

ABSTRACT OF A THESIS

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A COMPARISON OF THE COOPERATIVE METHOD  
OF TEACHING FILING  
WITH  
THE TRADITIONAL TEXTBOOK METHOD

Submitted by

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In partial fulfillment of the requirements  
for the Degree of Master of Education

Colorado

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ABSTRACT.

Although cooperative office training has been offered in various sections of the country for a number of years and in Topeka for two years prior to this experiment, it was questionable as to whether the most effective vocational method of teaching filing was being employed. The classification "file clerk" was the most common division of the clerical field according to Topeka employers' own classifications. Because the clerical office workers compose such a large division of the locally employed persons, it was decided to test an individual plan against a traditional textbook plan of teaching through actual experimentation in the filing division of the clerical field.

The Denver plan.

A plan of individual instruction was developed in Denver by Hinderman and other administrators and is referred to as the "Denver plan." It had helped most effectively in training for the war emergency and may become much used in post-war vocational education. It is based on A Unit of Instruction: How to Organize It and How to Teach It. This plan has been used successfully for several years at the Emily Griffith Opportunity School, but no scientific measurement had been made to determine its effectiveness in the field of filing when compared with a traditional textbook method. However, Hershey (15) had in progress at the time this study began an experiment in the writing of business letters.

It was decided to set up two matched groups and use the Denver plan for teaching filing to the experimental group. Employers' job specifications on cooperative jobs showed that all of them desired filing training for their vocational students in office practice. This added additional weight to the desire to test the individual plan against the traditional plan then in common use.

The decision to test the Denver plan for the experimental group against the traditional textbook plan for the control group led to a statement of the problem as "What is the effectiveness of the cooperative, job-specification plan of teaching filing compared with the traditional textbook method?" when the experimental group is taught according to Denver's A Unit of Instruction: How to Organize It and How to Teach It.

Analysis of this major question revealed that five subordinate questions should be answered through research and experimentation, as follows:

1. What is the cooperative vocational plan of teaching filing?
2. What is the traditional textbook method?
3. How are the experimental and the control groups to be organized?
4. What methods and devices shall be used in making evaluations?
5. What are the results?

#### Procedure.

The basic skills and related information used in the business practice of filing were obtained by reference to authori-

ties on the campus of Colorado Agricultural and Mechanical College, through employer specifications, and by submission to the business advisory committee in Topeka. These formed the basis of the content used in both the control and experimental groups, together with the textbook used by the control group. Matched pairs chosen from the girls in the office practice classes, cooperative and non-cooperative, made up the experimental and control groups for this experiment. Criteria used in selecting students and determining the equivalency were: chronological age, sex, grade in high school, previous grade average, intelligence, knowledge of business fundamentals, and knowledge of filing. All students used in the experiment were girls in the senior year of high school. Application of the critical ratio formula showed no statistically significant differences between the two groups, since the  $t$  scores ranged from 0 to .98. The teacher's conclusion that these critical ratios were not significant was based on Treloar's (36:32) statement that a critical ratio of two or more is required for statistical significance and also upon Remmers and Gage's (33:550). Two or more was regarded as a significant quotient in this experiment. Less than that as insignificant.

Statistical calculations. To arrive at a critical ratio, ages, grade averages, and scores were placed in frequency tables and arithmetic means calculated from a guessed mid-point according to the accepted formula:  $A. M. = \text{Guessed } M-P + (\frac{t}{c})S$ , when "A. M." is the arithmetic mean, "M-P" is the mid-point, "c" is the correction, and "S" the step interval between frequency ranges.

The correction formula is:  $c = \frac{fd - fd}{N}$ . "C" is the correction, "f" the frequency, "d" the deviation above or below the guessed mid-point, and "N" the number of cases. Standard deviations of the scores were computed from Greene's formula (11:60):

$$\sigma = \left( \frac{fd^2 - (c)^2}{N} \right)^{1/2}$$
 S.  $\sigma$  is the standard deviation, "f" the frequency, "d" the deviation, " $\Sigma$ " the sum of, "c" the correction, and "S" the step interval.

Standard errors of the two means were calculated from the common formula:  $S. E. = \frac{\sigma}{\sqrt{N-1}}$  when "S. E." is the standard error of the mean, " $\sigma$ " the standard deviation, and "N" the number of cases.

Finally, the arithmetic means of the two groups were substituted in Treloar's critical ratio formula (36:29):

$$\underline{t} = \frac{AM_c - AM_e}{\sqrt{(S. E. _c)^2 + (S. E. _e)^2}}$$

" $\underline{t}$ " is the critical ratio. " $AM_c$ " is the arithmetic mean of the control group, and " $AM_e$ " the arithmetic mean of the experimental group. " $SE_c$ " is the standard error of the mean of the control group and " $SE_e$ " is the standard error of the mean of the experimental group.

The teaching included a total of 27.5 clock hours in filing. Each group was instructed by the writer of this study. Both groups handled the same filing materials and covered the same minimum content.

In the control class, instruction was by the traditional textbook method and included lectures and reading. Students asked questions and took notes as they desired. They also read the material as presented in their textbooks. Assignments were then

made in accordance with the study plan outlined in the appendix of their textbook, Progressive Indexing and Filing. Each student was allowed to progress at her own individual rate, although the daily textbook assignment was considered the minimum. Tests were given and reviewed in accordance with the printed schedule found in the appendix of the textbook.

Instruction in the experimental class was given as each student was ready for it and as she reached filing in her individual work plan. In order that experience and teaching on the job might be accumulated, none was taught until the second semester of her work program. Each student worked at her own rate of speed. Learning activities were divided into seven blocks of type jobs and a test job was given as each student completed the block. In this test, the student worked entirely independently of the instructor, and if successful, progressed to the next block. If unsuccessful, she reviewed the block just completed, was reinstructed, removed the difficulties, and passed another test job before moving to the next assignment.

#### Findings.

Reference to authorities, including the local advisory committee as well as persons on the campus of Colorado Agricultural and Mechanical College showed that the basic skills and related information required for successful filing on the job were as set out by the content analysis chart (Exhibit B of the appendix, page 124). Review of standardized tests based on these skills resulted in the selection of the National Clerical Ability Filing Test,

series 1941, as that by which the results of the experiment were evaluated. This filing test was first administered to the control and experimental groups at the start of the experiment, scored, and rechecked according to the test instructions. Reference to the minimum passing score of 128.5, established by the Joint Committee on Testing showed the employability of students according to business standards of filing. No member of either group reached that standard on the pre-test. Application of the critical ratio formula to the scores of both groups indicated no statistically significant difference between them.

The second administration of the test showed a t score of 6.09, which is a significant difference between the groups in favor of the experimental group. Sorensen's table (35:367) shows that the chances are very slight that this is not a true difference. Reference to the minimum passing score of the Joint Committee on Tests showed that 76 per cent of the experimental group and 15 per cent of the control group had reached or passed the minimum score of 128.5

#### Conclusion.

The cooperative plan based on the vocational unit of instruction method as it applied to this filing experiment proved itself significantly superior to the traditional textbook method of instruction. Reference to the t score proved that in teaching filing, this cooperative plan based on the individual unit of instruction is a desirable method for use in the filing division of vocational education.

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T H E S I S

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July 16, 1946

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Herbert D. Shotwell

ENTITLED A COMPARISON OF THE COOPERATIVE METHOD OF TEACHING FILING WITH THE TRADITIONAL TEXTBOOK METHOD

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION.

MAJORING IN TRADE AND INDUSTRIAL EDUCATION

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Acknowledgment should also be made of the contribution which might easily be overlooked by a person observing carelessly

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made by the students who participated in the experiment. Grateful acknowledgment is also made to their immediate work supervisors for their understanding of the problem of training students and their active cooperation in making job analyses.

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CHAPTER I.

INTRODUCTION.

For the past 100 years, the various fields of business science have been striding forward, although not at a uniform pace. Filing, the orderly arrangement and classification of written materials, is the last field to develop on a scientific basis. It has passed through several rather definite stages (29:19). First, the "remembering" era in which there were few records and the proprietor or clerks remembered the details of the business. In the second stage, the country had grown, business had expanded, and more records had to be kept. In this period, the written word took the place of the spoken word and clerks retained all papers relating to their particular duties. As a consequence, papers of importance were lost and headaches developed from their loss. The third stage, which extends to the present, began about twenty-five years ago when progressive firms reorganized their businesses into departments and opened branch offices. At this time, they found that personal and divisional files destroyed the continuity of records.

Central filing departments followed closely the development of vertical filing which stood papers on edge within folders that could be opened like a book without the necessity of unfolding filed papers. This, of course, was made possible by the introduction of vertical filing at the Chicago World's Fair in 1893. Its

use by business resulted in the saving of time, reduction of costs, and a fixing of definite responsibility for the whereabouts of business papers (29:20). So successful has it been that practically all businesses today use centralized files or controls.

Methods selected for filing today are chosen on the basis of use. There are three principal ways of filing written materials: alphabetically by name, by subject, and by location. Numeric filing offers a variation under an alphabetic card control and Soundex gives a phonetic solution of the problem of wide variations in spelling of common names. From these basic systems and their variations, business has selected the one or ones most suited to its use.

With the development of modern vertical methods came a need for trained workers who understood the scientific background of the systems employed by almost-universal centralized filing departments. No longer, as in the second stage, could filing be the responsibility of the person producing the record, or a stenographer be delegated the "unwelcome task" of running the files. Manufacturers of filing equipment developed file clerks within their own organizations first and then set up company schools in the cities to teach the fundamentals of filing to clerks who could operate under the manuals that now guide every well-organized filing department.

#### Significance of the problem.

From the school point of view, the teaching of filing as a part of clerical practice came slowly and unevenly. With the

introduction of shorthand, typing, and bookkeeping into the school curriculum, came the conviction that these were all that were necessary in the preparation for a life career in business. These courses were included in the curriculum merely as electives for those students who rejected the traditional college preparatory courses and insisted upon something which would serve their needs immediately upon graduation from high school.

At the present time, filing is taught in the office practice courses of practically all business schools, commercial courses in high schools, and in some colleges and universities.

Shaw (34:73) found that 98 of 114 schools in cities of over 100,000 population replying to her questionnaire reported offering actual practice in filing. The largest number, 97 per cent, reported filing as a part of their office practice courses.

Nichols (27:214) says that 85 per cent of office work is non-bookkeeping, non-typing, and non-stenographic, while 85 per cent of enrollments are in one of those fields. He further states that "one-third of all high school enrollments occur in the clerical field."

The file clerk has become a job of great importance and complexity. It is high time that the clerical courses should be given a major place in the program to the end that vocational business training may become more responsive to current demand for office help.

Holmdahl (17:144) recommends that the dominance of stenography and bookkeeping be eliminated and that office practice be put on a par with them. Surveys should determine what can best be included in the office practice course. The course should be at least one year in length and should develop specific skill in

duties to which the students seem best adapted. She quotes Arnold's findings in New York City as to the value of the cooperative plan in teaching office practice, showing that these students have more rapid salary raises and smaller turnover. 1/

Potter (31:28) in her 1945 publication, An Analysis of the Work of General Clerical Employees, notes that filing has long since been regarded as

one of the common activities of office workers and practically every training program includes some consideration of filing. . . . There is also a tendency, because of the commonness of its presence to neglect subjecting the teaching of it to critical examination.

Her percentages of time spent on filing in various kinds of offices indicate that it is one of the most important of all clerical practices. She found that it occupies 16.8 per cent of the time of general clerical workers in banking, 22.5 per cent for those in government work, 12.6 per cent for those in public utilities, 57.6 per cent for those in railroad offices, and even 10.5 per cent of the time of those engaged in retail selling. She also includes the activities of classifying and sorting under non-specialized work, although these are common activities of all file clerks.

The U. S. census of 1940 points out (37:102):

The clerical group increased more rapidly in relative importance than any other--from 0.6 of all workers in 1870 to 8.2% in 1930 . . . . .  
In 1940, the proportion of female workers in this group increased even more strikingly--from 0.1 in 1870 to 18.5% in 1940.

1/ Arnold, Frank J. Comparative study of a cooperative commercial program and a non-cooperative program. Master's thesis, New York University, 1928. 82 p. ms.

Of the total labor group of 583,626 in Kansas, the clerical, sales, and kindred workers number 83,839. This group ranks second to the farmers and farm managers classification.

In Topeka, the clerical, sales, and kindred workers number 9,931, the largest group in the city, and compose over 25 per cent of the total labor force of 36,126.

Poort (30:20) in his 1941 thesis entitled Occupational Opportunities for Business Workers in Topeka, Kansas, surveyed 105 firms engaged in wholesale and retail distribution, transportation, manufacturing, and banking. His study of 6,273 employees shows that 2,387 of the total 3,466 are engaged in secretarial and similar activities, 1,044 in accounting, and 35 in financial-type employment. In addition, he found 1,539 in general clerical positions such as office boys and girls, messengers, special clerks, switchboard operators, and miscellaneous. Many of these include the filing process in part or completely as one of their duties.

Since his study included the major number of employed clerical workers and covered all fields of office activity, its proportions of workers can be considered substantially correct.

His use of a questionnaire in directed personal interviews with employers rather than through employee contact probably gave a truer picture of real employment levels than census data; employers appear much less likely to select classifications on a higher-sounding level than some employees might under such circumstances. For that reason, his selection of employer classifications and obtaining his information from them would seem to offer a more valid picture of the various jobs.

Topeka and its vocational training.

This capital city of 67,833 population (37:144) is the home of state offices, state or national headquarters of many insurance companies, several foundries, three large meat packing plants, numerous stores and wholesale organizations, and the Santa Fe Railroad office building, and is predominantly an office town. Its business training program covers the clerical field through cooperative courses in retail selling and office practice. Both of these are Federally-sponsored programs. It also offers office practice to high school seniors on a non-cooperative basis. The cooperative group operates on an individual instruction basis, with 450 hours of coordinated business experience in most student programs for which one credit per semester is offered.

The problem.

Since the clerical office force in Topeka is such a large portion of the total working group, and because of the fact that office practice is offered on both an individual instruction and a traditional textbook plan, the question of which is more effective is vital. As previously pointed out from Poort's findings, more office workers are classified as "file clerks" than any other division of clerical workers.

With the question of method presented in sharpest focus, it became necessary to select the unit from the general field of office practice upon which experimentation should first be made. "File clerk" was the most common designation of clerical worker in the city. Hence the question arose, "What is the effectiveness of



the cooperative, job-specification plan of teaching filing as compared with the traditional or textbook method?"

In attempting to solve the problem by analysis, the following sub-questions emerged:

1. What is the cooperative plan of teaching filing?
2. What is the traditional or textbook method?
3. How are the experimental and control groups to be organized?
4. What methods and devices are to be used in making evaluations?
5. What are the results?

By securing answers to these subordinate questions, the answer to the major question, "What is the effectiveness of the cooperative, job-specification plan of teaching filing as compared with the traditional or textbook method?" will be found.

Since the job analyses for the cooperating firms show few jobs with many points of similarity and because employers' order of preference vary widely, the teaching plan of the cooperative group had to possess to an outstanding degree two characteristics: It had to be individual and thorough, but at the same time flexible enough to accommodate itself to the jobs encountered.

#### Individual instruction.

Hershey (15:21) states:

Individual instruction has long been recognized . . . as a very real basis for meeting the needs of individual growth and learning. . . .

Teachers are genuinely concerned as to the best methods of helping each student, for they recognize that the uniqueness of every individual is expressed in many ways.

She traces (15:22) the development of individual plans of instruction from Harris rebellion in 1868 against the requiring of all students to do the same amount of work in secondary schools; his recommendation for the organization of the curriculum into units, and the placing of students in flexible groups so that the faster ones could be promoted every five weeks and the slower need repeat only "a relatively small part of the year's work."

Also mentioned is the Batavia plan of special coaching for individuals as needed and Search's development of individual instruction within the grade school system for the schools of Pueblo, Colorado. "This marked the beginning of the modern individual instruction movement."

She traces Burke's development in San Francisco Normal School of special "techniques and devices for teaching . . . school subjects individually to pupils in a class group," and states that it was widely adopted by other school systems and became the foundation of the Winnetka system which instituted improvements, became widely publicized and copied.

Also mentioned is Parkhurst's "Dalton Plan," based on contracts covering a month's work and subdivided into daily portions of "problems of special readings, written work, and other exercises." She points out (15:24) that it could be used by only a few teachers, "if desired, instead of by the whole school."

Morrison divided work into units "' capable of being understood . . . rather than merely . . . remembered.'" Miller's deviation of the Dalton plan was to substitute "over-all units of learning" for the daily lesson and to allow students to work together

until challenged and enthused at the beginning of each unit. Then they worked individually under the teacher's guidance on contracted problems and finally came together again for discussion and unification of their work. Under an adaptation of his plan, students were allowed to choose their grades at the beginning of an elective course and worked toward that grade on their contracts.

Hershey (15:125-6) ascribes the passing of all but the Winnetka and Dalton plans to these factors: (1) Rapid increase in enrollment which reduced the amount of funds and number of teachers available. (2) Failure to achieve results due to introduction of individual plans without thorough knowledge of their methods. (3) Individual techniques are difficult and there were too few teacher-training agencies. (4) Strong leadership that made individual instruction successful was lost, causing a return to cheaper and easier methods. (5) . . . "and finally there was a swing away from over-concern with subject matter" and the "substitution of ability grouping, differentiated assignments . . . enrichment . . . minimum essentials . . . and group projects."

She further points out that vocational education has generally regarded individual instruction as a necessity because students enroll at irregular intervals and in response to a felt need. Hence, they miss too much under group instruction plans and their levels of competence vary so much that they must be allowed to start at the level of "skill, experience, and occupational aptitude" which is theirs at the time of entry. (15:26)

The Federal Government recognized the need for financial assistance in organizing these individual programs and to meet the

higher expense involved in individual instruction and lower pupil-teacher ratios by the passage of the Smith-Hughes Act of 1917 and the George-Deen Act of 1936. Funds set up are used for reimbursing teachers' salaries for vocational work in the local schools on the basis of dollar-for-dollar matching. Office work is included in the statement of policies for the administration of Vocational Education by the office of education for the United States as a part of trade and industry. (39:65). This applies only to Smith-Hughes funds. To qualify for this program, it is necessary that the student spend 50 per cent of his time in actual office work on a cooperative basis.

War demands increased the need for trained workmen and the principles of vocational education were compacted and streamlined into such war training programs as the War Manpower Commission's Job Instructor Training, Job Methods Training, Job Relations Training, and How to Learn a Job. For the retailing field, the Business Service Division of the U. S. Office of Education produced How to Teach an Employee and Human Relations Training. The latter was designed (1) to prevent many personnel management problems from arising and (2) to solve those that did arise without loss of production or the services of a valuable person in the organization.

White states (41:100):

Job instructor training is an old and well seasoned product with a comparatively new label, put up in an attractive package and tied with a bright new ribbon. In the crucible of experience, it is as old as resourceful teaching and as new as cold analysis.

Job instructor training is not to be confused with mass production methods or group instruction. It is

individual training. Its aim, objective, and goal is to train a person to do a job, quickly, correctly, and conscientiously.

At this time, the Vocational Division of the Denver Public Schools was also developing a more thorough and comprehensive plan (6:29) based upon these modernized principles of vocational education and called A Unit of Instruction: How to Organize It and How to Teach It. (6) This plan was successful in wartime training, and bids fair to become the basis of individualized instruction in many fields because of its careful tying up of operation (skill) sheets with closely related information sheets and with the actual practice of the student on various jobs within the units of a field.

Since the job analyses for the cooperating Topeka firms show few jobs with many points of similarity and because employers' order of preference vary widely, the teaching plan of cooperative business classes must possess two characteristics: It must be individual and thorough, but at the same time flexible enough to accommodate itself to the jobs encountered. The Denver plan was chosen because it meets these two needs of the individual plan used by the experimental group.

Other studies of the same or a similar nature will be discussed in the following chapters.

CHAPTER II.

REVIEW OF RESEARCH.

Some excellent studies and comments have been made by competent persons in the file division of office practice training in business education as well as in the field of experimenting on a comparative basis. Many of these have been brought to light in the review of research. Those which relate to Question 1, "What is the cooperative plan of teaching filing?" are as follows:

R. B. McHenry (23:285) is author of an article published in the Industrial Arts and Vocational Education Magazine for September, 1941, entitled Measuring Accomplishments in Cooperative Part-Time Training, which states:

All plans of cooperative part-time work have as an objective the training of youth on the job, plus the giving by the school of technically related and generally related subject content which is necessary to make a trainee efficient in his vocation. . . .

In all communities, the cooperative part-time work provides a minimum of 20 clock hours per week of experience on the job and ten hours or more in the generally related or technically related subject content. The job training, technically related, and generally related material are determined by an analysis of the occupational field and through the counsel of the employer, advisory committee, employees, and others in the occupation.

The coordinator's activity as related to the cooperative part-time school is two-fold: first, he works as a supervisor to trainees training in the shop, business, or laboratory; second . . . the coordinators spend a portion of each day teaching general and technically related material to the trainees in their organized related classes.

This article is important because it gives the job-speci-

fication background for teaching filing and other cooperative subjects and tells how work experience is used as a training device in cooperative part-time programs.

William E. Haines (13:258) published an article in February, 1943, entitled Work Experience and Business Education in which he concludes:

Vocational and early integration demands the integration of adequate actual work experience with classroom instruction. . . . Brief and sporadic periods of training are not sufficient.

He further states that employers prefer pre-experienced students and that if business education is to be truly vocational, it must cause its program to stem from the needs of the employer. Finally he states that cooperative part-time classes . . . can meet these needs.

In 1938, Thomas L. Norton (28:153) in his book, Education for Work, which was based upon the New York Regents' inquiry into the character and cost of secondary education, recommends that part-time cooperative work in business occupations be given on a broad basis. The student can then use his training to advantage in more than one type of employment. As Poort (30) pointed out, filing is the most common office position in Topeka; this comment confirms the use of filing as the basis of this experiment and sets up the cooperative part-time plan as one most desirable. Thus Norton's recommendation adds weight to the selection of filing as one of the most important skills to be acquired under the cooperative plan.

Elvin S. Eyster (9:4-5) in an address delivered at the Regional Conference on Business and Distributive Education held at

the Oklahoma Agricultural and Mechanical College on June 16, 1944, entitled Cooperative Secretarial Training, defined cooperative training as the inclusion in the school program of actual work on the job with definite traditional instruction material which relates to the job experiences themselves. He also said "There must be two periods in job instruction to two in academic work."

He listed subjects to be put in cooperative office training as office practice or clerical practice, secretarial practice, filing, machine transcription, and bookkeeping.

This statement is important in that it clearly defines cooperative training in filing as well as other business subjects and recommends that filing be included in the group of subjects for which cooperative office training should be given.

McDougall (22:83-4 ff) in his 1943 thesis, entitled Description of Student Work Programs with a Specific Evaluation of the National Youth Administration Work Program in the Secondary Schools of Ohio, presents similar definitions for cooperative part-time work programs. He finds commercial education within the definition of work programs, that its courses are considered very valuable by school administrators and the public, and that the cooperative part-time plan is the answer to the desire to supply some form of work experience and vocational training for youth.

Further findings were that 1,103 of the 1,252 high schools in Ohio provided work experiences in one or more programs. There were two types used: (1) Those not directed specifically to training an individual for a specific employment and (2) the other type, largely sponsored by the Federal Government.



Guidance trends in Ohio indicate that the function of the secondary school will be to assume some responsibility for placement. Education through work experiences and work programs provides practical demonstrations of modern educational theories. He heartily endorses the use of Federal funds and places the responsibility for initiating programs on local communities. He declares that only by complete knowledge can the school adapt its program to serve community needs, and that the major responsibility for school-community coordination rests with the school administrators.

These findings are important in that they explain cooperative plans of teaching clearly and advocate the Federally-sponsored type of program offered the experimental group in Topeka.

