PRACTICAL ARTS COURSE CONTENT AS INDICATED BY THE NEEDS
AND INTERESTS OF DENTON JUNIOR HIGH SCHOOL
SIXTH GRADE BOYS

APPROVED:

[Signatures]
PRACTICAL ARTS COURSE CONTENT AS INDICATED BY THE NEEDS
AND INTERESTS OF DENTON JUNIOR HIGH SCHOOL
SIXTH GRADE BOYS

THESIS

Presented to the Graduate Council of the North'
Texas State Teachers College in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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Denton, Texas

August, 1936

625°9
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CHAPTER I

INTRODUCTION

Statement of Problem:

To determine the proper content of a course of study in Practical Arts as indicated by the needs and interests of sixth grade boys.

Delimitations:

This study was limited to the sixth grade boys of the Denton Junior High School, and only their needs and interests which were directly connected and associated with Practical Arts were taken into consideration.

Terminology:

The term Practical Arts, as used in this study, refers to those activities commonly included in Industrial Arts, Vocational Education, Home Mechanics, General Shop Work, Practical Arts and related activities which children may perform as members of the home, school and the community or social group in which they live.

Terms such as intelligence quotients, mechanical aptitudes quotient, chronological age, mechanical aptitudes age, mental age, and all other terms, are used in this study as in general educational usage.

Procedure:

Four sets of tests were used in obtaining the data regarding the mental, mechanical, and achievement status of the Junior
High School boys.

The following tests were administered: The Detroit Alpha Intelligence test form "M"; the Detroit Alpha Intelligence test, form "R", the Detroit Mechanical Aptitudes test for boys, and the New Stanford Achievement test.

The first three tests mentioned above were administered, scored and recorded by the writer. The New Stanford Achievement test was administered and scored under the direction of Dr. L. A. Sharp, Director of Demonstration School, Teachers College, Denton, Texas.

An interest Questionnaire regarding practical arts was compiled, administered, and tabulated by the writer.

When the four tests noted above had been administered, complete data were found to be available on seventy-seven boys. Sixty of these boys replied to one section of the Questionnaire mentioned above and sixty-eight of the boys replied to the other.

The purpose of this study is to acquaint the writer and others interested with the practical arts needs and interests, mechanical and intellectual capacities, personal characteristics, and home environment of the sixth grade boys of the Denton Junior High School in order to determine the proper content of a course of study.

When the writer has acquired a thorough knowledge of the facts concerning the various phases of this study, he will attempt to determine the proper contents of a course of study for
boys in sixth grade practical arts as indicated by the needs and interests brought out by the above findings.

Furthermore, the writer is assuming that the STANDARDS OF ATTAINMENTS IN INDUSTRIAL ARTS TEACHING is sufficient basis for use in this study with regard to activities and information units in the various divisions of industrial arts.

The writer is also assuming that the activities and information units in which the boys are interested and in which are included learning activities listed in the above noted publication, are worth consideration with regard to course content in practical arts. Furthermore, the author is assuming that any activity which has been performed by five or more sixth grade boys is within the performance range of some other sixth grade boys.

The writer has accepted the following statements as opinions of the various persons quoted, and for the purpose of this study will assume that they are correct and will attempt to follow them.

According to Dr. Dewey "An interest is primarily a form of self-expressive activity—that is, growth that comes through activity upon nascent tendencies."²

¹ STANDARDS OF ATTAINMENTS IN INDUSTRIAL ARTS TEACHING, American Vocational Association, Pittsburgh, Pennsylvania, Dec. 7, 1934.
² John Dewey, Interest And Effort in Education, p. 15.
He also states that "interests mean unified activity". Furthermore, he concludes "every interest...... attaches itself to an object". ³

Newkirk and Green state: "An early knowledge of special aptitudes of pupils is of great importance to the teacher of Industrial Education courses". ⁴

The writer will attempt to determine the special aptitudes of the pupils to be used in this study and to select activities which will be in keeping with the special aptitudes of the individual pupils.

With regard to practical arts Cox makes the following statement:

"Analysis of the actual interests and activities of boys and girls and young adults of the community served by the school, furnish the only secure bases for determining what opportunities the school should offer. The Industrial Arts teacher needs to know the significance for children of the repair and construction and manipulation of cooking utensils and materials, vacuum cleaners, automobiles, plumbing fixtures, carpentry tools, radios, sewing machines, printing presses, electric fans, motor boats, farm machinery, lawn mowers, knife sharpeners, painting and re-decorating materials and instruments and the rest." ⁵

The writer assumes that Cox is correct in the above statement and that by analyzing the actual interests and activities of boys in the sixth grade with regard to practical arts, he can determine a secure basis for the proper content of a course in practical arts.

⁴ Louis Vest Newkirk and Harry A. Greene, Tests and Measurements in Industrial Education, pp. 88-89
⁵ W. L. Cox, The Junior High School and Its Curriculum, p.347.
For the last and final assumptions the writer assumes that the Detroit Mechanical Aptitudes Test for boys, the Detroit Alpha Intelligence Examination, Form M and R, and the Stanford Achievement tests are reliable enough to meet the requirements of a study of this type. The data from these tests will be scored, tabulated and analyzed according to the methods set forth in their Manuals of Direction.
CHAPTER II

STUDY OF PERSONAL DATA CONCERNING DENTON

JUNIOR HIGH SCHOOL SIXTH

GRADE BOYS

Two sheets were used to gather data concerning the boys and their parents. These sheets were the Personal Data Sheet for Boys and the Data Sheet Concerning Parents. A copy of each sheet is given in the Appendix.

Boys' Ages, M.A.Q., and Success in School:

The analysis of the tabulations concerning the personal data of the boys used in this study gives the median number of years which the boys had attended school, as six years; while the upper extreme was seven years and the lower extreme was five years, and the 25 percentile and 75 percentile as six years.

Those boys who had been in school only five years were found to be in the four upper mechanical aptitude groups; while those who had been in school seven years were found to be in the lower mechanical aptitude groups. The exceptions to the above statement as to those who had spent seven years in school were those boys who had attended kindergarten, and they were all in the upper M.A.Q. groups.

All boys above 95 M.A.Q. had passed all of their work each year, and ten percent of the boys used in this study had skipped one or more grades; while fifteen percent of the boys used in this
study were found to have failed one or more years of school work. Boys
who had failed work ranged up to 114 I.Q.

Boys' Hobbies:

The percent given below in this discussion may seem to be in error; however, it must be kept in mind that each boy may have one, two or even more hobbies. Twenty-nine percent of the boys have reading as one of their hobbies, while 23.5 percent of the boys have wood work as their hobby. The following is a list of other hobbies, and the percent preceding each hobby refers to the percent of boys who engage in that hobby: Eighteen percent, swimming; 13 percent, fishing; 12.5 percent, making model airplanes; 9.7 percent, music; 12.5 percent, outdoor sports; 8.3 percent, repairing; 8.3 percent, baseball; 6.9 percent, sports; 6.9 percent, kites; 6.9 percent, art; 5.5 percent, nature study; 5.5 percent, horse back riding; 5.5 percent, play and games; 4 percent, insect collection; 4 percent, bicycle riding. Two and seven tenths percent have as one of their hobbies each of the following: Live stock, crystal radio sets, raising chickens, football. One and three tenths percent have each of the following as one of their hobbies: Rock collecting, collecting soda pop lids, collecting cigar boxes, general collections, bill collection, making guns, collecting flowers, making chests and cabinets, general shop, letter exchanging, scout work, mechanics, athletics, operating soft drink stands, riding scooters, playing violin, playing sweepsey, aviation, building model trains and
model towns, selling magazines and going to wild west movies.

Some of the above noted hobbies seem to be duplications of other hobbies noted in this list; however, the boys made a very definite distinction between the general field of a definite hobby and the hobby in which they engage.

Boys' Hobbies

<table>
<thead>
<tr>
<th>Hobby</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>29%</td>
</tr>
<tr>
<td>Stamp Collecting</td>
<td>23.5%</td>
</tr>
<tr>
<td>Wood Work</td>
<td>23.5%</td>
</tr>
<tr>
<td>Swimming</td>
<td>18%</td>
</tr>
<tr>
<td>Fishing</td>
<td>13%</td>
</tr>
<tr>
<td>Making Model Airplanes</td>
<td>12.5%</td>
</tr>
<tr>
<td>Outdoor Sports</td>
<td>12.5%</td>
</tr>
<tr>
<td>Music</td>
<td>9.7%</td>
</tr>
<tr>
<td>Repairing</td>
<td>8.3%</td>
</tr>
<tr>
<td>Base Ball</td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>6.9%</td>
</tr>
<tr>
<td>Making Kites</td>
<td>6.9%</td>
</tr>
<tr>
<td>Art</td>
<td>6.9%</td>
</tr>
<tr>
<td>Radio</td>
<td>5.5%</td>
</tr>
<tr>
<td>Movies</td>
<td>5.5%</td>
</tr>
<tr>
<td>Nature Study</td>
<td>5.5%</td>
</tr>
<tr>
<td>Horseback Riding</td>
<td>5.5%</td>
</tr>
<tr>
<td>Play and Games</td>
<td>5.5%</td>
</tr>
<tr>
<td>Collecting Insects</td>
<td>4%</td>
</tr>
</tbody>
</table>

Two and seven tenths percent of the boys have as one of their hobbies each of the following:

1. Livestock
2. Crystal Radio Sets
3. Raising Chickens
4. Football

One and three tenths percent of the boys have each of the following as one of their hobbies:

1. Rock Collecting
2. Collecting Soda Pop Lids
3. Collecting Cigar Boxes
4. General Collections
5. Bill Collection
6. Making Guns
7. Collecting Flowers
8. Making Chests and Cabinets
9. General Shop
10. Letter Exchanging
11. Scout Work
12. Athletics
13. Operating Soft Drink Stand
14. Riding Scooters
15. Playing Violin
16. Playing Sweepesy
17. Aviation
18. Building Model Trains
19. Building Model Towns
20. Selling Magazines
21. Going to Wild West Movies
Contagious Diseases:

Eighty-three and nine tenths percent of the boys had had whooping cough, 73.6 percent had had mumps, and 97 percent had had their adenoids removed, while 19.4 percent were still in need of medical attention. Twenty and five tenths percent of the boys had had diphtheria, while 11 percent had had pneumonia and 8.3 percent had had malaria. Only 1.5 percent had had typhoid fever. Thirty-three and two tenths percent had had their tonsils removed, while 20.8 percent had infected tonsils and were in need of medical attention. Eighteen percent had had pink eye, 11 percent had had itch, 1.3 percent had had trench mouth. Seventy-four percent of the boys had good vision, while 26 percent had poor vision. Eighty-nine percent had good hearing, while 11 percent had poor hearing.

The various diseases are prominent in all M.A.Q. and I.Q. groups.

The boys having poor vision are not limited to any I.Q. or M.A.Q. group, while those having poor hearing range from 100 M.A.Q. downward, and 63 percent having poor hearing are in the I.Q. group of 100 and lower.

Occupations of the Mothers:

Seventy-six percent of the mothers were housewives, while from one-half of one percent to two percent of the mothers were employed in each of the following capacities: Teacher, clerk,
typist, bookkeeper, laundress, saleslady, dressmaker, matron, beauty parlor operator, nurse, cafe waitress and quilting.

Present Occupations of Mothers

Housewife ...................... 76%

From one-half of one percent to two percent in each of the following:

1. Teacher
2. Clerk
3. Typist
4. Bookkeeper
5. Laundress
6. Saleslady
7. Beauty Operator
8. Nurse
9. Cafe
10. Quilting

Former Occupations of Mothers:

It is interesting to note that the only former occupations of 47 percent of the mothers was that of house work, while 21 percent of the mothers had formerly been teachers. Twelve and five tenths percent had formerly been salesladies, whereas 5.5 percent had formerly been nurses, and 6.5 percent had formerly worked on farms or in field work.

Each of the following occupations had formerly employed from one percent to three percent of the mothers: Post Office clerk, stenographer, seamstress, laundress, Demonstration Agent, designer, typist, secretary, pianist for theater and night club, waitress, bookkeeper, dry goods buyer, cafe operator.

*Note: Some mothers had formerly been engaged in two or more occupations at different times.
It is interesting to note from the above data, that practically one-half of the mothers have never been gainfully employed other than for household work. Whereas a slight percent over one-fifth of them have formerly been school teachers, other occupations in the order in which they were employed, were saleslady, farm and field workers and nurses.

Mothers' Former Occupations

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household work</td>
<td>47%</td>
</tr>
<tr>
<td>Teachers</td>
<td>21%</td>
</tr>
<tr>
<td>Salesladies</td>
<td>12.5%</td>
</tr>
<tr>
<td>Nurses</td>
<td>5.5%</td>
</tr>
<tr>
<td>Farm Work</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

From one to three percent each of the following:

1. Post Office Clerk
2. Stenographer
3. Dressmaking
4. Laundress
5. Designers
6. Typist
7. Secretary
8. Music—Plays
9. Saleslady
10. Waitress
11. Bookkeeper
12. Buyer
13. Cafe

Occupations of Fathers:

Nine percent of the fathers were carpenters, 9 percent were salesmen, 10 percent were painters, 6 percent teachers, 6 percent farmers, 3 percent city workers, 3 percent brick layers, 6 percent truck drivers and 4.5 percent mechanics.

Between one and two percent of the fathers were in each of the following occupations: Construction worker, tax collector, stone cutter, contractor, tailor, county agents, oil field chief, house moving, electrician, dairy owner and operator, mattress maker, barber, laundry worker, city worker, roofer, insurance special agents, blacksmith, section hand, bookkeeper, merchant,
general merchant, produce merchant, motion picture operator.

Practically the only connection which could be established between the father's occupation and the boy's M.A.Q. and I.Q. was in that of the teacher. The others seem to range from one group to another without regard to M.A.Q. and I.Q.

Present Occupations of Fathers

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painters</td>
<td>10.6%</td>
</tr>
<tr>
<td>Carpenters</td>
<td>9%</td>
</tr>
<tr>
<td>Salesmen</td>
<td>9%</td>
</tr>
<tr>
<td>Farmers</td>
<td>6%</td>
</tr>
<tr>
<td>Teacher</td>
<td>6%</td>
</tr>
<tr>
<td>Truck Driver</td>
<td>6%</td>
</tr>
<tr>
<td>Mechanic</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

From one to three percent in each of the following:

1. Brick Layer
2. Brick Factory
3. Government Worker
4. Stone Cutter
5. Contractor
6. Tailor
7. County Agent
8. Oil Field Chief
9. House Moving
10. Electrician
11. Mattress Maker
12. Barber
13. Laundry
14. City Worker
15. Roofer
16. Insurance Agent
17. Blacksmith
18. Section Hand
19. Bookkeeper
20. Merchant
21. Producer
22. Motion Picture Operator
23. Painter
24. Dairyman
25. Tax Collector

Avocations of Fathers:

The percentages noted below may seem to be incorrect; however, each of the fathers may have one or more avocations; hence, the high percentages. Thirty-five percent of the fathers have reading as one of their avocations. Thirty-two percent of the fathers have fishing as one of their avocations, while 15 percent have radio as an avocation. Ten percent of the fathers have baseball as one of their avocations, while 10 percent have hunting as one.
Six percent of the fathers have each of one of the following as their avocation: Live stock and soft ball.

