright, LeRoy		Dill City	Dill City	
York, H. L.	609 E. S. Bend	Muskogee	Alice Robertson	

APPENDIX B

To support any program of school shop planning this outline which is used by professor C. L. Hill in teaching Industrial Arts Education 323, Organization and Administration of Industrial Arts Courses, is included in this thesis. The writer enjoyed studying this outline and feels that it is adequate as a guide for planning and organizing an industrial arts general shop.

APPENDIX B

ORGANIZING AND EQUIPPING THE INDUSTRIAL ARTS SHOP
Cary L. Hill, Associate Professor
Industrial Arts Education and Engineering Shopwork
A. and M. College, Stillwater, Oklahoma

"A school shop should be thought of not only as a place for making projects, but equally as a place for planning, investigating, testing, experimenting, consulting, evaluating, - - - - . In short, the school shop should be thought of as a place for thinking as well as for fooling and doing."

Many shop teachers, school administrators and architects will have at sometime, the responsibility for planning new shops or the re-modeling of old shops. This portion of the bulletin is written in an attempt to answer many of the questions which will arise in school shop planning. No attempt has been made to standardize shops and equipment to the extent that all communities will have exactly the same types of shops. This material is offered only as suggestions and when specific information is required concerning the planning of shops and equipment an authority in one of the teacher training institutions of the state should be contacted.

I BASIC CONSIDERATIONS

The planning of the shop and the selection of equipment should be based upon the following factors:

1. Objectives and aims of the course.
2. Age of the pupil.
3. Number of pupils to be served.
4. Type of shop. (Metalwork, woodwork, drawing, etc.)
5. Budget available for building and equipment.

6. Future budget possibilities.
7. Space available for addition or separate building.
8. Space available for future expansion.

II LOCATION, SIZE AND SHAPE OF THE SCHOOL SHOP

1. Addition to the main school building.
 - a. Located for the least disturbance.
 - b. Insulated from the main building.
 - c. Hall space leading to the shop area.
2. Separate building.
 - a. Located near the main building.
 - b. Building to fit contour of the grounds.
 - c. Architectural design similar to the main building.
 - d. Roofed over passage-way between buildings.
3. Shop area size and shape. (exclusive of rooms for storage, tools, lectures, offices, etc.)
 - a. Shape.
 1. One shop plan - Rectangular.
 2. Two shop plan - "I", "T", or "L" shape.
 3. Three to five shop plan - "II", "U", OR "O" shape.
 4. Multi-shop plan - Letters above plus "E" and "C".
 - b. Width to length ratio of $1:1\frac{1}{2}$ or $1:2$.
 - c. Heavy shops (wood, metal, general shop, graphic arts, etc.)
 1. A minimum of 75 square foot per pupil.
 - d. Light shops (drawing, crafts, etc.)
 1. A minimum of 40 square feet per pupil.

III AUXILIARY ROOMS OR AREAS

1. Mezzanines
 - a. Ceiling height, above floor - minimum of 6 feet
 - b. Dust proof flooring.
 - c. Railing along the outside edge.
 - d. Toe boards under railing at edge of the floor.
 - e. Stairs leading to mezzanine.
2. Stock rooms
 - a. Lumber storage.

1. Minimum of 12 feet in length.
2. Equipped with wall racks or "T" racks for vertical or horizontal storage.
3. Omit heating facilities.
4. Two doors - Outside door for receiving materials and door in opposite end of room leading into the shop.
5. "Pigeon hole" racks for short lengths.
6. Special racks for panel stock.

b. Metal Storage

1. Minimum of 12 feet in length.
2. Equipped with extra metal wall racks or "T" racks for vertical or horizontal storage.
3. Two doors - Outside door for receiving materials and door in opposite end leading into the shop.
4. Racks for sheet metal.
5. Racks or "pigeon holes" for short lengths.

c. Other supply rooms.

1. Size - determined by materials to be stored.
2. Equipped with shelves, bins, drawers, racks, hooks, etc.
3. Located adjoining the shop area or in the shop area.

3. Planning center.

- a. May include library, drawing tables, study tables, exhibit cases, files for project prints, instruction sheets, etc.
- b. Located in an adjoining room to shop.
- c. Clean area within the shop area.
- d. Located on mezzanine.
- e. Glassed partition walls if adjoining shop area.