The following research bears upon Question 2, "What is the traditional or textbook method of teaching filing?"

Holmdahl (17:98-9 ff) surveyed the office training programs of the United States in cities of over 8,000 population in 1931. Her survey of some 400 senior high schools disclosed a wide variation in equipment and subjects taught. Filing was included in 97 per cent of the courses, all of which used texts and sometimes supplementary practice equipment. Sometimes filing was taught from separate texts and at other times it was taught from secretarial or office practice books having a section or sections devoted to filing.

Further findings were that time given to filing ranged from five to 36 hours of instruction; "equally great diversity was found in the topics included in the course as in equipment and texts used"; there was little uniformity in prerequisites; most schools gave it in the fourth year of high school; little business material

was used and few permitted dropouts to put in a large amount of time in office practice. One-half the schools offered less than ten hours of training in filing and indexing.

The two most-used texts were SoRelle's Secretarial Practice and Library Bureau's Progressive Indexing and Filing.

Few schools offer office practice. California and Pennsylvania lead the states in which it is offered. A majority offer one semester of five hours a week in the fourth year. There was confusion in interpretation of the terms "office, clerical, and secretarial." The proportion of commercial students taking office practice is very low. A majority of courses are secretarial practice. General skills instead of specific skills are stressed; time given is too short for real skill training; there is no uniformity in practical experience; teachers have little or no work experience, a small amount of academic training. Holmdahl also states that surveys and analyses of business organizations, duties of employees, machines used, and checkups of graduates are helping. She recommends wider use of actual business material and increase in the practical experience available to students.

These findings are important in that they show texts to be the principal traditional method of teaching filing and the one used for the control group in Topeka as most commonly used. Also, that use of job specifications helps in improving instruction.

Shaw,(34:40-41 ff) in her 1935 Study to Determine the Status of Cooperative Business Education in the Public Secondary Schools of the United States, found that 23 of 85 cities over 100,000 in population in 19 states offered cooperative business education.

Of this number, 38 per cent offered filing, 38 per cent offered bookkeeping, and 47.6 per cent clerical work. Coordinators were used by 80 per cent and 100 per cent offered the work in the eleventh or twelfth grades. As their objective, 100 per cent gave: the acquiring of a "marketable skill or semi-skill by learning the fundamental subjects" while experiencing participation in business.

Further findings were that those participating in the plan than those not participating or those engaged in research; enrollments vary greatly; requirements and teacher qualifications vary widely.

Her conclusions were that a small number of schools offer cooperative business experience programs; small numbers elect it; the expense is great; there might be placement difficulty if many adults were unemployed; and its future depends on changing economic conditions.

Shaw's findings are significant in that they show that the cooperative plan is not the predominant plan in about two-thirds of our large cities; that those who participate in it are enthusiastic; and that filing and clerical work predominate in those schools which teach under this plan.

Agnes Lebeda (21:24-6) wrote an article in January of 1942, entitled Office Practice in Ten States. She found the same wide diversity in equipment and texts as Holmdahl, but the predominating method of teaching filing was again on the basis of the traditional textbook method.

She sets up as objectives: Give the student a workable knowledge of filing"; furnish opportunities for effective partici-

pation on the job as office workers; prepare students directly for office work. She also characterizes the cooperative plan as "one of the most effective but one of the most difficult to put into operation."

Her study is important in that it includes Kansas and shows that the textbook is the traditional method of teaching filing in Kansas; that it predominates in these ten states; and that the cooperative plan is a desirable one.

Mott in New York, Lappenbush in Washington, Buchen (4) in Wisconsin--all set up programs for teaching filing and other phases of office practice on the basis of generalized needs of business and under the traditional methods of teaching by textbooks rather than by providing job experience and developing individual units of instruction from the felt needs found in actual employer specifications.

The above research has pointed out that the traditional method of teaching is by textbook, with some use of actual business materials. Two of the writers have stated that Progressive Indexing and Filing is the most commonly used text.

The following comments and findings have bearing upon Question 3, "How are the experimental and control groups to be organized?":

Werrell (40:13) in his 1938 thesis entitled A Study to Develop an Employment Procedure Through Job Analysis and Job Specifications used Form One of a job analysis sheet developed by the Minneapolis Civic Association (24:76). It was found satisfactory by three of the largest industrial firms in Denver for the purpose

of securing job information from employers. This is the form used for obtaining such information by direct interview with the employers of the experimental students. A copy appears as Exhibit B of the Appendix to this study.

Denver (6:4-5) outlines an effective plan for organizing and teaching courses in vocational subjects, once the unit to be developed is named and its scope determined. The organizer ascertains (1) What must the worker do over and over on the job to be successful? (2) What must the worker know to be successful on the job? (3) What are the learning activities which provide the best media for combining knowing and doing activities to correlate proper work habits with developing speed and accuracy in the student?

Each activity which is called an "operation" or a "basic skill," is broken down into steps and key points to teach the learner what to do and how to do each particular phase of the total job. A list of tools and materials, sketches, and safety precautions is also needed. Each of these breakdowns is called an "operation sheet." These operations are based upon certain ideas, facts, and procedures which the student must know. Among the related information which the student must possess are trade terms, codes, rules, and methods of procedure. These information items are written up separately and given to the learner in an information sheet.

Learning activities and representative jobs are then carefully selected and the learner is given several jobs of each type so that he will have sufficient practice in performing the essential activities. Logical procedure is then established by listing the

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content analysis under (1) type of job and job number, broken at appropriate intervals with testing; (2) operations to be performed; (3) items of related information in the order in which they will be first used; and (4) time and accuracy standards.

The Denver plan also organizes these data into the form of a chart with (1) the type jobs down the left hand column, with numbers listed separately and consecutively; (2) operations to be performed listed in slanting spaces across the top of the chart in the order of their frequency; (3) the items of related information required to get each job done (with alphabetic designation of the items of information listed across the bottom and then keyed into the chart.) A copy of this chart is included in Exhibit C of the Appendix.

The student then makes a work plan for each job containing: List of all the operations that are to be performed and the pertinent items of related information, together with time required by an experienced worker to do the job and an estimated time of his own. This plan must be approved by the instructor before the student begins work. All new operations are taught the student before he is required to perform them.

The instructor uses the four-step plan--preparation, presentation, application, and follow-up. In this process, he tells and shows the student how to perform each operation and gives the necessary information. Next, the student tells and shows the instructor. The instructor helps him in this phase of the work until the student is able to deliver a standard performance. This pro-

cess is repeated for each new operation, the instructor explaining and showing as described. At the conclusion of the jobs within a particular area, the learner is tested as to his grasp of these basic operations and the application of pertinent information. Here the responsibility of planning the operations and selecting the items of information he will need rests with the student and he performs the operation without any help from the instructor. If his performance is up to standard, he goes on to his next group of jobs; if not, he goes back over the jobs already performed and receives help from the instructor until his errors are corrected and his performance on another test job comes up to standard.

In her 1945 magazine article, Hershey (16:172, 192) states that the administrative and coordinating staffs of the Emily Griffith Opportunity School developed and wrote a teacher training manual outlining a plan for individual instruction to help meet the need for "better and sounder instruction." It is entitled A Unit of Instruction: How to Organize It and How to Teach It. It not only shows how to develop individual instructional units of work that meet industrial and business standards, but provides for instructing the teacher in the same way he will later instruct his students in the use of the material in these units.

She further states (15:57) that these principles have been successfully adapted to meet the training need of several large industrial plants and governmental agencies in the city. This manual is also used in three courses at Colorado Agricultural and Mechanical College and at Emporia Teachers College (Kansas) for special summer work in vocational education. "Students pursue

this type of learning with enthusiasm because it is concise and time saving."

Shotwell says (3:303) that errors are diagnosed by the teacher through questioning as well as by observation and are corrected at once. Definitely planned follow-up of all operations is included in the teaching plan to insure that pre-determined objectives are reached.

Pupils who fall below the given standard are questioned and observed until the cause of failure is located. Re-instruction is then immediately given and alternate jobs of the same type are provided. They must reach the given standard on this particular group of jobs before they are permitted to advance.

Test jobs of a type suited to the objectives of a group of type jobs provide the final means of diagnosis and any necessary reteaching or repeated performance . . . Praise of the correct steps of the operation should precede pointing out of the faulty one.

Engelhart (8:103-9) wrote an article in 1930 entitled Techniques Used in Securing Equivalent Groups. There he states that in precise educational experimentation, evaluation of the experimental factor is dependent upon the mean gain in achievement of the experimental and of the control group. The groups selected should be as nearly equivalent as possible at the start of the experiment because the difference between the two groups is ascribed to the operation of the experimental factor. A number of different techniques have been employed to secure this initial equivalence.

Two experimenters who worked together applied an intelligence test and pertinent achievement tests to find out what was the initial status of the chosen students in the two groups. Others have assumed that equality of the means of the groups or reference



to general intelligence indicated a satisfactory equivalence. Still others have stated that equivalence is secured when the mean mental age and the mean chronological age of two groups are the same.

Some experiments have used students paired so that there was a mate in the control group for each student in the experimental group, each mate having the same mental age or intelligence test score. Mating has made it possible to claim equivalence to a greater extent in the groups than would otherwise be possible. In one of these experiments to test a lecture-demonstration method against an individual laboratory method, the two groups were selected by matching students whose scores were approximately equal on both Army Alpha and Otis group intelligence scales. Pupils were changed from group to group until the means of the two groups were very nearly equal.

Another experimenter selected those whose intelligence test scores could be paired within a range of two points with those of the mate in the other group. Another method selected equal groups on the basis of ability or aptitude for the specific activity which was to be the determining factor for the results obtained in the experiment. Still another method has been to pair students on the basis of an initial achievement test, considering the groups equal because the means of the initial scores, chronological ages, mental age, intelligence quotient, and scores on motor tests were approximately the same.

Research workers now generally accept the principle that intelligence quotients offer one means of securing group equivalency, while many others try to secure identical groups on the basis of

several criterion measures, as well as intelligence quotients. Pupils probably should be paired on intelligence scores and other criteria, such as chronological age, previous achievement in the field covered by the experiment, sex, race, and aptitude, by comparison of means and standard deviations of measures which they are required to meet. Study habits, personality traits, and physical conditions should be taken into consideration. The technique used in securing equivalence and the basis of matching should be that one or ones most directly pertaining to the problem and the conditions of the experiment.

This article is valuable in that it clears the meaning of equivalence and sketches the previously-used methods of obtaining it in educational experiments.

Hackworth (12) wrote a thesis in 1939 on Self-Motivated Shop Classes versus Traditional Classes in which he made a study of over-age boys and girls having maximum intelligence quotients of 90 who had been unsuccessful in the traditional curriculum of the elementary schools of Birmingham, Alabama. He divided the 110 students into two equivalent groups of 55 each. One group became the self-motivated shop class; the other a traditional academic class. His criteria for establishing equivalency were: Intelligence quotients, chronological age, mean grade scores on the Stanford Achievement Test, and educational age. His findings show a significant difference in favor of the self-motivated group.

This study is significant because it lists the criteria which were used successfully in establishing the equivalency of an experimental and a control group.

Miller (24) completed a thesis in 1940 entitled The Relation Between Industrial Arts Courses and Occupational Choices in which his purpose was to find out what influence industrial arts experiences had on students' occupational choices, if any. Two groups of 80 students were selected at Dunwoody Institute for the school year of 1938-39 and compared. The selection of the 40 pairs was made on the basis of age, number of months attendance at Dunwoody, average shop ratings, and the fact that all had finished the twelfth grade.

He found that those who had taken industrial arts made more reliable choices than the others and that the course had helped discover and develop occupational interests and aptitudes. Again we find in this experiment a method of establishing group equivalency for experimental purposes.

Josserand's thesis in 1940 (19), measuring the relative merits of teaching ninth grade drafting by an experimental method as compared with the traditional method is also pertinent. He selected 29 matched pairs from 110 students, using grades for the previous semester, age, previous drawing experience, Otis S.-A Intelligence scores (higher examination) for intelligence quotients, and the MacQuarrie Test for Mechanical Ability as the criteria for matching. He refers to Krueger's (20:554) experiment with regard to the Otis S.-A test scores, which showed no significant difference in giving the test to a group or to individuals.

These findings are significant in that they set a pattern for administering the Otis S.-A (higher form) Intelligence Test. It was used in this experiment to determine intelligence quotients of

the experimental and control group, scores being obtained partly from school records on this test and partly by testing those students who had not previously taken it. They were tested in groups.

Josserand (19) repeated the Fischer Mechanical Drawing Tests to find previous knowledge of the group and to test the progress made by the two classes. He refer's to Anastasia's (1:321) findings (1) that practice adds to the reliability of a test and (2) that any carry over from the previous experience cannot be definitely shown. He found the experimental group significantly superior when taught under his experimental method.

This study is valuable because it details the methods of establishing equivalency. It also establishes a precedent for the administration of the same test of achievement used as a pre-test for the purpose of evaluating the progress of two groups.

Krueger's (20:554) magazine article entitled Note Concerning Group Influence Upon Otis S.-A Test Scores relates an experiment he conducted in 1936 concerning the influence of a group upon Otis S.-A test scores. He used 160 students, mostly sophomores. There were four sections and both forms (A and B) were given in each section, both individually and as a group. Form A was given to Sections II and IV as individuals, followed by Form B, given to them as a group. At the same time, Form B was given to individuals of Sections I and III and Form A to the same sections as groups. Correlations calculated for the difference between the average for the individual tests and the average for groups showed the groups as having a slightly higher average. On the other hand, the difference of .50 was not considered significant, since the difference between

the two means was only 1.09.

He also found that when the individual and group tests both followed the initial tests, the individual test average was slightly higher. The difference of .42 was not considered significant, since the reliability of the difference between the means was only 1.05. Statistically, the administration of the test in groups had little influence upon the Otis S.-A. higher form tests. Those who took them separately from the group made the same scores as if they had been with the group.

This study is pertinent because it shows that the successful test administration depends upon neither a group nor an individual method.

Fryer's (10:273-77) magazine article of 1922 entitled Occupational Intelligence Standards summarizes a study of Army Recruit records from the first World War. He found that those with higher Army Alpha scores held higher level jobs. He listed 20 occupations with "engineer" first, that classification showing an average Alpha score of 161 and an equivalent mental age of 19.0; "stenographer and typist" was sixth with Alpha score of 103 and mental age of 16.6; and "office clerk" was eighth, with Alpha score of 96 and mental age of 16.2.

His study is valuable since it shows that an average intelligence level of 96 to 103 is necessary for clerks, typists, and stenographers, all of whom have filing duties.

Procter's article (32:783-84) on Intelligence and Length of Schooling in Relation to Occupational Levels reported the results of an experiment to determine the vocational attainments of

school children when they became adults. He tested 1,514 high-school-age children when they became adults as well as when they were in high school. At the end of 945 testings, 13 years after these students had left high school, he checked to see what occupational adjustment they had made. Payroll titles were grouped into five broad classifications, from high- to low-level jobs and average intelligence quotients calculated for all those in each classification.

This study also indicates that "stenographer and clerical worker" (third of the five groups) requires an average intelligence quotient of around 104.

Haynes (14:21-2) in commenting on Tests in Business Education, lays down the following criteria for their selection.

1. Validity, the measurement of what it claims to measure, is the most important single criterion.
2. Reliability. "How accurately does it measure the various learning that it is intended to measure?"
3. Objectivity.
4. Administration. Is it easy to give? Are the directions easy for student and administrator?
5. Graduated difficulty of items.
6. The variety of items. It should cover a number of learning activities.

The National Office Managers Association tests (18:3), co-sponsored by the National Council for business education tests students wishing to enter business employment upon graduation from high school. This committee has representatives from 49 commercial teacher organizations, ranging from the Kansas Commercial Teachers Association and the Eastern Kansas Commercial Teachers Association

to the National Education Association's Department of Business Education. Its tests have been reviewed and statistically evaluated for the years 1940, 1941, and 1942 (18:36-7). On the secondary school level, 60 per cent of the testees were certified. Norms and percentiles established for the 1941 Filing and Business Fundamentals tests are included in the Appendix (Exhibit H) of this study.

Bulletin Three (18:8,9) of the Joint Committee on Tests states:

The file clerk must know commonly used principles of filing, be familiar with the commonly used filing equipment, and be able to handle a reasonable volume of filing material over a substantial period of working time. A test of principles is used; also an actual filing test which each testee takes and files carefully selected material. A two-hour time limit is set for the test. . . . .

The fundamentals test covers spelling and English usage, business arithmetic, and business information and is taken by each testee. . . . These . . . tests are intensely practical . . . and one who succeeds in one of them will be likely to succeed in the position from which its materials are drawn. They are production speed tests, not simply spurt-speed tests.

The committee advises secondary schools to select about the top 25 per cent of each class.

S. J. Turille, in two personal letters to the author (See the Appendix, Exhibit A), stated that these tests are the most reliable and valid now available, "among the best we have," and especially adapted to measuring student achievement in filing and other phases of office work.

Nichols (26:36-7) in reporting on the 1941 test program, says that these tests were offered students before graduation in 65 test centers with 200 schools participating. The percentage of

successful candidates was about what might be expected.

"The so-called minor fields are entitled to more attention than they received." He includes filing as one of these fields.

Bills (2:13) classifies tests under two headings: (1) aptitude tests, "which predict ability to do the work after the student has been trained" and (2) trade or performance tests.

She designates mental ability tests as trade tests for clerical workers, pointing out that 75 per cent of the persons in Aetna Life Insurance Company who have difficulty in adjusting themselves have mental abilities below their critical score. She says:

Probably the best way of expressing the efficiency of any test is in terms of the percentage of times it succeeds or fails to select the desired group. If you get a 75 per cent correct choice above a given critical score . . . I believe the test predicts success as well as it can be expected to. . . .

The National Clerical Ability tests may be called about 70 per cent trade tests and 30 per cent general mental alertness tests. You need have no hesitancy in accepting both the mental alertness and trade ability of anyone certified by these tests as being beyond the average.

These comments and extracts are considered especially valuable, coming from recognized authorities in the field, two of whom, Turille and Nichols, were informed of the specific nature of the experiment. They are considered as validating the tests satisfactorily.

The following research has bearing upon the evaluation of test results:

Darley comments (5:84) in his recent (1943) book, Tests and Counseling in the High School Program, on the fact that the great majority of statisticians and test makers are conservative.



They are perhaps too well aware of the possible errors in sampling human behavior in samples of people. Therefore, nearly all critical ratios must be between two and three before significance is attached to them. When the critical ratio is below two, the difference found is ascribed to random or chance factors.

This comment is of importance since it states the point at which differences become statistically significant to the majority of conservative experts in the field. Because he found and states that the possibility of random or chance errors is about one in 20 on the basis of a critical ratio of two, and because other studies have also used it, two or more will be considered a significant difference, less than that as insignificant.

Drinkall (7) in his 1941 thesis entitled The Analytical versus the Traditional Method of Teaching the Electrical Theory of Direct Current Motors in Dunwoody Institute, measured the effectiveness of the two methods. Using 58 pairs, he matched them on the basis of chronological age, previous schooling, number of months at Dunwoody Institute, and shop marks on a percentage basis. To measure the equivalency of the two groups and their progress, he used (7:34-5) the formula proposed by Treloar (36:29) in his Outline of Biometric Analysis. For each of the criteria, he found the average for each item; then the standard deviations and standard errors of the means. Finally, he substituted these values in Treloar's formula where t equals

$$\frac{AM_c - AM_e}{\sqrt{(SE_c)^2 + (SE_e)^2}}$$

He considered any answer of less than two insignificant

and probably due to errors of random sampling. Figures on each of the four criteria resulted in a difference of less than two. Any answer of two or more was considered significant. Using the same test at the beginning and at the end of the course to measure student progress, he found a significant difference of 2.69, showing that his method of teaching the experimental group was statistically significant as compared with the traditional method.

Hershey (15) completed a thesis in 1945 measuring and evaluating the teaching of letter typing to prospective clerks on the basis of an individual Denver plan for the experimental group and a traditional method for the control group. She, too, used a typical matching procedure of this kind and also used the same test at the end of the teaching period as at the beginning. Her calculations were also based upon this same Treloar formula, and she found the group taught under the Denver plan significantly superior in achievement to the control group.

This formula will be used for equating the groups and for calculating the presence or absence of statistical significance between the two groups in the findings set out in Chapter IV.

As a result of this review of literature, Question 1, "What is the cooperative plan of teaching filing?" is answered and Question 2, "What is the traditional textbook method?" is answered. Question 3, "How are the experimental and control groups to be organized?" and Question 4, "What methods and devices are to be used in making evaluations," are also answered.

Question 5, "What are the results?" is not answered.

Following chapters will attempt to supply that answer.

CHAPTER III.

METHODS AND MATERIALS.

In order to carry on this filing experiment, the following materials were used: (1) Summary of duties, including filing, of those employed on cooperative office work in Topeka. Form 1, shown in Exhibit B of the Appendix, was used for obtaining these duties. (2) A unit of instruction on filing to be used as the basis for instruction of the experimental group after its validation by the office advisory committee. A copy is included in the Appendix as Exhibit C. (3) Scores from the standardized tests administered to all participating students. (4) Other data from school records such as age, previous grades, sex, and number of years in school. If students had previously been tested, intelligence quotients were also obtained from school records. This data, with the scores from the standardized tests, formed the basis of establishing equivalency for the control and the experimental groups.

Sources

The summary of duties of cooperative office employees in Topeka was taken from recorded direct interviews with employers participating in this type of work during the school years 1944-45 and 1945-46. They ranged in size from offices employing only one person to those hiring 25 or more.

The advisory committee for office work, a list of whose

names appears in the Appendix as Exhibit D, was used in setting up the unit of instruction in filing. Further suggestions pertaining to the specific experiment were received from two well-known business educators, S. J. Turille of Madison College and F. G. Nichols of Harvard University.

A third source in this connection was Denver's A Unit of Instruction: How to Organize It and How to Teach It. The latter provided the plan for individual instruction under which the filing unit was developed. It was planned by nine Denver school administrators under the direction of Roy A. Hinderman, assistant superintendent and director of research of the Denver Public Schools. This method has been used successfully by the Emily Griffith Opportunity School, several large industries, and certain governmental agencies in the city of Denver. The manual describing how to set up units of instruction is used at the Colorado Agricultural and Mechanical College, Fort Collins, Colorado, as the textbook in three courses in vocational education. It is also used in vocational education courses in Emporia State Teachers College, Emporia, Kansas.

#### Testing.

All students took the National Clerical Ability Filing Test, series 1941, during the school years 1944-45 and 1945-46. During the first day of class, all students in both the control and experimental classes were given this test, a copy of which is shown in the Appendix as Exhibit E. Since this test requires 120 minutes of working time, some students completed it on the second day of their respective classes. It requires the alphabetizing of a group

of names, the alphabetic arrangement with necessary cross references of a set of miniature correspondence, and their sorting together. In addition, it asks multiple-choice questions which the student should answer, such as "What method of filing is preferred or commonly used, for files in which the majority of letters are written by hand?" Choice is made of alphabetic, chronological, geographic, numeric, and subject. True-false questions are also used, such as "Names which have no consonants will have no numeric code numbers in Soundex." All papers were carefully scored from a key and all scores were rechecked before being recorded. The obtained score from this test showed what the student knew about filing at the beginning of the course and served as the first criterion for matching the two groups.

Some students had not taken an intelligence test previously. Upon completing the first filing test, they were given the Otis Quick-Scoring Test of Mental Ability, Higher Form D. This test is included in the Appendix as Exhibit F. It contains a list of questions that gradually grows more difficult, such as "The opposite of gentle is , --strong, careless, humane, thoughtless, rough." "One number is wrong in the following series. What should that number be? --1, 4, 9, 16, 25, 36, 45, 64." After each student had completed the test, the instructor secured the number of correct answers by means of a key. Each test was rechecked before being recorded. From these scores, the intelligence quotients were secured by reference to a chart given in the key. These intelligence quotients were used as the second criterion in matching the two groups.