The following avocations were included as one of those of the fathers, and the percent preceding them is the percent of fathers who had them as an avocation: Four and five tenths percent, picture shows; 4.5 percent, carving; 5 percent, study; 3 percent, sports; 3 percent, singing; 3 percent, games; 3 percent, resting.

For each of the following, 1.5 percent: Radio, travel, English, Penmanship, mechanics, work, golf, sleep, aviation, picnics, horse races, playing piano, athletics, cabinet work, gardening, flowers, visiting sick and repairing.

Avocations of Mothers:

The percentages given below would seem to be in error; however, it must be kept in mind that each mother might have one, two or even more avocations.

The percent noted below preceding each avocation refers to the number of mothers who have it as one of their avocations: Thirty-five percent, reading; 20 percent, sewing; 13 percent, handwork; 9 percent, religious work; 8 percent, sports; 9 percent, music; 12.5 percent, homemaking; 5 percent, gardening; 25 percent, handwork; 4 percent, fishing; 2.7 percent, cooking; 2.7 percent, dancing; 2.7 percent, raising chickens; 2.7 percent, art. Between one and two percent for each of the following: Cafe, cookery, movies, bridge, literature, English, picnics, visiting sick, teaching, hiking, collecting poems, story-writing; child psychology, night club.
Mothers' Avocations

1. Reading.................. 35 %
2. Sewing.................. 25 %
3. Handwork................ 13.6%
4. Homemaking................. 12.5%
5. Religious work........... 9.7%
6. Music.................... 9.7%
7. Sports................... 8.3%
8. Gardening................. 5.5%
9. Fishing................... 4.1%
10. Travel................... 4.1%
11. Cooking.................. 2.7%
12. Dancing................... 2.7%
13. Chickens................ 2.7%
14. Art....................... 2.7%
15. Radio.................... 2.7%
16. Night Clubs.............. 1.5%
17. Child Psychology........ 1.5%
18. Story Writing............ 1.5%
19. Collecting Poems........ 1.5%
20. Hiking................... 1.5%
21. Teaching................ 1.5%
22. Visiting Sick............ 1.5%
23. Picnics.................. 1.5%
24. English.................. 1.5%
25. Literature.............. 1.5%
26. Bridge................... 1.5%
27. Movies................... 1.5%
28. Cafe..................... 1.5%

Fathers' Avocations

1. Reading .................. 35 %
2. Fishing................... 32 %
3. Radio..................... 15%
4. Baseball.................. 10.6%
5. Hunting................... 10.6%
6. Soft Ball.................. 6%
7. Live Stock................ 6%
8. Picture Shows............. 4.5%
9. Carving.................... 4.5%
10. Study .................... 3%
11. Sports ................... 3%
12. Resting ................... 3%
13. Religion................ 3%
14. Games .................... 5%
15. Singing .................. 3%
16. English ................ 1.5%
17. Penmanship............... 1.5%
18. Travel ................... 1.5%
19. Mechanics ............... 1.5%
20. Golf ..................... 1.5%
21. Sleep .................... 1.5%
22. Aviation ................. 1.5%
23. Picnics .................. 1.5%
24. Horse Races ............. 1.5%
25. Play Piano .............. 1.5%
26. Athletics ............... 1.5%
27. Cabinet Work ............ 1.5%
28. Garden ................... 1.5%
29. Flowers ................. 1.5%
30. Forty-two .............. 1.5%
31. Visiting Sick .......... 1.5%
32. Repairing .............. 1.5%
33. Work ................... 1.5%

Abnormal Homes:
The domestic life is what would ordinarily be called abnormal for 27.1 percent of the boys. Six and nine tenths percent of the boys came from broken homes or homes where the mother and father
are separated. Five percent of the boys came from homes where
the mothers are deceased, while 12.5 percent came from homes
where the fathers are deceased; 2.7 percent of the boys are
adopted, and the writer was unable to obtain data concerning
the adopted boys' parents.

<table>
<thead>
<tr>
<th></th>
<th>Father</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>50</td>
<td>47</td>
</tr>
<tr>
<td>Median</td>
<td>45</td>
<td>41</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>38</td>
<td>36</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>32</td>
<td>29</td>
</tr>
</tbody>
</table>

It may be noted from the above table, that the upper extreme
age of the father is 66 years, while the lower extreme father's
age is only 32 years. The median age of the fathers is 45 years.
The 75 percentile age of the fathers is 50; the 25 percentile
is 38 years.

The upper extreme age of the mothers is 66, while the lower
extreme age of the mothers is 29 years. The median age of the
mothers is 41, while the 75 percentile age of the mothers is 47,
and the 25 percentile age is 26. Except for the upper extreme,
the mothers are at all points from two to four years younger than
the fathers.
Birth State of Mothers:

Sixty-nine percent of the mothers were born in Texas, while 31 percent were born in other states. Eight percent came from Tennessee; 7 percent from Arkansas; 3 percent from Oklahoma and Iowa, and between one and two percent from the following states: Alabama, Louisiana, Kentucky, Illinois, Georgia and Indiana.

Birth State of Fathers:

It is interesting to note that 56 percent of the fathers whose boys were used in this study, were born in Texas, while 44 percent of them were born in other states. The states and the percent born there are Alabama, 7 percent; Tennessee, 6 percent; Arkansas, 6 percent; Kentucky, 5 percent; Nebraska, Mississippi, Missouri and Oklahoma, 3 percent each; Kansas, Maryland, Pennsylvania, Georgia, Louisiana, Illinois had between one and two percent each.

Comparison of I.Q. and M.A.Q. with States Traveled in and Number of Children in the Family:

The writer offers the following tables for consideration and speculation. Under no circumstances does he offer recommendations or draw conclusions from them. They give the number of states traveled in percentiles and the number of children in family percentiles as compared with the M.A.Q. and I.Q. of the boys tested. These tables may be interpreted as ordinary percentile tables are interpreted.
### TABLE II

<table>
<thead>
<tr>
<th></th>
<th>105</th>
<th>96-104</th>
<th>90-95</th>
<th>89-Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>2</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>Lower Extreme</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### TABLE III

<table>
<thead>
<tr>
<th></th>
<th>105</th>
<th>96-104</th>
<th>90-95</th>
<th>89-Lower</th>
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<tbody>
<tr>
<td>Upper Extreme</td>
<td>18</td>
<td>3</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>4</td>
<td>3</td>
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<td>2</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lower Extreme</td>
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<td>1</td>
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</tbody>
</table>

### TABLE IV

<table>
<thead>
<tr>
<th></th>
<th>105</th>
<th>96-104</th>
<th>90-95</th>
<th>89-Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Median</td>
<td>2</td>
<td>2</td>
<td>1½</td>
<td>1</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE V

CHILDREN—IQ

<table>
<thead>
<tr>
<th></th>
<th>105</th>
<th>95-104</th>
<th>90-95</th>
<th>89-Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>9</td>
<td>10</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Towns Lived In:

Of the boys used in this study, 30 percent had lived in only one town; 38 percent in only two towns; 19 percent in only three towns; 13 percent in four or more towns.

States Resided In:

Of the boys used in this study, 84 percent had lived in Texas only. Sixteen percent had lived in one or more other states.
CHAPTER III
ANALYSIS OF TEST DATA

"The following grade standards for end of October (based upon 2851 scores) are given for the Detroit Mechanical Aptitudes Examination for boys, although the critical meaning of a score on this test is the standing of the pupil with respect to his age group, rather than to his grade." ¹ The scores for the sixth grade, according to their table is as follows: The 75 percentile score was 92.5; the median score was 80 and the 25 percentile score was 65.3. The upper and lower extreme scores were not given.

The Denton Junior High School scores on this test were as follows: The scores ranged from the upper extreme of 114 down to the lower extreme, which was 51. The median score was 94; 75 percentile score 105, and the 25 percentile score 83.

The following comparison may be made: The Denton Junior High scores were above the Detroit scores to the extent of 12.5 on the 75 percentile; 14 on the median and 19.7 on the 25 percentile.

The real significance of these scores will be shown in relation to the I.Q. differences of the groups.

The national-wide grade medians for the Alpha Intelligence test were based upon 43,057 scores. The upper and lower extremes

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¹Harry J. Baker and Alex. G. Crockett, Manual of Directions for Detroit Mechanical Aptitudes Examination For Boys, p.7
were omitted. The median score was 115; the 75 percentile 134. The Detroit Junior High school scores on this test ranged from the upper extreme of 208 to the lower extreme of 22. The median score was 127; the 75 percentile score 146 on the median and 107 on the 25 percentile.

**TABLE VI**

INTELLIGENCE SCORES

<table>
<thead>
<tr>
<th></th>
<th>Detroit Scores for Sixth Grade²</th>
<th>Denton Junior High Scores for Sixth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Percentile</td>
<td>Not Given</td>
<td>208</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>134</td>
<td>146</td>
</tr>
<tr>
<td>Median</td>
<td>115</td>
<td>127</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>94</td>
<td>107</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>Not Given</td>
<td>22</td>
</tr>
</tbody>
</table>

The indications made by the total scores seem to indicate that the Denton Junior High School boys have higher mechanical aptitude quotients than those used in obtaining the Detroit results. However, the exact opposite is the case.

TABLE VII
MEchanical Aptitude Scores

<table>
<thead>
<tr>
<th></th>
<th>Detroit Results(^3)</th>
<th>Denton Junior High Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>Not Given</td>
<td>141</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>92.5</td>
<td>105</td>
</tr>
<tr>
<td>Median</td>
<td>80</td>
<td>94</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>63.5</td>
<td>83</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>Not Given</td>
<td>51</td>
</tr>
</tbody>
</table>

Table VII, as previously explained, would give the general impression that the Denton Junior High School boys would have a higher I.Q. than the Detroit boys. However the actual results were not so high as the table seems to indicate. These scores are of little significance in this section of the study other than for comparative purposes.

When the chronological ages of the group of boys being studied had been tabulated, the upper extreme age for the group was found to be 14 years and 9 months; while the median age was 12 years and 1 month and the lower extreme of the chronological age was 10 years and 5 months. Thus the chronological age of the group ranged from 10 years and 5 months to 14 years and 9 months. In general it covered an age range of 4 years and 4 months.

\(^3\)Harry J. Baker and Alex. C. Crockett, *Manual of Directions for Detroit Mechanical Aptitudes Examination for Boys*, p. 7.
The chronological age of the group may be compared with the mental age, mechanical age and achievement age on the comparative age table shown in Table VIII.

TABLE VIII

COMPARATIVE AGES

<table>
<thead>
<tr>
<th></th>
<th>Chron. Age</th>
<th>Mental Age</th>
<th>Mechanical Age</th>
<th>Achievement Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>14-9</td>
<td>15-9</td>
<td>15-5</td>
<td>15-5</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>12-11</td>
<td>13-6</td>
<td>12-2</td>
<td>15-1</td>
</tr>
<tr>
<td>Median</td>
<td>12-1</td>
<td>12-6</td>
<td>11-5</td>
<td>11-11</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>11-7</td>
<td>11-8</td>
<td>10-7</td>
<td>11-3</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>10-5</td>
<td>8-0</td>
<td>8-4</td>
<td>10-0</td>
</tr>
</tbody>
</table>

The range of the chronological age of the boys used in this study has been explained in the preceding paragraphs. The comparative age table gives the mental age range of the group to extend from the upper extreme of 15 years and 9 months down to the lower extreme of 8 years. The median mental age is 12 years and 6 months. The 75 percentile mental age 13 years and 8 months and the 25 percentile 11 years and 8 months. In general the mental age range covered by the group is 7 years and 9 months.

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4 Harry J. Baker, Manual of Directions and Teachers Handbook, The Detroit Alpha Intelligence Test, Forms M and R for Grades 5 to 9, p. 8
5 Harry J. Baker and Alex C. Crockett, Manual of Directions for Detroit Mechanical Aptitudes Examination for Boys, p. 6.
6 Achievement Age, New Stanford Achievement Test, on file at Denton Junior High School.
The mental age of the group extends from 12 months above the upper extreme chronological age to 2 years and 5 months below the lower extreme chronological age. The median mental age is 7 months above the median chronological age. The 75 percentile mental age in 9 months above the 75 percentile chronological age, and the 25 percentile mental age is 1 month above the 25 percentile chronological age.

This part of the table indicates that there is a wide range in the I.Q.s. of the group studied. The mechanical age of the boys used in this study ranges from 15 years and 5 months at the upper extreme to 8 years and 4 months at the lower extreme. In general the mechanical age range of the group is 7 years and 1 month. The median mechanical age is 11 years and 5 months. The 75 percentile mechanical age is 12 years and 2 months, and the 25 percentile mechanical age is 10 years and 7 months. The mechanical age of the group extends from 8 months above the chronological age at the upper extreme to 2 years and 1 month below the chronological age at the lower extreme. The median mechanical age is 6 months below the median chronological age. The 75 percentile mental age is 9 months below the 75 percentile chronological age; and the 25 percentile mechanical age is 12 months below the 25 percentile chronological age.

It may be noted from the table that the upper extreme mechanical age is 4 months below the upper extreme of the mental age, and the
lower extreme mechanical age is 4 months above the lower extreme mental age. The median mechanical age is one year and three months below the median mental age. The 75 percentile mechanical age is 1 year and 6 months below the 75 percentile mental age and the 25 percentile mechanical age is one year and one month below the 25 percentile mental age. This seems to indicate that the mechanical age of the group is below their mental.

The achievement age of the group ranges from 15 years and 5 months at the upper extreme to 10 years at the lower extreme.

The median achievement age is 11 years and 11 months. The 75 percentile achievement age is 13 years and 1 month, and the 25 percentile achievement age is 11 years and 3 months. In general, the achievement age range is 5 years and 5 months.

It may be noted from the comparative age table that the upper extreme achievement age is 8 months above the upper extreme chronological age, 4 months below the upper extreme mental age and exactly the same as the upper extreme mechanical age; that it is 5 months below the lower extreme chronological age, two years above the lower extreme mental age and 1 year and 8 months above the lower extreme mechanical age.

The median achievement age is 2 months below the median chronological age, 9 months below the median mental age and 6 months above the median mechanical age. The 75 percentile achievement age is 2 months above the 75 percentile chronological age, 7 months
below the 75 percentile mental age, and 11 months above the 75 percentile mechanical age.

The 25 percentile achievement age is 4 months below the 25 percentile chronological age, 5 months below the 25 percentile mental age, and 8 months above the 25 percentile mechanical age.

Hence, the age range covered is 4 years and 4 months for the chronological age; 7 years and 9 months for the mental age; 6 years and 1 month for the mechanical age; and 5 years and 5 months for the achievement age.

Detailed Analysis of Detroit Alpha Intelligence Test:

The chronological age and the tests score medians have already been discussed. The Detroit Alpha Intelligence Tests Form M and Form R were divided into 8 different sections or sheets, and these in turn are placed in 5 different groups. The groups are A. Information, B. Vocabulary, C. Visual Imagery, D. Reasoning, E. Educational.