4. Lecture and demonstration room or area.

a. Room

1. Room - adjoining shop area - glassed partition.
2. Equipped for showing motion pictures.
3. Raised platform for arm chairs.
4. May include teacher's desk and files.

b. Area in shop -

1. Located in clean area of shop.
2. Raised platform for arm chairs.

5. Washing facilities and toilets.

a. In shop area for washing.

1. Rectangular metal basin with over-head hot and cold controlled water mixers.

2. Circular ceramic basins with center hot and cold controlled water mixers.

b. Toilet - adjoining shop area.

1. Same type of washing facilities as in shop area.
2. Standard sanitary urinals and stools.
3. Showers for bathing.
4. Lockers for change of clothes.

6. Finishing room or area in shop.

a. Room

1. Size - average 10 feet by 12 feet
2. Location - adjoining shop.
3. Walls - glazed brick or tile to 42 inches high and glasses to ceiling with 12" by 11" panes.
4. Doors - two in opposite sides of room opening outward for safety.
5. Light - Natural and artificial with fixtures mounted on walls at an angle. Use only safety lamps.
6. Exhaust system - special booth with exhaust fan for spray painting. Exhaust should be above building and away from adjoining walls.
7. Heating - Maintained at 75 degrees by radiators or forced air.
8. Water - basin with hot and cold water.
9. Safety factors - Safety lamps
Spark proof switches and motors
Safety containers for rags and inflammable materials.
Fire-proof storage cabinet for inflammable finishes.

7. Office space.

a. Located in shop area.

On raised platform 8" to 10" high.

b. In separate room.

Adjoin shop

Glass partition

View of entire shop from desk.

c. Either location should contain desk, chairs, files, etc.

8. Tool room

a. Location and design.

1. Centrally located near aisles of travel.
2. In view from any area of shop.
3. 42" high walls of wood or tile topped with glass or

- expanded metal or hardware cloth.
4. Size - depends on the type of shop and amount of tools to be stored.
 5. Service window and door -
Small room should have combination door and service window. (Dutch door)
 6. Service ledge 42" from floor.
 7. Ledge covered with heavy linoleum for tool protection.
 8. Equipped with panels, drawers, shelves and tool boxes for tool storage.
 9. Locker room or area.
Located in wash room, near entrance to shop or in special room for storage of aprons, books, change of clothes, etc.
10. Project storage
- a. Drawers under benches.
 - b. Lockers along walls.
 - c. Lockers under mezzanine.
 - d. Lockers built into wall space.
 - e. Separate storageroom.
 - f. On mezzanine.
11. Exhibit space
- a. Cabinets - Base from floor 2 feet.
Top from floor 7 feet.
Length and width determined by space available and material for exhibit.
 - b. Built-in show case
Built in partition wall between shop and main building or in entrance hall of separate building.
Hall side of case glassed with plate glass.
Rear of case contains doors opening into the shop for mounting of exhibits.
12. Assembly area.
- a. Open area near large service door.
 - b. In wood shop glue and clamps located near assembly area.

IV OTHER FACILITIES

1. Heating and ventilation of shop
 - a. Heated from central heating
 - b. Unit heating from ceiling type heaters with fans.
 - c. Radiant heating systems.
 - d. All-blast system- introducing fresh air.
2. Artificial lighting.

- a. Ceiling lights
 - Incandescent or fluorescent
 - b. Consult lighting engineer for correct amount of light.
 - c. Individual lights on machines, etc.
 - d. Ceiling lights in circuits running parallel to windows.
 - e. Separate switches and fuses for each circuit.
 - f. Master control panel for all lights near shop entrance.
3. Convenience outlets
- a. Located every ten feet around shop.
 - b. Located on posts where posts are used in shop.
 - c. Distribute outlets in several circuits each with separate switch and fuses.
 - d. Master control switch for all outlets.
4. Gas, water and air lines
- a. Gas - lines to heating units, hot plates, forges, heat treating, soldering, etc.
 - b. Water - copper or iron pipes to sinks, wash basins, drinking fountains and toilets.
 - c. Compressed air - for operating machines, painting and cleaning.
 - d. Locations of pipes
 - Below floor
 - In concrete floor
 - All pipes in the open
 - Above ceiling
 - e. Safety factors
 - Master control valves in all lines.
5. Power lines and control panels
- a. Buss-duct system.
 - b. Equally spaced underfloor wiring system.
 - c. Underfloor conduit system.
 - d. Overhead conduit system.
 - e. Wall conduit system.
 - f. Master control panel located in open area for quick access.
6. Other electrical conveniences
- a. Radio
 - b. Public address system
 - c. Telephone
 - d. Buzzers.
7. Fire protection
- a. Fireproof material in construction of building.
 - b. Spark proof switches, motors and lights in inflammable areas.
 - c. Proper extinguishers
 - d. Containers for oily rags and waste materials.

