

A RECOMMENDED COURSE OF STUDY IN JUNIOR HIGH
INDUSTRIAL ARTS FOR CLAY CENTER, KANSAS

by 214

Melvin Gene Cales

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A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

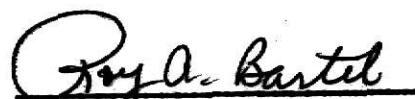
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Approved by:


Major Professor

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HISTORICAL BACKGROUND

The history of industrial arts has been one of constant change. From its earliest beginnings of father-to-son relationships, through the apprenticeship system of Egypt, and up to the present time, interest in industrial education has increased rapidly.

One of the most important factors to influence industrial education in the United States was the Centennial Exposition in Philadelphia in 1876. Here the educators had a chance to view the exhibits of other countries. Foremost of these were the Swedish Sloyd and Russian methods.

The Sloyd system was a highly organized work program with a handcraft tradition. Under the leadership of Otto Salomon, Naas, Sweden, it had a pronounced influence on general education as it stressed the development of useful articles. In contrast, the Russian method developed by Victor Della Vos was based upon an analysis of operations, processes, and manipulative work, resulting in a series of exercises with little or no concern for the construction of useful projects.¹

Industrial arts as a school subject in the United States began in 1880, with the opening of the Manual Training School of Washington University in St. Louis, Missouri. The school was directed by Calvin M. Woodward.

Professor Woodward, who at first was concerned with the preparation of future engineering students, quickly began to advocate the use of manual training in the secondary schools of the United States.

¹Leslie H. Cochran, Innovative Programs in Industrial Education (Bloomington, Illinois: McKnight and McKnight Publishing Co., 1970), p. 2.

Beginning in 1893, the term "manual arts" came into use as a substitute for the term "manual training." The new term was made a part of the new technical annex at Teachers College, Columbia University; the Macy Manual Arts Building made a significant contribution to the history of education relating to industry.

The courses given under the names manual training, manual arts, and industrial arts differed from one another in various ways. Manual training gave emphasis to hand skills and woodworking, occupational preparation, selection of occupation, and entrance into engineering schools. Manual arts, while still emphasizing skills, permitted students to work on useful articles. There was a degree of freedom in the selection of projects, and an appreciation of good design was stressed. Industrial arts, in its early phases, was characterized by the development of the technical high schools, of junior high school industrial arts programs, and of the exploratory function of industrial arts. Content of industrial arts at this period included drawing, woodworking, metalworking, electricity, and general crafts.

Federal aid for various educational purposes has been in existence since the passage of the Northwest Ordinance of 1785.

In 1917, Congress passed the Smith-Hughes Law, and this shifted responsibility for vocational classes to separate facilities, enabling industrial arts educators to devote their efforts to the aims of general education.²

There is a definite need for this kind of education. When the junior high school was first established, one of the reasons often stated

²Ibid., pp. 7-8.

for its need was that of prevocational training--a course for the non-college bound.³

From these early beginnings, industrial arts as a school subject has prospered in the schools of the United States.

BACKGROUND TO THE PROBLEM

Mr. John Dupree, Project Developer, Regional Office of the United States Office of Education, was contacted by the Kansas State Board of Education, Division of Vocational Education, with an application for a grant for federal funds amounting to \$713,000. Mr. Wilbur A. Rawson, Technical Assistance Supervisor, Division of Vocational Education, initiated the request for funds. The request for federal funds would encompass a three-year period dating from July 1, 1970 to June 30, 1973. The project for the state of Kansas is to be a new venture and not an extension of, continuation or addition to any other specific project currently supported by the United States Office of Education.

Funds for the exemplary project were granted and are being administered through the Kansas State Department of Education. The designated supervisor is Wilbur A. Rawson.

This project is to be implemented and operated in three separate school settings in Kansas. Student population figures show that approximately one third of the elementary and secondary students in Kansas attend schools in cities of less than 7,000 population (rural setting), one third attend schools in cities from 7,000 to 35,000 (rural-urban setting), and one third attend in cities over 35,000 (urban setting).

³George C. Stoumbis and Alvin W. Howard, Schools for the Middle Years (Scranton, Pennsylvania: International Textbook Co., 1969), p. 484.