A comparison of the age median for the different tests may easily be made for the comparative age given in Table IX.
### TABLE IX

**INTELLIGENCE TEST—COMPARATIVE AGE**

(Age Norms by Test Divisions\(^7\))

<table>
<thead>
<tr>
<th>Chron. Age</th>
<th>Information Age</th>
<th>Vocab. Age</th>
<th>Visual Imagery Age</th>
<th>Reason. Age</th>
<th>Educ. Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme 14-9</td>
<td>17-10</td>
<td>20-0</td>
<td>21-0</td>
<td>18-8</td>
<td>16-2</td>
</tr>
<tr>
<td>75 Percentile 12-11</td>
<td>14-0</td>
<td>14-4</td>
<td>14-0</td>
<td>14-3</td>
<td>14-0</td>
</tr>
<tr>
<td>Median 12-1</td>
<td>12-5</td>
<td>12-6</td>
<td>13-6</td>
<td>12-10</td>
<td>13-0</td>
</tr>
<tr>
<td>25 Percentile 11-7</td>
<td>10-10</td>
<td>11-0</td>
<td>11-0</td>
<td>11-8</td>
<td>11-5</td>
</tr>
<tr>
<td>Lower Extreme 9-2</td>
<td>7-10</td>
<td>7-10</td>
<td>7-6</td>
<td>8-4</td>
<td>8-3</td>
</tr>
</tbody>
</table>

The upper extreme information age is 17 years and 10 months, and the lower extreme information age is 7 years and 10 months. The median information age is 12 years and 5 months. The 75 percentile information age is 14 years and the 25 percentile is 10 years and 10 months. In general, the information age range extends from 7 years and 10 months to 17 years and 10 months and covers an age range of 10 years.

The upper extreme information age is 3 years and 1 month above the upper extreme chronological age, while the lower extreme information age is 4 months below the lower extreme chronological age.

The median information age is 4 months above the median chronological age. The 75 percentile information age is 1 year and 1 month above the 75 percentile chronological age, and the 25 percentile information age is 9 months below the 25 percentile chronological age.

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\(^7\)Harry J. Baker, *Manual of Directions and Teacher's Handbook for the Detroit Alpha Intelligence Test, Forms M and R for Grades 5 to 9*, p. 11
The upper extreme vocabulary age is 20 years; the lower extreme vocabulary age is 7 years and 10 months. The median vocabulary age is 12 years and 6 months. The 75 percentile vocabulary age is 14 years and 4 months, and the 25 percentile vocabulary age is 11 years.

The upper extreme vocabulary age is 5 years and 3 months above the upper extreme chronological age and 2 years and 2 months above the upper extreme information age. The lower extreme vocabulary age is 4 months below the lower extreme chronological age and exactly the same as the lower extreme information age.

The median vocabulary age is 5 months above the median chronological age and 1 month above the median information age. The 75 percentile vocabulary age is 1 year and 5 months above the 75 percentile chronological age, and 4 months above the 75 percentile information age. The 25 percentile vocabulary age is 7 months below the 25 percentile chronological age, and 2 months above the 25 percentile information age.

The upper extreme visual imagery age is 21 years, while the lower extreme visual imagery age is 7 years and 6 months. The median visual imagery age is 13 years and 6 months. The 75 percentile visual imagery age is 14 years, and the 25 percentile visual imagery age is 11 years.

The upper extreme visual imagery age is 6 years and 3 months above the upper extreme chronological age, 3 years and 2 months above the upper extreme information age and 1 year above the upper
extreme vocabulary age; whereas the lower extreme visual imagery age is 8 months below the lower extreme chronological age, 4 months below the lower extreme information age and 4 months below the lower extreme vocabulary age. The median visual imagery age is 1 year and 5 months above the median chronological age, 1 year and 1 month above the median information age, and 1 year above the median vocabulary age. The 75 percentile visual imagery age is 1 year and 1 month above the 75 percentile chronological age, exactly the same as the 75 percentile information age and 4 months below the 75 percentile vocabulary age; whereas the 25 percentile visual imagery age is 7 months below the 25 percentile chronological age and 2 months above the 25 percentile information age.

The upper extreme reasoning age is 18 years and 8 months, and the lower extreme reasoning age is 8 years and 4 months. The median reasoning age is 12 years and 10 months. The 75 percentile reasoning age is 14 years and 3 months, and the 25 percentile reasoning age is 11 years and 8 months.

The upper extreme reasoning age is 3 years and 11 months above the upper extreme chronological age, 10 months above the upper extreme information age, 2 years and 4 months below the upper extreme visual imagery age; whereas the lower extreme reasoning age is 2 months above the lower extreme chronological age, 6 months above the lower extreme information age, 6 months above the lower extreme vocabulary age, and 10 months above the lower extreme visual imagery
age. The median reasoning age is 9 months above the median chronological age, 5 months above the median information age, 4 months above the median vocabulary age, and 8 months below the median visual imagery age. The 75 percentile reasoning age is 1 year and 4 months above the 75 percentile chronological age, 3 months above the 75 percentile information age, 1 month below the 75 percentile vocabulary age and 3 months above the 75 percentile visual imagery age.

The upper extreme educational age is 16 years and 2 months, and the lower extreme educational age is 8 years and 3 months. The median educational age is 13 years. The 75 percentile educational age is 14 years, and the 25 percentile age is 11 years and 5 months.

The upper extreme educational age is 1 year and 5 months above the upper extreme chronological age, 1 year and 8 months below the upper extreme information age, 3 years and 10 months below the upper extreme vocabulary age, 4 years and 10 months below the upper extreme visual imagery age, 2 years and 6 months below the upper extreme reasoning age. The lower extreme educational age is 1 month above the lower extreme chronological age, 5 months above the lower extreme information age, 5 months above the lower extreme information age, 5 months above the lower extreme vocabulary age, 2 years and 6 months below the lower extreme reasoning age. The median educational age is 11 months above the median chronological age, 7 months above the median information age, 6 months above the median
vocabulary age, 6 months below the median visual imagery age, 2 months above the median reasoning age. The 75 percentile educational age is 1 year and 1 month above the 75 percentile chronological age, exactly the same as the 75 percentile educational age, 4 months lower than the 75 percentile vocabulary age, exactly the same as the 75 visual imagery age, and 3 months below the 75 percentile reasoning age. The 25 percentile educational age is 2 months below the 25 percentile chronological age, 7 months above the 25 percentile informational age, 5 months above the 25 percentile vocabulary age, 5 months above the 25 percentile visual imagery age, and 3 months below the 25 percentile reasoning age.

The age range covered by the different sections of the intelligence test range from 7 years and 11 months as in the educational division, to 13 years and 6 months in the visual imagery division. The information age range is 10 years, and the reasoning division age range is 10 years and 4 months; while the vocabulary age range is 12 years and 2 months, and the chronological age range is only 6 years and 7 months.

The above data would seem to indicate that a large percent of the boys have an exceedingly high mental age. However, the fact must be kept in mind that the upper extreme for the group is only 15 years and 9 months, and the lower extreme mental age is 8 years. Thus, the mental age range is only 7 years and 9 months. This eliminates the possibility of a large percent of the group having an exceedingly low mental age or as low as the data would seem to
indicate.

The mental age of each individual is made up of his information age, vocabulary age, visual imagery age, reasoning age and educational age. Thus, as in case study No. 34, the information age is 10 years and 10 months, the vocabulary age 15 years and 6 months, the visual imagery age is 19 years and 6 months, reasoning age 10 years and 10 months and the educational age 9 years and 6 months. This would set the general mental age of the individual at 11 years and 6 months, according to the Detroit Alpha Intelligence Mental Age Norms.\footnote{Harry J. Baker and Alex C. Crockett, Manual of Directions for Detroit Mechanical Aptitude Examination for Boys, p. 6.}

Analysis of Detroit Mechanical Aptitude Examination Results:

The Detroit mechanical aptitude examination is divided into eight different tests, and these tests are in turn grouped into three sections regarding: A, Mechanical Information, B, Motor Skill, C, Visual.

\begin{table}
\centering
\begin{tabular}{|l|c|c|c|c|}
\hline
\hline
Upper Extreme & 14-9 & 15-4 & 17-4 & 15-10 \\
75 Percentile & 12-11 & 11-10 & 14-0 & 13-4 \\
Median & 13-1 & 10-8 & 13-0 & 12-5 \\
25 Percentile & 11-7 & 9-9 & 11-5 & 10-7 \\
Lower Extreme & 10-5 & 8-4 & 9-4 & 9-0 \\
\hline
\end{tabular}
\caption{Comparative Ages}
\end{table}

\footnote{Tbid, p 11.}
According to Table V the upper extreme mechanical information age is 15 years and 4 months, and the lower extreme mechanical information age is 6 years and 4 months. The median mechanical information age is 10 years and 6 months. The 75 percentile mechanical information age is 11 years and 10 months, and the 25 percentile mechanical information age is 9 years and 9 months.

The upper extreme mechanical information age is 7 months above the upper extreme chronological age, and the lower extreme mechanical information age is 2 years and 1 month below the lower extreme chronological age. The median mechanical information age is 1 year and 5 months below the median chronological age. The 75 percentile mechanical information age is 1 year and 1 month below the 75 percentile chronological age, and the 25 percentile mechanical information age is 1 year and 10 months below the 25 percentile chronological age.

The upper extreme motor skill age is 17 years and 4 months, and the lower extreme motor skill age is 9 years and 4 months. The median motor skill age is 13 years. The 75 percentile motor skill age is 14 years, and the 25 percentile motor skill age is 11 years and 5 months.

The upper extreme motor skill age is 2 years and 7 months above the upper extreme chronological age, and 2 years above the upper extreme mechanical information age, and 1 year and 1 month below the lower extreme chronological age, and 1 year above the lower extreme mechanical information age. The median motor skill age is
11 months above the median chronological age, and 2 years and 4 months above the median mechanical information age. The 75 percentile motor skill age is 1 year and 1 month above the 75 percentile chronological age, and 2 years and 2 months above the 75 percentile mechanical information age. The 25 percentile motor skill age is 2 months below the 25 percentile chronological age, and 1 year and 8 months above the 25 percentile mechanical information age. The upper extreme visual age is 15 years and 10 months, and the lower extreme visual age is 9 years. The median visual age is 12 years and 5 months. The 75 percentile visual is 13 years and 4 months and the 25 percentile visual age is 10 years and 7 months.

The upper extreme visual age is 1 year and 1 month above the upper extreme chronological age, 6 months above the upper extreme mechanical information age, and 1 year and 6 months below the upper extreme motor skill age. The lower extreme visual age is 1 year and 5 months below the lower extreme chronological age, 8 months above the lower extreme mechanical information age, and 4 months below the lower extreme motor skill age. The median visual age is 4 months above the median chronological age, 1 year and 9 months above the median mechanical information age, and 7 months below the median motor skill age. The 75 percentile visual age is 5 months above the 75 percentile chronological age, 1 year and 6 months above the 75 percentile mechanical information age, and 8 months below the 75 percentile motor skill age. The 25 percentile visual age is 1 year below the 25 percentile chronological age, 10 months above the
25 percentile mechanical information age, and 10 months below the 25 percentile motor skill age. Thus the mechanical information age range is 7 years, the motor skill age range is 6 years, and the visual age range is 6 years and 10 months.

The data given above would seem to indicate that there would be a large percent of the group which would have an extremely high mechanical aptitude age, and another large percent which would have an extremely low mechanical aptitude age. It must be kept in mind, however, that the mechanical aptitude age is made up of the mechanical information age, the motor skill age and the visual age, and that a child may be low in one and high in another.

Case study No. 22 illustrates the above noted points. His information age is 10 years and 8 months; his motor skill age, 14 years and 8 months, his visual age, 11 years and 5 months. His general mechanical aptitude age is 11 years and 8 months according to the Detroit Mechanical Aptitude Examination Age Norms for boys.

Percent Falling in Each Intelligence Quotients Group:

The upper extreme intelligence quotient is 160, and the lower extreme intelligence quotient is 102. The 75 percentile intelligence quotient is 115, and the 25 percentile intelligence quotient is 93.

Twenty-one percent of the Denton Junior High School boys had an I.Q. of 118 or above, while 13 percent of them were in the I.Q.

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Harry J. Baker and Alex C. Crockett, Manual of Directions for Detroit Mechanical Aptitudes Examination for Boys, p. 6.
group of 111 to 117 inclusive, and 7 percent of them were included in the I.Q. group of 105 to 110 inclusive. Thirty percent of the Denton Junior High School boys were in the I.Q. group of 96 to 104 inclusive, and 9 percent of them were in the I.Q. group of 90 to 95 inclusive, while 8 percent of them were in the I.Q. group of 83 to 89 inclusive, and 12 percent of them were in the I.Q. group of 82 and lower. Seventy-one percent of the Denton Junior High School boys were in the I.Q. group of 96 or above. It may also be noted that 29 percent of the Denton Junior High School boys were in the I.Q. group of 95 and lower.

Percent Falling in Each Mechanical Aptitude Quotients Group:

The upper extreme mechanical aptitude quotient is 134, and the lower extreme mechanical aptitude quotient is 164. The median mechanical aptitude quotient is 93. The 75 percentile mechanical aptitude quotient is 100, and the 25 percentile mechanical aptitude quotient is 85.

Four percent of the Denton Junior High School boys fall within the M.A.Q. group of 118 to 134 inclusive, and 6 percent of them fall within an M.A.Q. group of 111 to 117 inclusive, while 8 percent of them fall within an M.A.Q. group of 105 to 110 inclusive. Nineteen percent of the Denton Junior High School boys fall within the M.A.Q. group of 96 to 104 inclusive, and 26 percent of them fall within the M.A.Q. group of 90 to 95 inclusive, while 18 percent of them fall within the M.A.Q. group of 83 to 89 inclusive, and 17 percent of them fall within the M.A.Q. group of 82 or lower.
Thirty-nine percent of the Denton Junior High School boys fall within the M.A.Q. group of 96 and above, and 61 percent of them fall within the M.A.Q. group of 95 and lower.

TABLE XI

<table>
<thead>
<tr>
<th>I.Q. and M.A.Q. Groups</th>
<th>Percent falling in each I.Q. Group</th>
<th>Percent falling in each M.A.Q. Group</th>
<th>Normal percent in any age group which fall in each I.Q., M.A.Q. Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>118 and above</td>
<td>21</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>111-117</td>
<td>13</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>105-110</td>
<td>7</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>96-104</td>
<td>30</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>90-95</td>
<td>9</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>85-89</td>
<td>8</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>82 and lower</td>
<td>12</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>

(Decimals have been omitted in Table No. XI and the nearest whole number used.)