8. Chalk boards and bulletin boards

a. Chalk boards

1. Permanent or portable
2. Materials - Slate
Green vitreous material fused to plate glass
Composition fiber board with slated surface.

b. Bulletin boards

1. Permanent or portable
2. Materials - cork
fiber board

c. Location

1. Near chalk board area.
2. Near entrances
3. Over wash basins
4. Walls of shop

9. Tool storage

a. Tool cabinets

1. Located near work area.
2. Tools may be locked up.
3. Individual racks for all tools.

b. Tool panels

1. Same as tool cabinets but cannot be closed.

10. Disposal systems

- a. Waste such as dust, shavings both wood and metal.
- b. Fumes from welding and finishing departments.

11. Painting of interior walls and equipment

a. Research in painting

1. Pittsburgh Plate Glass Company
2. Dupont Company

b. Color identification of service lines

1. Blue - liquids
2. Green - gases
3. Orange on white - electricity

12. Floor drains and drinking fountains

a. Floor drains for auto mechanics shops.

b. Drinking fountains.

1. Types - Exposed
Recessed
Faucet attached to cold water spigot
Water coolers

2. Safety and health factors
 3. Squirt proof
13. Non-skid material around machines
- a. Abrasive material on cloth backing
 - b. Abrasive paints applied to floor
 - c. Rubber matting
14. Safety marking of aisles of travel and danger zones

V ARCHITECTURAL FEATURES

1. Separate building or addition design
 - a. Should correspond to that of original or other buildings on the campus.
2. Walls and partitions - (Permanent or temporary)
 - a. Composition
 1. Outside walls
 - Brick or tile
 - Wood or metal
 - Concrete or concrete block
 2. Partitions -
 - Non-bearing walls - 6" faced tile
 - Plaster on metal studding and lath
 - With windows - placed 12" from floor to 7' from floor
 - b. Interior wall finishes -
 1. Glazed tile or brick
 2. Plastered
 3. Composition board
 4. Plaster board
 5. Sound-proof covering
3. Floors
 - a. Top of floors at least 6" above grade level
 - b. Composition
 1. Wood floors and joists
 2. Heavy timber sub-floor on timber or steel beams
 3. Concrete slab on steel joists
 4. Re-inforced concrete slabs
 - c. Surface material
 1. Matched wood
 2. Wood blocks
 3. Concrete
 4. Terrazzo
 5. Asphalt mastic
 6. Clay tile
 7. Marble

8. Cork and linoleum tile
9. Rubber tile
10. Clay brick
11. Linoleum cork carpet

4. Roofs

- a. Flat roofs
- b. Gabled roofs
- c. Sawtooth roofs
- d. Monitor type roofs
- e. Arch type roofs
- f. Posts in the school shop

5. Windows

- a. Glass area and pane size
- b. Types -
 1. Double hung windows
 2. Casement windows
 3. Factory type windows
- c. Location -
 1. Wall space for equipment
 2. North, east, west or south
- d. Size and heights -
 1. To ceilings
- e. Sill heights -
 1. 42" from floor

6. Doors

- a. Personal access doors -
 1. Safety latches
 2. Open outward
 3. Minimum width - 36"
- b. Material access doors
 1. Overhead roll type
 2. Overhead solid door
 3. Divided sliding door
 4. Divided hinged door
 5. Minimum width - 8 feet
 6. Minimum height - 8 feet

7. Ceilings

- a. Heights determined by -
 1. Size of room
 2. Equipment to be installed
 3. Type of shop
 4. With or without mezzanine
- b. Composition
 1. Acoustical material
 2. Metal
 3. Plaster and lath
 4. Plaster board

8. Stairs

- a. Location
- b. Weight loads
- c. Proper widths
- d. Adequate lighting
- e. Landing space
- f. Height of rise - $6 \frac{5}{8}$ " to $7 \frac{3}{4}$ "
- g. Width of trend - $9 \frac{1}{2}$ " to $11 \frac{1}{2}$ "
- h. Hand rail
- i. Non-slip covering on treads

9. Ramps

- a. Used in place of stairs of four risers or less
- b. Rise per foot

10. Loading docks

- a. Where possible height of bed of commercial truck

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