This distribution of student population was one of the main factors for the selection of the three project locations. The three schools were selected to represent typical community settings found in Kansas, the objective being to produce model occupational education programs that can be duplicated in similar school settings throughout Kansas. The project locations are: Clay Center representing the rural, Lawrence representing the rural-urban, and Kansas City representing the urban. Each school has presented an outline of procedures for producing the desired results of the exemplary program. The procedures are based on facilities and resources available and attainable in each community. The three centers chosen are financially capable to carry out the program after the federal support is withdrawn.⁴

As the rural representative, Clay Center is the location of four firms that manufacture agriculture implements. Further consideration was given because the local school budget supports a vocational building trades program at the high school level without federal subsidization. The school system has the reputation with the State Department of Education of being willing to experiment with new educational methods.

⁴Wilbur A. Rawson, "An Exemplary Program in Occupational Education in Typical Kansas Rural, Rural-Urban and Urban School Settings" (unpublished proposal for exemplary program or project in vocational education, State Board of Education, Topeka, Kansas, December, 1969).

Students in Kansas high schools have various training programs to choose from, ranging from college preparation to technical education. Because of limitations in some schools, such as, lack of finances and facilities to provide the programs, a complete range is not available to students in every school system.

Table 1

High School Enrollment by Programs in Kansas

Program	Percentage
College preparation	81.7
Home economics	9.2
Agriculture	5.3
Business education	2.4
Trade and industry	2.2
Technical education	0.2

Source: Kansas State Department of Education, Division of Vocational Education, 1967-68.

Table 2 shows that in 1968, 42 percent of the student population actually enrolled in a four-year college program while only 10 percent enrolled in private or trade schools (7 percent) and technical schools (3 percent).

Table 2
Post High School Training Programs, 1968 (Kansas)

Program	Percentage
Four year college	42
Employed full time	17
Junior college	15
Miscellaneous*	9
Private or trade school	7
Unknown	7
Area vocational technical schools	3

*Includes military

Source: Kansas State Department of Education, Division of Vocational Education, 1967-68.

The Bureau of Census indicates that the employment opportunity for craftsmen and technicians in Kansas is 29 percent of the total work force, yet only 10 percent of the high school graduates received training in private or trade schools or vocational technical schools in 1968 (Table 2).

Table 3
Employment by Occupational Areas

Occupation	Percentage
Craftsmen and technicians	29
Distribution	17
Clerical office	14
Farm	14
Professional	11
Service workers	9
Others	6

Source: United States Department of Commerce, Bureau of the Census, 1960.

High school enrollment in technical education in 1967-68 of 0.2 percent (Table 1) with an employable task force in Kansas of 29 percent (Table 3) indicates a need for expanding technical training at the high school level.

The problem of occupational choice for students in Kansas is neither more complex nor confusing than in any other state, but Clay Center and the state of Kansas were fortunate to receive federal funds to help finance an experiment in occupational study.

Federal funds have been used for counselor training programs, and the support of vocational agriculture and vocational home economics to help students with occupational choices. Additional funds have been provided for special programs, such as, the exemplary project, in the hope of providing a service to the student population.

It is anticipated that the information gathered by the three exemplary projects will result in occupational education receiving more emphasis in Kansas school curriculums in the future.

REVIEW OF LITERATURE

Industrial arts education has experienced a vast change over the past century as have other areas of the curriculum, vastly so since the influence of Sputnik. Automation, new technological developments, and economic factors have brought attention to "needs" of youth in terms of experiences and activities to help understand our society.

Many of the new programs to emerge in the last ten years have been a result of the Vocational Education Act of 1963. Federal money has contributed much to the area of research and development activities.

Industrial Arts Curriculum Project

The Industrial Arts Curriculum Project (IACP) was a proposal submitted to the United States Office of Education by Donald G. Lux, Willis E. Ray, Jacob Stern, and Edward Towers. This was a joint effort between Ohio State University and the University of Illinois.

The first phase of the program is "The World of Construction," which is a year-long course for junior high school students. It is designed to give every student an opportunity to study and use knowledge and skills typical of construction industry.

The second phase of the program is "The World of Manufacturing." It is a year-long junior high school course directed at the development of an understanding of how the managed production system produces and services manufactured goods.⁵

The Minnesota Plan

The Minnesota Plan has been one of the more influential programs to be developed. It was started in the late 1950's by the industrial education faculty at the University of Minnesota.