Comparative Study of Percent Falling in Each I.Q. and M.A.Q. Group:

It is interesting to note from Table XI that 21 percent of the Denton Junior High School boys fall within the I.Q. group of 118 and above. The normal percent of boys in any age group falling within the 118 and above I.Q. group is 8 percent. Only 4 percent of the boys fall within the M.A.Q. of 118 and above. The normal percent of boys in any age group falling within the 118 and above M.A.Q. group is 8 percent. Thirteen percent of the Denton Junior High School boys fall within the I.Q. group of 111 to 117, while only 8 percent
fall within the 111 to 117 M.A.Q. group. The normal percent of boys in any age group falling within 111-117 I.Q. and M.A.Q. groups is 12 percent. Seven percent of the Denton Junior High School sixth grade boys fall within the I.Q. group of 105-110, while 8 percent of them fall within the M.A.Q. group of 105-110. The normal percent of boys in any age range falling within the 105-110 I.Q. and M.A.Q. group is 18 percent. Thirty percent of the Denton Junior High School sixth grade boys fall within the I.Q. group of 96-104, while only 19 percent of them fall within the 96-104 M.A.Q. group. The normal percent of boys in any age range falling within the 96-104 I.Q. and M.A.Q. group is 24 percent. Nine percent of the Denton High School sixth grade boys fall within the I.Q. group of 90-95, while 26 percent of the boys fall within the M.A.Q. group of 90-95. The normal percent of boys in any age range falling within this group is 18 percent. Eight percent of the Denton Junior High School sixth grade boys fall within the I.Q. group of 83-89, while 18 percent fall within the 83-89 M.A.Q. group. The normal percent of boys in any age group falling within this range M.A.Q. and I.Q. is 12 percent. Twelve percent of the Denton Junior High School boys fall within the I.Q. group of 82 and lower, while 17 percent of the boys fall within the 82 and lower M.A.Q. group. The normal percent of boys in any age group falling within this group is 8 percent.
### TABLE XII

**COMPARATIVE I.Q. AND M.A.Q.**

<table>
<thead>
<tr>
<th></th>
<th>I.Q.</th>
<th>M.A.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extreme</td>
<td>160</td>
<td>134</td>
</tr>
<tr>
<td>75 Percentile</td>
<td>115</td>
<td>100</td>
</tr>
<tr>
<td>Median</td>
<td>102</td>
<td>93</td>
</tr>
<tr>
<td>25 Percentile</td>
<td>93</td>
<td>85</td>
</tr>
<tr>
<td>Lower Extreme</td>
<td>59</td>
<td>64</td>
</tr>
</tbody>
</table>

Comparison of I.Q. and M.A.Q.

The upper extreme I.Q. is 160, the lower extreme I.Q. is 59. The median I.Q. is 102, the 75 percentile I.Q. is 115 and the 25 percentile I.Q. is 93. The upper extreme M.A.Q. is 134, and the lower extreme is 64. The median M.A.Q. is 93, the 75 percentile M.A.Q. is 100, and the 25 percentile M.A.Q. is 85. The I.Q. range extends from 59 to 160 or over an I.Q. range of 101 points, while the M.A.Q. range extends from 64 to 134, or over an M.A.Q. range of 70 points. Thus the I.Q. range is 31 points wider than the M.A.Q. range. The upper extreme M.A.Q. is 26 points lower than the upper extreme I.Q., while the lower extreme M.A.Q. is 5 points higher than the lower extreme I.Q. The median M.A.Q. is 11 points lower than the median I.Q. The 75 percentile M.A.Q. is 15 points lower than the 75 percentile I.Q., while the 25 percentile M.A.Q. is 6 points lower than the 25 percentile I.Q. Thus it can easily be seen that 75 percent of the boys of the Denton Junior High School are below 100 M.A.Q.; whereas only between 45 percent and 48 percent are below 100 I.Q.

*Detroit Mechanical Aptitudes Examinations and Detroit Alpha Intelligence Tests were used to obtain above results on Denton Junior High School Boys.*
CHAPTER IV

ANALYSIS OF INTEREST QUESTIONNAIRE DATA

Preparation of Interest Questionnaire:

The writer worked with eight boys over a period of nine months. A check list was made of their practical arts interests. Information which they wished to learn was noted, and the activities which they had performed or wished to perform were also included in this check list. Thirty-eight activities were listed in question form under the heading of "How Do You Like?"

Twenty-eight information units were listed in question form under the heading "Would you like to know?"

1. The effect of moisture on wood, etc.

Eighty-eight activities suggested during the course of the nine months were listed in a random order, the several activities not necessarily having any connection with those which preceded or followed. The directions included in the questionnaire instructed the boy to rate the activities according to the interests which he might have toward them: 1. Figure three was to indicate interest. 2. Figure two was to indicate indifference. 3. Figure one indicated dislike for the activity. These figures were to be placed in front of the activity listed. If the boy had previously performed the activity listed, he was instructed to place a check mark in the parenthesis at the right of the activity listed.
In the treatment of the data received on this questionnaire the number 3 was used as first place, the number 2 as second place, the number 1 as third place, and all activities which had been omitted were tabulated as zeros and placed under the heading of place number 4. In order to determine the ranking of each activity with relation to the other activities listed, the following formula was used: \( R_1 \times F \times R_2 \times F \times R_3 \times F \times R_4 \times F \), total weighted value. In this formula \( R \) equals rating, and sub 1, 2, 3, and 4 are the places used in the rating, and \( F \) is the frequency. Thus the lowest total weighted value was given first place, and the highest total weighted value was given last place, and the other total weighted values were placed accordingly.

In the case of two or more activities having the same total weighted value, all of these of the same total weighted value were placed together, the number corresponding to their median was used as their placement number, and each separate activity in the group was given this number.

The data obtained on the interest questionnaire was tabulated on large check sheets. These check sheets were arranged to give a double check on each item entered. One large check sheet was used for each division of the questionnaire. The data obtained was placed on the check sheets in the order of the descending I.Q.'s.
A separate set of check sheets were then drawn from the above check sheets, grouping the boys according to their mechanical aptitude quotients, rather than their intelligence quotients. Because of the insufficient numbers at the upper and lower extremes and the 75 and 25 percentiles, the results were divided into four mechanical aptitude quotient groups: Group I, 105 and above mechanical aptitude quotient; Group II, 96 to 104 mechanical aptitude quotient; Group III, 90 to 95 mechanical aptitude quotient; Group IV, 89 and lower mechanical aptitude quotient.

Analysis and Interpretation of Questionnaire Data:

Sixty-eight boys responded to the two divisions containing 28 units and 38 activities respectively. Only 60 boys responded to the 88 activities listed in the interest questionnaire.

The treatment in the data of this section of the study is divided into five parts.

I. Section number one includes a list of the activities listed in the order of ranking given them by the boys, and the number placed at the right of each activity refers to the number of boys who had actually performed it.

II. Section number two includes the statistical treatment of the activities, and in it they are placed according to the ranking given them by the boys. The lowest total weighted value was
placed first, and the highest total weighted value was placed last.

III. Section number three includes the 28 practical arts Information Units placed in the ranking which they were given by the various M.A.Q. groups of boys.

IV. Section number four includes the 38 practical arts jobs ranked in the order given them by the various M.A.Q. groups of boys.

V. Section number five includes the 38 practical arts activities as ranked by the various M.A.Q. groups of boys.

The activities listed on the following pages are practical arts activities, ranked in the order in which they were ranked by the entire group of boys replying to the questionnaire. The number placed at the right of each activity refers to the number of boys who had actually performed the activity. It will be noticed from a study of this list that each activity in the group had been performed by at least five boys, while some of the activities had been performed by as many as 51 boys. An example of an interpretation of these charts may be given as follows: Twenty-three boys had taken a bicycle apart and put it back together; 42 boys had made bird houses of wood; 38 boys had made toys for children; 18 boys had given first aid treatment; 20 boys knew the kinds and grades of sand-paper; 17 boys had tied boy scout tender-foot knots; 28 boys...
had carved small articles; 34 boys had used a steel square; 16 boys had removed stoppage from pipes.

Since each activity in this list had been performed by five or more boys, it stands to reason that the activities are not too difficult for sixth grade junior high school boys.
LIST I

GENERAL PRACTICAL ARTS JOBS

How do you like—— Number Performing the activity

1. To take a bicycle apart and put it back together? 23
2. To visit factories?
3. To visit electric plants?
4. To visit machine shops?
5. To install radio sets?
6. To ask questions about machinery and how it works?
7. To make bird houses of wood?
8. To take an auto apart?
9. To repair an auto and put it back together?
10. To make crystal radio set?
11. To make kites?
12. To carve boxes, trays, watch fobs, buttons, etc?
13. To make electric bell hook-up?
14. To make toys for children?
15. To take apart an electric iron?
16. To make first-aid kit of metal and wood?
17. To repair and put an iron back together?
18. To make ornaments of copper?
19. To make bird houses of metal?
20. To make bird houses of concrete?
21. To set up electric trains?
22. To read articles on radio?
23. To make kitchen utensils of tin cans?
24. To make wagons?
25. To make toy airplanes?
26. To make toy boats?
27. To set up "Mechano"recktors or mechanical apparatus?
28. To make ornaments of brass?
29. To read articles on mechanical construction of airplanes?
30. To make toy windmills?
31. To make butterfly-mounting case?
32. To figure out drawings?
33. To make drawings?
34. To make tackle containers?
35. To make flower stands of iron?
36. To make wicker baskets?
37. To make cold-iron decorations?
38. To make toys of tin cans?
<table>
<thead>
<tr>
<th>Question</th>
<th>Number Performing activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you like to know—</td>
<td></td>
</tr>
<tr>
<td>1. How to give first aid treatment?</td>
<td>18</td>
</tr>
<tr>
<td>2. The sizes of wire?</td>
<td>9</td>
</tr>
<tr>
<td>3. How sizes of auger bits and drill bits are indicated?</td>
<td>17</td>
</tr>
<tr>
<td>4. How to protect and preserve woods?</td>
<td>11</td>
</tr>
<tr>
<td>5. The object of wood-finish?</td>
<td>19</td>
</tr>
<tr>
<td>6. The effect of moisture on woods?</td>
<td>13</td>
</tr>
<tr>
<td>7. The names of the different wrenches and the purposes for which they are used?</td>
<td>12</td>
</tr>
<tr>
<td>8. How to distinguish the more common woods in general use in the community and their principal characteristics and working qualities?</td>
<td>10</td>
</tr>
<tr>
<td>10. How to make a mechanical drawing of a simple project?</td>
<td>14</td>
</tr>
<tr>
<td>11. Kinds and grades of sharpening tools?</td>
<td>13</td>
</tr>
<tr>
<td>12. Kinds and grades of sand-paper?</td>
<td>20</td>
</tr>
<tr>
<td>13. Safety with respect to electrical appliances?</td>
<td>8</td>
</tr>
<tr>
<td>14. The names of the different kinds of plumbing fixtures and fittings?</td>
<td>9</td>
</tr>
<tr>
<td>15. The names of the different kinds of pipe fittings?</td>
<td>10</td>
</tr>
<tr>
<td>16. The kinds and sizes of nails and how made?</td>
<td>20</td>
</tr>
<tr>
<td>17. The kinds of rope and method of dimensioning?</td>
<td>12</td>
</tr>
<tr>
<td>18. How nails are sold?</td>
<td>25</td>
</tr>
<tr>
<td>19. How water-pipe is dimensioned?</td>
<td>6</td>
</tr>
<tr>
<td>20. The gages of sheet steel?</td>
<td>8</td>
</tr>
<tr>
<td>22. The distinguishing characteristics of the more common metals?</td>
<td>9</td>
</tr>
<tr>
<td>23. The durability of the different kinds of finish?</td>
<td>10</td>
</tr>
<tr>
<td>24. The materials from which finishes are made?</td>
<td>7</td>
</tr>
<tr>
<td>25. The sizes of brads and how sold?</td>
<td>15</td>
</tr>
<tr>
<td>26. The grades and uses of steel wool?</td>
<td>7</td>
</tr>
<tr>
<td>27. The nominal and actual standard dimensions of lumber?</td>
<td>8</td>
</tr>
<tr>
<td>28. The sizes, kinds, and uses of corner fasteners?</td>
<td>10</td>
</tr>
</tbody>
</table>
LIST III

GENERAL PRACTICAL ARTS ACTIVITIES

Number performing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tie Boy Scout tenderfoot knots.</td>
<td>17</td>
</tr>
<tr>
<td>2. Use a Boy Scout knife.</td>
<td>39</td>
</tr>
<tr>
<td>3. Regulate a watch or clock.</td>
<td>19</td>
</tr>
<tr>
<td>4. Build models</td>
<td>25</td>
</tr>
<tr>
<td>5. Trace and test lighting system.</td>
<td>9</td>
</tr>
<tr>
<td>6. Grease a car</td>
<td>14</td>
</tr>
<tr>
<td>7. Bore holes with auger-bits.</td>
<td>37</td>
</tr>
<tr>
<td>8. Install electric bells.</td>
<td>11</td>
</tr>
<tr>
<td>9. Use a wrench.</td>
<td>37</td>
</tr>
<tr>
<td>10. Plan and construct a simple motor.</td>
<td>14</td>
</tr>
<tr>
<td>11. Apply paint on old and new surfaces.</td>
<td>30</td>
</tr>
<tr>
<td>12. Solder cooking utensils.</td>
<td>11</td>
</tr>
<tr>
<td>13. Use pliers and wire-cutters.</td>
<td>38</td>
</tr>
<tr>
<td>14. Renew carbon brushes in small motor.</td>
<td>10</td>
</tr>
<tr>
<td>15. Make or repair a picture frame.</td>
<td>15</td>
</tr>
<tr>
<td>16. Repair, cover, or rebind books.</td>
<td>19</td>
</tr>
<tr>
<td>17. Change oil in engine.</td>
<td>13</td>
</tr>
<tr>
<td>18. Test and care for battery.</td>
<td>12</td>
</tr>
<tr>
<td>19. Cut and set glass.</td>
<td>17</td>
</tr>
<tr>
<td>20. Construct a simple telegraph system.</td>
<td>16</td>
</tr>
<tr>
<td>21. Carve small articles.</td>
<td>28</td>
</tr>
<tr>
<td>22. Use a rip-saw.</td>
<td>31</td>
</tr>
<tr>
<td>23. Prepare and use glue.</td>
<td>34</td>
</tr>
<tr>
<td>24. Refinish furniture.</td>
<td>18</td>
</tr>
<tr>
<td>25. Finish concrete surfaces.</td>
<td>8</td>
</tr>
<tr>
<td>26. Care for tools to prevent rust.</td>
<td>27</td>
</tr>
<tr>
<td>27. Sharpen scissors or shears.</td>
<td>21</td>
</tr>
<tr>
<td>28. Read gas and electric meters.</td>
<td>8</td>
</tr>
<tr>
<td>29. Wash and polish car.</td>
<td>29</td>
</tr>
<tr>
<td>30. Repair puncture with cold patch.</td>
<td>23</td>
</tr>
<tr>
<td>31. Fit a tool handle.</td>
<td>23</td>
</tr>
<tr>
<td>32. Repair puncture with hot patch.</td>
<td>14</td>
</tr>
<tr>
<td>33. Use a jack-plane.</td>
<td>28</td>
</tr>
<tr>
<td>34. Use a file.</td>
<td>35</td>
</tr>
<tr>
<td>35. Locate and replace blown fuses.</td>
<td>18</td>
</tr>
<tr>
<td>36. Mix and pour concrete.</td>
<td>14</td>
</tr>
<tr>
<td>37. Sharpen knives.</td>
<td>33</td>
</tr>
<tr>
<td>38. Use a cold-chisel.</td>
<td>34</td>
</tr>
<tr>
<td>39. Sharpen a garden hoe or shovel.</td>
<td>16</td>
</tr>
<tr>
<td>40. Attach casters and gliders.</td>
<td>15</td>
</tr>
<tr>
<td>41. Reset chairs.</td>
<td>15</td>
</tr>
<tr>
<td>42. Sharpen a hand-sickle.</td>
<td>15</td>
</tr>
<tr>
<td>Number Performing the activity</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td></td>
</tr>
<tr>
<td>43. Tighten loose joints on chair or other furniture.</td>
<td>26</td>
</tr>
<tr>
<td>44. Put knobs or pulls on drawers.</td>
<td>18</td>
</tr>
<tr>
<td>45. Use a screwdriver.</td>
<td>41</td>
</tr>
<tr>
<td>46. Sharpen a garden hoe or shovel.</td>
<td>27</td>
</tr>
<tr>
<td>47. Adjust a lawn-mower.</td>
<td>21</td>
</tr>
<tr>
<td>48. Wire a socket and plug.</td>
<td>19</td>
</tr>
<tr>
<td>49. Plan and construct a simple buzzer.</td>
<td>6</td>
</tr>
<tr>
<td>50. Use a hand drill.</td>
<td>35</td>
</tr>
<tr>
<td>51. Repair upholstering.</td>
<td>13</td>
</tr>
<tr>
<td>52. Fit and lay linoleum.</td>
<td>23</td>
</tr>
<tr>
<td>53. Put new wire on screen frames.</td>
<td>14</td>
</tr>
<tr>
<td>54. Plan and construct a heater.</td>
<td>8</td>
</tr>
<tr>
<td>55. Wrap and tie packages properly.</td>
<td>21</td>
</tr>
<tr>
<td>56. Use a simple woodwork tool.</td>
<td>32</td>
</tr>
<tr>
<td>57. Remove dents from kitchen utensils and other utensils.</td>
<td>9</td>
</tr>
<tr>
<td>58. Shape screwdriver tip.</td>
<td>23</td>
</tr>
<tr>
<td>59. Splice wire.</td>
<td>23</td>
</tr>
<tr>
<td>60. Make splices in electric wires.</td>
<td>16</td>
</tr>
<tr>
<td>61. Plan and construct a simple light circuit.</td>
<td>8</td>
</tr>
<tr>
<td>62. Use a cross-cut saw.</td>
<td>33</td>
</tr>
<tr>
<td>63. Clean and care for paint brushes.</td>
<td>19</td>
</tr>
<tr>
<td>64. Clean and refinish floors.</td>
<td>17</td>
</tr>
<tr>
<td>65. Plan the procedure in doing a job.</td>
<td>12</td>
</tr>
<tr>
<td>66. Smooth a surface with sandpaper.</td>
<td>37</td>
</tr>
<tr>
<td>67. Use corner-braces and mending plates in repairing furniture.</td>
<td>11</td>
</tr>
<tr>
<td>68. Repair flush tank.</td>
<td>13</td>
</tr>
<tr>
<td>69. Replace light bulbs.</td>
<td>31</td>
</tr>
<tr>
<td>70. Remove and replace tire.</td>
<td>27</td>
</tr>
<tr>
<td>71. Use a hack-saw.</td>
<td>28</td>
</tr>
<tr>
<td>72. Use lacquer and enamel in home decoration.</td>
<td>17</td>
</tr>
<tr>
<td>73. Assemble and repair electrical appliance cord.</td>
<td>13</td>
</tr>
<tr>
<td>74. Remove sediment from radiator.</td>
<td>16</td>
</tr>
<tr>
<td>75. Use a lawn-mower.</td>
<td>42</td>
</tr>
<tr>
<td>76. Replace sash-cord and weights.</td>
<td>8</td>
</tr>
<tr>
<td>77. Nail and draw nails.</td>
<td>35</td>
</tr>
<tr>
<td>78. Use a hack-saw.</td>
<td>15</td>
</tr>
<tr>
<td>79. Locate a break in a circuit.</td>
<td>13</td>
</tr>
<tr>
<td>80. Use a steel square.</td>
<td>34</td>
</tr>
</tbody>
</table>
LIST III