Students were next tested upon their knowledge of business fundamentals. The National Clerical Ability Test of Business Fundamentals was given the members of each group. A copy of this test is included in the Appendix as Exhibit G. It contains sections devoted to spelling, use of the apostrophe, word usage, general business information, and arithmetic. Its sections include such choices as: "I am sure that (its, it's, it is) too late now. A person who is named in a will to see that its provision are carried out is called an executor. At 57½¢ a pair, how many pairs of children's gloves can be bought for \$23? --35, 39, 40, 41."

These tests were carefully graded by the use of a scoring key and rechecked before being recorded. The scores obtained were the third criterion for matching the two groups.

All the above tests were commented upon at greater length in the review of literature set forth in Chapter II.

Other data. Other data needed, namely: ages, previous grades, sex, years in school and the intelligence quotients of those who had been tested before were obtained from school records on file in the offices of Topeka High School. They became respectively the fourth, fifth, and sixth criteria for matching.

Forms required. One form, Exhibit B, was used in the interview with employers. Using duplicate copies of this form, the experimenter secured information on the types of jobs for which cooperative office workers were used. This included machines and types of files, as well as filing duties. Information from similar inquiries was also used for two years preceding the experiment in

determining the types of files and filing duties performed in the city of Topeka.

Methods.

Choice of students. Since all students were in class at least 15 hours a week for one school year in the experimental group and for at least one semester in the control group, these were selected for this experiment. While many of the control group were engaged in part-time work, the cooperative or experimental group was regularly employed a minimum of the required 15 hours a week and their work was coordinated and planned on an individual rather than a group basis.

Student program. All students were regularly enrolled in either the one-semester office practice course or the cooperative part-time schedule. The former received instruction according to the following schedule:

Filing - - - - - 27.5 hours (both groups)

Adding and crank-driven calculators - - - 18.5 hours,  
(control group only)

Key-driven calculators - - - - - 20.5 hours,  
(control group only)

Duplication - - - - - 3 to 5 hours (control group only)

Testing - - - - - 6.5 hours (both groups)

Besides filing, the cooperative or experimental group was given instruction in whatever other phases of office work were called for on their particular jobs.

The control group operated one hour a day for one semester and received one credit. The experimental group spent

two hours a day in class for one school year and received six credits, including two for their downtown employment.

Traditional textbook method. The basic textbook following the traditional method was Library Bureau's Progressive Indexing and Filing, mentioned by Holmdahl as the most generally used by schools teaching filing in the United States and also by Lebeda (21:25) as the one most used in the region of which Kansas is a part. It had been in use in the commercial curriculum of Topeka High School since 1931. The course outline included in the above text was used as the basic outline for the control group. Miniature filing practice sets and correspondence were also used in both groups, as well as typed cards, since both are included as part of the recommended materials for use with the above text and are widely used by schools teaching filing.

The teacher discussed filing principles and procedures with the control group in the order given in the suggested textbook course outline, answered questions as they arose, and gave tests as called for in the textbook outline. Students completed assignments from the outline as fast as they could, attempting a minimum daily contract as called for in the outline. Since the time available was limited to 27.5 hours, this group was unable to complete the study of the entire textbook. This shortage of time is due to the fact that Topeka High School requires rotation of equipment and one-half the classroom time must be devoted to other phases of office practice.

Unit of instruction method. The experimental group was taught by the method given in Denver's A Unit of Instruction: How



to Organize It and How to Teach It. The instructional material is first broken up into rather small "units" or parts. These units are named and their scope definitely determined. Then the organizer finds out (1) What the worker must DO again and again on the job to be successful in this particular work, (2) what he must KNOW before he can do these things successfully on the job, and (3) what learning activities contribute most to combining knowing and doing activities into correct work habits and develop satisfactory standards of speed and accuracy.

Such basic skill or "operation" (doing activity) is broken down into steps and key points which teach the learner what and how to do each part of the operation in the most effective order. This breakdown is called an operation sheet and is much like the job breakdown sheets used during the war period in the Training Within Industry Program.

In the filing unit especially prepared for this experiment, 24 operations were set up: Choosing new-type job, filling in a student work plan, putting student work plan into operation, typing cards (alphabetic), sorting alphabetically, filing alphabetically, pulling filed material, coding (Soundex system), sorting (Soundex), filing (Soundex), inspecting correspondence, indexing correspondence, cross referring (alphabetic), transferring inactive material, coding (numeric), sorting (numeric), filing numerically, coding (Triple Check), filing (Triple Check), coding geographically, filing geographically, coding by subject, and filing by subject. These activities are also included in the textbook and were taught to the control group in accordance with its outlined procedure.

Every operation sheet must be accompanied by facts, ideas or procedures which the worker must know. Such things as trade terms, codes and regulations, science or mathematics needed, arrangements of various files, and methods of preparation or construction are included. These information items were written up separately and given to the learner as an "information sheet" at the time he needed them. A total of 24 information sheets were needed for the filing unit involved in this experiment, as follows: Titles, units, indexing and filing; rules of alphabetizing; content analysis chart and individual progress record; typing material for filing; alphabetic sorting; file handling; the housing of cards; guides; Soundex system of filing; released for filing; general filing procedure; correspondence identification; rules for Soundex filing; folders; the student work plan; key letters, equivalents and code numbers; the housing of correspondence; cross reference; the numeric filing system; numeric folders; numeric guides; Triple Check filing; subject filing; geographic filing; and transfer procedures.

Instruction was given the control group on these items in the traditional textbook manner, following the plan as outlined in the preceding discussion of this method.

The experimental group used carefully prepared "type jobs," which are learning activities intended to give the student enough practice in performing operations (two or more for each type job), and applying the necessary information. This unit includes 21 type jobs. They are divided into seven main blocks covering: typing and filing cards alphabetically; numerically; by Soundex, inspecting; reading; indexing; coding, sorting, and filing corres-

pondence alphabetically; numerically; by Triple Check; geographically; and by subject. The titles, cards, miniature cross reference sheets, and correspondence were the same as those used by the students in the traditional textbook class.

Under the experimental plan, as each block of jobs is finished, the learner is tested to sample his degree of mastery. Here he plans his own operations and applies necessary information without help from the instructor. If his performance is satisfactory, he goes on to the next block and its jobs; if it is not satisfactory, he must go back in review of the type jobs already completed until he can successfully perform on a second test job based on them.

Eight such test jobs were prepared for the filing unit used in this experiment and alternate tests were worked out for any student not successful in passing any test job.

Logical procedure is set up by means of a content analysis chart which lists: (1) type jobs down the left hand column. These are numbered consecutively and are broken at intervals by test jobs. (2) Operations which the student performs, entered in slanting lines across the top of the chart in the order of their use frequency and numbered 0-1, 0-2, etc. (3) Items of related information entered in slanting lines across the bottom of the chart as nearly as possible in the order of first use and marked with letters of the alphabet.

Then the operations which must be performed for each type job and the items of related information which must be known are keyed into the right-to-left squares. The first operation to

be done on a particular job is numbered "1" at the top of the square on the same horizontal line with the type job, the second with "2", and so on until all operations for that job are listed in the correct order of doing. Items of related information directly pertaining to a specific operation are then entered by letter in the lower half of the square under the number.

On the right-hand side of the chart is listed an estimate of the time required by an experienced person to do that job and next to it is an estimate of time required by the average student.

In this respect, Hershey (15:100) states:

From experience with other units developed at the Emily Griffith Opportunity School, it has been found that the learner spends three to four times as long in doing the job as does the experienced person as he has to study and learn as well as to perform. After the learner has studied the operation and information sheets involved and has had some practice in using them, his performance time is cut to about twice that necessary for the experienced person.

Time elements for this unit were set up on this basis from the average time consumed by students on similar jobs for a number of years in Topeka High School and on the basis of similar experience of other filing teachers.

Completed charts are used in various ways. A large wall chart is always placed on the bulletin board in the classroom. Also, a photostatic copy, reduced to  $8\frac{1}{2}$  x 11 inches in size is used by the student in the preparation of work plans, checking off operations in which he has been instructed, and in checking his estimated time against the average.

Before the unit is taught, test jobs are worked out by

the instructor for each block of type jobs and alternate jobs are provided in case the student's performance on any block of type jobs is unsatisfactory when checked by the instructor upon completion.

Instructor's teaching guides may also be worked out covering the teaching of operations and special points of information that must be emphasized.

Hershey (15:102) outlines the teaching process as comprising four parts, as follows:

- (1) Preparation of the student.
- (2) Presentation by the instructor in steps and key points.
- (3) Try-out by the student with the instructor's help.
- (4) Follow-up of the student's performance during the assignment.

Student Work Plans were also made up for each type of job. A sample appears in the back of the unit, Exhibit C. The student lists the operations by number and by name. Opposite the operations he lists the items of related information by letter and by name. He then checks off the operations on which he has not received instruction. Next he estimates his time for each operation and the total time for the job. Then he divides the entire work plan into work periods and submits the completed plan to the instructor for his approval. Upon securing this, he proceeds to perform the operations he already knows, recording his actual time in the column provided. For the first and subsequent unknown operations, he comes to the teacher for instruction under the four-step plan previously mentioned. All jobs are checked by the instructor; hence desirable standards of accuracy are maintained at all times.

Part played by Topeka employers.--Topeka employers cooperated in the program in two ways: first, by representation on the

office advisory committee. Names of these representatives are listed as Exhibit D of the Appendix. A partial validation of the content analysis chart was secured by submitting it to them before the teaching process began. Second, they employed the cooperative or experimental students under the program sponsored jointly by the school and the Kansas State Board for Vocational Education. These employers also supplied the information concerning office duties as requested on Form 1. A sample of this Form 1 appears as Exhibit B in the Appendix, together with a listing of the duties so found.

All employers from whom information was received concerning those in the experimental group required these students to perform some or many filing duties. Where slight variations of standard procedure were found in individual offices, the student was taught the standard procedure and an explanation was given by the instructor of the reason for the variation found on the job.

Group equivalency. Engelhart (8:103-109) was quoted in the review of literature in Chapter II to the effect that groups selected for experimental purposes should be as nearly equal at the start of an experiment as possible. Josserand (19), Hackworth (12), Miller (24), Drinkall (7), and Hershey (15) established equivalence and used Treloar's (36:29) critical ratio formula in experiments similar to this one.

Remmers and Gage (33:549) stated that in testing the null hypothesis of an obtained statistical measure, whether this be an arithmetic mean, a median, a standard deviation, or a semi-quartile

range, an obtained difference between arithmetic means or standard deviations or a coefficient of correlation, the number of standard errors above or below zero in which the measure would fall must be determined. A critical ratio or fraction is determined. Its numerator is the calculated difference of the measures in question and the denominator is the standard error of the difference. From a table of areas under the normal curve included by the mean and ordinates, erected at various standard deviation distances along the range above and below the zero point, the probability of whether or not the obtained difference could have occurred in a population of differences whose mean is zero can be determined. If this difference falls at a point so many standard errors from zero mean so that only five out of 100 of such measures can be ascribed to random sampling, the measure is said to be significant or very significant. The critical ratio formula given as an example involving the arithmetic means of an experimental and a control group is (33:550):

$$\frac{t}{\sqrt{(SE_a)^2 + (SE_b)^2}} = \frac{M_a - M_b}{\sqrt{(SE_a)^2 + (SE_b)^2}}$$

Although differing in symbols used, this form is the same as the one given by Treloar (36:29).  $M_a$  is the arithmetic mean of one group,  $M_b$  is the arithmetic mean of the other;  $SE_a$  is the standard error of the first;  $SE_b$  is the standard error of the second group.

From detailed examination of this formula, it can be seen that the arithmetic means and the standard errors of the group must be determined before the formula can be applied. The formula used to calculate the standard error of the means for less than 30 cases

is:  $SE = \frac{\sigma}{\sqrt{N-1}}$ . " $\sigma$ " is the standard deviation and "N" the number of cases. 1/

Determination of the arithmetic means and the standard deviations used in this experiment follows the technique outlined by Greene (11:15-17; 45). He defines the mean as a point on a scale such that the sum of the deviations above it is exactly equal to the sum of the deviations below it. It can be determined equally well by assuming a point in the distribution of scores and computing the necessary correction to reach a perfect balance of the deviations for data distributed in frequency tables. However, the means calculated from the frequency distributions will differ slightly from the mean calculated from the same ungrouped data. This difference usually is small, and is brought about by the arbitrary grouping of the cases in the frequency table. It cannot be avoided. His formula for the computed mean is as follows:

$$A. M. = \text{Guessed } M-P \pm (\pm c)S.$$

The guessed mean is the mid-point of the range of scores thought to be the average. The correction, "c", is computed according to the formula:  $c = \frac{\sum fd - fd}{N}$ . "F" is the frequency of occurrence within a step interval. In this experiment, frequencies apply to scores, grade averages, and ages in months. "D" is the deviation above or below the range in which the guessed mid-point occurs. "N" is the number of cases represented in the group. Deviations are the differences between scores and some selected point on the scale, usually the arithmetic mean. They are positive or negative according to

1/ Garrett, Henry E. Statistics and Education. p. 201. New York, Longmans, Green & Co., 1937. 493 p.



whether the score is larger or smaller than the point of reference. Greene (11:45) also states the formula for the standard deviation as follows: 
$$= \sqrt{\frac{\sum fd^2 - (\sum c)^2}{N}}$$
 S.  $\frac{\sum fd^2}{N}$  is the algebraic sum of frequency times distribution squared, divided by the number of cases, "N"; "c" is the correction; and "S" the number of units per step in the frequency table.

Hershey (15:115) quotes the table given by Sorensen (35:367) in his book Statistics for Students of Psychology and Education, to show the chances of true difference greater than zero in the critical ratio calculations. See Table 1 on next page.

Procedure. In this experiment, 26 matched pairs of students were chosen from the total enrollment in cooperative office practice and non-cooperative office practice during the school years 1944-5 and 1945-6. The cooperative class became the experimental group and the non-cooperative became the control group. Students from the control group were matched with those in the experimental group on the basis of previous knowledge of filing, intelligence quotients, knowledge of business fundamentals, age, grade, sex, and previous grades in school. All members of both groups were girls in their twelfth year of high school.

Beginning on the first day in class, each individual was given the National Clerical Ability Filing Test, series 1941, by the instructor. At the completion of 27.5 clock hours of instruction, the students of each group were given the same test, as in the case of Jossierand's experiment (19) and Hershey's (15). The first test showed what each student knew about the subject and the second measured the amount of progress made in filing during the

Table 1.--Sorensen's Table Showing the Chance of True Differences  
on the Basis of 1,000 Chances.

<u>Diff/diff</u>	<u>Chances in 1,000</u>	<u>Diff/diff</u>	<u>Chances in 1,000</u>
0.00	500	1.55	939
0.05	520	1.60	945
0.10	540	1.65	951
0.15	560	1.70	955
0.20	579	1.75	960
0.25	599	1.80	964
0.30	618	1.85	968
0.35	637	1.90	971
0.40	656	1.95	974
0.45	674	2.00	977
0.50	691	2.1	982
0.55	709	2.2	986
0.60	726	2.3	989
0.65	742	2.4	992
0.70	758	2.5	994
0.75	773	2.6	995
0.80	788	2.7	996.5
0.85	802	2.8	997.4
0.90	816	2.9	998.1
0.95	829	3.0	998.7
1.00	841	3.1	999.0
1.05	853	3.2	999.3
1.10	864	3.3	999.5
1.15	875	3.4	999.7
1.20	885	3.5	999.77
1.25	894	3.6	999.84
1.30	903	3.7	999.89
1.35	911	3.8	999.93
1.40	919	3.9	999.95
1.45	926	4.0	999.97
1.50	933	4.5	999.997

teaching period. The first test also furnished one of the bases for computing the presence or absence of a statistical difference between the control and experimental groups at the beginning of the experiment, while the second test formed the basis of determining the statistical difference between the two groups at the end of the experiment.

The critical ratio technique recommended by Remmers and Gage (33:550) and by Treloar (36:29) was applied to the scores obtained from each administration of the tests. The formula is as follows:

$$\underline{t} = \frac{AM_c - AM_e}{\sqrt{(SE_c)^2 + (SE_e)^2}}$$

Answers to the question "What methods and devices are to be used in making evaluations?" are found in this chapter.

The answer to question 5, "What are the results?" is set forth in the next chapter, "Findings."

## CHAPTER IV.

## FINDINGS.

Following the precedent established by other experiments of this nature discussed in the review of literature, Chapter II, two matched groups of students were set up.

Bases for matching.

The first basis for determining equivalency for the experimental and control groups was knowledge of filing before any instruction was given to either group. Upon the advice of competent authorities (See Exhibit A of the Appendix) and because of the cooperation of such large numbers of commercial education associations and the National Office Managers Association in preparing, scoring, and validating the National Clerical Ability test batteries were chosen for this experiment.

Within the first week of the experimental school years, 1944-5 and 1945-6, the National Clerical Ability Filing Test, series 1941, was administered to the students in both the control and the experimental groups. As shown by Table 2, page 62, the arithmetic mean of the scores made by the control group was 63.5, with a standard deviation of 16.73. The arithmetic mean of the experimental group was 62.94, with a standard deviation of 14.56, as set forth in Table 3, page 63. A copy of this test is given as Exhibit E of the Appendix. The test was administered strictly in accordance with instructions, checked with a scoring key, and re-

Table 2.--FILING ABILITY OF CONTROL GROUP, BASED ON NATIONAL CLERICAL ABILITY TEST OF FILING, 1941 SERIES, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION. FIRST ADMINISTRATION.

Scores: 102, 84, 81, 80, 79, 79, 78, 74, 72, 69, 69, 67, 64, 63, 61, 59, 57, 55, 53, 47, 44, 42, 42, 41, 35.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
98.5-105.5	102	1	+6	6	36
91.5- 98.5	95	0	+5	0	00
84.5- 91.5	88	0	+4	0	00
77.5- 84.5	81	6	+3	18	54
70.5- 77.5	74	2	+2	4	8
63.5- 70.5	67	4	+1	4	4
56.5- 63.5	60	5	0	0	00
49.5- 46.5	53	2	-1	-2	2
42.5- 49.5	46	2	-2	-4	8
35.5- 42.5	39	3	-3	-9	27
28.5- 35.5	32	1	-4	-4	16

S = 7                      N = 26                       $\sum fd^2 = 155$

ARITHMETIC MEAN

$c = \frac{\sum fd - fd}{N} = \frac{+32 - 19}{26} = .5$

AM = Gussed M-P + ( $\frac{+}{-}c$ )S =

60 + (.5)7 = 63.5

STANDARD DEVIATION

$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (\frac{+}{-}c)^2} \right) S =$

$\left( \sqrt{\frac{155}{26} - (.5)^2} \right) 7 = 16.73$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--step interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 3.--FILING ABILITY OF EXPERIMENTAL GROUP, BASED ON NATIONAL CLERICAL ABILITY TEST OF FILING, SERIES 1941, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION. FIRST ADMINISTRATION.

Scores: 105, 80, 79, 77, 77, 75, 75, 72, 71, 70, 70, 64, 62, 61, 71, 59, 56, 55, 55, 52, 52, 51, 46, 37, 34.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
98.5-105.5	102	1	+6	6	36
91.5- 98.5	95	0	+5	0	00
84.5- 91.5	88	0	+4	0	00
77.5- 84.5	81	2	+3	6	18
70.5- 77.5	74	6	+2	12	24
63.5- 70.5	67	3	+1	3	3
56.5- 63.5	60	4	0	0	00
49.5- 56.5	53	7	-1	-7	7
42.5- 49.5	46	1	-2	-2	4
35.5- 42.5	39	1	-3	-3	9
28.5- 35.5	32	1	-4	-4	16

S = 7                      N = 26                       $\Sigma fd^2 = 117$

ARITHMETIC MEAN

$$c = \frac{+\Sigma fd - fd}{26} = \frac{+27 - 16}{26} = .42$$

$$AM = 60 + (.42)7 = 62.94$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\Sigma fd^2}{N} - (tc)^2} \right) S =$$

$$\left( \sqrt{\frac{117}{26} - (.42)^2} \right) 7 = 14.56$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of Cases;  $\Sigma$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

checked before being entered as a part of the experimental record. Figure 1, page 65, presents graphic representation of the range of scores, their arithmetic means, and the medians.

For the control group, the standard error of the mean was computed as 3.35. For the experimental, it was 2.91. These are set forth in Table 4, page 66. Substitution in the critical ratio formula followed by Hershey (15) and others previously mentioned gave a t score of .13. These computations are shown in Table 5, page 66.

Following the procedure used by Hershey (15) in a similar experiment on the typing of business letters, a tabulation was made of the errors found in the first administration of this test. When tests were scored and this count of errors tabulated, the arithmetic mean of the control group was found to be 117.5, with a standard deviation of 16.73. These are shown in Table 6, page 67. The arithmetic mean of the experimental group was 118.06, with a standard deviation of 14.56, as shown in Table 7, page 68. The range of errors in these scores, their arithmetic means, and the medians are shown graphically in Figure 2, page 69. For the control group, the standard error of the mean was found to be 3.35 and for the experimental group, 2.91. These results are set forth in Table 8, page 70. Application of the critical ratio technique previously described gave a t score of .13 for the experimental group. These computations are given in Table 9, page 70.

The second basis for matching the two groups was intelligence quotients. This was used by other experimenters as set forth in Chapter II. Some students already had recorded intelligence

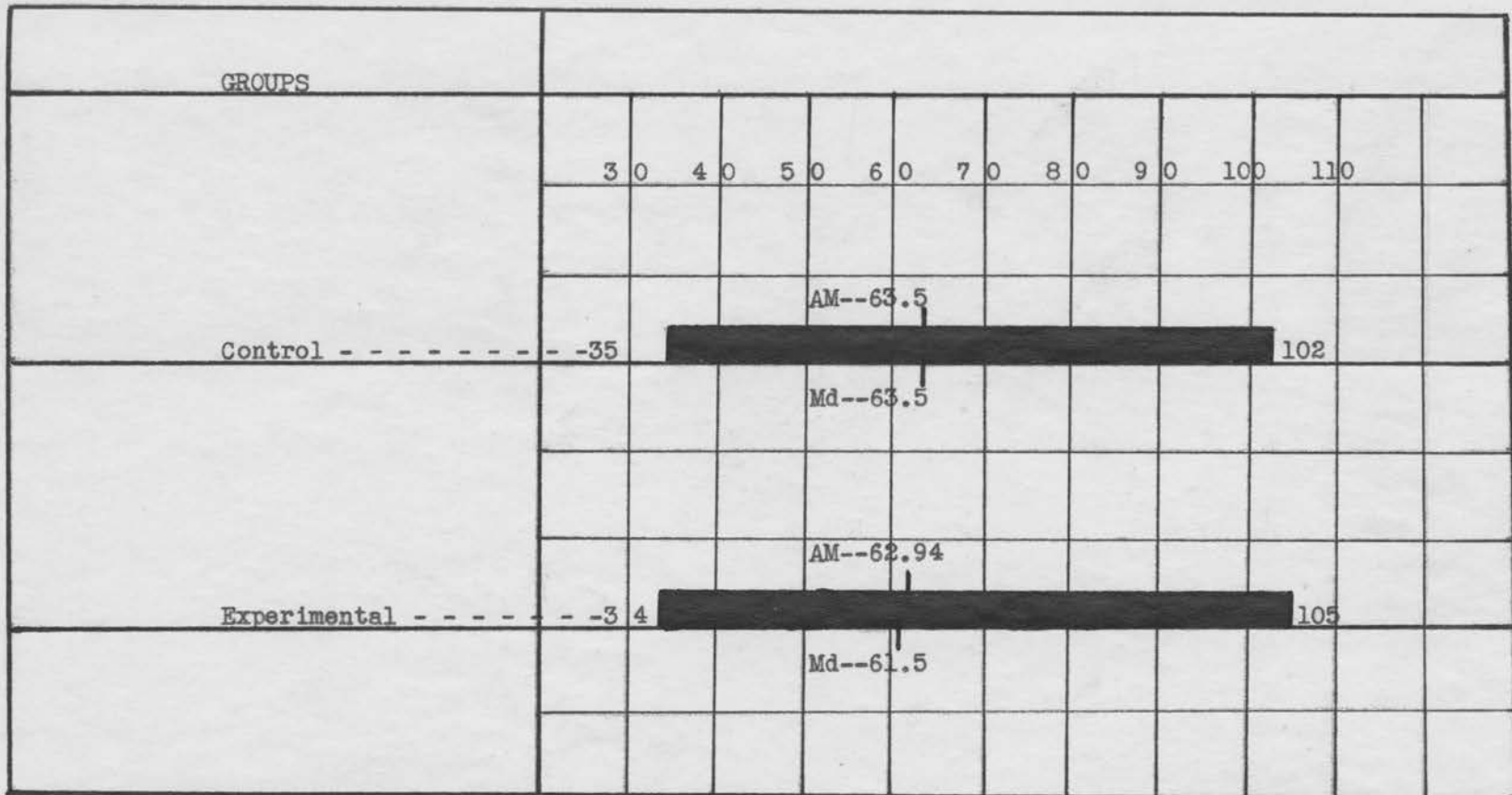


Figure 1.--Filing ability scores of both control and experimental groups, based on National Clerical Ability test of filing, 1941 series. First administration.