The Minnesota Plan attempts to develop a greater degree of individualized instruction. The transitional curriculum identified three "cores of experience" (science-mathematics, technology, and design). The unique feature of this plan was the timing of instruction. In order to obtain maximum integrative effect, intercore related courses were taken simultaneously.⁶

Interdisciplinary Vocational Education

The Interdisciplinary Vocational Education program was a joint effort of the Paola High School, Paola, Kansas, and Kansas State University. Under the direction of Dr. R. J. Agan, the project was designed to develop a new vocational educational program that would eliminate duplication of content in the various programs, and would focus on those elements that are common to all vocational fields.

By combining the efforts of the teachers in occupational education, the program focuses on the common and differential aspects of

⁵Cochran, op. cit., pp. 79-80.

⁶Ibid., p. 11.

vocational subjects. This way teachers in the fields of agriculture, business, health, home economics, industrial arts, and guidance present a correlated program that provides occupational information and job selection criteria, guidance activities in self-assessment, and experiences that will lead to preparation in a specific vocational field.⁷

Orchestrated Systems Approach

The Orchestrated Systems Approach was developed under the direction of Dr. Lewis W. Yoho, Dean, School of Technology, Indiana State University. During the late 1950's and early 1960's, considerable concern was developed as to what should or should not be included in industrial arts.

The program is based upon a modeling process where content is identified and applied, thus circumventing the traditional approach of selecting content from particular trade or technical areas. The first level of concern is with the production and consumption of industrial goods. The second level is shared with other education subject areas, such as agriculture, business, and home economics. The third level is composed of a breakdown of the four major areas of consumer goods: manufacturing, construction, producing services and salvage industries, and industrial-technical communication. The fourth level models are used to identify specific units and to reveal the differences important to industrial arts, industrial vocational, and industrial-technical education.⁸

⁷R. J. Agan and others, "Commonalities in Occupations" (unpublished course of study manual, Kansas State University, July, 1968).

⁸Cochran, op. cit., pp. 52-55.

PURPOSE OF THE REPORT

The purpose of this report is to develop a recommended industrial arts curriculum for use in the junior high school at Clay Center, Kansas.

Objectives of the report are:

1. To give a brief historical review of industrial arts
2. To show influence of other innovative programs on the industrial arts curriculum
3. To develop a recommended industrial arts curriculum.

COURSE OF STUDY

The development of the proposed course is for local use at Clay Center Junior High (grades 7 and 8) and attempts to fulfill the general objectives established by the exemplary project.⁹

The Industrial Arts Committee composed of the curriculum director, a junior high industrial arts instructor, and high school instructors of woodworking, metals, building trades, and drafting, adopted the following general objectives for industrial arts:

1. Introduce the world of technology to the junior high school student.
2. Develop positive attitudes, habits, and ideals of health and safety.
3. Develop elementary skills in manipulative ability in the use and care of common tools used in modifying and handling materials of industry.
4. Develop student knowledge and appreciation of good work-

⁹See Appendix, p. 27.

manship and design.

5. Develop the student's ability to select wisely, but intelligently, and properly care for the industrial products he buys and uses.

6. Develop self-discipline, reliance, and confidence in a variety of situations.

7. Develop an attitude of cooperation and readiness to assist others in a group undertaking.

8. Develop an active interest in industrial life, production, and distribution.

9. Develop an attitude of orderly method of procedure in the performance and completion of any task.¹⁰

Using the general objectives established in the application of the exemplary project and the general objectives adopted by the Unified School District 379 Industrial Arts Committee as guides, the following "blueprint" for an academic year's work is intended to serve as a guide for the teacher.¹¹

Some of the mini courses incorporated in the eighth grade curriculum are not listed in specific sequence. Sequence has no direct bearing as to when they should be included.

The general descriptions of content are for mechanical drawing, woodworking, electricity, metals, plastics, mass production, and home economics. Technical information, safety instruction, and occupational information become integral parts of the course content.

¹⁰Industrial Arts Committee, Industrial Arts Curriculum Guide, (Clay Center, Kansas, Unified School District 379, 1967).

¹¹Exemplary project objectives, Appendix, p. 27.

Areas of Instruction

- A. Mechanical drawing
 - 1. Objectives
 - 2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations
 - 3. Textbooks
- B. Woodworking
 - 1. Objectives
 - 2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations
 - 3. Textbook
- C. Electricity
 - 1. Objectives
 - 2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations
 - 3. Textbook
- D. Metals
 - 1. Objectives
 - 2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations
 - 3. Textbook
- E. Plastics
 - 1. Objectives

2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations
 3. Textbook
- F. Mass production
1. Objectives
 2. Developmental procedures
 - a. Basic information
 - b. Fundamental operations
- G. Home economics
1. Objectives
 2. Developmental skills and learnings
 - a. Basic information
 - b. Fundamental operations

More detailed descriptions of the areas are found in the Appendix.