GENERAL PRACTICAL ARTS ACTIVITIES—Concluded

<table>
<thead>
<tr>
<th>Number Performing the activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>81. Use a ruler.</td>
</tr>
<tr>
<td>82. Remove old finish from furniture.</td>
</tr>
<tr>
<td>83. Plan and construct a transformer.</td>
</tr>
<tr>
<td>84. Tie an underwriters knot.</td>
</tr>
<tr>
<td>85. Remove stoppage from pipes.</td>
</tr>
<tr>
<td>86. Replace eash-cord and weights.</td>
</tr>
<tr>
<td>87. Clean out traps in sink and floor drain.</td>
</tr>
<tr>
<td>88. Read a working drawing.</td>
</tr>
</tbody>
</table>

The following pages contain an analysis of the ratings given for the various activities by the entire group of 68 boys for the first two divisions and 60 boys for the last one.

The formula given before for determining the ranking was used in this as in all other divisions, and the statistical data for determining the ranking is shown after each activity. An explanation for the proper use of these charts may be noted as follows:

"To take a bicycle apart and put it back together" is ranked in first place. The other activities in which the boys are less interested are ranked below. It is suggested that the person wishing to use this study should not use more than the first fifty percent of the activities listed in each group, if he wishes to work within the interests of the group as a whole. However, the ranking given the various activities under the M.A.Q. ranking discussion seems to place the activities better for the boys using them and lends a more practical organization of materials.
<table>
<thead>
<tr>
<th>General Practical Arts Jobs</th>
<th>Weighted Values</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R₁</td>
<td>R₂</td>
</tr>
<tr>
<td>1. To take a bicycle apart and put it back together?</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>2. To visit factories?</td>
<td>33</td>
<td>11</td>
</tr>
<tr>
<td>3. To visit electric plants?</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>4. To visit machine shops?</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>5. To install radio set?</td>
<td>29</td>
<td>11</td>
</tr>
<tr>
<td>6. To ask questions about machinery and how it works?</td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>7. To make bird houses of wood?</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>8. To take an auto apart?</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>9. To repair an auto and put it back together?</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>10. To make crystal radio set?</td>
<td>29</td>
<td>9</td>
</tr>
<tr>
<td>11. To make kites?</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>12. To carve boxes, trays, watchfobs, buttons, etc?</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>13. To make electric bell hook-up?</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>14. To make toys for children?</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>15. To take apart an electric iron?</td>
<td>20</td>
<td>14</td>
</tr>
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<td>16. To make first-aid kit of metal and wood?</td>
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<td>17. To repair and put an iron together</td>
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<td>18. To make ornaments of copper</td>
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<td>19. To make bird houses of metal?</td>
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<td>20. To make bird houses of concrete?</td>
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<td>21. To set up electric trains?</td>
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<td>22. To read articles on radio?</td>
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<td>23. To make kitchen utensils of tin cans?</td>
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<td>24. To make wagons?</td>
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<td>25. To make toy airplanes?</td>
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<td>26. To make toy boats?</td>
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<td>27. To set up &quot;Mechano,&quot; &quot; Erectors&quot; or mechanical apparatus?</td>
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<td>28. To make ornaments of brass?</td>
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<td>29. To read articles on mechanical construction of airplanes?</td>
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<td>30. To make toy windmills?</td>
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<td>31. To make butter-fly mounting case?</td>
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<td>32. To figure out drawings?</td>
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<td>33. To make drawings?</td>
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<td>34. To make tackle containers?</td>
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<td>35. To make flower stands of iron?</td>
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<td>36. To make wicker baskets?</td>
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<td>37. To make cold-iron decorations</td>
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<td>38. To make toys of tin cans?</td>
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## CHART II

### PRACTICAL ARTS INFORMATION UNITS

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<tr>
<td>1. How to give first aid treatment?</td>
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<tr>
<td>2. The sizes of wire?</td>
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<tr>
<td>3. How sizes of auger bits and drill bits are indicated?</td>
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<tr>
<td>4. How to protect and preserve woods?</td>
<td>31</td>
<td>13</td>
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<tr>
<td>5. The object of wood finish?</td>
<td>32</td>
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</tr>
<tr>
<td>6. The effect of moisture on woods?</td>
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<tr>
<td>7. The names of the different wrenches and purposes for which used?</td>
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<tr>
<td>8. How to distinguish the more common woods in general use in community and their principal characteristics and working qualities?</td>
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<tr>
<td>10. How to make a mechanical drawing of a simple project?</td>
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<td>11. Kinds and grades of sharpening tools?</td>
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</tr>
<tr>
<td>12. Kinds and grades of sand-paper?</td>
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<td>13. Safety with respect to electrical appliances?</td>
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<td>14. The names of the different kinds of plumbing fixtures and fittings?</td>
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<td>15. The names of the different kinds of pipe fittings?</td>
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<td>16. The kinds and sizes of nails and how made?</td>
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<tr>
<td>17. The kinds of rope and method of dimensioning?</td>
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<td>18. How nails are sold?</td>
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<td>19. How water-pipe is dimensioned?</td>
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<td>20. The gages of sheet steel?</td>
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<td>21. The effect of heat on metal?</td>
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<td>22. The distinguishing characteristics of the more common metals?</td>
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<td>23. The durability of the different kinds of finish?</td>
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<td>24. The materials from which finishes are made?</td>
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<td>25. The sizes of brads and how sold?</td>
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<td>26. The grades and uses of steel wool?</td>
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<td>27. The nominal and actual standard dimensions of lumber?</td>
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<td>28. The sizes, kinds, and uses of corner fasteners?</td>
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### CHART III

**GENERAL PRACTICAL ARTS ACTIVITIES**

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<td>1. Tie Boy Scout tenderfoot knots.</td>
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<td>23. Use a Boy Scout knife.</td>
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<tr>
<td>24. Regulate a watch or clock.</td>
<td>...............</td>
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<td>13</td>
<td>8</td>
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<td>25. Build models</td>
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<td>26. Trace and test lighting system</td>
<td>...............</td>
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<td>27. Grease a car.</td>
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<td>73. Bore holes with auger-bits</td>
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<td>74. Install electric bells.</td>
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<td>92. Use a wrench.</td>
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<td>93. Plan and construct a simple motor</td>
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<td>112. Apply paint on old and new surfaces</td>
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<td>15</td>
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<td>113. Solder cooking utensils.</td>
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<td>123. Use pliers and wire-cutters</td>
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<td>133. Renew carbon brushes in small motor</td>
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<td>16</td>
<td>13</td>
<td>6</td>
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<td>153. Make or repair a picture frame</td>
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<td>15</td>
<td>15</td>
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<td>154. Repair, cover, or rebind books.</td>
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<td>155. Change oil in engine.</td>
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<td>158. Test and care for battery.</td>
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<td>20. Cut and set glass.</td>
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<td>20. Construct a simple telegraph system</td>
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<td>20. Carve small articles.</td>
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<tr>
<td>24. Use a rip-saw.</td>
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<td>7</td>
<td>13</td>
<td>123</td>
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<td>24. Prepare and use glue.</td>
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<td>10</td>
<td>9</td>
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<tr>
<td>24. Refinish furniture.</td>
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<td>14</td>
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<td>24. Finish concrete surfaces.</td>
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<td>14</td>
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<td>24. Care for tools to prevent rust.</td>
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<td>12</td>
<td>9</td>
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<tr>
<td>283. Sharpen scissors or shears.</td>
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<td>285. Read gas and electric meters.</td>
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<td>289. Wash and polish car.</td>
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<tr>
<td>289. Repair puncture with cold patch.</td>
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<td>311. Fit a tool handle.</td>
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<td>312. Repair puncture with hot patch.</td>
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<td>341. Use a jack-plane.</td>
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<td>341. Use a file.</td>
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<td>342. Locate and replace blown fuses.</td>
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<td>342. Mix and pour concrete.</td>
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<td>37. Sharpen knives.</td>
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<td>393. Use a cold-chisel.</td>
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<td>393. Sharpen a garden hoe or shovel.</td>
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<td>17</td>
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<td>393. Attach casters and gliders.</td>
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<td>15</td>
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<td>392. Reseat chairs.</td>
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<td>43. Sharpen a hand-sickle.</td>
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<td>43. Tighten loose joints on chair or other furniture.</td>
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<td>43. Put knobs or pulls or drawers.</td>
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<td>47. Use a screwdriver.</td>
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<td>47. Sharpen a garden hoe or shovel.</td>
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<td>47. Adjust a lawn-mower.</td>
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<td>47. Wire a socket and plug.</td>
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<td>47. Plan and construct simple buzzer.</td>
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<td>51. Use a hand drill.</td>
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<td>51. Repair upholstery.</td>
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<td>51. Fit and lay linoleum.</td>
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<td>55. Put new wire on screen frames.</td>
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<td>55. Plan and construct a heater.</td>
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<td>55. Wrap and tie packages properly.</td>
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<td>55. Use simple woodwork tools.</td>
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<td>55. Remove dents from kitchen utensils and other utensils.</td>
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<td>59½. Shape screwdriver tip.</td>
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<td>59½. Splice wire.</td>
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<td>59½. Make splices in electric wires.</td>
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<td>59½. Plan and construct a simple light circuit.</td>
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<td>62½. Use a cross-cut saw.</td>
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<td>62½. Clean and care for paint brushes.</td>
<td>21 15 13 11</td>
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<td>65. Clean and refinish floors.</td>
<td>19 16 16 9</td>
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<td>65. Plan procedure in doing a job.</td>
<td>21 14 14 11</td>
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<td>65. Smooth a surface with sandpaper.</td>
<td>22 14 11 13</td>
<td>135</td>
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<tr>
<td>68½. Use corner-braces and mending plates in repairing furniture.</td>
<td>20 13 18 9</td>
<td>136</td>
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<td>68½. Repair flush tank.</td>
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<tr>
<td>68½. Replace light bulbs.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>68½. Remove and replace tire.</td>
<td>21 14 13 12</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72½. Use a back-saw.</td>
<td>22 13 11 14</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72½. Use lacquer and enamel in home decoration.</td>
<td>20 13 17 10</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72½. Assemble and repair electrical appliance cord.</td>
<td>22 11 15 12</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72½. Remove sediment from radiator.</td>
<td>21 13 14 12</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75. Use a lawn-mower.</td>
<td>20 15 12 13</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75. Replace sash-cord and weights.</td>
<td>21 11 17 11</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77. Nail and draw nails.</td>
<td>22 13 9 16</td>
<td>139</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77½. Use a hack-saw.</td>
<td>28 14 8 13</td>
<td>139</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>79. Locate a break in a circuit.</td>
<td>21 12 13 14</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81. Use a steel square.</td>
<td>19 15 12 14</td>
<td>141</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Chart III

**GENERAL PRACTICAL ARTS ACTIVITIES—Concluded**

<table>
<thead>
<tr>
<th>General Practical Arts Activities</th>
<th>Weighted Values</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R₁</td>
<td>R₂</td>
</tr>
<tr>
<td>81. Use a ruler.</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>81. Remove old finish from furniture.</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>82. Plan and construct a transformer.</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>83. Tie an underwriters knot.</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>85. Remove stoppages from pipes.</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>86. Replace sash-cord and weights.</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>87. Clean out traps in sink and floor drain.</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>87. Read a working drawing.</td>
<td>15</td>
<td>13</td>
</tr>
</tbody>
</table>
This section includes the twenty-eight practical arts information units as ranked by the various M.A.Q. groups of boys. The statistical treatment used in obtaining the ranking of the various activities has been omitted in order that the activities may be more readily accessible. It may be noted that the activities are rated differently by the different groups of boys. "How sizes of auger-bits and drill bits are indicated" is rated as 1\(\frac{1}{2}\) by the highest M.A.Q. group; it is rated as 27 by the 96 to 104 M.A.Q. group. It is ranked as 21 by the 90 to 95 group, and it is ranked as 19 by the 89 and lower M.A.Q. group.