Table 4.--STANDARD ERROR OF THE MEAN IN FILING ABILITY OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON FIRST ADMINISTRATION OF NATIONAL CLERICAL ABILITY TEST OF FILING, SERIES 1941.

<u>Control Group</u>		<u>Experimental Group</u>
Previously Computed Symbols Involved:		Previously Computed Symbols Involved:
N = 26	$\sigma_c = 16.73$	N = 26
		$\sigma_e = 14.56$
$SE_c = \frac{16.73}{5} = 3.35$		$SE_e = \frac{14.56}{5} = 2.91.$

Symbol Explanation: N--Number of Cases:  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 5.--CRITICAL RATIO APPLIED TO FILING ABILITY OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON FIRST ADMINISTRATION OF NATIONAL CLERICAL ABILITY TEST OF FILING, SERIES 1941.

Previously Computed symbols involved:  $AM_c$ --63.5;  $AM_e$ --62.94  
 $SE_c$ --3.35;  $SE_e$ --2.91.

$$t = \frac{63.50 - 62.94}{\sqrt{(3.35)^2 + (2.91)^2}} = \frac{.56}{4.44} = .13$$

Symbol Explanation:  $t$ --Critical Ratio;  $AM_c$ --Arithmetic Mean of Control Group;  $AM_e$ --Arithmetic Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 6.--ERRORS MADE BY CONTROL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING THE ARITHMETIC MEAN AND THE STANDARD DEVIATION. FIRST ADMINISTRATION.

Errors: 146, 140, 139, 139, 137, 134, 128, 126, 124, 124, 122, 120, 118, 117, 114, 112, 112, 109, 107, 103, 102, 102, 101, 100, 97, 79.

<u>m</u>	<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
	145.5-152.5	149	1	+4	4	16
	138.5-145.5	142	3	+3	9	27
	131.5-138.5	135	2	+2	4	8
	124.5-131.5	128	2	+1	2	2
	117.5-124.5	121	5	0	0	00
	110.5-117.5	114	4	-1	-4	4
	103.5-110.5	107	2	-2	-4	8
	96.5-103.5	100	6	-3	-18	54
	89.5- 96.5	93	0	-4	0	00
	82.5- 89.5	86	0	-5	0	00
	75.5- 82.5	79	1	-6	-6	36

S = 7

N = 26

$\sum fd^2 = 155$

ARITHMETIC MEAN

$$c = \frac{+19-32}{26} = -.5$$

$$AM = 121 + (-.5)7 = 117.5$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2 - (\sum c)^2}{N}} \right) S =$$

$$\left( \sqrt{\frac{155 - (-.5)^2}{26}} \right) 7 = 16.73$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 7.--ERRORS MADE BY EXPERIMENTAL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION. FIRST ADMINISTRATION.

Errors: 147, 144, 135, 130, 129, 129, 129, 126, 126, 125, 122, 120, 120, 119, 117, 111, 111, 110, 109, 106, 106, 104, 104, 102, 101, 76.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
145.5-152.5	149	1	+4	4	16
138.5-145.5	142	1	+3	3	9
131.5-138.5	135	1	+2	2	4
124.5-131.5	128	7	+1	7	7
117.5-124.5	121	4	0	0	00
110.5-117.5	114	3	-1	-3	3
103.5-110.5	107	6	-2	-12	24
96.5-103.5	100	2	-3	-6	18
89.5- 96.5	93	0	-4	0	00
82.5- 89.5	86	0	-5	0	00
75.5- 82.5	79	1	-6	-6	36

S = 7                      N = 26                       $\sum fd^2 = 117$

<u>ARITHMETIC MEAN</u>	<u>STANDARD DEVIATION</u>
$c = \frac{f16-27}{26} = -.42$	$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (\sum c)^2} \right) S =$
$AM = 121 + (-.42)7 = 118.06$	$\left( \sqrt{\frac{117}{26} - (-.42)^2} \right) 7 = 14.56$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

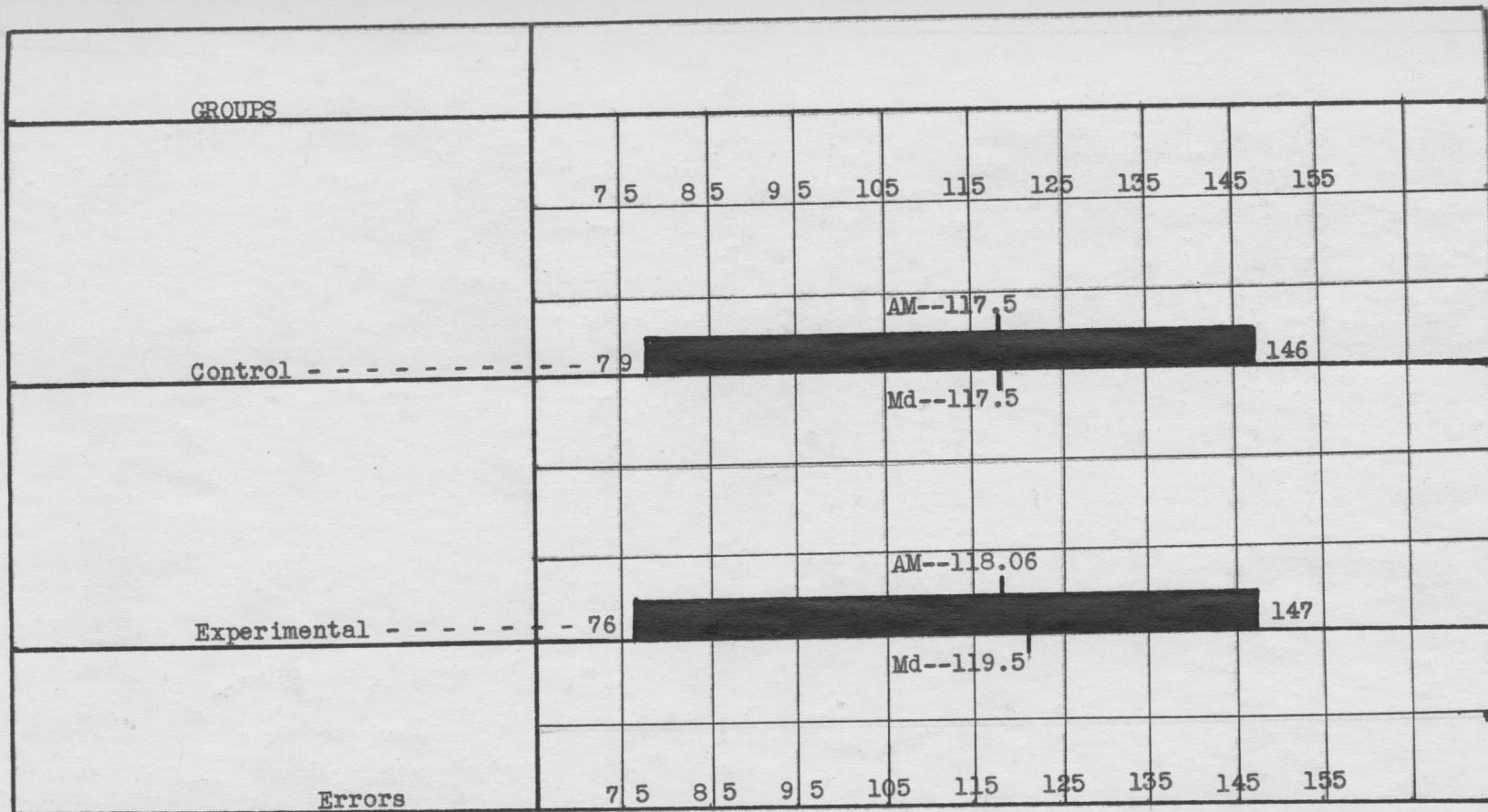


Figure 2.--Errors made by both control and experimental groups on National Clerical Ability test of filing, series 1941, first administration.

Table 8.--STANDARD ERROR OF THE MEAN OF FILING ERRORS OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON FIRST ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

<u>Control Group</u>	.	<u>Experimental Group</u>
Previously Computed Symbols Involved:	.	Previously Computed Symbols Involved:
N = 26 $\sigma_c = 16.73$	.	N = 26 $\sigma_e = 14.56$
$SE_c = \frac{16.73}{5} = 3.35$	.	$SE_e = \frac{14.56}{25} = \frac{14.56}{5} = 2.91$
	.	

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 9.--CRITICAL RATIO APPLIED TO ERRORS OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON FIRST ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

Previously Computed Symbols Involved:  $AM_c$ --117.5;  $AM_e$ --118.06;  $SE_c$ --3.35;  $SE_e$ --2.91.

$$\underline{t} = \frac{118.06 - 117.50}{(3.35)^2 + (2.91)^2} = \frac{.56}{4.44} = .13.$$

Symbol Explanation:  $\underline{t}$ --Critical Ratio;  $AM_c$ --Arithmetic Mean of the Control Group;  $AM_e$ --Arithmetic Mean of the Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

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quotients as part of their school records and these quotients were obtained from the high school office. However, some of them had never taken an intelligence test. For such students, the instructor set up a testing procedure as soon as they were through with the filing test mentioned previously. Intelligence quotients were determined from administration of the Otis Self-Administering Test of Mental Ability, Higher Form D. A sample of this test appears as Exhibit F of the Appendix. After careful scoring and rechecking, these quotients were made a part of the experimental record. As shown in Table 10, page 72, the arithmetic mean of the control group was found to be 101.67, with a standard deviation of 8.85. For the experimental group, the arithmetic mean was 98.67 and its standard deviation 7.77. These are set forth in Table 11, page 73. The range of scores, the two means, and the medians are presented graphically in Figure 3, page 74.

Application of the critical ratio technique previously set out showed a t score of 1.28 in favor of the control group. See Table 13, page 75 for these computations.

The third criterion for selection of the two groups was their knowledge of business fundamentals. For determination of this information, the National Clerical Ability Test of Business Fundamentals was used. Some students had taken intelligence tests prior to this experiment. In their cases, business fundamentals was the second test taken. For the others, it was the third. This test was given to each student and carefully scored according to the procedure set up in the scoring key accompanying the test. All scores were rechecked before becoming a part of the groups' record.

Table 10.--INTELLIGENCE QUOTIENTS OF CONTROL GROUP, BASED ON OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY, HIGHER FORM D, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION.

Scores: 121, 118, 115, 114, 111, 107, 107, 106, 105, 104, 104, 101, 100, 100, 100, 100, 99, 98, 97, 96, 95, 93, 92, 90, 87, 85.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
118.5-121.5	120	1	+6	6	36
115.5-118.5	117	1	+5	5	25
112.5-115.5	114	2	+4	8	32
109.5-112.5	111	1	+3	3	9
106.5-109.5	108	2	+2	4	8
103.5-106.5	105	4	+1	4	4
100.5-103.5	102	1	0	0	00
97.5-100.5	99	6	-1	-6	6
94.5- 97.5	96	3	-2	-6	12
91.5- 94.5	93	2	-3	-6	18
88.5- 91.5	90	1	-4	-4	16
85.5- 88.5	87	1	-5	-5	25
82.5- 85.5	84	1	-6	-6	36

S = 3                      N = 26                       $\sum fd^2 = 227$

ARITHMETIC MEAN

$$c = \frac{+30-33}{26} = -.11$$

$$AM = 102 + (-.11)3 = 101.67$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (t_c)^2} \right) S =$$

$$\left( \sqrt{\frac{227}{26} - (-.11)^2} \right) 3 = 8.85$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 11.--INTELLIGENCE QUOTIENTS OF EXPERIMENTAL GROUP, BASED ON OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY, HIGHER FORM D, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION.

Scores: 116, 115, 111, 105, 104, 104, 103, 101, 98, 98, 98, 97, 97, 96, 95, 94, 94, 93, 93, 92, 90, 90, 80.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>Σfd<sup>2</sup></u>
115.5-118.5	117	1	6	6	36
112.5-115.5	114	1	5	5	25
109.5-112.5	111	1	4	4	16
106.5-109.5	108	0	4	0	00
103.5-106.5	105	4	2	8	16
100.5-103.5	102	2	1	2	2
97.5-100.5	99	3	0	0	00
94.5- 97.5	96	6	-1	-6	6
91.5- 94.5	93	5	-2	-10	20
88.5- 91.5	90	2	-3	-6	18
85.5- 88.5	87	0	-4	0	00
82.5- 85.5	84	0	-5	0	00
79.5- 82.5	81	1	-6	6	36

S = 3

N = 26

Σfd<sup>2</sup> = 175

ARITHMETIC MEAN

$$c = \frac{+25-28}{26} = -.11$$

$$AM = 99 + (-.11)3 = 98.67$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\Sigma fd^2}{N} - (t_c)^2} \right) 3 =$$

$$\left( \sqrt{\frac{175}{26} - (-.11)^2} \right) 3 = 7.77$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of Cases; Σ--Sum of; c--Correction; AM--Arithmetic Mean; σ--Standard Deviation.



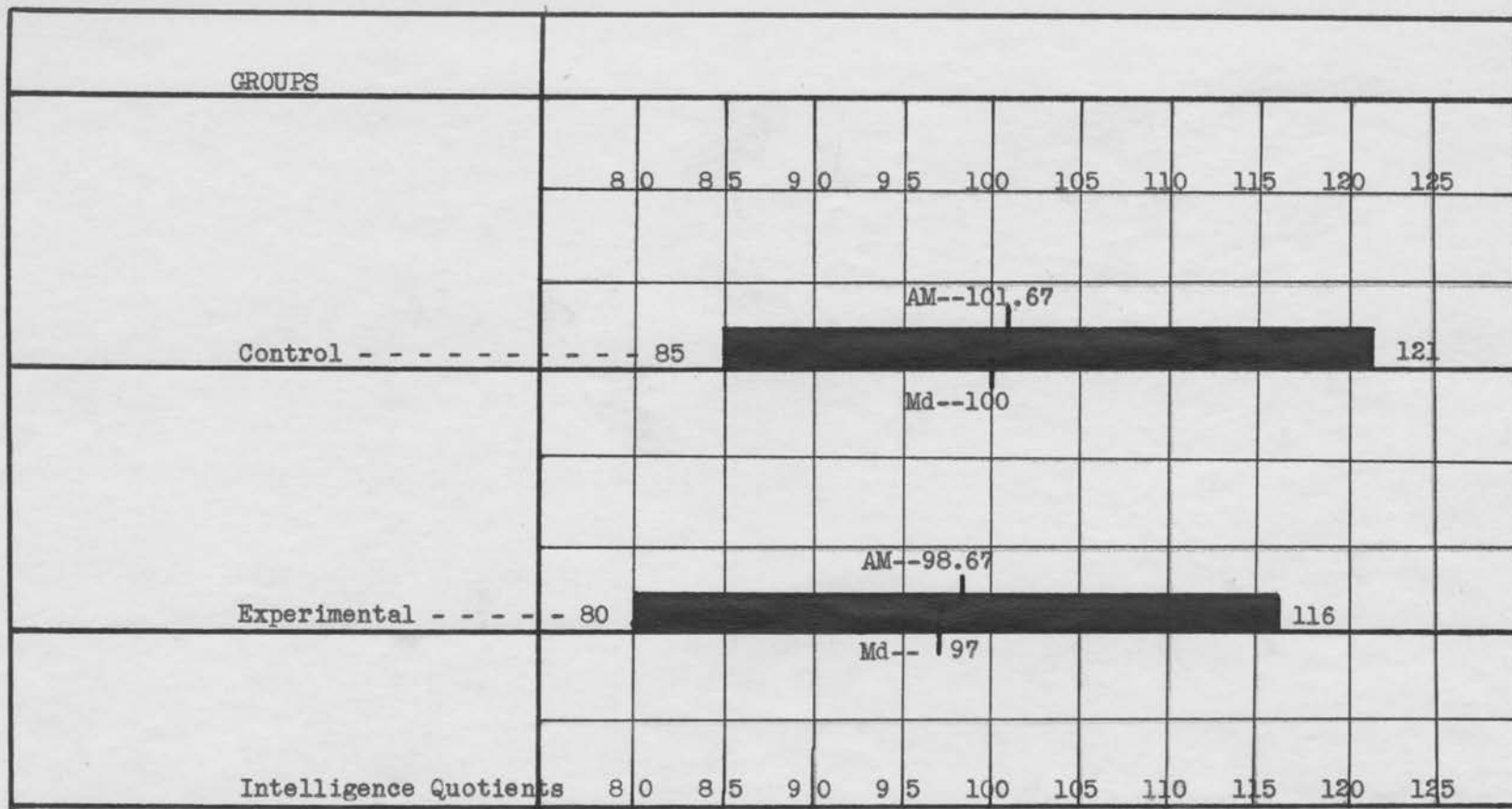


Figure 3.--Intelligence quotients of both control and experimental groups, based on Otis Self-administering tests of mental ability, Higher form D.

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Table 12.--STANDARD ERROR OF THE MEAN IN INTELLIGENCE QUOTIENTS OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON OTIS SELF-ADMINISTERING TEST OF MENTAL ABILITY, HIGHER FORM D.

<u>Control Group</u>	<u>Experimental Group</u>
Previously Computed Symbols Involved:	Previously Computed Symbols Involved:
N = 26 $\sigma_c = 8.85$	N = 26 $\sigma_e = 7.77$
$SE_c = \frac{8.85}{5} = 1.77$	$SE_e = \frac{7.77}{5} = 1.55$

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 13--CRITICAL RATIO APPLIED TO INTELLIGENCE QUOTIENTS OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY, HIGHER FORM D.

Previously Computed Symbols Involved:  $AM_c$ --101.67;  $AM_e$ --98.67;  $SE_c$ --1.77;  $SE_e$ --1.55;

$$t = \frac{101.67 - 98.67}{\sqrt{(1.77)^2 + (1.55)^2}} = \frac{3.00}{2.35} = 1.28$$

Symbol Explanation:  $t$ --Critical ratio;  $AM_c$ --Arithmetic Mean of Control Group;  $AM_e$ --Arithmetic Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Upon calculation, it was found that the arithmetic mean of the scores for the control group was 62.44, with a standard deviation of 20.72, as shown in Table 14, page 77. For the experimental group, the arithmetic mean was 62.79, with a standard deviation of 16.31. This is pointed out in Table 15, page 78. Graphic representation of the range of all scores, arithmetic means, and medians is presented in Figure 4 on page 79. The control group had a standard error of the mean of 4.14 and the experimental group a standard error of the mean of 3.26. These are set forth in Table 16, page 80.

The t formula for calculation of critical ratios was then applied to these business fundamentals scores and a statistical difference of .066 in favor of the experimental group was found, as shown in Table 17 on page 80.

The fourth criterion selected for matching in this experiment was age in months of each of the participating students. The office of Topeka High School furnished the date of birth for these students, which were first checked with the date of birth recorded on the intelligence or business fundamentals tests. After these dates of birth had been secured and checked, the ages of the students in months were determined, from the time of birth to the beginning of school on the years covered by the experiment, 1944-45, and 1945-46. These ages were grouped into ranges as shown in Tables 18 and 19, pages 81 and 82. The arithmetic mean of the control group was found to be 207.86 months, with a standard deviation of 5.88. The arithmetic mean of the experimental group was 207.71, with a standard deviation of 4.26. The range of these ages in months,

Table 14.--SCORES MADE BY CONTROL GROUP ON NATIONAL CLERICAL ABILITY TEST OF BUSINESS FUNDAMENTALS, SHOWING THE ARITHMETIC MEAN AND THE STANDARD DEVIATION.

Scores: 101.25, 98.25, 13.25, 91.0, 86.25, 84.5, 82.25, 79.0, 72.05, 68.25, 65.0, 59.5, 55.75, 55.5, 52.5, 52.25, 51.75, 50.5, 50.0, 50.0, 48.5, 46.75, 35.5, 32.25, 27.0, 25.0.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
94.5-101.5	98	2	+5	10	50
87.5- 94.5	91	2	+4	8	32
80.5- 87.5	84	3	+3	9	27
73.5- 80.5	77	1	+2	2	4
66.5- 73.5	70	3	+1	3	3
59.5- 66.5	63	2	0	0	00
52.5- 59.5	56	2	-1	-2	2
45.5- 52.5	49	7	-2	-14	28
38.5- 45.5	42	0	-3	0	00
31.5- 38.5	35	2	-4	-8	32
24.5- 31.5	28	2	-5	-10	50

S = 7                      N = 26                       $\sum fd^2 = 228$

<u>ARITHMETIC MEAN</u>	.	<u>STANDARD DEVIATION</u>
$c = \frac{+32-34}{26} = -.08$	.	$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (tc)^2} \right) S =$
$AM = 63 + (-.56) = 62.44$	.	$\left( \sqrt{\frac{228}{26} - (-.11)^2} \right) 7 = 20.72$
	.	

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Stemp Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 15.--SCORES MADE BY EXPERIMENTAL GROUP ON NATIONAL CLERICAL ABILITY TEST OF BUSINESS FUNDAMENTALS, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION.