Guide to Lesson Plan

A. Objectives

Objectives are stated in terms of student activities. These statements suggest the evidence of learning on the part of the student.

B. Developmental skills and learnings

1. Basic information

An overview of textbook material presented through teacher explanation or demonstration points out activities closely related to student performance. Many explanations or demonstrations include the use of visual

aids, such as transparencies or filmstrips. Discussion of a topic may enter to provide the teacher with feedback from the students. Related occupational information, vocabulary, and technological aspects would be used to set the student's frame of reference for a day's activity. Safety precautions would be given when applicable.

2. Fundamental operations

Student activities are under the direct supervision of the teacher. The pupil has classroom responsibility, establishes some of his own goals, and learns to perform functional operations.

Sample Lesson Plan

A. Objectives

The student will learn to correctly place dimensions on a working drawing. The student will examine some of the occupations related to drafting.

B. Developmental skills and learnings

1. Basic information

Examine with the students two methods of placing dimensions on a working drawing. Observe the two methods, aligned and unidirectional, on the overhead projector screen. (Using overlays, show correct placement of dimensions for both systems.) Note the differences: if the dimensions can be read from the bottom only, it is the unidirectional system. If the dimensions can be read from the bottom and the right side, it is the

aligned system. Discuss the advantage and disadvantage of each system using information from the textbook, pages 27-29.

Stress to the students that when placing dimensions on a working drawing, all break-down dimensions must add up to a total equaling the over-all dimension. Care must be taken to make sure dimensions of the three corresponding views are the same.

A field trip to Hutchinson Manufacturing is planned for observation in the engineering and fabrication departments. Discuss with the students the possible uses of dimensions by the engineering department and how dimensions affect the work in the fabrication department.

During the visit in the engineering department, the engineer can explain the use of dimensions in his work. He can point out the importance of accuracy, neatness, and show why break-down and over-all dimensions are important to workers in his department.

In the fabrication department, blueprints of the original working drawings are distributed to various workers. A welder has to know exactly where to weld two pieces together. A press operator has to know the exact location and size of holes to be bored. A sheetmetal worker has to know where and how many degrees to bend a piece of metal. All of these workers have to be able to read and understand a working drawing.

A summary of the visit will be made to record for the

class the importance of dimensioning and the occupations we observed that were affected by dimensions.

2. Fundamental operations

Mount a clean sheet of drawing paper and draw to scale the assigned project. Use the unidirectional system to place the dimensions on the three views drawn. The student's drawing will be evaluated according to accuracy of measurement, neatness, and proper application of dimensions by the unidirectional system.

SUMMARY

Any attempt as complex as curriculum design requires some type of basic structure to serve as a guide. The guidelines for this report has been the exemplary project as proposed by the Kansas State Department of Education and by Unified School District 379, Clay Center, Kansas.

As our technological society becomes more complex, the need for more occupational information increases in order to understand and interpret the role of industry.

From the study of various programs that have been developed in the last decade, in general, there seems to be a trend away from craft-oriented programs toward programs that are industrial oriented.

The junior high industrial arts program should be exploratory in nature. The proposed program better fills the need of Clay Center youth by including the area of mass production, plastics, and home economics which the students have not had in the past. This also increases the number of occupational areas for examination, which is one of the main objectives of the exemplary project.

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APPENDIXES

FOUR PHASE PROGRAM FOR EXEMPLARY OCCUPATIONAL STUDY---
CLAY COUNTY UNIFIED SCHOOL DISTRICT 379
CLAY CENTER, KANSAS

I. Orientation

A. Grades K-6

1. Classroom units of study in the social studies curriculum will be taught in helping young students gain a comprehensive understanding of job families in the "world of work."

The classroom study will give emphasis to the development of respect and appreciation for all occupations which contribute to the welfare of society.

2. Elementary students will be provided the opportunities to visit businesses, service agencies, and industries in the local community.