How to give first aid treatment is ranked by the 105 and above M.A.Q. group as 1\(\frac{1}{2}\). It was ranked as 7\(\frac{1}{2}\) by the 96-104 M.A.Q. group; 3\(\frac{1}{2}\) by the 90 to 95 group; 1\(\frac{1}{2}\) by the 89 and lower M.A.Q. group.

It may be distinctly noted from the different charts that each M.A.Q. group has certain activities which it prefers and which may or may not be preferred by the other groups. It may also be noted that there are certain activities in which the combined groups register the same amount of disinterest. They all register practically the same disinterest in the distinguishing characteristics of the more common metals. The sizes, kinds, and uses of corner fasteners had a slightly wider rating by the various groups; yet they all registered disinterest in it.
CHART IV

PRACTICAL ARTS INFORMATION DESIRED BY
BOYS OF 105 M.A.Q. AND ABOVE

The information units used in Practical Arts are listed
below in order of preference of boys of 105 M.A.Q. and above.

1½. How sizes of auger bits and drill bits are indicated?
1½. How to give first aid treatment?
3. The effects of heat on metal?
4½. Safety with respect to electrical appliances?
4½. How to make a mechanical drawing of a simple project?
6. The effect of moisture on woods?
6. The object of wood-finish?
8. The names of the different kinds of pipe fittings?
8. The names of the different wrenches and the purposes for which
they are used?
10½. How to protect and preserve woods?
10½. The sizes of wire?
14. How to distinguish the more common woods in general use in the
community and their principal characteristics and working
qualities?
14. The kinds and sizes of nails and how made?
14. Kinds and grades of sandpaper?
14. The grades and uses of steel wool?
14. The kinds of rope and method of dimensioning?
18½. How water pipe is dimensioned?
18½. The names of the different kinds of plumbing fixtures and
fittings?
18½. How nails are sold?
18½. Kinds and grades of sharpening tools?
21½. The distinguishing characteristics of the more common metals?
21½. The materials from which finishes are made?
24½. The sizes, kinds, and uses of corner fasteners?
24½. Kinds, sizes of screws, and how they are sold?
24½. The durability of the different kinds of finish?
24½. The gauges of sheet steel?
27½. The nominal and actual standard dimensions of lumber?
27½. The sizes of brads and how sold?
CHART V

PRACTICAL ARTS INFORMATION DESIRED BY
BOYS OF 96-104 N.A.C. RATING

1 1/2. How to protect and preserve woods?
1 1/2. The durability of the different kinds of finish?
3. The names of the different kinds of plumbing fixtures and fittings?
7 1/2. How to distinguish the more common woods in general use in the community and their principal characteristics and working qualities?
7 1/2. The effect of moisture on woods?
7 1/2. The names of the different wrenches and the purposes for which they are used?
7 1/2. The sizes of wire?
7 1/2. The gauges of sheet steel?
7 1/2. Safety with respect to electrical appliances?
7 1/2. How to give first aid treatment?
7 1/2. How to make a mechanical drawing of a simple project?
14. The object of wood finish?
14. The materials from which finishes are made?
14. How nails are sold?
14. The sizes of brads and how sold?
14. The kinds of rope and method of dimensioning?
18. The nominal and actual standard dimensions of lumber?
18. Kinds and grades of sharpening tools?
18. How water pipe is dimensioned?
20 1/2. The distinguishing characteristics of the more common metals?
20 1/2. The effect of heat on metal?
22 1/2. The kinds and sizes of nails and how made?
22 1/2. The names of the different kinds of pipe fittings?
24 1/2. Kinds and grades of sandpaper?
24 1/2. The grades and uses of steel wool?
26. The sizes, kinds, and uses of corner fasteners?
27. How sizes of auger bits and drill bits are indicated?
28. Kinds, sizes of screws, and how they are sold?
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The effect of moisture on wood?</td>
</tr>
<tr>
<td>2</td>
<td>Kinds and grades of sharpening tools?</td>
</tr>
<tr>
<td>3a</td>
<td>The names of the different wrenches and the purposes for which they are used?</td>
</tr>
<tr>
<td>3b</td>
<td>How to give first aid treatment?</td>
</tr>
<tr>
<td>5a</td>
<td>How to distinguish the more common woods in general use in the community and their principal characteristics and working qualities?</td>
</tr>
<tr>
<td>5b</td>
<td>The sizes of wire?</td>
</tr>
<tr>
<td>7a</td>
<td>Kinds, sizes of screws, and how they are sold?</td>
</tr>
<tr>
<td>7b</td>
<td>The names of the different kinds of pipe fittings?</td>
</tr>
<tr>
<td>8</td>
<td>The effect of heat on metal?</td>
</tr>
<tr>
<td>10a</td>
<td>How to protect and preserve wood?</td>
</tr>
<tr>
<td>10b</td>
<td>How nails are sold?</td>
</tr>
<tr>
<td>12a</td>
<td>The object of wood finish?</td>
</tr>
<tr>
<td>12b</td>
<td>How water pipe is dimensioned?</td>
</tr>
<tr>
<td>15a</td>
<td>The durability of the different kinds of finish?</td>
</tr>
<tr>
<td>15b</td>
<td>The kinds of rope and method of dimensioning?</td>
</tr>
<tr>
<td>15c</td>
<td>The materials from which finishes are made?</td>
</tr>
<tr>
<td>17a</td>
<td>Kinds and grades of sandpaper?</td>
</tr>
<tr>
<td>17b</td>
<td>Safety with respect to electrical appliances?</td>
</tr>
<tr>
<td>19a</td>
<td>The names of the different kinds of plumbing fixtures and fittings?</td>
</tr>
<tr>
<td>21a</td>
<td>The nominal and actual standard dimensions of lumber?</td>
</tr>
<tr>
<td>21b</td>
<td>How sizes of auger bits and drill bits are indicated?</td>
</tr>
<tr>
<td>21c</td>
<td>The gages of sheet steel?</td>
</tr>
<tr>
<td>24a</td>
<td>The kinds and sizes of nails and how made?</td>
</tr>
<tr>
<td>24b</td>
<td>The sizes of brads and how sold?</td>
</tr>
<tr>
<td>24c</td>
<td>How to make a mechanical drawing of a simple project?</td>
</tr>
<tr>
<td>26a</td>
<td>The distinguishing characteristics of the more common metals?</td>
</tr>
<tr>
<td>27a</td>
<td>The grades and uses of steel wool?</td>
</tr>
<tr>
<td>28a</td>
<td>The sizes, kinds, and uses of corner fasteners?</td>
</tr>
</tbody>
</table>
CHART VII

PRACTICAL ARTS INFORMATION DESIRED BY BOYS
OF 89 AND LOWER M.A.Q. RATING

1½. The object of wood finish?
1¾. How to give first aid treatment?
3. How to distinguish the more common woods in general use in
   the community and their principal characteristics and
   working qualities?
4. The materials from which finishes are made?
5. The kinds of rope and method of dimensioning?
7. How to protect and preserve woods?
7. The names of the different kinds of plumbing fixtures and
   fittings?
7. The uses of wire?
9½. The names of the different wrenches and the purposes for
   which they are used?
9½. How to make a mechanical drawing of a simple project?
11. Safety with respect to electrical appliances?
13. The effect of moisture on woods?
13. Kinds and grades of sharpening tools?
13. The effect of heat on metal?
15½. The nominal and actual standard dimensions of lumber?
15½. How water pipe is dimensioned?
19. The kinds and sizes of nails and how made?
19. The sizes, kinds, and uses of corner fasteners?
19. Kinds, sizes of screws, and how they are sold?
19. The grades and uses of steel wool?
19. How sizes of auger bits and drill bits are indicated?
22½. The durability of the different kinds of finish?
22½. The distinguishing characteristics of the more common metals?
24. How nails are sold?
25. The gages of sheet steel?
26. The names of the different kinds of pipe fittings?
27½. The sizes of brads and how sold?
27½. Kinds and grades of sandpaper?
The following charts give the ranking that each of the M.A.G. groups gave the 38 Practical Arts Activities noted there on.

These charts should be interpreted in the same manner as the previous charts regarding the M.A.G. ranking were interpreted.

It is suggested that only the first fifty percent of the activities listed in this group, as in the other groups, be used as activities for a practical arts program.
CHART VIII

PRACTICAL ARTS JOBS DESIRED BY
BOYS OF 105 M.A.Q.

Rank

1. To make electric bell hook-up.
2. To visit electric plants.
2 ½. To carve boxes, trays, watch-fobs, buttons, etc.
5. To visit machine shops.
5. To visit factories.
5. To make first aid kit of metal and wood.
10 ½. To take an auto apart.
10 ½. To take a bicycle apart and put it back together.
10 ½. To read articles on radio.
10 ½. To install radio set.
10 ½. To ask questions about machinery and how it works.
10 ½. To make toy windmills.
10 ½. To make toys for children.
10 ½. To make kitchen utensils of tin cans.
17 ½. To make toy airplanes.
17 ½. To make toy boats.
17 ½. To set up electric trains.
17 ½. To repair an auto and put it back together.
17 ½. To make bird houses of wood.
17 ½. To make tackle containers.
22 ½. To make wagons.
22 ½. To set up "Mechano", "Erectors" or mechanical apparatus.
22 ½. To make drawings.
22 ½. To make bird houses of concrete.
27. To figure out drawings.
27. To make crystal radio set.
27. To make wicker baskets.
27. To make cold-iron decorations.
27. To make kites.
31 ½. To take apart an electric iron.
31 ½. To make ornaments of copper.
31 ½. To make bird houses of metal.
31 ½. To make butterfly-mounting case.
34 ½. To read articles on mechanical construction of airplanes.
34 ½. To make ornaments of copper.
36 ½. To repair and put an iron back together.
36 ½. To make toys of tin cans.
38. To make flower stands of iron.
CHART IX

PRACTICAL ARTS JOBS DESIRED BY BOYS
OF 95-104 M.A.Q. RATING

Rank

1. To visit electric plants.
2. To take a bicycle apart and put it back together.
4. To make a crystal radio set.
4. To make electric bell hook-up.
4. To make a first aid kit of metal.
7. To take apart an electric iron.
7. To read articles on radio.
7. To make kites.
7. To carve boxes, trays, watch-fobs, buttons, etc.
11. To repair and put an iron back together.
11. To repair an auto and put it back together.
11. To install radio set.
11. To visit factories.
15. To take an auto apart.
15. To make ornaments of copper.
15. To make bird houses of wood.
15. To make bird houses of metal.
19. To visit machine shops.
19. To ask questions about machinery and how it works.
19. To make bird houses of concrete.
23. To read articles on mechanical construction of airplanes.
23. To make ornaments of brass.
23. To make flower stands of iron.
23. To make toys for children.
23. To make kitchen utensils of tin cans.
27. To make wagons.
27. To figure out drawings.
27. To make cold-iron decorations.
27. To make butterfly-mounting case.
30. To make wicker baskets.
31. To make toy airplanes.
31. To make toy windmills.
34. To set up "Mechano", "Erectors" or mechanical apparatus.
34. To make drawings.
34. To make tackle containers.
36. To make toys of tin cans.
37. To make toy boats.
37. To set up electric trains.
CHART X

PRACTICAL ARTS JOBS DESIRED BY BOYS
OF 90-95 N.A.Q. RATING

Rank

2. To install radio set.
2. To repair an auto and put it back together.
2. To make electric bell hook-up.
4. To take an auto apart.
5. To take a bicycle apart and put it back together.
5. To visit machine shops.
7. To make bird houses of metal.
7. To make first aid kit of metal and wood.
9. To make butterfly-mounting case.
12. To take apart an electric iron.
12. To visit electric plants.
12. To visit factories.
12. To make ornaments of copper.
12. To make bird houses of concrete.
12. To make flower stands of iron.
17. To set up electric trains.
17. To repair and put an iron back together.
17. To make bird houses of wood.
19. To read articles on radio.
19. To ask questions about machinery and how it works.
21. To make ornaments of brass.
21. To make toys for children.
24. To set up "Mechano", " Erectors" or mechanical apparatus.
24. To make drawings.
24. To make tackle containers.
26. To make crystal radio set.
27. To make wicker baskets.
30. To make wagons.
30. To make toy boats.
30. To figure out drawings.
30. To make toy windmills.
30. To make kitchen utensils of tin cans.
30. To make kites.
34. To read articles on mechanical construction of airplanes.
36. To make toy airplanes.
36. To make cold-iron decorations.
36. To make toys of tin cans.
38. To carve boxes, trays, watch-fobs, buttons, etc.
CHART XI

PRACTICAL ARTS JOBS DESIRED BY BOYS
OF 89 AND LOWER M.A.Q. RATING

Rank
1. To visit factories.
2. To take a bicycle apart and put it back together.
3. To install radio set.
4. To visit machine shops.
5. To make bird houses of wood.
6. To make crystal radio set.
7. To visit electric plants.
8. To ask questions about machinery and how it works.
9. To make kites.
10. To set up "Mechano", " Erectors" or mechanical apparatus.
11. To make toy boats.
12. To repair and put an iron back together.
13. To make toy airplanes.
14. To set up electric trains.
15. To figure out drawings.
16. To make toy windmills.
17. To make ornaments of copper.
18. To take apart an electric iron.
19. To read articles on radio.
20. To carve boxes, trays, watch-fobs, buttons, etc.
21. To make drawings.
22. To take an auto apart.
23. To make bird houses of metal.
24. To make bird houses of concrete.
25. To make toys for children.
26. To make wagons.
27. To read articles on mechanical construction of airplanes.
28. To make butterfly-mounting case.
29. To make tackle containers.
30. To make first aid kits of metal and wood.
31. To make flower stands of iron.
32. To make kitchen utensils of tin cans.
33. To make electric bell hook-up.
34. To make ornaments of brass.
35. To make toys of tin cans.
36. To make wicker baskets.
37. To make cold-iron decorations.
38. To take an auto apart.
The following charts give the ranking that each of the M.A.Q. groups gave the 88 general practical arts activities noted there on. These charts should be compared and interpreted in the same manner as the preceding charts, concerning the M.A.Q. activity ranking.