Scores: 94.25, 93.0, 87.75, 85.50, 76.50, 82.0, 72.75, 72.75, 66.75, 66.75, 66.5, 64.75, 60.25, 57.75, 54.75, 54.25, 54.0, 49.75, 48.75, 48.5, 48.2, 47.0, 46.25, 46.0, 43.75, 30.75.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
87.5-94.5	91	3	+4	12	48
80.5-87.5	84	2	+3	6	18
73.5-80.5	77	1	+2	2	4
66.5-73.5	70	5	+1	5	5
59.5-66.5	63	2	0	0	00
52.5-59.5	56	4	-1	-4	4
45.5-52.5	49	7	-2	-14	28
38.5-45.5	42	1	-3	-3	9
31.5-38.5	35	-	-4	-	00
24.5-31.5	28	1	-5	-5	25

S = 7                      N = 26                       $\sum fd^2 = 141$

ARITHMETIC MEAN

$$c = \frac{+25-26}{26} = -.03$$

$$AM = 63 + (-.03)7 = 62.79$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (c)^2} \right) S =$$

$$\left( \sqrt{\frac{141}{26} - (-.03)^2} \right) 7 = 16.31$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

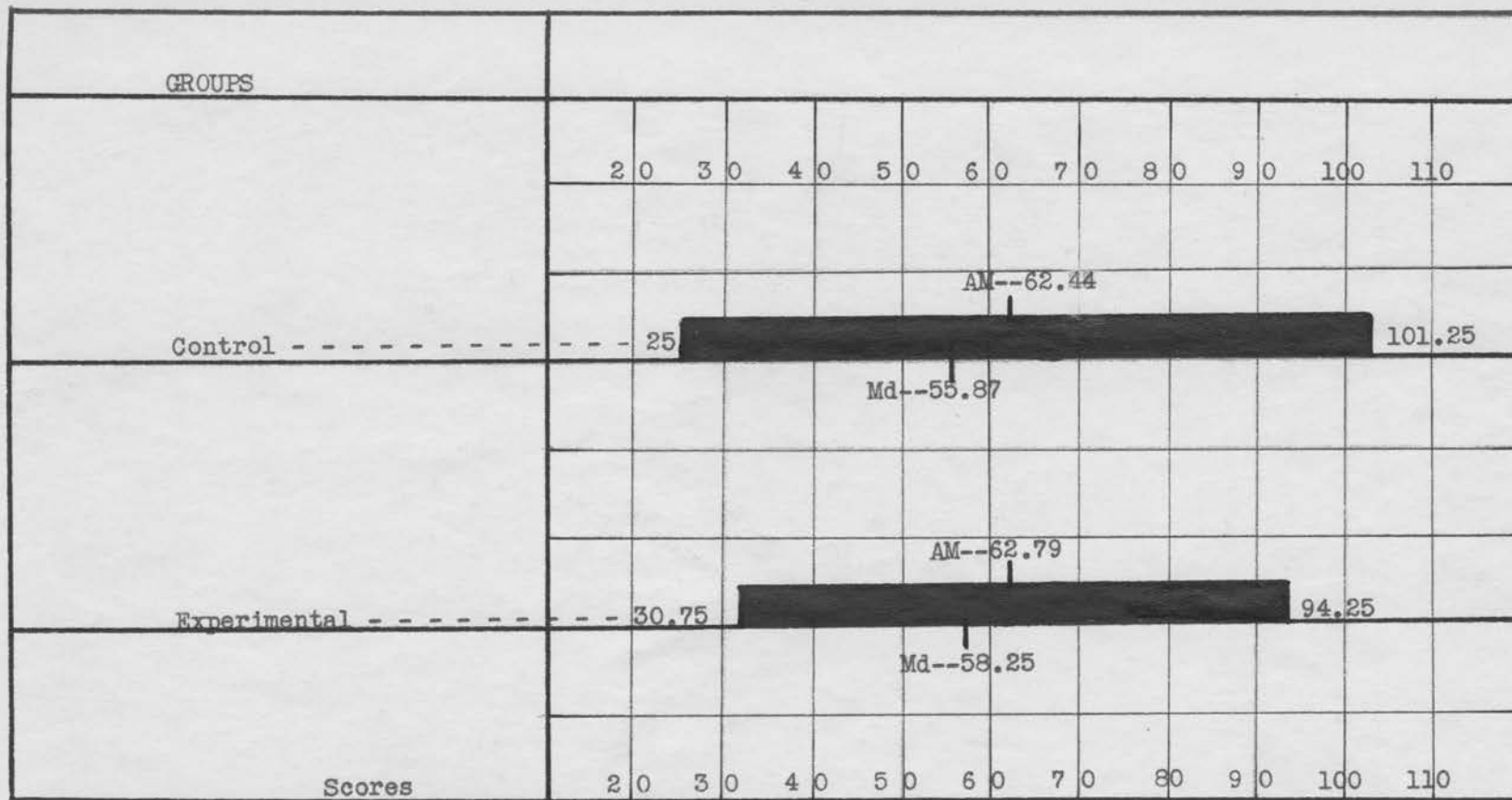


Figure 4.--Scores made by both control and experimental groups on National Clerical Ability test of business fundamentals.

Table 16.--STANDARD ERROR OF THE MEAN IN SCORES MADE BY BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON NATIONAL CLERICAL ABILITY BUSINESS FUNDAMENTALS TEST.

<u>Control Group</u>	<u>Experimental Group</u>
Previously Computed Symbols Involved:	Previously Computed Symbols Involved:
N = 26	N =
$\sigma_c = 20.72$	$\sigma_e = 16.31$
$SE_c = \frac{20.72}{5} = 4.14$	$SE_e = \frac{16.31}{5} = 3.26$

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 17.--CRITICAL RATIO APPLIED TO SCORES OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON NATIONAL CLERICAL ABILITY TEST OF BUSINESS FUNDAMENTALS.

Previously Computed Symbols Involved:  $AM_c$ --62.44;  $AM_e$ --62.79;  $SE_c$ --4.14;  $SE_e$ --3.26.

$$\bar{t} = \frac{62.79 - 62.44}{\sqrt{(4.14)^2 + (3.26)^2}} = \frac{.35}{5.27} = .066$$

Symbol Explanation:  $\bar{t}$ --Critical Ratio;  $AM_e$ --Arithmetic Mean of Experimental Group;  $AM_c$ --Arithmetic Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group.

Table 18.--AGES OF CONTROL GROUP IN MONTHS, BASED ON TOPEKA HIGH SCHOOL RECORDS, SHOWING ARITHMETIC MEANS AND STANDARD DEVIATIONS.

Ages in Months: 217, 217, 216, 215, 213, 213, 212, 211, 211, 210, 209, 209, 208, 208, 208, 207, 206, 205, 205, 204, 204, 200, 200, 199, 199, 194.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
216.5-219.5	218	2	+3	6	18
213.5-216.5	215	2	+2	4	8
210.5-213.5	212	5	+1	5	5
207.5-210.5	209	6	0	0	00
204.5-207.5	206	4	-1	-4	4
201.5-204.5	203	2	-2	-4	8
198.5-201.5	200	4	-3	-12	36
195.5-198.5	197	0	-4	0	00
192.5-195.5	194	1	-5	-5	25

S = 3      N = 26       $\Sigma fd^2 = 104$

ARITHMETIC MEAN

$c = \frac{+15-25}{N} = -.38$   
 $AM = 209 + (-.38)3 = 207.86$

STANDARD DEVIATION

$\sigma = \sqrt{\frac{\Sigma fd^2}{N} - (c)^2} S =$   
 $\left( \sqrt{\frac{104}{26} - (-.38)^2} \right) 3 = 5.88$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\Sigma$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.



Table 19.--AGES OF EXPERIMENTAL GROUP IN MONTHS, BASED ON TOPEKA HIGH SCHOOL RECORDS, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION.

Ages in Months: 216, 215, 213, 213, 212, 212, 212, 210, 210, 210, 210, 209, 209, 208, 207, 207, 207, 206, 205, 205, 204, 203, 203, 199, 198.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
213.5-216.5	215	2	+3	6	18
210.5-213.5	212	5	+2	10	20
207.5-210.5	209	7	+1	7	7
204.5-207.5	206	7	0	0	00
201.5-204.5	203	3	-1	-3	3
198.5-201.5	200	1	-2	-2	4
195.5-198.5	197	1	-3	-3	9

S = 3                      N = 26                       $\sum fd^2 = 61$

ARITHMETIC MEAN

$$c = \frac{+23-8}{26} = .57$$

$$AM = 206 + (.57)3 = 207.71$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (tc)^2} \right) S =$$

$$\left( \sqrt{\frac{61}{26} - (.57)^2} \right) 3 = 4.26$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\Sigma$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

the arithmetic means, and the medians are shown graphically in Figure 5, page 84. The standard error of the control group's mean was 1.18 and that of the experimental group was .85, as set forth in Table 20, page 85. Application of the critical ratio formula to these means and standard errors produced a fraction of .010 in favor of the control group. (Table 21, page 85).

The fifth criterion for selecting the two equivalent groups was previous grades in high school. Since Topeka operates under a 6-3-3 plan, the final year of junior high school was considered as a part of the high school grades. The basic grades, A, B, C, and D were assigned an average value after computing the numeric range, as follows:

A	- - - - -	93.5-100.0	Range.	96.75	Average.
B	- - - - -	85.5- 93.5,	"	89.25	"
C	- - - - -	77.5- 85.5,	"	81.75	"
D	- - - - -	70.0- 77.5,	"	74.25	"

After the averages were determined, the arithmetic means and the standard deviations were computed by the procedures previously used. As shown in Table 22, page 86, the arithmetic mean of the control group was 87.86, with a standard deviation of 3.81. The arithmetic mean of the experimental group was also 87.86, with a standard deviation of 3.63. This is shown in Table 23, page 87. The control group had a standard error of the mean of .76 and the experimental group .73, as set forth in Table 24, page 88. Upon application of the critical ratio formula as shown in Table 25, page 88, the differential fraction was found to be 0. Graphic representation of the ranges of scores, arithmetic means, and medians is shown by Figure 6, page 84.

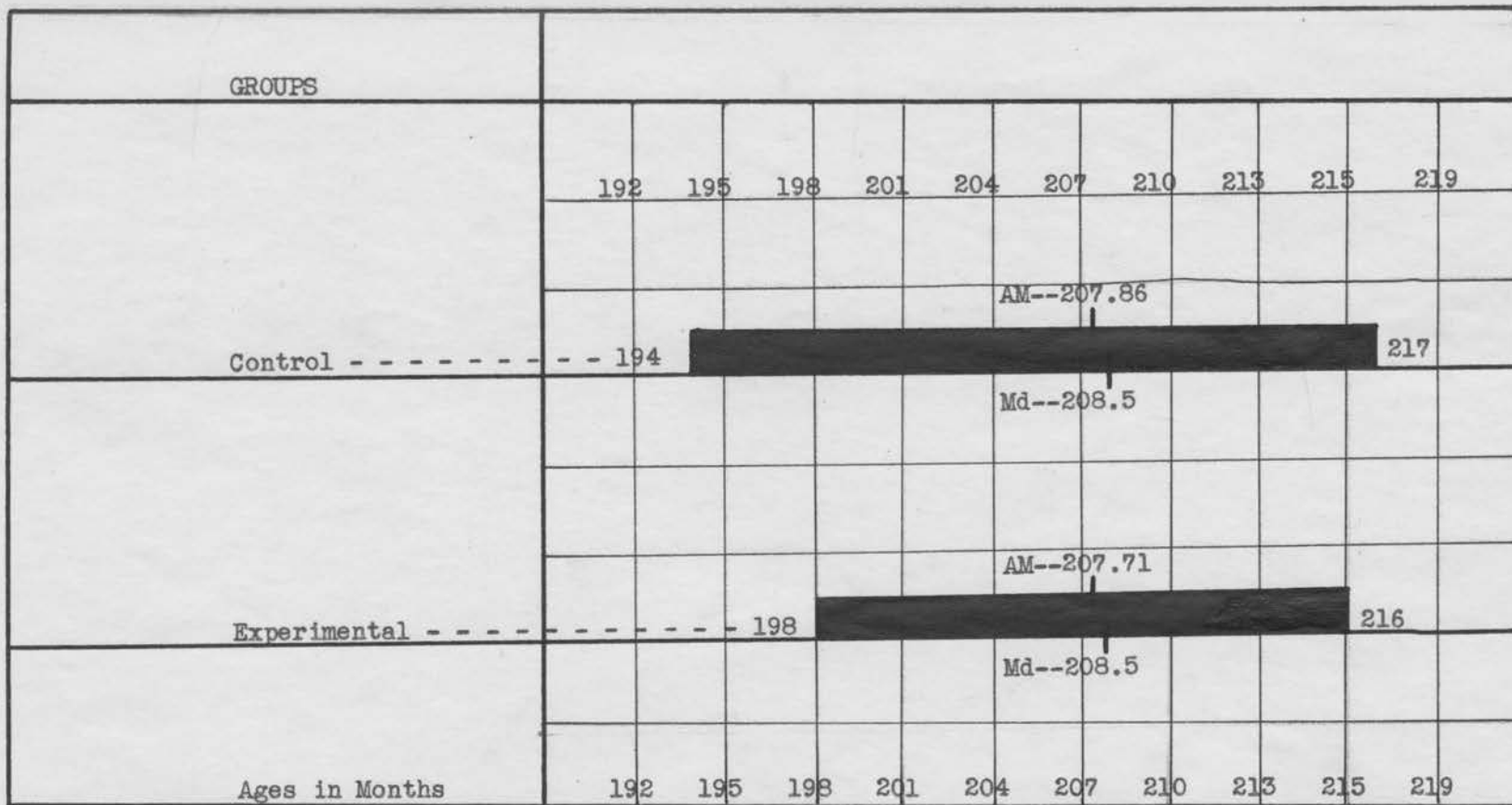


Figure 5.--Ages in months of both control and experimental groups, based on Topeka High School office records.

Table 20.--STANDARD ERROR OF THE MEAN OF AGES IN MONTHS OF CONTROL AND EXPERIMENTAL GROUPS, BASED ON RECORDS OF TOPEKA HIGH SCHOOL.

<u>Control Group</u>	.	<u>Experimental Group</u>
Previously Computed Symbols Involved:	.	Previously Computed Symbols Involved:
N = 26 $\sigma_c = 5.88$	.	N = 26 $\sigma_e = 4.26$
$SE_c = \frac{5.88}{5} = 1.18$	.	$SE_e = \frac{4.26}{5} = .85$
	.	

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 21.--CRITICAL RATIO APPLIED TO AGES IN MONTHS OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON TOPEKA HIGH SCHOOL RECORDS.

Previously Computed Symbols Involved:  $AM_c$ --207.86;  $AM_e$ --207.71;  $SE_c$ --1.18;  $SE_e$ --.85.

$$t = \frac{207.86 - 207.71}{\sqrt{(1.18)^2 + (.85)^2}} = \frac{.15}{2.1149} = .010$$

Symbol Explanation:  $t$ --Critical Ratio;  $AM_c$ --Arithmetic Mean of Control Group;  $AM_e$ --Arithmetic Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 22.--GRADES MADE BY CONTROL GROUP, BASED ON SCHOOL RECORDS, SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION.

Grades: 96.12, 95.63, 95.36, 91.92, 91.92, 91.31, 89.75, 89.73, 89.01, 88.96, 88.38, 88.06, 87.37, 86.75, 86.37, 86.14, 85.91, 85.62, 85.23, 85.18, 85.15, 85.11, 84.07, 83.45, 82.71, 80.91.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
93.5-96.5	95	3	+2	6	12
90.5-93.5	92	3	+1	3	3
87.5-90.5	89	6	0	00	00
84.5-87.5	86	10	-1	-10	10
81.5-84.5	83	3	-2	-6	12
78.5-81.5	80	1	-3	-3	9

$$S = 3$$

$$N = 26$$

$$\sum Fd^2 = 46$$

ARITHMETIC MEAN

$$c = \frac{+9-19}{26} = -.38$$

$$AM = 89 + (-.38)3 = 87.86$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (t_c)^2} \right) S =$$

$$\left( \sqrt{\frac{46}{26} - (-.38)^2} \right) 3 = 3.81$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid-Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 23.--GRADES MADE BY EXPERIMENTAL GROUP, BASED ON SCHOOL RECORDS AND SHOWING THE ARITHMETIC MEAN AND STANDARD DEVIATION.

Grades: 94.35, 93.60, 92.86, 91.06, 90.82, 90.36, 90.0, 89.25, 88.35, 88.21, 88.0, 87.91, 87.80, 87.69, 87.69, 86.43, 86.43, 86.21, 85.05, 84.80, 84.75, 83.76, 83.48, 83.0, 81.55, 80.18.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
93.5-96.5	95	2	+2	4	8
90.5-93.5	92	3	+1	3	3
87.5-90.5	89	10	0	0	00
84.5-87.5	86	6	-1	-6	6
81.5-84.5	83	4	-2	-8	16
78.5-81.5	80	1	-3	-3	9

$S = 3$                    $N = 26$                    $\sum fd^2 = 42$

ARITHMETIC MEAN

$$c = \frac{+7-17}{26} = -.38$$

$$AM = 89 + (-.38)3 = 87.86$$

STANDARD DEVIATION

$$= \sqrt{\frac{\sum fd^2}{N} - (\frac{\sum d}{N})^2} S =$$

$$\sqrt{\frac{42}{26} - (-.38)^2} 3 = 3.63$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of Cases;  $\Sigma$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 24.--STANDARD ERROR OF THE MEAN OF GRADES OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON TOPEKA HIGH SCHOOL RECORDS.

<u>Control Group</u>		<u>Experimental Group</u>
Previously Computed Symbols Involved:		Previously Computed Symbols Involved:
N = 26	$\sigma_c = 3.81$	N = 26
		$\sigma_e = 3.63$
$SE_c = \frac{3.81}{5} = .76$		$SE_e = \frac{3.63}{5} = .73$

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Control Group.

Table 25.--CRITICAL RATIO APPLIED TO GRADES OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON TOPEKA HIGH SCHOOL RECORDS.

Previously Computed Symbols Involved:  $AM_c$ --Arithmetic Mean of Control Group--87.86;  $AM_e$ --87.86;  $SE_c$ --3.81;  $SE_e$ --3.63.

$$t = \frac{87.86 - 87.86}{\sqrt{(3.81)^2 + (3.63)^2}} = \frac{0}{1.1105} = 0.$$

Symbol Explanation: t--Critical Ratio;  $AM_e$ --Arithmetic Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

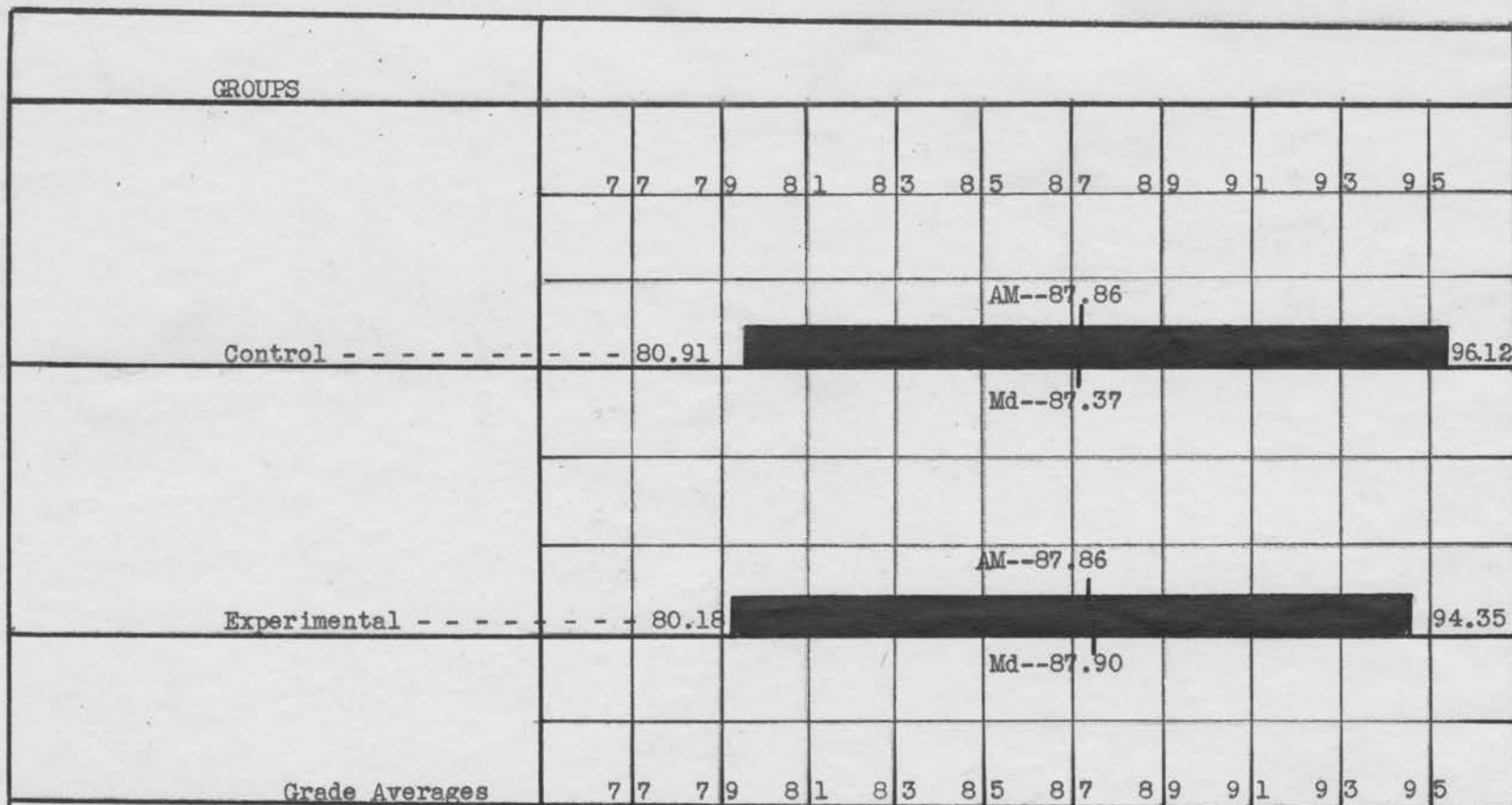


Figure 6.--Average grades made by both control and experimental groups, based on school records of Topeka High School.



Examination of office records showed that all students were in the twelfth year of high school and each member of the two groups was a girl.

#### Teaching procedure.

The present filing experiment started with the opening of the first semester of the school year 1944-45 and continued in the school year 1945-46. After matching was completed, each student received 27.5 clock hours of filing instruction; or as in the case of the experimental group, had completed the filing unit in less time. The control group was taught under the traditional textbook type of instruction previously mentioned and the experimental group under the individual unit plan as already discussed. Both groups were given the National Clerical Ability Filing Test, series 1941, on the first day they were in the class. After the 27.5 clock hours of training under the teaching plan used in her group, each student was given the test again, as in the case of Jossierand's (19) and Hershey's (15) experiments. The first test showed what each student knew about the subject at the beginning of instruction and the second measured the amount of progress made.

The second administration of this filing test was carefully scored and rechecked. As shown in Table 26, page 91, the arithmetic mean of the control group was found to be 98.82, with a standard deviation of 23.45. The arithmetic mean of the experimental group, as shown in Table 27, page 92, was 134.73, with a standard deviation of 17.92. The arithmetic means, medians, and ranges of scores are graphically represented in Figure 7, page 93. The standard error of the two means, as set out in Table 28, page 94.

Table 26.--SCORES MADE BY CONTROL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION. SECOND ADMINISTRATION.

Scores: 150, 144, 140, 129, 123, 120, 115, 108, 105, 101, 96, 95, 92, 92, 90, 89, 85, 84, 82, 80, 76, 73, 73, 72, 70, 66.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
149.5-156.5	153	1	+8	8	64
142.5-149.5	146	1	+7	7	49
135.5-142.5	139	1	+6	6	36
128.5-135.5	132	1	+5	5	25
121.5-128.5	125	1	+4	4	16
114.5-121.5	118	2	+3	6	18
107.5-114.5	111	1	+2	2	4
100.5-107.5	104	2	+1	2	2
93.5-100.5	97	2	0	0	00
86.5- 93.5	90	4	-1	-4	4
79.5- 86.5	83	4	-2	-8	16
72.5- 79.5	76	3	-3	-9	27
65.5- 72.5	69	3	-4	-12	48

S = 7

N = 26

$\sum fd^2 = 309$

ARITHMETIC MEAN

$$c = \frac{+40-33}{26} = -.26$$

$$AM = 97 + (-.26)7 = 98.82$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (-c)^2} \right) S =$$

$$\left( \sqrt{\frac{309}{26} - (-.26)^2} \right) 7 = 23.45$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of Cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 27.--SCORES MADE BY EXPERIMENTAL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION. SECOND ADMINISTRATION.