B. Grades 7 and 8 - All attendance centers

1. Occupations study

- a. An occupational studies program for all students in grades 7 and 8 under the leadership of counselors is proposed.
- b. A video tape recorder and television receivers would be used to bring a great variety of occupations into the classroom.
- c. Extensive use of filmstrips, 8mm single concept cartridge loop films and other media will be used in the development of the comprehensive understanding of the broad field of work.

- d. Provisions will be made in the program for seminars, panel discussions, and talks by community resource people.
 - e. A Student-Business-Industry Day will be promoted through cooperative endeavors of the school, the Chamber of Commerce, and local business and industry.
 - f. The local program will also provide for the junior high school students to visit high school laboratories and shops.
- 2. Intensified guidance and counseling services
 - a. Qualified counselor(s) will be employed to establish counseling services at the 7th and 8th grade level.
 - b. An intensive testing program will be established.
 - c. Counseling services will be provided to students and parents in helping both parent and child develop realistic occupational goals.

II. Exploration

- A. Elementary (5-6) - Clay Center Elementary Schools
 - 1. Summer gardening
- B. Grades 7 and 8 - All attendance centers
 - 1. The present curriculum in industrial arts and home economics will be expanded.
 - 2. Small Business Organization (McKinley School)
 - a. It is proposed that a quasi business organization be established for selected students.
 - 3. Summer Service Agency - McKinley and Clay Center High School Grade 9.

a. It is proposed that a small group of students organize a summer quasi business organization for contracting their services and operate a cooperative gardening project.

4. Work-study opportunities in school employment will be provided a limited number of students where needed.

C. Senior high school (Grades 9-12)

1. Classroom activity taught by the project coordinator for students planning to enroll the following year in the cooperative occupations study. This classroom work would include in-depth studies of individually selected occupations in line with the interests of the student. This class would be at the junior level and following educational training in various occupational and vocational courses during the freshman and sophomore years. The course would be preparatory for students planning and determining their training station for the cooperative experience in their senior year.
2. Intensive guidance and counseling services will be provided to students in helping each understand his interests and aptitudes and develop realistic and meaningful occupational goals. A counselor's services would be vital to successful placement in the cooperative occupational experience program.

III. Applied experiences

A. Senior high school (Grades 9-12)

1. Applied vocational and occupational student experiences

will include enrollment in existing curricular opportunities in vocational and occupational oriented courses.

2. Model programs presently in existence - Clay Center Community High School

- a. Cooperative building project. This is the first year of a cooperative building project whereby students in various classes planned and are building a house of approximately 1400 square feet.
- b. Level IV special education students are phased in to some of the regular high school courses of study where they have the aptitude to function along with core work in the special education classroom.

3. Diversified cooperative occupational study program - All three senior high schools

- a. On-the-job occupational experience will be provided students at the senior level desiring enrollment in the program. This program is proposed for daily on-the-job training of two to three hours depending upon needs and plans of the individual student. Placement in the program will be at an entry level.
- b. Enrollment in the cooperative program will be accompanied with class work devoted to commonalities or related topics. Advisory help will be given to the project coordinator through lay advisory committees.

4. Provisions will be made for students from the senior high schools in Wakefield and Longford to enroll part time in the Clay Center Community High School for training

opportunities.

IV. Placement and follow-up

- A. Services of the guidance department will include a placement services for initial placement of graduates desiring occupational placement immediately following high school graduation.
- B. Placement services will be provided students desiring additional vocational training such as in Area Vocational Schools, Institutes of Technology, and colleges.
- C. The counselors will conduct a continuous follow-up study of graduates to assist any desiring help in changing occupations, job location, or enrollment in other training programs.
- D. Follow-up studies will be made for the purposes of program evaluation.
- E. The counselors will assist students in finding gainful employment on a part time basis during the school year and also finding summer employment.