It is suggested that only about the first fifty percent of the activities listed be used as activities in a practical arts program.
CHART XII

GENERAL PRACTICAL ARTS ACTIVITIES DESIRED BY BOYS OF 105 AND ABOVE M.A.Q. RATING

Rank

1. Tie Boy Scout tenderfoot knots.
2. Use simple woodwork tools.
3. Test and care for battery.
4. Repair puncture with hot patch.
5. Regulate a watch or clock.
6. Mix and pour concrete.
7. Change oil in engine.
8. Repair puncture with cold patch.
9. Build model.
10. Finish concrete surfaces.
11. Remove dents from kitchen utensils and other utensils.
12. Grease a car.
13. Remove sediment from radiator.
14. Use a rip-saw.
15. Construct a simple telegraph system.
16. Care for tools to prevent rust.
17. Wash and polish car.
18. Solder cooking utensils.
19. Use a screwdriver.
20. Use a Boy Scout knife.
21. Read gas and electric meter.
22. Plan and construct a simple buzzer.
23. Plan and construct a simple motor.
24. Plan and construct a simple light circuit.
25. Plan and construct a heater.
26. Remove and replace tire.
27. Use a cross-cut saw.
28. Use a steel square.
29. Use a ruler.
30. Use pliers and wire-cutters.
31. Assemble and repair electrical appliance cord.
32. Plan and construct a simple light circuit.
33. Plan and construct a transformer.
34. Repair flush tank.
35. Make or repair a picture frame.
36. Nail and draw nails.
37. Use a cold-chisel.
38. Use a wrench.
40. Sharpen a garden hoe or shovel.
41. Prepare and use glue.
42. Locate a break in a circuit.
43. Plan the procedure in doing a job.
CHART XII

GENERAL PRACTICAL ARTS ACTIVITIES DESIGNED BY BOYS OF 105 AND ABOVE N.A.Q. RATING

—Continued

Rank
40.3. Pit and lay linoleum.
40.3. Replace light bulbs.
50.3. Sharpen scissors or shears.
50.3. Sharpen a chisel.
50.3. Sharpen a hand-sickle.
50.3. Attach casters and gliders.
50.3. Reset chairs.
50.3. Repair upholstering.
50.3. Refinish furniture.
50.3. Renew carbon brushes in small motor.
50.3. Smooth a surface with sandpaper.
50.3. Clean out traps in sink and floor drain.
65. Use a hack-saw.
65. Use a lawn-mower.
65. Shape screwdriver tip.
65. Apply paint on old and new surfaces.
65. Install electric bells.
65. Locate and replace blown fuses.
65. Remove stoppage from pipes.
65. Replace splashcord and weights.
65. Read a working drawing.
65. Carve small articles.
65. Use a jack-plane.
65. Put up a clothes line.
75. Wrap and tie packages properly.
75. Clean and care for paint brushes.
75. Use a file.
75. Adjust a lawn-mower.
75. Put new wire on screen frames.
75. Put knobs or pulls on drawers.
75. Remove old finish from furniture.
75. Repair, cover, or rebind books.
80. Use a hand drill.
80. Cut and set glass.
80. Fit a tool handle.
80. Use corner-branches and mending plates in repairing furniture.
80. Make splices in electric wires.
84. Tighten loose joints on chair or other furniture.
84. Sharpen knives.
84. Clean and refinish floors.
84. Use lacquer and enamel in home decoration.
87. Tie an underwriters knot.
88. Splice wire.
CHART XIII

GENERAL PRACTICAL ARTS ACTIVITIES DESIRED BY BOYS OF 90-95 M.A.Q. RATING

Bank
1. Carve small articles.
2. Use a Boy Scout knife.
3. Sharpen scissors or shears.
4. Prepare and use glue.
5. Tie Boy Scout tenderfoot knots.
6. Use a wrench.
7. Bore holes with auger-bit
8. Fit a tool handle.
9. Apply paint on old and new surfaces.
10. Use a hand drill.
11. Make or repair a picture frame.
12. Use a file.
13. Use pliers and wire cutters.
15. Build models.
16. Sharpen a plane-bit and chisel.
17. Refinish furniture.
18. Plan and construct a simple motor.
19. Grease a car.
20. Use a hack-saw.
21. Shape screwdriver tip.
22. Sharpen knives.
23. Sharpen a garden hoe or shovel.
25. Install electric bells.
26. Make splices in electric wires.
27. Construct a simple telegraph system.
29. Repair puncture with cold patch.
30. Repair puncture with hot patch.
31. Trace and test lighting system.
32. Use a back-saw.
33. Use a rip-saw.
34. Use a jack-plane.
35. Splice wire.
36. Cut and set glass.
37. Use lacquer and enamel in home decoration.
38. Clean and care for paint brushes.
39. Read gas and electric meters.
40. Locate a break in a circuit.
41. Replace sash-cord and weights.
42. Plan the procedure in doing a job.
43. Care for tools to prevent rust.
44. Fit and lay linoleum.
CHART XIII

GENERAL PRACTICAL ARTS ACTIVITIES DESIGNED BY
BOYS OF 90-95 M.A.-2. RATING

---Continued

Rank
39½. Use simple woodwork tools.
53. Use a screwdriver.
53. Use a cross-cut saw.
53. Use a cold-chisel
53. Put new wire on screen frames.
53. Tighten loose joints on chair or other furniture.
53. Use corner-braces and mending plates in repairing furniture.
53. Put knobs or pulls on drawers.
53. Clean and refinish floors.
53. Plan and construct a simple light circuit.
53. Tie an underwriters knot.
53. Repair flush tank.
53. Put up a clothes-line.
53. Smooth a surface with sandpaper.
53. Regulate a watch or clock.
53. Use a ruler.
53. Repair upholstering.
66. Remove old finish from furniture.
66. Locate and replace blown fuses.
66. Wire a socket and plug.
66. Assemble and repair electrical appliance cord.
66. Plan and construct a transformer.
66. Clean out traps in sink and drain.
66. Repair, cover, or rebind books.
66. Solder cooking utensils.
66. Wash and polish car.
75½. Reseat chairs.
75½. Plan and construct a simple buzzer.
75½. Wrap and tie packages properly.
75½. Finish concrete surfaces.
75½. Remove dents from kitchen utensils and other utensils.
75½. Replace light bulbs.
75½. Test and care for battery.
75½. Remove and replace tire.
81. Use a steel square.
81. Remove stoppage from pipes.
81. Adjust a lawn-mower.
84½. Use a lawn-mower.
84½. Plan and construct a heater.
84½. Read a working drawing.
84½. Remove sediment from radiator.
81½. Nail and draw nails.
81½. Mix and pour concrete.
CHART XIII

GENERAL PRACTICAL ARTS ACTIVITIES DESIRED BY
BOYS OF 90-95 M.A.Q. RATING

--Continued

Rank
2. Install electric bell.
2. Locate and replace blown fuses.
2. Repair, cover, or rebind books.
5%. Wrap and tie packages properly.
10. Apply paint on old and new surfaces.
10. Locate a break in a circuit.
10. Tie Boy Scout tenderfoot knots.
10. Make or repair a picture frame.
10. Solder cooking utensils.
10. Repair puncture with hot patch.
10. Cut and set glass.
16. Test and care for battery.
21. Use a hand-drill.
21. Use corner-braces and mending plates in repairing furniture.
21. Put knobs or pulls on drawers.
21. Wash and polish car.
26. Use a cold-chisel.
26. Regulate a watch or clock.
26. Repair puncture with hot patch.
26. Construct a simple telegraph system.
34. Use a hack-saw.
34. Use a screwdriver.
34. Use a Boy Scout knife.
34. Use a jack-plane.
34. Sharpen knives.
34. Sharpen a plane-bit and chisel.
34. Splice wire.
34. Plan and construct a simple buzzer.
34. Plan and construct a simple light circuit.
43. Use a wrench.
43. Sharpen scissors or shears.
43. Sharpen a garden hoe or shovel.
43. Reset chairs.
43. Repair upholstering.
43. Refinish furniture.
43. Clean and refinish floors.
43. Wire a socket and plug.
Chart XIII

General Practical Arts Activities Desired By Boys of 90-95 M.A.Q. Rating
---Continued

Rank
43. Change oil in engine.
43. Remove and replace tire.
43. Use a rip-saw.
53. Use a cross-cut saw.
53. Use a steel square.
53. Use a lawn mower.
53. Use pliers and wire-cutters.
53. Use lacquer and enamel in home decoration.
53. Repair puncture with cold patch.
53. Care for tools to prevent rust.
63. Nail and draw nails.
63. Use a file.
63. Shape screwdriver tip.
63. Put new wire on screen frames.
63. Clean and care for paint brushes.
63. Assemble and repair electrical appliance cord.
63. Tie an underwriters knot.
63. Plan the procedure in doing a job.
63. Fit and lay linoleum.
63. Use simple woodworking tools.
63. Remove dents from kitchen utensils and other utensils.
71. Fit a tool handle.
71. Attach casters and gliders.
71. Remove old finish from furniture.
71. Replace light bulbs.
71. Remove sediment from radiator.
76. Use a ruler.
76. Sharpen a hand-sickle.
76. Prepare and use glue.
76. Locate a break in a circuit.
76. Read a working drawing.
79. Plan and construct a transformer.
79. Remove stoppage from pipes.
81. Use corner-branches and mending plates in repairing furniture.
81. Replace sash-cord and weights.
85. Put up a clothes line.
85. Smooth a surface with sandpaper.
86. Use a back-saw.
86. Repair flush tank.
86. Clean out traps in sink and floor drain.
88. Serve small articles.
CHART XIV

GENERAL PRACTICAL ARTS ACTIVITIES DESIRED BY
BOYS OF 69 AND LOWER M.A.Q. RATING

Rank
1. Regulate a watch or clock.
2. Build models.
3. Carve small articles.
4. Grease a car.
5. Use a Boy Scout knife.
6. Install electric bells.
7. Use simple woodwork tools.
8. Tie Boy Scout tenderfoot knots.
9. Use a hand drill.
10. Care for tools to prevent rust.
11. Repair, cover, or rebind books.
12. Use a cross-cut saw.
13. Use pliers and wire-cutters.
14. Use a wrench.
15. Sharpen knives.
17. Fit a tool handle.
19. Replace sash-cord and weights.
20. Finish concrete surfaces.
21. Smooth a surface with sandpaper.
22. Solder cooking utensils.
24. Repair puncture with cold patch.
25. Prepare and use glue.
26. Attach casters and gliders.
27. Refinish furniture.
28. Locate and replace blown fuses.
29. Repair flush tank.
30. Make and repair picture frame.
31. Wash and polish car.
32. Trace and test lighting system.
33. Use a rip-saw.
34. Use a lawn mower.
35. Use a jack-plane.
36. Use a file.
37. Splice wire.
38. Put new wire on screen frames.
40. Clean and care for paint brushes.
41. Wire a socket and plug.
42. Test and care for battery.
43. Sharpen a hand-sickle.
CHART XIV

GENERAL PRACTICAL ARTS ACTIVITIES DESIGNED BY
BOYS OF 89 AND LOWER M.A.C. RATING
--Continued

Rank
46. Apply paint on old and new surfaces.
46. Construct a simple telegraph system.
46. Plan and construct a simple motor.
46. Mix and pour concrete.
46. Fit and lay linoleum.
46. Replace light bulbs.
55. Use a hack-saw.
55. Use a back-saw.
55. Bore holes with auger-bit.
55. Sharpen scissors or shears.
55. Adjust a lawn-mower.
55. Tighten loose joints on chair or other furniture.
55. Repair upholstering.
55. Lead gas and electric meters.
55. Plan and construct a simple buzzer.
63. Nail and draw nails.
63. Use a screwdriver.
63. Use corner-braces and mending plates in repairing furniture.
63. Remove dents from kitchen utensils and other utensils.
63. Remove sediment from radiator.
68. Clean and refinish floors.
68. Use lacquer and enamel in home decoration.
68. Make splices in electric wires.
68. Remove stoppage from pipes.
68. Remove and replace tire.
68. Repair puncture with hot patch.
74. Use a cold-chisel.
74. Sharpen screwdriver tip.
74. Sharpen a garden hoe or shovel.
74. Sharpen a plane-bit and chisel.
74. Put knobs or pulls on drawers.
74. Tie an underwriter's knot.
81. Use a steel square.
81. Use a ruler.
81. Remove old finish from furniture.
81. Assemble and repair electrical appliance cord.
81. Plan and construct a transformer.
81. Plan and construct a heater.
81. Plan and construct a simple light circuit.
86. Locate a break in a circuit.
86. Read a working drawing.
86. Put up a clothes-line.
88. Clean out traps in sink and floor drain.
FINDINGS

NOTE: All findings herein noted refer to the Denton Junior High School sixth grade boys or to their fathers and mothers as specified, unless otherwise distinguished.

1. All boys above 95 M.A.Q. had passed all of their work each year and 10 percent of the boys used in this study had skipped one or more grades, while 15 percent of the boys used in this study who were below 95 M.A.Q. were found to have failed one or more years of school work. Those boys who had failed work, ranged as high as 114 I.Q.

2. Seventy-seven percent of the boys who have had little or no guidance in practical arts work have one or more hobbies which directly involve practical arts activities and information units.

3. The boys having poor vision are not limited to any M.A.Q. or I.Q. group, while those having poor hearing range from 100 M.A.Q. downward, and 63 percent of the number having poor hearing are in the I.Q. group of 100 and lower.

4. Seventy-six percent of the mothers of the boys are housewives, while 29 percent of the mothers have outside employment.

5. The former occupations in which the mothers had been engaged may be given as follows: Forty-seven percent, housewives;
21 percent, teachers; 12.5 percent, salesladies; 5.5 percent, nurses; 6.5 percent, field workers. Thus practically one-half of the mothers had never been gainfully employed other than for household work; while a slight percent over one-fifty of them had formerly been school teachers. Other occupations were saleslady, farm and field work, and nurses.

6. The seven leading occupations of the fathers were as follows: Laborers, 11.6 percent; painters, 10.6 percent; carpenters, 9 percent; salesman, 9 percent; farmers, 6 percent; teachers, 6 percent; truck drivers, 6 percent; mechanics, 6 percent. Other occupations employed only from 1 to 3 percent.

7. The nine leading avocations for the fathers were: Reading, 35 percent; fishing, 32 percent; radio, 15 percent; baseball, 10.6 percent; hunting, 10.6 percent; softball, 6 percent; livestock 6 percent; picture-shows, 4.5 percent; carving, 4.5 percent. Other avocations included only from 1 to 3 percent each.

8. The ten leading avocations for mothers were: Reading, 35 percent; sewing, 25 percent; homemaking, 12.5 percent; handwork, 13.8 percent; religious work, 9.7 percent; sports, 8.3 percent; music, 9.7 percent; gardening, 5.5 percent; fishing, 4.1 percent; travel, 4.1 percent. Other avocations range from 1 to 2.7 percent each.
9. Fifty percent of the fathers and mothers were between 36 and 50 years of age. The upper extreme was 66 years of age and the lower extreme was 29 years of age.

10. Sixty-nine percent of the mothers were born in Texas, while 31 percent were born in other states.

11. Fifty-six percent of the fathers were born in Texas, while 44 percent were born in other states.

12. The Denton Junior High School sixth grade boys' scores on the Detroit Alpha Intelligence tests are from ten to twelve points higher at the 75 percentile, median, and 25 percentile than the scores set up for the sixth grade in the Detroit table.

13. The Denton Junior High School sixth grade boys' scores on the Detroit Mechanical Aptitudes Examination are from twelve and one-half to nineteen and seven-tenths higher at the 75 percentile, median, and 25 percentile, than the scores set up for the sixth grade in the Detroit table.

14. The chronological a e median is 12 years and 1 month, while the 75 percentile is 12 years and 11 months, and the 25 percentile is 11 years and 7 months. The median mental age is 12 years and 8 months, and the 75 percentile is 13 years and 9 months. The mental age range is 7 years and 9 months. The median mechanical
age is 11 years and 5 months, and the 75 percentile is 12 years and 2 months, while the 25 percentile is 10 years and 7 months. The mechanical age range is 7 years and 1 month. The median achievement age is 11 years and 2 months, and the 75 percentile is 13 years and 1 month, while the 25 percentile is 11 years and 3 months. The achievement age is 5 years and 5 months.

15. Seventy-one percent of the Denton Junior High School sixth grade boys fall within the LQ group of 96 and above, while 29 percent of them are in the LQ group of 95 and lower.

16. Thirty-nine percent of the Denton Junior High School sixth grade boys fall within the MA IQ group of 96 and above, and 61 percent of them fall within the MA IQ group of 95 and lower.