Scores: 158, 155, 155, 154, 151, 149, 149, 144, 143, 140, 140, 140, 139, 139, 138, 137, 133, 132, 130, 129, 124, 123, 112, 102, 93, 88.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
156.5-163.5	160	1	+3	3	9
149.5-156.5	153	4	+2	8	16
142.5-149.5	146	4	+1	4	4
135.5-142.5	139	7	0	0	00
128.5-135.5	132	4	-1	-4	4
121.5-128.5	125	2	-2	-4	8
114.5-121.5	118	0	-3	0	00
107.5-114.5	111	1	-4	-4	16
100.5-107.5	104	1	-5	-5	25
93.5-100.5	97	0	-6	0	00
86.5- 93.5	90	2	-7	-14	98

$S = 7$

$N = 26$

$\sum fd^2 = 180$

ARITHMETIC MEAN

$c = \frac{+15-31}{26} = -.61$

$AM = 139 + (-.61)7 = 134.73$

STANDARD DEVIATION

$= \left( \sqrt{\frac{\sum fd^2}{N} - (c)^2} \right) S =$

$\left( \sqrt{\frac{180}{26} - (-.61)^2} \right) 7 = 17.92$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of Cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

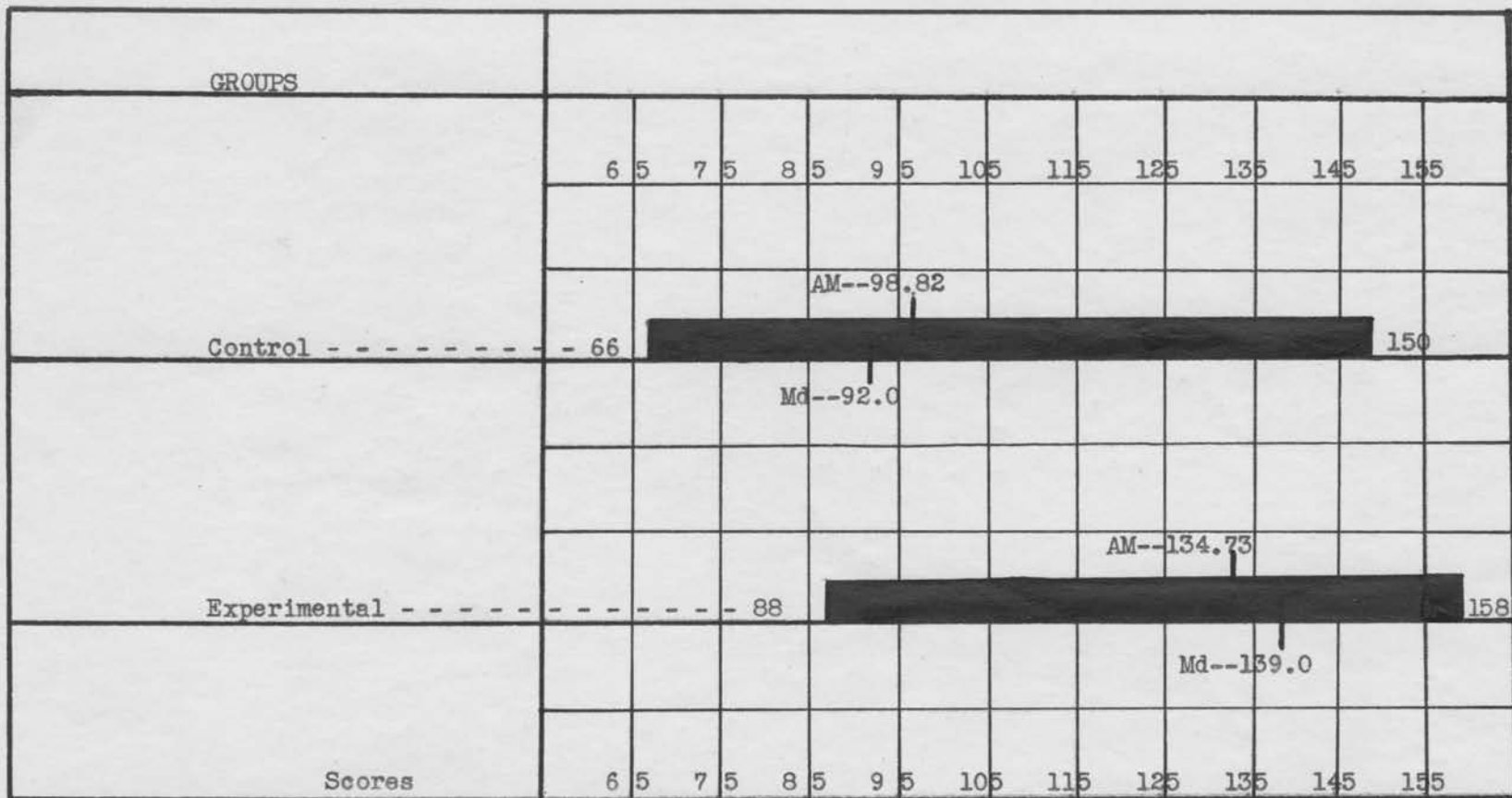


Figure 7.--Scores made by both control and experimental groups on second administration of the National Clerical Ability filing test, series 1941.

Table 28.--STANDARD ERROR OF THE MEAN OF SCORES OF BOTH CONTROL AND EXPERIMENTAL GROUPS ON SECOND ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

<u>Control Group</u>	.	<u>Experimental Group</u>
Previously Computed Symbols Involved:	.	Previously Computed Symbols Involved:
N = 26	.	N = 26
$\sigma_c = 23.45$	.	$\sigma_e = 17.92$
$SE_c = \frac{23.45}{5} = 4.69$	.	$SE_e = \frac{17.92}{5} = 3.58$

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 29.--CRITICAL RATIO APPLIED TO SCORES OF BOTH CONTROL AND EXPERIMENTAL GROUPS, BASED ON SECOND ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

Previously Computed Symbols Involved:  $AM_e$ --Arithmetic Mean of Experimental Group--134.73;  $AM_c$ --98.82;  $SE_e$ --3.58;  $SE_c$ --4.69.

$$\frac{t}{V} = \frac{134.73 - 98.82}{\sqrt{(3.58)^2 + (4.69)^2}} = \frac{35.91}{5.90} = 6.09$$

Symbol Explanation:  $t$ --Critical Ratio;  $AM_c$ --Arithmetic Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group.

gave a t score of 6.09 in favor of the experimental group.

The errors made by the two groups on this test were also tabulated. Table 30, page 96, shows that the arithmetic mean of errors made by the control group was 83.1, with a standard deviation of 24.22. The experimental group had an arithmetic mean of 47.26, with a standard deviation of 18.62. See Table 31, page 97. The range of errors arithmetic means, and medians are shown graphically in Figure 8, page 98. The control group had 4.84 as the standard error of the mean and the experimental 3.72, as set out in Table 32, page 99. Application of the critical ratio formula gave a t score of 5.88 for the control group.

The next step will be a discussion and interpretation of these findings in Chapter V.

Table 30.--ERRORS MADE BY CONTROL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION. SECOND ADMINISTRATION.

Errors: 115, 111, 109, 108, 108, 105, 101, 99, 97, 96, 92, 91, 89, 89, 86, 85, 80, 76, 73, 66, 61, 58, 52, 41, 37, 31.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
112.5-119.5	116	1	+5	5	25
105.5-112.5	109	4	+4	16	64
98.5-105.5	102	3	+3	9	27
91.5- 98.5	95	3	+2	6	12
84.5- 91.5	88	5	+1	5	25
77.5- 84.5	81	1	0	0	00
70.5- 77.5	74	2	-1	-2	2
63.5- 70.5	67	1	-2	-2	4
56.5- 73.5	60	2	-3	-6	18
49.5- 56.5	53	1	-4	-4	16
42.5- 49.5	46	0	-5	0	00
35.5- 42.5	39	2	-6	-12	72
28.5- 35.5	32	1	-7	-7	49

S = 7

N = 26

$\sum fd^2 = 314$

ARITHMETIC MEAN

$$c = \frac{+41-33}{26} = .3$$

$$AM = 81 + (.3)7 = 83.1$$

STANDARD DEVIATION

$$\sigma = \left( \sqrt{\frac{\sum fd^2}{N} - (t_c)^2} \right) S =$$

$$\left( \sqrt{\frac{314}{26} - (.3)^2} \right) 7 = 24.22$$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step Interval; N--Number of cases;  $\sum$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.

Table 31.--ERRORS MADE BY EXPERIMENTAL GROUP ON NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941, SHOWING ARITHMETIC MEAN AND STANDARD DEVIATION. SECOND ADMINISTRATION.

Errors: 93, 88, 79, 69, 58, 57, 52, 51, 49, 48, 44, 43, 42, 42, 41, 41, 41, 38, 37, 32, 32, 30, 27, 26, 26, 23.

<u>C. I.</u>	<u>M-P</u>	<u>f</u>	<u>d</u>	<u>fd</u>	<u>fd<sup>2</sup></u>
91.5-98.5	95	1	+7	7	49
84.5-91.5	88	1	+6	6	36
77.5-84.5	81	1	+5	5	25
70.5-77.5	74	0	+4	0	00
63.5-70.5	67	1	+3	3	9
56.5-63.5	60	2	+2	4	8
49.5-56.5	53	2	+1	2	2
42.5-49.5	46	4	0	0	00
35.5-42.5	39	7	-1	-7	7
28.5-35.5	32	3	-2	-6	12
21.5-28.5	25	4	-3	-12	36

S = 7

N = 26

$\sum fd^2 = 184$

ARITHMETIC MEAN

$c = \frac{+27-25}{26} = .07$

AM = 46 + (.07)7 = 46.49

STANDARD DEVIATION

$= \sqrt{\left( \frac{\sum fd^2}{N} - (c)^2 \right)} S =$   
 $\sqrt{\left( \frac{184}{26} - (.07)^2 \right)} 7 = 18.62$

Symbol Explanation: C. I.--Class Interval; M-P--Mid Point; f--Frequency; d--Distribution; S--Step interval; N--Number of Cases;  $\Sigma$ --Sum of; c--Correction; AM--Arithmetic Mean;  $\sigma$ --Standard Deviation.



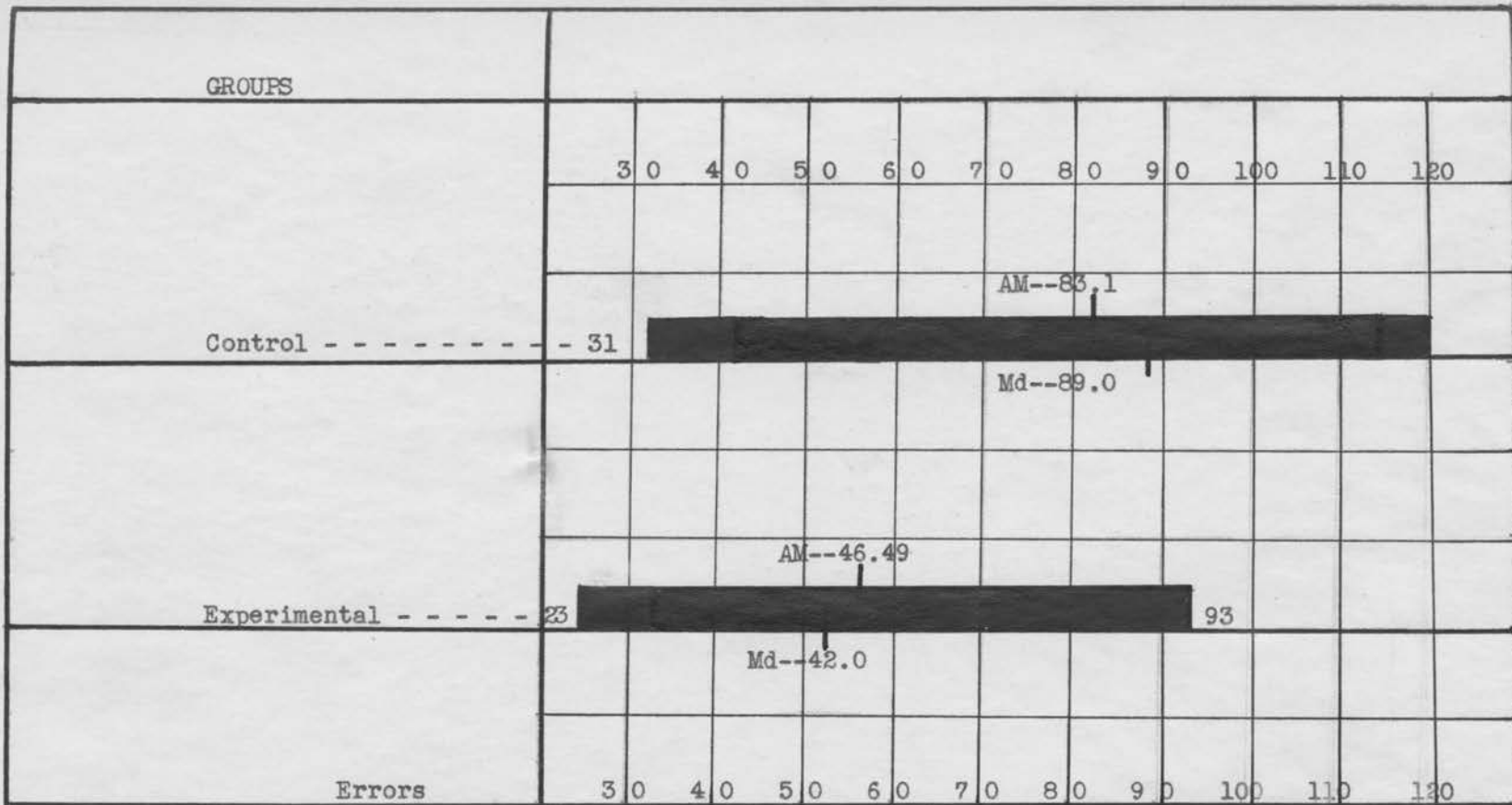


Figure 8.--Errors made by both control and experimental groups on National Clerical Ability test of filing ability, series 1941, second administration.

TABLE 32. STANDARD ERROR OF THE MEAN OF ERRORS MADE BY CONTROL AND EXPERIMENTAL GROUPS ON SECOND ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

<u>Control Group</u>	<u>Experimental Group</u>
Previously Computed Symbols Involved:	Previously Computed Symbols Involved:
N = 26 $\sigma_c = 24.22$	N = 26 $\sigma_e = 18.62$
$SE_c = \frac{24.72}{5} = 4.84$	$SE_e = \frac{18.62}{5} = 3.72$

Symbol Explanation: N--Number of Cases;  $\sigma_c$ --Standard Deviation of Control Group;  $\sigma_e$ --Standard Deviation of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

Table 33.--CRITICAL RATIO APPLIED TO ERRORS OF BOTH CONTROL AND EXPERIMENTAL GROUPS ON SECOND ADMINISTRATION OF NATIONAL CLERICAL ABILITY FILING TEST, SERIES 1941.

Previously Computed Symbols Involved:  $AM_c$ --83.10;  $AM_e$ --46.49;  $SE_c$ --4.84;  $SE_e$ --3.72.

$$t = \frac{83.10 - 47.26}{\sqrt{(4.84)^2 + (3.72)^2}} = \frac{35.84}{6.10} = 5.88$$

Symbol Explanation:  $t$ --Critical Ratio;  $AM_c$ --Arithmetic Mean of Control Group;  $AM_e$ --Arithmetic Mean of Experimental Group;  $SE_c$ --Standard Error of the Mean of Control Group;  $SE_e$ --Standard Error of the Mean of Experimental Group.

CHAPTER V.

DISCUSSION.

To determine the effectiveness of the cooperative, job-specification plan of teaching filing as compared with the traditional or textbook method of teaching the same subject, two groups of students were matched on the basis of knowledge of filing, intelligence quotients, knowledge of business fundamentals, ages in months, previous high school grades, sex, and year in school.

First administration of National Clerical Ability Filing Test, series 1941.

As pointed out in other experiments previously discussed, many authorities have concluded that pre-knowledge of the subject is one of the most necessary bases for matching two groups for experimental purposes.

Within the first week of their respective school years, 1944-45 and 1945-46, each member of the two groups was given the National Clerical Ability Filing Test; series 1941, and the tests were carefully graded and rechecked before being made a part of the experimental record. The arithmetic mean of the control group was found to be 63.5, with a standard deviation of 16.73. (See Table 2, page 62). In Table 3, page 63, the arithmetic mean of the experimental group was found to be 62.94, with a standard deviation of 14.26. In order to arrive at a critical ratio, it is necessary to calculate the standard errors of the two means. Calculations shown

in Table 5, page 66, show a standard error of the mean for the control group of 3.35 and a standard error of the mean of 2.91 for the experimental group. By substitution in the critical ratio formula, (See Table 5, page 66), a t score of .13 in favor of the control group was found. Treloar (36:29) has stated that such a ratio must be two or more to be considered statistically significant. Hence this .13 is considered not significant. It is therefore assumed that there is no statistically significant difference between the two groups in their knowledge of filing at the time of matching.

Errors made in this test were also tabulated (Tables 6 and 7, pages 67 and 68). This served as a check upon the calculations made in the scores. If the scores showed a difference in favor of the control group, the errors should show such a difference in favor of the experimental. Calculation of the means showed 117.5 for the control group, with a standard deviation of 16.73 and 118.06 for the experimental group, with a standard deviation of 14.56. These are shown in Tables 6 and 7. Again the standard errors of the two means were calculated. Table 8, page 70, shows that the control group had a standard error of 3.35 and the experimental, 2.91. These arithmetic means and standard errors of the means were then substituted in the critical ratio formula as shown in Table 9, page 70. From these calculations, a fraction of .13 was found in favor of the experimental group. Since the difference was less than the required two, it was considered not significant. Because it had the expected quotient in favor of the experimental group, the two were assumed to be well matched in pre-knowledge of filing, as shown by their scores and confirmed by this error check

on this first administration of the 1941 filing test.

Intelligence.

Intelligence is considered to be one of the most widely recognized foundations for selecting matched groups for experimental purposes. In accordance with this criterion, the intelligence quotients of all students were obtained by reference to school records or by testing if such records were not found. After all such quotients were secured, the arithmetic means and standard deviations of each group were found by the procedure shown in Tables 10 and 11, pages 72 and 73. The control group had a mean of 101.67, with a standard deviation of 8.85 and the experimental had an arithmetic mean of 98.67, with standard deviation of 7.77. Standard errors of these means were computed in Table 12, page 75. The control group was found to have a standard error of 1.77 and the experimental one of 1.55. Substitution in the critical ratio common to such experiments gave a t score or fraction of 1.28 in favor of the control group. This fraction is less than the two required to have statistical significance. Because of that fact, the two groups were assumed to be satisfactorily mated and no significant difference was considered between them in intelligence.

Business fundamentals.

Following the matching on the basis of intelligence quotients, the members of each group were given the National Clerical Business Fundamentals tests, which were carefully scored and rechecked before recording. The arithmetic mean of the control group was found to be 62.44, with a standard deviation of 20.72;

that of the experimental group was 62.79, with standard deviation of 16.31. (Tables 14 and 15, pages 77 and 78). In order to calculate a critical ratio, the standard errors of the means were computed in Table 16, page 80, and found to be 4.14 for the control group and 3.26 for the experimental. Substitution of the ascertained means and standard errors in the critical ratio formula as shown by Table 17, page 80, gave a t score of .010 in favor of the experimental group. Since a score of two or more is essential to point out any significant difference, this quotient was considered not significant and the two groups were assumed to be matched satisfactorily on the basis of their knowledge of business fundamentals.

#### Ages in months.

As previously stated, the ages of all students were calculated from birth records provided by the high school office. This was figured from date of birth to the beginning of the school year in which the student participated as a member of either group. Age is a criterion used by other experimenters (15), and is considered a helpful one in equating two groups. The arithmetic mean of the control group was found to be 207.86, with a standard deviation of 5.88 as shown in Table 18, page 81. The experimental group had an arithmetic mean of 207.71, with a standard deviation of 4.26. (See Table 19, page 82.) Standard errors of the two means were again calculated so that a critical ratio might be determined (Table 21, page 85). Substitution of these means and standard errors into the formula yielded a t score of .010 which is considered not significant. Following the practice of similar experimenters, the groups

were considered as not significantly different because this fraction was below the two required to point out a real difference between the two groups. On the basis of these findings, the two groups were considered as matched according to ages in months.

Previous high school grades.

Grades and intelligence quotients are considered by many experimenters as about equal in value in matching two groups. In this experiment, grades were secured from office records and reduced to an average as shown on page 83 of Chapter IV. The average became the basis for calculation of the means shown in Tables 22 and 23 on pages 86 and 87. The control group had an arithmetic mean of 87.86, with a standard deviation of 3.81, while the experimental group had a mean of 87.86, with standard deviation of 3.63. Standard errors were calculated as shown in Table 24, page 88, in order that substitution might be made in the critical ratio formula. As set out in Table 25, page 88, these means and standard errors gave a critical ratio of 0, which is not considered significant because it is less than two. The two groups are therefore considered as satisfactorily matched on the basis of previous grades in high school.

School records showed that all students included in the experiment were girls and were in their twelfth year of high school.

Students in this experiment were thus matched on the basis of knowledge of filing, intelligence, business fundamentals, ages in months, and previous grades in high school. A summary of scores made, ages, and grade averages is shown in Tables 26 and 27 on the

Table 34.--SCORES MADE BY THOSE CHOSEN FOR CONTROL GROUP IN  
ESTABLISHING BASIS OF EQUIVALENCY.

<u>Students</u>	<u>Intelligence Quotients</u>	<u>Age</u>	<u>Business Fundamentals</u>	<u>Previous Grades</u>	<u>Filing Pre-test</u>
A. B.	111	211	48.50	88.06	74
B. B.	114	206	59.50	80.91	67
N. B.	118	215	98.25	95.63	64
V. B.	107	204	65.00	86.14	57
J. C.	104	208	52.25	83.45	69
M. C.	100	212	51.75	88.38	44
B. D.	87	205	27.00	85.15	42
G. D.	99	209	101.2	95.36	79
G. D.	100	207	35.50	88.96	59
R. D.	106	217	50.50	89.01	55
M. F.	96	200	93.25	89.75	78
B. H.	105	217	82.25	91.92	63
C. H.	98	194	32.25	87.37	53
C. H.	101	208	50.00	86.75	61
G. H.	93	200	50.00	85.62	42
I. H.	97	213	79.00	89.73	41
B. J. J.	104	216	72.00	91.31	79
M. L.	100	208	68.25	84.07	35
A. S.	85	199	52.50	85.91	47
B. S.	95	209	55.50	82.71	72
J. S.	100	213	25.00	85.18	69
L. S.	115	210	91.00	96.12	102
M. S.	121	199	86.25	91.92	84
R. S.	92	211	46.75	85.23	80
M. W.	90	204	55.75	85.11	57
M. W.	107	205	84.50	87.37	81
Total	2645	5400	2250.87	1623.50	1654

Scores Based On

INTELLIGENCE QUOTIENT--OTIS Self-Administering Test of  
Mental Ability, Higher Form D.

AGE IN MONTHS -----School Records

BUSINESS FUNDAMENTALS--NATIONAL Clerical Ability Test of  
Business Fundamentals, 1940.

FILING ABILITY-----NATIONAL Clerical Ability Test of  
Filing Ability, 1940.

PREVIOUS GRADES-----School Records.



Table 35.--SCORES MADE BY THOSE CHOSEN FOR EXPERIMENTAL GROUP IN ESTABLISHING BASIS OF EQUIVALENCY.