GENERAL OBJECTIVES

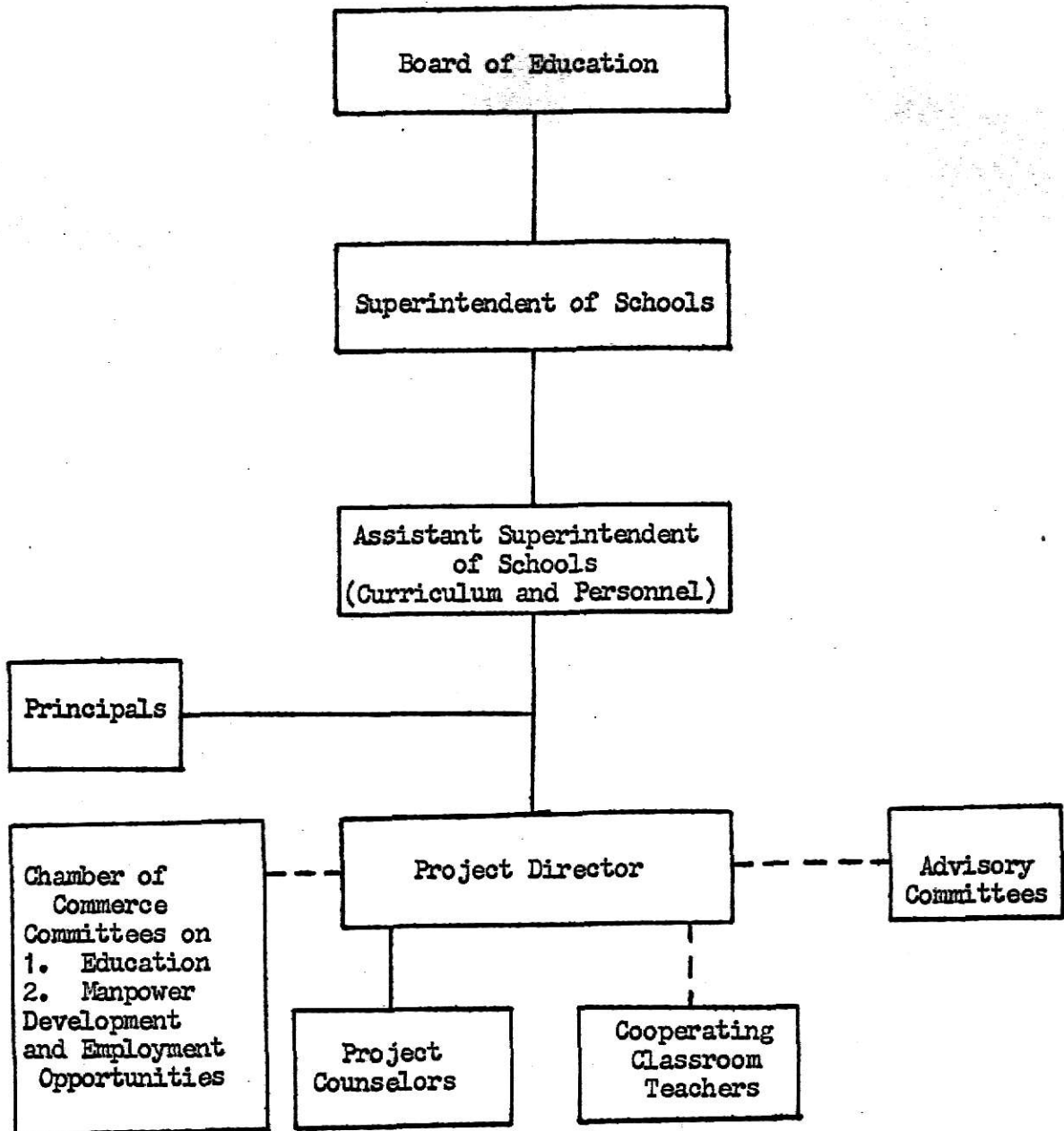
The general objectives for the Clay County Unified School District Exemplary Program have been developed to apply to all areas of the curriculum.

1. Help all students develop appreciation of the scope and importance of the industry and occupations involved.
2. Help all students develop understanding of the employment opportunities available and the preparation needed to enter and make progress in the occupation.
3. Help all students develop effective work habits and attitudes and understanding of employer-employee and customer relationships.
4. Help all students develop ability to manage time, energy and money as a wage earner.
5. Help all students develop understanding of labor laws in the state.
6. Help all students develop ability to carry out proper procedures in applying for a job.
7. Help all students develop ability to identify needed health and safety practices.
8. Help all students develop ability to use communication skills related to the occupational area involved.
9. Help all students develop awareness of personal-social traits which are essential for the successful worker--patience, personal appearance, cooperation, consideration of others, industriousness, initiative, reliability and trustworthiness.

10. Help all students develop skills and procedures performed by the worker in the occupation.

11. Help all students develop abilities needed to exercise and follow effective leadership in fulfilling occupational, social and civic responsibilities.