17. All boys answering the practical arts questionnaire had performed five or more activities out of 126 activities listed and had a working knowledge of one or more of the information units.

18. Activities ranked by the group as a whole were not necessarily ranked for the same place by the separate groups.

19. The different mechanical aptitude quotient groups were interested in practical arts activities.

20. The different MA IQ groups do not have the same practical
arts interests to the same extent; their different interests are
expressed in the different ranking which the various R.A.C.
groups gave the practical arts activities.
CONCLUSIONS

1. Since the purpose of practical arts is to help the boy perform better those practical arts activities in which he might engage as a member of the home, the school, and the community or social group to which he belongs, the sixth grade boys of the Denton Junior High School are in need of practical arts instruction, for seventy-seven percent of those studied have hobbies which are directly connected with practical arts activities.

2. The sixth grade boys of the Denton Junior High School are in need of practical arts training, for 100 percent of those studied were interested in five or more activities which they would perform as a member of the home, the school, and the community or social group to which they belong.

3. The various N.A.Q. groups of boys have interests common to that group and which may or may not be common to other groups, and if each group used should be divided into more divisions, and more cases in each division were available, a more marked difference in the interests of the N.A.Q. groups would become evident.

4. The sixth grade boys of the Denton Junior High School need a practical arts program which will offer widely varied activities suitable to meet the needs and interests of the boys in the different N.A.Q. groups.
5. According to the data gathered the conclusion may be drawn that the occupation of the parents have but little influence, if any at all, on the practical arts interests of the boys.

6. The avocational interests of the boys seem to be influenced by the avocational interests of both parents; hence, the boys practical arts interests are influenced by their parents avocational interests since the boys avocational interests are closely related to their practical arts interests.

7. All boys are more or less interested in practical arts, and the individual boys in the high N.A.Q. group do not necessarily have more or fewer practical arts interests than the boys in the lower N.A.Q. groups.

8. There is more variation in the practical arts interests of the individuals in the separate N.A.Q. groups than there is in the combined groups as a whole; hence, the conclusion may be drawn that a practical arts program set up for the separate N.A.Q. groups might in some cases fail to meet the needs of the individual boys to an extent much greater than would be the case of a comprehensive varied program set up for the group as a whole.
RECOMMENDATIONS

1. Practical arts course content for a group of boys with the characteristics herein studied should be made up of widely varied types of activities and widely varied types of information units.

2. The course content will more nearly meet the need and interests of sixth grade boys in the various M.A.Q. groups if only the first fifty percent of the activities listed are used. However, in some individual cases activities below the first fifty percent may be used to advantage.

3. When the results of this study are to be used in an actual teaching situation, the writer suggests that the teacher select activities for each M.A.Q. group from the first fifty percent of activities and information units for the respective M.A.Q. groups which will aid in accomplishing the purposes set forth.

4. A thorough study should be made of the home environment of the individuals and the course content used should aid in the development of practical arts interests and care for needs which are in line with their domestic surroundings.
BIBLIOGRAPHY


APPENDIX

The practical arts jobs listed below are made up of learning activities set forth in STANDARDS OF ATTAINMENT IN INDUSTRIAL ARTS TEACHING by the Industrial Arts Section of the American Vocational Association.

Practical Arts Jobs

How do you like—

1. To make wagons?
2. To make toy airplanes?
3. To make toy boats?
4. To set up electric trains?
5. To set up "Mechano" or "Erectors" or mechanical apparatus?
6. To take apart an electric iron?
7. To repair and put an iron back together?
8. To take an auto apart?
9. To repair an auto and put it back together?
10. To take a bicycle apart and put it back together?
11. To read articles on mechanical construction of airplanes?
12. To read articles on radio?
13. To figure out drawings?
14. To make drawings?
15. To make crystal radio set?
16. To install radio set?
17. To visit machine shops?
18. To visit electric plants?
19. To visit factories?
20. To ask questions about machinery and how it works?
21. To make toy windmills?
22. To make ornaments of copper?
23. To make ornaments of brass?
24. To curve boxes, trays, watch-foils, buttons, etc?
25. To make wicker baskets?
26. To make cold-iron decorations?
27. To make bird houses of wood?
28. To make bird houses of metal?
29. To make bird houses of concrete?
30. To make flower stands of iron?
31. To make butter-fly mounting case?
32. To make electric bell hook-up?
33. To make first aid kit of metal and wood?
34. To make toys for children?
APPENDIX

How do you like—(continued)

35. To make toys of tin cans?
36. To make kitchen utensils of tin cans?
37. To make kites?
38. To make tackle containers?

List projects which you would like to make:

1. __________________________ 2. __________________________

3. __________________________ 4. __________________________

5. __________________________ 6. __________________________

.................................

Practical Arts Information Units

Would you like to know—

(1) 1. How to distinguish the more common woods in general use in the community and their principal characteristics and working qualities? ( ) 47II

(2) 2. The effect of moisture on wood? 47II

(3) 3. How to protect and preserve woods? 47II

(4) 4. The nominal and actual standard dimensions of lumber? 47II

(5) 5. The object of wood finish? 47II

(6) 6. The durability of the different kinds of finish? 47 II

(7) 7. The materials from which finishes are made? 47 II

(1-2-3) 8. The kinds and sizes of nails and their uses? 38 III-4

(4) 9. How nails are sold? 38 III-4

(6) 10. The sizes of brads and how sold? III 4

(7) 11. The sizes, kinds, and uses of corner-fasteners? 38 III 4

(1-3-4) 12. Kinds, sizes of screws, and how they are sold? 38 III-5

(1) 13. Kinds and grades of sand-paper? III-6

(4) 14. The grades and uses of steel wool? III-6

(13) 15. Kinds and grades of sharpening tools III

(17) 16. The names of the different kinds of pipe fittings? 49-II

(16) 17. How sizes of auger bits and drill are indicated? 49-II

(18) 18. How water pipe is dimensioned? 49-II

(19) 19. The names of the different kinds of plumbing fixtures and fittings? 49-II

(20) 20. The names of the different wrenches and the purposes for which they are used? 48-II

(21) 21. The sizes of wire? 49-II

(22) 22. The kinds of rope and method of dimensioning? 48-II
APPENDIX

Would you like to know—(continued)

(23) 23. The distinguishing characteristic of the more common metals? 48-II
(24) 24. The gages of sheet steel? 48-II
(26) 26. Safety with respect to home electrical appliances? 48-II
(Safety) 27. How to give first aid treatment?
(Mechanical Drawing) 28. How to make a mechanical drawing a simple project?

List things which you would like to know about:

1. __________________________ 2. __________________________
3. __________________________ 4. __________________________
5. __________________________ 6. __________________________
APPENDIX

General Practical Arts Activities

(1) 1. Nail and draw nails. 47-1
(2) 2. Use a hack-saw. 47-1
     3. Use a screwdriver. 47-
(20) 4. Use a hack-saw. 35-1
     5. Use a rip-saw. 47-1
     6. Use a cross-cut saw. 47-1
(Woodwork) 7. Use a steel square
(Woodwork) 8. Use a ruler.
(10) 9. Use a lawn-mower. 47
(11) 10. Use a cold-chisel. 47-1
(General Metal Work) 11. Use pliers and wire-cutters.
(15) 12. Use a hand drill. 47-1
(Handicrafts) 13. Use a Boy Scout knife.
(39) 14. Use a jack-plane. 12
(17) 15. Use a file. 47-1
(12) 16. Use a wrench. 47-1
(16) 17. Bore holes with auger bit. 47-1
     18. Shape screwdriver tip. 47-1
     19. Sharpen knives. 47-1
(6) 20. Sharpen scissors or shears. 47-1
     21. Sharpen a garden hoe or shovel. 47-1
     22. Sharpen a plane-bit and chisel. 47-1
(8) 23. Sharpen a hand-sickle. 47-1
(9) 24. Adjust a lawn-mower. 47-1
(14) 25. Splice wire. 47-1
(20) 26. Prepare and use glue. 47-1
(21) 27. Cut and set glass. 47-1
(24) 28. Put new wire on screen frames. 47-1
(26) 29. Fit a tool handle. 47
(27) 30. Tighten loose joints on a chair or other furniture. 47-1
(28) 31. Use corner-braces and mending plates in repairing furniture. 47-1
(29) 32. Put knobs or Pulls on drawers. 47-1
(30) 33. Attach casters and gliders. 47-1
(31) 34. Reseat chairs. 47-1
(34) 35. Repair upholstering. 47-1
(33) 36. Remove old finish from furniture. 47-1
(34) 37. Refinish furniture. 47-1
(35) 38. Clean and refinish floors. 47-1
(36) 39. Apply paint on old and new surfaces. 47-1
(37) 40. Use lacquer and enamel in home decoration. 47-1
(39) 41. Clean and care for paint brushes. 47-1
     42. Install electric bells. 47-1
(40) 43. Renew carbon brushes in small motor. 47
(20) 44. Locate and replace blown fuses. 40-1
(43) 45. Wire a socket and plug. 47-1
APPENDIX

General Practical Arts Activities

---continued

(44) 46. Read gas and electric motors. 47-1
(5-6-7-8) 47. Make splice in electric wires. 40-1

(Elementary)

(48) 49. Assemble and repair electrical appliance cord. 40-II
(20) 50. Construct a simple telegraph system. 41-4
(8) 51. Plan and construct a transformer. 41-4
(10) 52. Plan and construct a simple buzzer. 41-4
(15) 53. Plan and construct a simple motor. 41-4
(1) 54. Plan and construct a heater. 41-4
(17) 55. Plan and construct a simple light circuit. 41-1
(31) 56. Tie an underwriters knot. 40-1

(Handicrafts) 57. Build models.

(48) 58. Repair flush tank. 47
(49) 59. Clean out traps in sink and floor drain. 47
(50) 60. Remove stoppage from pipes. 47-1
(53) 61. Replace mash-cord and weights. 47-1
(55) 62. Wrap and tie packages properly. 47
(56) 63. Tie Boy Scout tenderfoot knots. 47-1
(1) 64. Read a working drawing. 35-1
(3) 65. Plan the procedure in doing a job. 35-1
(60) 66. Mix and pour concrete. 47-1
(61) 67. Finish concrete surfaces. 47-1
(63) 68. Care for tools to prevent rust. 47-1
(64) 69. Put up clothes-line. 47-1
(65) 70. Fit and lay linoleum. 47-1
(3) 71. Smooth a surface with sandpaper. 38 III 6

(Woodwork) 72. Make or repair a picture frame.
(Selected) 73. Repair, cover, or rebind books.
(Woodwork) 74. Use simple woodwork tools.
(6) 75. Solder cooking utensils. 51-1

(Home Mechanic) 76. Remove dents from kitchen utensils and other utensils.

(Home Mechanic)

(77) 78. Regulate a watch or clock.
(4) 79. Grease a car. 44-1
(5) 80. Change oil in engine. 44-1
(6) 81. Wash and polish car. 44-1
(9) 82. Replace light bulbs. 44-1
(10) 83. Remove sediment from radiator. 44-1
(11) 84. Test and care for battery. 44-1
(15) 85. Remove and replace tire. 44-1
(14) 86. Repair puncture with cold patch. 44-I
(15) 87. Repair puncture with hot patch. 44-I
(33) 88. Trace and test lighting system. 45-II

(Woodwork) 88. Carve small articles.

The ( ) indicates activity; first number, 48 etc., indicates page; second number, 1,2,3, etc., indicates group.
# APPENDIX

## Comparative Ranking of General Practical Arts

Activities by Various M.A.Q. Groups

<table>
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<tr>
<th>General Practical Arts Activities</th>
<th>105 and Above M.A.Q. Group</th>
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### APPENDIX

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## APPENDIX

### Comparative Ranking of Practical Arts Information

Units by Various MAQ Groups

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(W) Practical Arts Information Units listed in the order in which they appeared in Practical Arts Interest Questionnaire.

(X) Is the total weighted scores for each group on each activity.

(Y) Is the tentative ranking given for each group on each activity.

(Z) Is the corrected ranking for each group on each activity.
## APPENDIX

### Comparative Ranking of Practical Arts Jobs by Various M.A.Q. Groups

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<th>Practical Arts Job No.</th>
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(W) Jobs listed as they appeared on Practical Arts Interest Questionnaire.
(X) Is the total weighted score for each group on each activity.
(Y) Is the tentative ranking given for each group on each activity.
(Z) Is the corrected ranking for each group on each activity.
PERSONAL DATA SHEET
FOR BOYS

Name ______________________ Age ______ Birth date ______ Date ______

Grade ______ Sex ______ Place of birth ______

Present address ____________ Street or RFD ____________ city ____________
county ______ state ______

Father's address ____________ Street or RFD ____________ city ____________

Mother's address ____________ Street or RFD ____________ city ____________

Years child has attended school ______ Grades repeated ______
Grades skipped ________ Schools attended ______

State ______ Name of school ______ city ______ state ______
state ______ Name of school ______

city ______ state ______ Name of school ______
State ______

List addresses where you have lived with your parents ______
city ______ state ______

List states in which you have traveled ______

1. ______ 2. ______ 3. ______ 4. ______ 5. ______

Make a list of your avocations or hobbies ______

1. ______ 2. ______

3. ______ 4. ______ 5. ______

List the clubs of which you are a member ______

1. ______ 2. ______ 3. ______

4. ______ 5. ______

Disease history: Whooping-cough ______; Mumps ______; Measles ______; Adenoids ______
Scarlet-fever ______; Diphtheria ______; Pneumonia ______; Malaria ______; Typhoid fever ______; Tonsilitis ______; Pink eye ______; Itch ______; Trench Mouth ______
Vision: Good ______; Poor ______; Hearing: Good ______; Poor ______; Weight ______
Height ______. Physical development: Immature ______; Normal ______; Overmature for age ______; Number of children in family ______; Boys ______; Girls ______.
Older ______; Younger ______.

Test Record: 1. ______________________ Score ______ M.A. ______ I.Q. ______

2. ______________________ 3. ______________________ 4. ______________________

5. ______________________ 5. ______________________

Date tests were given: 1. ______ 2. ______ 3. ______ 4. ______ 5. ______.
APPENDIX

DATA SHEET CONCERNING PARENTS

Name of student: ____________________________ Age: ________________

Present address: ____________________________
Street or RFD: __________ City: __________ State: __________

FATHER

Name: ____________________________________ Age: ________________
Last name: ______ other names: ______ Month, day, year: ______ Total years: ______

Place of birth: ____________________________ City: __________ County: __________ State: __________

Education: Ward school: ______ High school: ______ College: ______
University: ______ Professional school: ______ Technical school: ______

Degrees: ______ Honors: ______________________

World war veteran: ______ Time spent in service: ______ At home: ______
Abroad: ______ Service record(Special honors): ______________________

Occupation: ________________ Number of years in present occupation: ______
List former occupations in which your father has engaged: ______________________
Avocation: ______________________

MOTHER

Name: ____________________________________ Age: ________________
Last name: ______ other names: ______ Month, day, year: ______ Total years: ______

Place of birth: ____________________________ City: __________ County: __________ State: __________

Education: Ward school: ______ High school: ______ College: ______
University: ______ Professional school: ______ Tech. school: ______

Degrees: ______ Honors: ______________________

Present occupation: ______________________ Former occupations: ______________________
Avocation: ______________________