<u>Students</u>	<u>Intelligence Quotients</u>	<u>Age</u>	<u>Business Fundamentals</u>	<u>Previous Grades</u>	<u>Filing Pre-test</u>
M. A.	93	213	48.20	84.75	55
C. B.	95	205	66.75	88.21	34
L. F. B.	93	212	54.75	88.00	46
M. D.	94	212	57.75	87.69	56
D. L. E.	105	213	66.50	83.76	77
J. E.	96	209	76.50	88.35	61
L. G.	96	203	54.25	87.80	55
B. L. H.	98	199	64.75	84.80	62
J. H.	116	205	93.00	93.60	61
J. D. H.	97	207	72.75	86.21	71
R. H.	98	210	43.75	86.43	59
V. J.	96	205	46.25	87.69	52
L. L.	103	198	87.75	90.36	105
R. M.	98	204	30.75	83.00	64
A. N.	111	210	85.50	94.35	37
T. P.	97	207	48.75	87.91	79
V. P.	90	212	82.00	90.82	75
B. R.	104	210	49.75	85.05	75
M. R.	104	210	48.50	89.25	52
B. L. S.	80	209	47.00	86.43	52
D. S.	94	216	46.00	80.18	51
I. S.	115	208	66.75	92.86	77
K. S.	90	206	54.00	83.48	80
S. S.	105	207	94.25	91.06	72
N. W.	92	215	60.25	81.55	70
R. W.	101	203	72.75	90.00	70
Total	2561	5408	1639.20	2249.06	1648

Scores Based On:

INTELLIGENCE QUOTIENT--OTIS Self-Administering Tests of  
Mental Ability, Higher Form D.  
AGE IN MONTHS -----School Records  
BUSINESS FUNDAMENTALS--NATIONAL Clerical Ability Test of  
Business Fundamentals, 1940.  
PREVIOUS GRADES-----School Records  
FILING ABILITY-----NATIONAL Clerical Ability Test of  
Filing Ability, 1940.

preceding page. Table 36 below summarizes the findings on the basis of these criteria.

Table 36.--SUMMARY OF CRITERIA USED IN ESTABLISHING THE EQUIVALENCY OF THE CONTROL AND EXPERIMENTAL GROUPS.

Criteria of Equivalency	. Control Group			. Experimental Group			Diff. t
	: AM	: SD	: SEM	: AM	: SD	: SEM	
Previous Knowledge of Filing	: 63.5	: 16.73	: 3.35	: 62.94	: 14.56	: 2.91	: .13
Intelligence	: 101.67	: 8.85	: 1.77	: 98.67	: 7.77	: 1.55	: 1.28
Business Fundamentals	: 62.44	: 20.72	: 4.14	: 62.79	: 16.31	: 3.26	: .066
Ages in Months	: 207.86	: 5.88	: 1.18	: 207.71	: 4.26	: .85	: .010
Grades	: 87.86	: 3.81	: .76	: 87.86	: 3.63	: .73	: .00

Symbol Explanation: AM--Arithmetic Mean; SD--Standard Deviation; SEM--Standard Error of the Mean; t--Critical Ratio.

The statistical experts quoted previously in this experiment stated that a difference of two or more would be required for statistical differences to be significant. In these criteria, the actual differences approached zero in the five just discussed, ranging from 0 to 1.28. It will be observed that the control group exceeded the experimental group in intelligence and previous knowledge of filing. The experimental group exceeded the control group only in knowledge of business fundamentals. There was no difference in previous grades and slight difference in ages, although the control group exceeded the experimental in this respect.

#### Teaching process.

After the matching procedure was satisfactorily completed, the two groups were taught under the two plans, the individual unit

for the experimental and the traditional or textbook plan for the control. At the conclusion of 27.5 clock hours of such instruction or upon the completion of the unit in the experimental group, each student was again tested by means of the same test. This procedure had previously been used in similar experiments by Josserand (19), Hershey (15) and others previously mentioned. This procedure measured the improvement due to instruction.

Second administration of National Clerical Ability Filing Test, series 1941.

This test was administered at the completion of training, graded, and rechecked in the same manner as the first one. As shown by Table 26, page 91, the arithmetic mean of the control group was 98.82, with a standard deviation of 13.45. The mean of the experimental group was 134.73, with a standard deviation of 17.92. (See Table 27, page 92). In order to determine whether this difference was significant, it was necessary to calculate the standard errors. For the control group, it was 4.69 (Table 28, page 94), and for the experimental, 3.58. Table 29, page 94, shows the critical ratio determined from these arithmetic means and standard errors when substituted in the critical ratio formula. A quotient of 6.09 was obtained in favor of the experimental group. Since it is a greater difference than two, it is considered significant. Reference to Sorensen's table given on page 59 shows that the chances are very slight that this difference was due to chance, but is a true difference between the accomplishments of the two groups. As a result of this finding, the experimental group is assumed to have produced a significantly superior gain over the control group. This

gain is ascribed to the working of the experimental plan in its use as the teaching procedure for the experimental group.

As in the case of the pre-test, errors made by the two groups were figured and the arithmetic means determined as shown in Table 30, page 96. For the control group it was 83.1, with a standard deviation of 24.22. For the experimental group, the mean was 46.49, with standard deviation of 18.62. (Table 31). The standard errors of the two means were again calculated and found to be 4.84 for the control group and 3.72 for the experimental. (Table 32, page 99). Critical ratio calculations shown in Table 33, page 99, give a t score of 5.88, which is a significant difference. Reference to Sorensen's table (35:367) shows that the chances are very slight that this is not a true difference. It confirms the finding above, in that the control group with a lower mean should show a significant difference over the experimental in the number of errors made. This is considered another validation of the statistically significant difference found between the two groups.

Comparison of both groups with the passing score established by the Joint Committee on Tests for the National Clerical Ability Filing Test, series 1941.

The experimental vocational group used in this study worked both in school and on the job to attain the skills and knowledges required by offices and the degree of such skills as they desire. All such standards are subject to review by the local advisory committee and are kept up-to-date. While students achieve skills in varying degrees, they are also rated on various levels by their employers. The standards of filing ability desired by employ-

ers. The standards of filing ability desired by employers and concurred in by commercial teachers are ably set forth in the minimum passing requirements established by the Joint Committee on Tests. These standards were used as yardsticks to measure the accomplishment of the two groups through the second administration of the National Clerical Ability filing test. Results were as follows:

Applying the deadline or minimum passing grade set up by the Joint Committee, four of the students of the control group scored 128.5 or more in the second administration of the test. This is 15 per cent of the group and would be a normal percentage had the method of selection recommended by the above committee been applied to this group. (18:8-9) (26:36). Twenty students, or 76 per cent of the experimental group scored 128.5 or more on the second administration of the test. Results show the unit of instruction method definitely superior to the traditional method employed in this experiment. This answers question 5, "What are the results?"

Outcome from the standpoint of the students, the School and the employers.

Although there was a significant difference in the results produced through the unit of instruction method, both groups gained in the essential use of filing. While many of the control group were not prepared for direct entry into business, their future entry will be made with more confidence as a result of this increased knowledge. Members of the experimental group who desired them were offered full-time positions upon the completion of their cooperative training and several from the control group took up part-time or full-time work upon graduation. Each employer's office supervisor

was asked to rate students furnished cooperatively by the school and all expressed satisfaction through their ratings of the results obtained. Many made additional comments to the coordinator. All students in the cooperative group were still employed at the close of school in their respective years, 1944-45 and 1945-46.

The vocational section of the school itself benefited as a result of the experiment and the writing of the unit of instruction tested by this experiment. Since the time devoted to filing in the non-cooperative course has always been limited, it offers an opportunity to improve teaching results with little if any addition to the time schedule.

Limitations of the study.

Because of the limitation of equipment and the fact that only a small number of 15 to 20 students can be efficiently handled in a single vocational class, the number of students participating in this experiment was strictly limited. It should be repeated in numerous classes and localities in order to increase the number of cases and thereby the reliability of the findings.

Although the textbook used herein for the control group was the one found to be most widely used, another highly rated textbook might produce a variation in the results. Hence, the experiment might be reproduced effectively with the control group taught under another basic text.

While all members of the control group received 27.5 hours of filing instruction, the experimental unit of 27.5 hours was based on a time estimate for the average student. Several of the superior

or faster students completed the unit in less time and because of the pressure of other skills to be learned in connection with their work on the job, were permitted to take their tests upon completion of the unit. Although it is difficult to imagine greater statistical differences than the experiment shows, it is possible that these students might have scored better with the full 27.5 hours of filing training.

Problems for future research.

The success of this experiment on the cooperative method and its teaching of filing under an effective vocational instruction procedure indicates its superiority in filing instruction. Hershey's experiment (15) also points out the high vocational value of the same unit of instruction method applied to the typing of business letters. Further measurement of the merits of this plan are in order

More experimentation could be effectively carried on, not only in these two commercial fields, but in other branches such as calculating machines, duplication, shorthand, bookkeeping machine operation, and transcribing machine operation. Agriculture, distributive education, trade and industry, industrial arts, and home-making could well devote some experimentation to the unit method of instruction. It would seem that where there are recognized skills which require closely related information, the unit method of instruction might be used profitably.

CHAPTER VI.

SUMMARY.

Although cooperative training has been offered in various sections of the country for a number of years and in Topeka for two years prior to this experiment, it was questionable as to whether the most effective vocational method of teaching filing was being employed. The classification "file clerk" was the most common division of the clerical field according to Topeka employers' own classifications. Because the clerical office workers compose such a large division of the locally employed workers, it was decided to test an individual plan against a traditional textbook plan of teaching through actual experimentation in the filing division of the clerical field.

The Denver plan.

A plan of individual instruction was developed in Denver by Hinderman and other administrators and is referred to as "the Denver plan." It had helped most effectively in their training for the war emergency and may become much used in post-war vocational education. It is based on A Unit of Instruction: How to Organize It and How to Teach It. This plan has been used successfully for several years at the Emily Griffith Opportunity School, but no scientific measurement had been made to determine its effectiveness in the field of filing when compared with a



traditional textbook method. However, Hershey (15) had in progress at the time this study began an experiment in the writing of business letters.

It was decided to set up two matched groups and use the Denver plan for teaching filing to the experimental group. Employers' job specifications on cooperative jobs showed that all of them desired filing training for their vocational students in office practice. This added additional weight to the desire to test the individual plan against the traditional plan then in common use.

The decision to test the Denver plan for the experimental group against the traditional textbook plan for the control group led to a statement of the problem as "What is the effectiveness of the cooperative, job-specification plan of teaching filing as compared with the traditional textbook method?" when the cooperative or experimental group is taught according to Denver's A Unit of Instruction: How to Organize It and How to Teach It.

Analysis of this major question revealed that five subordinate questions should be answered through research and experimentation, as follows:

1. What is the cooperative vocational plan of teaching filing?
2. What is the traditional textbook plan?
3. How are the experimental and the control groups to be organized?
4. What methods and devices shall be used in making evaluations?
5. What are the results?

Procedure.

The basic skills and related information used in the business practice of filing were obtained by reference to authorities on the campus of Colorado Agricultural and Mechanical College, through employer specifications, and by submission to the business advisory committee in Topeka. These formed the basis of the content used in both the control and experimental groups, together with the textbook used by the control group. Matched pairs chosen from the girls in the office practice classes, cooperative and non-cooperative, made up the experimental and control groups for this experiment. Criteria used in selecting students and determining the equivalency were: chronological age, sex, grade in high school, previous grade average, intelligence, knowledge of business fundamentals, and knowledge of filing. All students used in the experiment were girls in the senior year of high school. Application of the critical ratio formula showed no statistically significant differences between the two groups, since the t scores ranged from 0 to 1.28. The teaching included a total of 27.5 clock hours in filing instruction. Each group was instructed by the writer of this study. Both groups handled the same filing materials and covered the same minimum content.

In the control class, instruction was by the traditional textbook method and included lectures and reading. Students asked questions and took notes as they desired. They also read the material as presented in their textbooks. Assignments were then made in accordance with the study plan outlined in the appen-

dix of their textbook, Progressive Indexing and Filing. Each student was allowed to progress at her own individual rate, although the daily textbook assignment was considered the minimum. Tests were given and scored in accordance with the printed schedule found in the textbook.

Instruction in the experimental class was given as each student was ready for it and as she reached filing in her individual work plan. In order that experience and teaching on the job might be accumulated, none was taught until the second semester of her work program. Each student worked at her own rate of speed. Learning activities were divided into seven blocks of type jobs and a test job was given as each student completed the block. In this test, the student worked entirely independently of the instructor, and if successful, progressed to the next block. If unsuccessful, she reviewed the block just completed, was reinstructed, removed the difficulties, and passed another test job before moving to the next assignment.

#### Findings.

Reference to authorities, including the local advisory committee as well as persons on the campus of Colorado Agricultural and Mechanical College showed that the basic skills and related information required for successful filing on the job were as set out by the content analysis chart (Exhibit B of the appendix, page 119). Review of standardized tests resulted in the selection of the National Clerical Ability Filing Test, series 1941, as that by which evaluation was carried out.

This filing test was first administered to the control and experimental groups at the start of the experiment, scored, and rechecked according to the test instructions. Reference to the minimum passing score of 128.5 established by the Joint Committee on Testing showed the employability of students according to business standards of filing. No member of either group reached that standard on the pre-test. Application of the critical ratio formula to the scores of both groups indicated no significant statistical difference between the two at the start of the experiment, since the t score was .13 in favor of the control group.

The second administration of the test showed a score of 6.09, which is a significant difference between the groups in favor of the experimental group. This would make the chances very slight that the difference was due to chance. Reference to the minimum passing score of the Joint Committee on Tests showed that 76 per cent of the experimental group and 15 per cent of the control group had reached or passed the minimum score of 128.5.

#### Conclusion.

The cooperative plan based on the vocational unit of instruction method as it applied to this filing experiment proved itself significantly superior to the traditional textbook method of instruction. Reference to the t score proved that in teaching filing, this cooperative plan based on the individual unit of instruction is a desirable method for use in the filing division of vocational education.

## APPENDIX.

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D. List of cooperating firms and names of Topeka Office Advisory Committee - - - - -	122
E. National Clerical Ability Test of Filing Ability, series 1941 - - - - -	123
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H. National Clerical Ability Table of Percentiles and Minimum scores, 1941 series - - - - -	126

EXHIBIT A.

Abstract of two letters written by S. J. TURILLE, Madison College, Harrisonburg, Virginia, to the experimenter:

August 2, 1944.

In reference to copies of the National Office Managers' Association Tests for use in pre-testing experiment, I have the following comments to make. These N. O. M. A. Tests are among the best we have in the field. . . . .

These tests would make excellent achievement tests, as well as prognostic tests. They are really achievement tests, however. . . . .

Let me know how many copies of this N. O. M. A. Test you are interested in and more specifically about the details of the control experiment you have in mind. I can then tell you more about the suitability of use.

August 9, 1944.

Your experiment in cooperative and non-cooperative office practice should prove to be a most interesting one. I notice that you are using a matching basis of age, grade, I. Q. test, and clerical ability test. It is a fine combination. Your intelligence testing and final achievement testing is good. However, I do think you need to break your study into dirimental areas within the broader area of office practice. This is necessary if your thesis is to be a real contribution. . . . . I am also wondering if the General Information Test and the Business Background Test of the N. O. M. A. would not be better than the . . . . Clerical Aptitude Test. I wish you would look into the matter.

## EXHIBIT B.

Form 1.--Job Analysis Sheet Developed by Minneapolis Civic Association.

JOB ANALYSIS SHEET

Job No \_\_\_\_\_ Job Name \_\_\_\_\_ Company \_\_\_\_\_  
 Department \_\_\_\_\_ Occupation \_\_\_\_\_ No. Employed on Job \_\_\_\_\_  
 Prepared By \_\_\_\_\_ Date Made \_\_\_\_\_

JOB DESCRIPTION OF Major Duties:  
 WHAT WORKER DOES

SEE ATTACHED SHEET

I. Character of Job		2. 2. Health Normal. 26	1. Nature sales. 1	
1. Routine. 5	3. Strength. " 26	2. Length. 2-9 mos.	2. Length. 2-9 mos.	
2. Repetitive. 23	4. Eyesight. " 26	3. Degree of Skill.	3. Degree of Skill.	
3. Automatic. 1	5. Hearing. " 26	TIME TO TRAIN		
4. Slow.	6. Sex. F. 25. M. 1.	1. Experienced	1. Experienced	
5. Medium. 20	VII. MENTAL REQUIREMENTS		workers 3. mos. 2.	
6. Rapid. 4	1. Spell. 10	2. Inexperienced	2. Inexperienced	
II. TYPE OF WORK		workers 9. mos. 26	workers 9. mos. 26	
1. Heavy.	2. Write well. 15	KIV. TRAINING AVAILABLE		
2. Light. 26	3. Mathematics 12	1. Limited. 26	1. Limited. 26	
3. Medium.	4. Write English 11	2. Complete.	2. Complete.	
4. Inside. 26	5. Speak English. 26	KV. GRADE OF INTELLIGENCE		
5. Outside.	VIII. ABILITIES-EXECUTIVE		REQUIRED	
6. Hazardous.	1. Instruct others. 2	1. High. 1	1. High. 1	
III. EXPOSURE No--26		2. Leadership. 1	2. Average. 25	
1. Heat.	3. Supervisory.	3. Low.	3. Low.	
2. Cold.	IX. ABILITIES-MANIPULATIVE		KVI. PERSONAL QUALITIES	
3. Dry.	1. Skilled. 26	1. Accuracy. 19	1. Accuracy. 19	
4. Wet.	2. Semi-skilled. 19	2. Neatness. 19	2. Neatness. 19	
5. Smoke.	3. Unskilled. 3	3. Speed. 13	3. Speed. 13	
6. Oil.	X. ABILITIES-TECHNICAL		4. Initiative. 15	
7. Fumes.	1. Materials. 7	5. Personality. 11	5. Personality. 11	
8. Dust.	2. Equipment. 12	6. Honesty. 20	6. Honesty. 20	
9. Acids.	3. Supplies. 8	7. Reliability. 20	7. Reliability. 20	
10. Special.	4. Business. 26	8. Appearance. 10	8. Appearance. 10	
IV. HEALTH HAZARDS No--26		XI. ABILITIES-CLERICAL		
1. Vibrations.	1. Typing. 20	9. Promptness. 20	9. Promptness. 20	
2. Noise.	2. Dictation. 8	10. Leadership. 5	10. Leadership. 5	
3. Nerves.	3. Bookkeeping. 11	11. Tact. 16	11. Tact. 16	
4. Eyestrain.	4. Filing. 26	12. Agressiveness. 3	12. Agressiveness. 3	
V. PHYSICAL REQUIREMENTS		13. Alertness. 19	13. Alertness. 19	
1. Standing. 21	5. Telephone. 12	XVII. RESPONSIBILITIES		
2. Sitting. 26	6. Switchboard.	1. Handle money. 5	1. Handle money. 5	
3. Moving. 20	7. Dictaphone. 2	2. Records. 19	2. Records. 19	
4. Stooping. 2	8. Mimeograph. 5	3. Equipment. 18	3. Equipment. 18	
5. Walking. 13	9. Spirit duplica. 1	4. Routine. 5	4. Routine. 5	
6. Climbing. 3	10. Adding machine. 14	5. Directed. 10	5. Directed. 10	
7. Reaching. 2	11. Cr. calculator. 4	6. Follow orders. 12	6. Follow orders. 12	
8. Lifting. 1	12. Key calculator. 6	7. Supervise. 2	7. Supervise. 2	
VI. PHYSICAL REQUIREMENTS- (personal)		OVER		
1. Weight. Normal 7	13. Bkkpg. machine. 3			
	14. Bill. machine. 3			
	15. Addressograph.			
	XII. PREVIOUS EXPERIENCE			
	No--8			



XVIII. CONTACTS

- 1. With public... 11
- 2. Other workers... 26
- 3. Telephone... 12

XXIV. MISCELLANEOUS.

- Cash register--1
- Ediphone-dictaphone--3
- Bookkeeping machines--Burroughs, Remington-Rand

XIX. EMPLOYMENT CONDITIONS

- 1. Part time... 26
- 2. Temporary.....
- 3. Intermittent.....
- 4. Permanent..... 2

XX. PERSONAL EQUIPMENT

REQUIRED Special

- 1. Clothing..... 6
- 2. Car.....
- 3. Other equipment.....

XXI. WORKING CONDITIONS --Saturdays vary from 5-9 hours.

- 1. Hrs. per day... 3-5
- 2. Starting at... 1-3
- 3. Quitting at... 5-6

XXV. REMARKS: (Explain anything not clear or to extend or check whatever needed to furnish clear analysis of the work)

- 4. Wages
  - a. Per hour... 35. to 55c.
  - b. Per day.....
  - c. Per week.....
  - d. Bonus..... 1
  - e. Commission.....
  - f. Other... raises possible 13

- 5. Wages--when paid
  - a. Daily.....
  - b. Weekly... 20
  - c. Bi-weekly... 6
  - d. Monthly.....

XXII. PROMOTION

- 1. Eligible..... 9
- 2. Possible..... 8
- 3. Not likely... 4
- 4. Next job... Full time. 5
- 5. Wages next... \$90. to \$120

XXIII. EDUCATIONAL REQUIREMENTS.

- 1. Grade.....
- 2. High school... 10
- 3. Vocational... 26
- 4. Technical.....
- 5. College..... 1?

- Handic money
- Records
- Equipment
- Sealing
- Printed
- Follow orders
- Supervisor

XXIII. PERSONAL EQUIPMENT (Personal)

XXIII. PERSONAL EQUIPMENT (Personal)

Job Duties of Cooperative Office Practice Students.

Accounting--bookkeeping:

Add salesmen's lists on 10-key adding machine.  
Prepare pay roll  
Post cash balances  
Check final cash for bills  
Prove inventories  
Figure retail prices  
Write payment receipts  
Post advertising totals  
Post payments  
Check ledgers for delinquent accounts  
Count and check drayage billing  
Check customer accounts  
Check out customers  
Check invoices, sales, and tax  
Make bank deposits  
Make profit and loss statements monthly  
Reconcile bank statements  
Enter daily receipts  
Enter invoices, sales, and tax  
Bill deliveries  
List checks  
Count and list cash  
Figure Social Security and Victory Tax  
Make reports--Social Security, sales tax, excise tax  
Check alterations book  
Keep stock records  
Keep perpetual inventory  
Add payments  
Add debits and credits  
Add clerk's sales  
Add lay-aways  
Add commissions  
Check off merchandise received  
Order supplies  
Check off supplies received against requisitions

General-clerical:

Answer general inquiries--telephone  
Give information on customer experience--telephone  
Check credit applications--telephone  
Give credit information--telephone  
Figure required deposits on new customer accounts (from table)  
Quote discounts (from table)--telephone or oral  
Keep perpetual inventory  
Fold and seal mail  
Run postage machine  
Buy new postage  
File adjuster's copies  
Write tally sheets.

EXHIBIT B.  
(Continued--3)

General clerical duties--continued

Write tally sheets--by hand  
Stamp sales book dates--posting, receiving, shipping  
Figure taxable sales  
List sales  
Register weekly papers  
Check papers for tear sheets  
Clip articles  
Prepare mats for mail  
Prepare insertion orders  
List time from daily work sheets  
List materials taken or returned  
Summarize materials  
Get material prices--catalog or quotation  
Add invoices  
Make change  
Pickout customer classifications  
Count cards  
Figure percentages  
Open, sort, distribute mail  
Operate addressograph--run and cut plates  
Wrap coins  
Stuff statement trays  
Add dray ladings--comptometer  
Check off telegraph information  
Make car reports  
Enter plant billings on drag sheets  
Cut stencils, mimeograph--duplication  
Cut stencils, addressograph--duplication  
Cut master carbons--duplication

Typing

Purchase orders  
Time Sheets  
Salesmen's records  
Bills  
Letters  
Reports  
Form letters  
Address envelopes  
Compose and type letters  
Prospect lists  
Commission cards  
Customers' cards  
Cases--legal and insurance  
Delinquent slips  
Legislative bills  
Registration lists  
Name cards  
Street cards

EXHIBIT B.  
(Continued---3,4)

Type letters from shorthand  
Type letters from Ediphone or Dictaphone cylinders

Sales duties

Help wait on customers  
Receive customers  
Supervise hanging stock  
Dress windows  
Pick out damaged merchandise

FILING duties

Sort and file contracts numerically  
Sort and file bills numerically  
Sort and file cards alphabetically  
Sort and file cards by subject  
Sort and file cards by sound  
Sort and file cards by date--tickler file  
Sort and file sheets alphabetically  
Cross refer  
Sort and file street cards  
Sort and file carbons alphabetically  
Sort and file cases by Triple Check  
Sort and file customers' statements alphabetically  
Sort and file customers' statements geographically  
Sort and file invoices in folders--also without folders  
File purchase orders alphabetically  
Alphabetize tear sheets, advertisements, adjuster's copies, news  
slips alphabetically  
Sort and file work orders alphabetically and numerically

Job Titles:

Stenographer  
Cashier-bookkeeper  
Typist  
Clerks--interviewing, filing, general  
Comptometer operator  
Student clerk

171  
Exhibit C.

Filing Unit

A UNIT OF INSTRUCTION IN

FILING

for use in the field of

OFFICE PRACTICE.