ORGANIZATION OF CLAY COUNTY UNIFIED
SCHOOL DISTRICT 379



MECHANICAL DRAWING

A. Objectives

1. The student will examine the field of drawing as a basic skill of industry
2. The student will be able to recognize and use the equipment necessary for drawing
3. The student should develop the ability to interpret graphic presentations and use them as a means of self-expression
4. The student will learn to write and speak the vocabulary used in mechanical drawing
5. The student should develop habits of independent and methodical procedure in the making of drawings

B. Developmental skills and learnings

1. Basic information
 - a. Role and importance of mechanical drawing to industry
 - b. Related occupational information
 - c. Names of basic drawing tools
 - d. Vocabulary of mechanical drawing
 - e. Grading of pencils
 - f. Basic lines of drawing
 - g. Planning a drawing and layout sheet
 - h. Views of objects
 - i. Sketching
 - j. Use of orthographic and pictorial drawings
2. Fundamental operations
 - a. Mount paper on drawing board

- b. Sharpen drawing pencil
- c. Measure with the scale
- d. Sketch lines and make a freehand working sketch
- e. Use T-square and triangles
- f. Clean and care for drawing instruments
- g. Erase pencil lines
- h. Pencil a drawing in correct order
- i. Draw views with hidden edges
- j. Dimension a drawing
- k. Sharpen and adjust a compass lead
- l. Make numerals
- m. Lay out nomenclature
- n. Make a drawing to scale
- o. Draw basic geometric constructions
- p. Draw Orthographic and Isometric drawings

3. Textbooks

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- d. Earl W. Harman. Introduction to Mechanical Drawing. Boston: Allyn and Bacon, 1963.

WOODWORKING

A. Objectives

1. The student will examine the field of woodworking as an industrial and an avocational skill
2. The student will be able to recognize and safely use hand woodworking tools and simple power tools
3. The student will develop shop safety and co-operation
4. The student will learn to recognize common woods and probable use
5. The student will examine the characteristics and uses of simple wood finishes
6. The student will be able to write and follow an orderly method of procedure for constructing a project
7. The student should develop an attitude of pride, self-confidence, and appreciation of workmanship in woodworking

B. Developmental skills and learnings

1. Basic information
 - a. General rules of safety in the shop
 - b. Names, uses, and care of hand tools and power equipment
 - c. Lay out pattern on stock
 - d. Correct methods of hand and power sawing
 - e. Correct methods of sharpening and service of equipment
 - f. Names and uses of common wood joints
 - g. Types and sizes of common wood fasteners
 - h. Gluing and clamping procedures
 - i. Make out stock bills and figure board feet
 - j. Prepare surface for and apply various finishes

k. Clean and care of paint and varnish equipment

2. Fundamental operations

a. Make a stock bill and plan a procedure

b. Make and read a working drawing

c. Square a board

d. Use and maintain tools

e. Joint and glue stock

f. Shape a chamfer and bevel

g. Lay out and cut common wood joints

h. Bore, drill and countersink

i. Assemble boards with common wood fasteners

j. Test for squareness

k. Prepare woods for finishing

l. Apply common wood finishes

3. Textbook

a. Chris H. Groneman and John L. Feirer. General Shop. 3d ed.

New York: McGraw-Hill Book Co., 1963.

ELECTRICITY

A. Objectives

1. The student will examine the field of electricity as it applies to industry
2. The student will develop fundamental skills and safety in basic electrical procedures
3. The student will develop a working knowledge of simple electricity, wiring, and maintenance
4. The student will learn to identify and use basic tools necessary for electrical work
5. The student will examine the field of electricity as an avocational skill

B. Developmental skills and learnings

1. Basic information
 - a. Electrical terms
 - b. Safety practices
 - c. Safe and proper use of tools
 - d. Production and distribution of electricity
2. Fundamental operations
 - a. Make a basic electrical diagram
 - b. Make common splices
 - c. Solder splices
 - d. Test and replace fuses or reset breaker switches
 - e. Do simple low voltage wiring
 - f. Measure with voltameter and ammeter

3. Textbook

- a. Chris H. Groneman and John L. Feirer. General Shop. 3d ed.
New York: McGraw-Hill Book Co., 1963.

METALS

A. Objectives

1. The student will examine the field of metalworking and metalworking use in industry
2. The student will develop fundamental skills and safety in the use of common metalworking tools
3. The student will examine the metalworking field as an avocational skill
4. The student should develop an understanding of the place and importance of metalworking in our environment

B. Developmental skills and learnings

1. Basic information

- a. Scope of metal industry
- b. Kinds and recognition of metals
- c. Care and use of tools and materials used in hand metalworking
- d. Manufacture of metals
- e. Safety practices
- f. Methods of fastening metals
- g. Methods of fabricating metals

2. Fundamental operations

- a. Measure and lay out
- b. Cut with a hacksaw
- c. Cut with a chisel
- d. Drill metal
- e. File metal
- f. Make angular and circular bends

g. Cut threads on metal

h. Riveting

3. Textbook

- a. Chris H. Groneman and John L. Feirer. General Shop. 3d ed.
New York: McGraw-Hill Book Co., 1963.

PLASTICS

A. Objectives

1. The student will examine the field of plastics as to properties and uses in industry
2. The student will be familiarized with materials and procedures used in working plastics
3. The student will develop fundamental skills and safety in the use of common plastic working tools
4. The student will learn the vocabulary used in working with plastics

B. Developmental skills and learnings

1. Basic information
 - a. Project plan and procedure
 - b. Related occupational information
 - c. Lay out patterns
 - d. Use of cutting tools
 - e. Shape and molding object
 - f. Finishing of plastics
 - g. Fabrication operations
 - h. Working cold or heated plastics
 - i. Safety practices involved with cements
2. Fundamental operations
 - a. Make a plan of procedure and stock bill
 - b. Lay out a pattern
 - c. Use cutting tools
 - d. Smooth a surface

- e. Round an edge
 - f. Drill a hole in plastic
 - g. Join surfaces with cement
 - h. Buffing to finish
 - i. Heating and bending
 - j. Forming of plastics
 - k. Safety practice with power equipment
3. Textbook
- a. Chris H. Groneman and John L. Feirer. General Shop. 3d ed.
New York: McGraw-Hill Book Co., 1963.

MASS PRODUCTION

A. Objectives

1. The student will learn the importance of industry to our way of life
2. The student will be familiar with the "wholeness" of industry and the inter-relationship of its parts
3. The student will learn how industry organizes for production
4. The student will understand the character of the production process
5. The student will learn about advertising and sales, investment, and cost and profit relationships

B. Developmental procedures

1. Basic information
 - a. Purpose of the project
 - b. Related occupational information
 - c. Production facilities
 - d. Industrial financing
 - e. Design of products
 - f. Training of employees
 - g. Labor and management
 - j. Marketing
 - i. Job schedule and production
2. Fundamental operations
 - a. Organizing class and selecting leaders
 - b. Study production facilities
 - c. Selection of product

- d. Design of product
- e. Financing the operation
- f. Training the workers
- g. Preparing product for market
- h. Marketing of product
- i. Keeping records

HOME ECONOMICS

A. Objectives

1. The student will examine the areas of home economics with emphasis on food and clothing
2. The student should develop his growth in independence and ability to direct his own behavior in relation to the society in which he lives
3. The student will examine the occupational opportunities in home economics

B. Developmental skills and learning

1. Basic information
 - a. Knowledge of kitchenware
 - b. Importance of a balanced diet
 - c. Proper manners
 - d. Clothing selection
 - e. Care of clothing
2. Fundamental operations
 - a. Prepare a planned meal
 - b. Shop for clothing
 - c. Simulate laundry and care of clothing

A RECOMMENDED COURSE OF STUDY IN JUNIOR HIGH
INDUSTRIAL ARTS FOR CLAY CENTER, KANSAS

by

Malvin Gene Cales

B. A., Ottawa University, 1959

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirement for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1971

ABSTRACT

Unified School District 379, Clay Center, Kansas, was selected as one of three project locations in the state of Kansas to be included in a three-year grant for \$713,000 funded by the United States Office of Education. The project is directed by the Kansas State Department of Education, Division of Vocational Education, with in-service training and evaluation conducted by the Department of Adult and Occupational Education of Kansas State University.

The Clay Center Schools are to serve as experimental systems for the development of an occupational educational curriculum for kindergarten through grade 12.

A brief historical background is given to show some of the past influences on the development of the industrial arts curriculum.

A review has been given of some innovative industrial arts programs that have been developed in the past decade to help the reader understand some of the current influences on the industrial arts curriculum.

The background to the problem is illustrated by using tables to show comparisons of the Kansas school curriculums as compared to job opportunities available in Kansas.

The recommended industrial arts curriculum is presented in descriptive form and is predominantly for local use in the Clay Center Junior High School.