H. D. Shotwell

Instructor

Adapted from: A Unit of Instruction: How to Organize It and How to Teach It. Copyright, School District Number One in the City and County of Denver and State of Colorado, 1943.

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FOREWORD

The purpose of this unit of instruction, Filing is to provide a short-unit course in flexible form to teach the student how to index and file material under conditions found on cooperative part-time jobs in Topeka, Kansas.

The six systems covered herein are:

Alphabetic  
Soundex  
Numeric  
Triple Check  
Geographic  
Subject

Alphabetic filing is the basis of all filing and will be first to be studied. Other systems will be taught in the order of usefulness as found in the actual job situations. Where job requirements permit, they will be taught in the order given in the above paragraph.

Each system in turn will be explained in detail and adequate practice provided to give the student a worth-while understanding of the subject. Further practice will be provided on the job itself on a vocational basis.

Authorities recognize that a course in indexing and filing develops in the student the sense of classification and fosters a faculty for decision, accuracy, and neatness.

H. D. Shotwell,  
Instructor in  
Office Practice.

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## INFORMATION SHEETS

Identifying  
Letter

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Type Job No. 1  
ALPHABETIC

Type and sort 42 titles.

From the list on page 6 of "Progressive Indexing and Filing." type and sort alphabetically 42 titles on 3 x 5 cards.

Type Job No. 3

131

Test No. 1.

See instructor.

Type Job No. 4  
SOUNDEX

Prepare and file 200 cards by Soundex.

From cards furnished by the instructor, code, and file 200 cards.

Write the code letters and numbers in the upper right-hand corner of the cards.

Sort. When cards are sorted, get Soundex index and tray from instructor and file.

Type Job No. 2  
ALPHABETIC

Sort and file 200 titles.

Sort and file 200 cards given you by the instructor.

When sorted alphabetically, file in A to G index furnished you by instructor.

Type Job No. 5  
SOUNDEX

Prepare and file 200 cards by Soundex.

From a list furnished by the instructor, type, code, and sort 200 cards for Soundex.

When cards are sorted, instructor will furnish tray with Soundex index. Then file them.

Type Job No. 6

Test Job No. 2.

See Instructor

Type Job No. 7  
ALPHABETIC

File 50 pieces of Mail.

From the 50 pieces of correspondence furnished you by the instructor, inspect, index, doce, and sort the material.

When material is sorted, get alphabetic index and tray from instructor and file them.

## Type Job No. 8

ALPHABETIC

Cross refer and file 25 pieces of mail.

Inspect, index, code, make cross-reference sheets and sort 25 pieces of mail furnished you by your instructor.

When the letters are sorted, file them in the same tray with the material from Job No. 7.

## Type Job No. 11

NUMERIC

Cross refer and file 5 pieces of mail.

Instructor will furnish you with 5 pieces of mail and the unnumbered cards for cross-reference.

Inspect, index, code, typecontrol and cross reference cards. Then sort cards and mail.

When material is sorted, the instructor will return tray from Job No. 11. File the cards and mail.

## Type Job No. 9

Test Job No. 3.

See Instructor.

## Type Job No. 12

Test No. 4

See Instructor

## Type Job No. 10

NUMERIC

Prepare and file 38 pieces of mail.

Instructor will furnish you with 38 pieces of mail. Inspect, index, code, type control cards, and sort cards and mail.

Instructor will furnish card and numeric indexes in which to file them.

## Type Job No. 13

TRIPLE CHECK

Prepare and file 50 pieces of mail.

Instructor will furnish you with 50 pieces of mail. Inspect, index, code on 30-division chart, and sort the 50 pieces.

When the material is sorted, get a tray from instructor. File material in Triple check setup.

Type Job No. 14

TRIPLE CHECK

Cross refer and file 25 pieces of mail.

Instructor will furnish you with 25 pieces of mail.

Inspect, index, code on 30-division chart, type cross references, and sort the material.

When material is sorted, file it with the material in Job No. 13.

Type Job No. 18

Test No. 6

See Instructor.

Type Job No. 15

Test No. 4.

See instructor.

Type Job No. 19

SUBJECT

Prepare and file 25 pieces of mail.

From the 25 pieces of mail furnished by the instructor, index, code, and file the titles.

Careful reading of the entire letter is essential to determining the correct filing subject.

Type Job No. 16

GEOGRAPHIC

Prepare and file 50 pieces of mail.

Instructor will furnish you with 50 pieces of mail. Inspect, index, code and sort them.

When sorted, get geographic index from instructor and file.

Type Job No. 20

SUBJECT

Cross refer and file 10 pieces of mail.

From the 10 pieces of mail furnished by the instructor, code, type cross reference sheets and file the titles with those of Job No. 19.

Type Job No. 17

GEOGRAPHIC

Cross refer and file 25 pieces of mail.

Instructor will furnish you with 25 pieces of mail.

Inspect, index, code, type cross references, and sort the material.

When Material is sorted, file it with the material from Job No. 16.

Type Job No. 21

Test No. 6.

See Instructor.



Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages

## TOOLS AND MATERIALS NEEDED:

Content Analysis Chart and Individual Progress Record  
Paper and pencil

## OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Select and write out next type job listed on Content Analysis Chart and Individual Progress Record.	a. Name and number exactly as shown.
2. Secure instructor's approval before planning job.	a. Content Analysis Chart and Individual Progress Record will show what has been accomplished. b. Station, tools, machinery and supplies must be available. c. Instructor may suggest another job in the same group.

## SKETCHES:

None

## SAFETY PRECAUTIONS:

None

## QUESTIONS:

1. Why is it desirable for the student to do type jobs in the order shown on the Content Analysis Chart?
2. If station, tools, machinery or supplies are not available, what procedure should the student follow?

Operation: FILLING IN A STUDENT WORK PLAN

OPERATION 0-2  
Sheet

Title of Unit: FILING

Field: Office Practice

Page 1 of 2 pages

## TOOLS AND MATERIALS NEEDED:

Student Work Plan

Content Analysis Chart and Individual Progress Record

Pencil

## OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Fill in heading.	a. For type job previously approved by instructor. b. Name of type job should be exactly as shown on Content Analysis Chart and Individual Progress Record, left-hand column.
2. List operations to be performed	a. Exact name and number of operation as given at top of Content Analysis Chart and Individual Progress Record. b. In correct sequence.
3. Check operations in which instructions have not been given.	a. Content Analysis Chart and Individual Progress Record indicates operations performed in previous type jobs. b. Content Analysis Chart and Individual Progress Record indicates type jobs completed.
4. List items of related information.	a. Exact title and identification letters of items of related information as given at bottom of Content Analysis Chart and Individual Progress Record.
5. Record accuracy required.	
6. Estimate and record time required to complete each operation.	a. In hours and tenths of an hour. b. Total time estimated for operations should compare



with estimated time for average student to complete type job

- 7. Mark off work plan into parts.
  - a. That can be completed in one session or in time available.
- 8. Secure instructor's approval of Work Plan
  - a. Instructor will initial plan at top.

**SKETCHES:**

None

**SAFETY PRECAUTIONS:**

None

**QUESTIONS:**

1. Why should type job be approved in advance by the instructor?
2. How are operations identified?
3. How are items of related information identified?
4. What constitutes a class session?

Title of Unit: FILING

Field: Office Practice

Page 1 of 2 Pages

## TOOLS AND MATERIALS NEEDED:

Content Analysis Chart and Individual Progress Record  
 Student Work Plan (approved)  
 Paper and Pencil  
 Job Directions and Specifications.

## OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Secure operation and information sheets.	a. Those listed in first part of your work plan.
2. Study first operation to be performed and make notes.	a. Notes should be arranged in an orderly manner on back of Work Plan or note paper. b. In terms of job directions and specifications. c. On application of steps to this part of the job. d. On application of key points, "knacks," "Feel," "timing," and safety precautions to be remembered.
3. Make computations.	a. On speeds, allowances, and waste. b. Using handbooks, references, and trade shortcuts.
4. Study information sheets and make needed notes.	a. For information on essential facts, ideas, and procedures as they apply to the operation.
5. Repeat steps 1, 2, 3, 4, for other operations, in this part of plan.	
6. Perform operations.	a. Only if instruction has already been received in operation. b. If instruction has not been received, ask instructor for instruction before attempting to do the operation.

- c. In correct order.
  - d. Check marks in line "Student Instructed" on Content Analysis Chart and Individual Progress Record indicate operations in which instruction has been received.
8. Record time taken.
  - a. In hours and tenths of an hour
  - b. On Work Plan opposite part completed.
9. Have instructor check and record accuracy achieved.
  - a. On Work Plan opposite part completed.
10. Repeat above nine steps for each unfinished part of plan for type job.
11. Have instructor check completed job and record on Content Analysis Chart and Individual Progress Chart.
  - a. Total time taken.
  - b. Accuracy achieved.
  - c. Instructor's initials indicate that job has been completed.

**SKETCHES:**

None

**SAFETY PRECAUTIONS:**

None

**QUESTIONS:**

1. What purpose is served by answering questions that are related to operations and items of information in which instruction has been given?
2. Why study items of related information for one operation at a time?

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages.

TOOLS AND MATERIALS NEEDED:

List of titles (Progressive Indexing and Filing, p 6)  
3 x 5 cards  
Typewriter  
Eraser

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place cards on typewriter desk	a. In convenient place b. Clean side up.
2. Flip top card into machine	a. Using hand easiest for you. b. Straight in the machine
3. Determine first and following units for the first name on your list (p 6)	a. Apply rules for indexing and filing b. Mental process.
4. Type title on card	a. As you determined it. b. With left margin of machine <u>two</u> spaces from left edge of card.
5. Type address on card	a. If any given. b. One space under title. c. Erase errors cleanly.
6. Type such other information as your office requires.	a. If your office requires it. b. In their form.
7. Lay typed card on the desk.	a. Using hand easiest for you. b. Face down. c. In separate pile.
8. Repeat steps 2, 3, 4, 5, 6, and 7 with each succeeding card.	

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. Why should call cards be typed two spaces from the left edge?
2. What advantage is there in flipping cards into the machine?

Title of Unit: FILING

Field: Office Practice

## TOOLS AND MATERIALS NEEDED:

Cards or Correspondence

Desk or Table

## OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place material on desk or table	a. In convenient location. b. Face up. c. Cards or correspondence
2. Estimate the number of pieces to be sorted	a. According to thickness b. Consider weight of paper.
3. Sort into rough alphabetic order	a. About 10% of the number of divisions in your file. b. By first unit only. c. Apply standard rules of indexing and filing.
4	
4. Sort each pile into exact alphabetic order	a. According to standard rules of indexing and filing. b. Consider as many units as necessary for correct placement
5. Combine piles into exact order	a. By alphabetic groups b. Apply standard rules of indexing and filing.

## SKETCHES:

None

## SAFETY PRECAUTIONS:

None

## QUESTIONS:

- About how many cards of ordinary weight would be in a bunch one inch thick?
- About how many sheets of correspondence in a pile one inch thick?
- What are the advantages of making a rough sort before you alphabetize exactly?
- What types of mechanical sorters are sometimes used?
- What business in Topeka uses a mechanical sorter of some kind?
- After sorting is completed, why is it necessary to pick up the piles in consecutive order?

Operation: FILING ALPHABETICALLY

OPERATION 0-6  
Sheet

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages

**TOOLS AND MATERIALS NEEDED:**

Sorted cards or correspondence  
File box with alphabetic index.

**OPERATION BREAKDOWN:**

<u>Steps</u>	<u>Key Points</u>
1. Place file tray or box before you	a. In convenient position b. With guides clearly visible.
2. Lay cards or correspondence on the desk	a. Within easy reach b. With titles in readable position
3. Pick up first card or sheet	a. With hand easiest for you. b. Title facing you.
4. Determine its filing units	a a. Standard rules of indexing and filing. b. Mental process.
5. Locate correct guide	a. With eye first.
6. Place card or sheet in proper position	a. Holding file open with free hand. b. Inside folder if correspondence. c. According to standard rules of indexing and filing. d. Title up if card, to <u>left</u> if correspondence.
7. Repeat steps 3, 4, 5, and 6 with each succeeding card or sheet.	

**SKETCHES:**

None.

**SAFETY PRECAUTIONS:**

Take hand directly to correct location AFTER eye has located guide.  
Avoid fumbling or unnecessary fingering.

**QUESTIONS:**

1. Why should you keep cards or correspondence neatly stacked while filing?
2. Give an example of a hyphenated surname; tell how it is treated.
3. Give an example of a hyphenated firm name and tell how it is filed.
4. Give an example of an apostrophe in a title and tell what the filing unit would be.
5. How would you file 4 cards with same title and different addresses?

Operation: PULLING FILED MATERIAL

OPERATION  
Sheet

0-7

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages.

TOOLS AND MATERIALS NEEDED:

Filed cards or correspondence  
List

Desk or table.  
In office, file cabinet.

OPERATION BREAKDOWN

<u>Steps</u>	<u>Key Points</u>
1. Place filed cards or correspondence on desk or table.	a. In convenient place
2. Place list beside file tray	a. Where easily seen.
3. Determine first title	a. Rules of alphabetizing b. Mental process
4. Locate proper guide	a. With eye first
5. Pull the title on card or correspondence	a. Holding file open with free hand.
6. Lay card or sheet on desk	a. In a separate pile b. Face down
7. Repeat steps 3, 4, 5, and 6 with each succeeding card or sheet.	a. Keep in neat pile

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. What is the difference between filing and pulling?

Title of Unit: FILING

Field: Office Practice

TOOLS AND MATERIALS NEEDED:

- Cards or correspondence
- Pencil

OPERATION BREAKDOWN

Steps

Key Points

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Place cards or sheets on desk</li> <li>2. Remove one piece from pile and place before you.</li> <li>3. Determine unit in title to be coded</li> <li>4. Determine and write first and subsequent key letters.</li> <li>5. Determine and write corresponding code number</li> <li>6. Turn card or sheet face down on desk</li> <li>7. Repeat steps 2, 3, 4, 5, and 6 with each succeeding card to be coded.</li> </ol> | <ol style="list-style-type: none"> <li>a. In convenient place</li> <li>b. Face up.</li> <li>a. Face up.</li> <li>b. In writing position.</li> <li>a. According to Rules for Soundex Coding.</li> <li>a. According to rules for Soundex Coding.</li> <li>b. In upper right-hand corner</li> <li>c. Opposite the title</li> <li>a. According to Rules for Soundex Soundex Coding.</li> <li>a. In convenient place on desk.</li> </ol> |
|--|---|

SKETCHES:

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SAFETY PRECAUTIONS:

None

QUESTIONS:

1. What advantage is gained by putting the key letters on cards or correspondence?
2. Why was the "d" in the above sketch not used in coding?
3. What letters are not used in Soundex coding?



Operation: SORTING (Soundex)

OPERATION 0-9  
Sheet

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages

TOOLS AND MATERIALS NEEDED:

Coded cards or correspondence  
Desk

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place material to be sorted in a stack on the table	a. In a convenient place b. Face up
2. Estimate the number of pieces in stack	a. According to thickness. b. Allow for kind of paper
3. Sort into alphabetic order	a. Considering only first <u>letter</u> of title.
4. Sort piles into numeric order	a. Exactly in each pile. b. According to <u>second</u> unit if numbers are the same.
5. Combine piles into consecutive order	a. According to first letters. b. Then according to numbers c. By second filing unit if numbers are the same.

SKETCHES:  
None

SAFETY PRECAUTIONS:  
None

QUESTIONS:

1. How do you sort if you have two numbers the same and they are both behind the same letter of the alphabetic order?
2. How does sorting two and sometimes three times in this system save you time?
3. Would you use a Soundex system to give information over the telephone regularly? Why or why not?

Operation: Filing (Soundex)

OPERATION 0-10  
Sheet

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages

TOOLS AND MATERIALS NEEDED:

Sorted cards or correspondence  
File box with Soundex guides

In office, file cabinet

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place file box before you	a. In convenient position b. With guides easily seen.
2. Place cards or sheets in stack on table or desk	a. In convenient place b. Face up
3. Pick up first card	a. With hand you use most easily
4. Locate correct alphabetic and numeric guides	a. Pick up with eye first b. Holding guide with free hand.
5. Place material behind guide	a. According to coding b. Apply rules for Soundex Filing. c. Consider units needed for correct placement.
6. Repeat steps 3, 4, and 5 with each succeeding card or sheet.	a. According to Soundex rules

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. What is the usual arrangement of guides in the Soundex System?
2. When too much material accumulates behind a single alphabetic guide, what other breakdowns can you make in Soundex?
3. If a name can be spelled in 11 different ways, in how many places would you have to look for it in a Soundex file?
4. What two sets of guides must a Soundex system have?

Operation: INSPECTING CORRESPONDENCE

OPERATION 0-11  
Sheet

Title of Unit: FILING

Field: Office Practice

Page 1 of 1 Pages.

TOOLS AND MATERIALS NEEDED:

Correspondence.

OPERATION BREAKDOWN:

Steps

Key Points

- |  |  |
|--|--|
| 1. Place correspondence on desk or table.                  | a. In one pile.<br>b. In easy-to-read position<br>c. In convenient location.   |
| 2. Observe markings of the first sheet                     | a. May indicate carbon or telegram.<br>b. May require no release   |
| 3. Locate release form                                     | a. If release mark needed<br>b. Marking used by your office<br>c. Return to source if needed marking is not present. |
| 4. Place approved sheet in a separate pile                 | a. Face down.  |
| 5. Repeat steps 2, 3, 4, and 5 with each succeeding sheet. |  |

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. Why does a carbon copy require no release mark?
2. If no stamp form of release is used, where do the release initials usually appear?
3. Why is it necessary to secure a release before you file a piece of correspondence?
4. What is the advantage of inspecting correspondence before you sort it?

Operation: INDEXING CORRESPONDENCE

OPERATION 0-12  
Sheet

Title of Unit: FILING

Page 1 of 1 Sheet.

Field: Office Practice

TOOLS AND MATERIALS NEEDED:

Inspected correspondence.

OPERATION BREAKDOWN:

Steps

Key Points

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Place the correspondence on the desk</li> <li>2. Read the letter</li> <li>3. Determine the filing units</li> <li>4. Determine whether or not cross reference is necessary</li> <li>5. Lay the sheet on the table</li> <li>6. Repeat steps 2, 3, 4, 5 with each succeeding piece of correspondence.</li> </ol> | <ol style="list-style-type: none"> <li>a. In convenient position</li> <li>b. Face up.</li> <li>a. To determine the filing units.</li> <li>b. Include letterhead and inside address.</li> <li>a. According to the system of filing you are using.</li> <li>b. Apply standard rules of alphabetizing and filing.</li> <li>a. According to the probability of use of a less important title.</li> <li>b. Mark if doubtful.</li> <li>a. In a separate pile</li> <li>b. Face down.</li> </ol> |
|---|--|

SKETCHES:

None

SAFETY PRECAUTIONS:

To save time, you will code correspondence requiring it as you go through the indexing procedure on the job.

QUESTIONS:

1. How does coding a piece of correspondence as soon as you index it save time?
2. How do you mark a cross reference sheet so you can tell it from the main title?
3. Why must you read the whole letter when indexing for coding?
4. If you cross referred the wrong title, could you still find it?

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice

TOOLS AND MATERIALS NEEDED:

Coded correspondence  
Cross reference sheets, cards, or labels  
Typewriter

OPERATION BREAKDOWN

<u>Steps</u>	<u>Key Points</u>
1. Lay material to be cross referred on desk or table.	a. In convenient place
2. Type new title	a. On appropriate form b. According to coding c. In correct indexing and filing order.
3. Type other information.	a. Address, if required b. Other information needed c. In proper place.
4. Turn completed material face down	a. In separate pile if of different sizes. b. In neat arrangement.
5. Repeat steps 2, 3, and 4 for each succeeding piece.	

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. What other information usually goes on a cross reference sheet?
2. When both the important title and the one of secondary importance are typed on a cross reference form, which is put at the top of the form?
3. What kind of cards are used for cross reference in a numeric card control?
4. What is the advantage of using labels when preparing permanent card cross references for a correspondence file?
5. Why is cross reference necessary?
6. How could you cross refer by name if your files were set up by state and town?

Operation: TRANSFERRING INACTIVE MATERIAL

OPERATION O-14  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

## TOOLS AND MATERIALS NEEDED:

Filed correspondence  
Transfer box

List (at times)

## OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place correspondence box on desk or Go to correspondence drawer	a. If in school b. In convenient position c. If in office
2. Locate first guide	a. With eye first b. Move hand immediately into proper position.
3. Locate folder	a. Containing material to be transferred. b. Handling properly.
4. Remove inactive material	a. According to transfer plan being followed. b. With hand easiest for you. c. Placing on desk or ledge
5. Mark card control	a. If used. b. In proper place.
6. Place transfer box on desk or table	a. In convenient position or b. In office, locate transfer drawer.
7. Place transferred material back of guides	a. In proper order for system used. b. With folders, if any.

## SKETCHES:

None

## Safety Precautions:

None

## QUESTIONS:

1. Why is it necessary to keep inactive material?
2. In what types of file will you find a permanent transfer system?
3. Why is the perfected two-period system preferred when there is room for it?
4. You have used a maximum-minimum type of transfer for two years; what period of time will your file cover at the time of transfer?

Operation: CODING TITLES (Numeric)

OPERATION 0-15  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages.

TOOLS AND MATERIALS NEEDED:

Consecutively numbered cards  
Released correspondence

Typewriter  
Pencil

OPERATION BREAKDOWN:

Steps

Key Points

- |   |   |
|---|---|
| 1. Place correspondence and cards                               | a. In convenient place<br>b. Face up.   |
| 2. Underline first title  | a. With units in filing order<br>b. Apply standard rules of indexing and filing.                              |
| 3. Place first numbered card in machine                         | a. Use flip technique<br>b. Straight<br>c. Stop two spaces from left of card.<br>d. Two spaces down from top. |
| 4. Type first card  | a. In correct form<br>b. Units in filing order<br>c. Names spelled correctly                                  |
| 5. Type address of title  | a. One space under title<br>b. Correctly  |
| 6. Write code number on correspondence                          | a. From right-hand corner of numbered card.<br>b. In upper right-hand corner of sheet.                        |
| 7. Place completed material on desk                             | a. In separate piles<br>b. Cards in alphabetic file box.  |
| 8. Repeat steps 2, 3, 4, 5, 6, and 7 for each succeeding title. | a. In same order<br>b. Correcting errors neatly.  |

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. How could you keep track of the numbers used for the card control?
2. Could you type numeric cards if the numbers were not pre-stamped on them? How?
3. How can you tell whether or not you have already typed a card for a title?

Operation: SORTING TITLES (Numeric)

OPERATION O-16  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

TOOLS AND MATERIALS NEEDED:

Coded Correspondence.

Typed Cards

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place material to be sorted on desk or table	a. In convenient place. b. Within easy reach.
2. Pick up first sheet of correspondence	a. With either hand.
3. Place in appropriate pile	a. By hundreds. b. According to coding.
4. Repeat steps 2 and 3 with each succeeding piece.	a. Placing in appropriate piles b. By hundreds.
5. Sort piles into strict numeric order.	
6. Combine piles	a. In consecutive order.
7. Sort cards alphabetically	a. According to correct sorting procedure. b. Include unnumbered cross reference cards, if any.
8. Combine cards into one pile.	a. Strictly alphabetically. b. In box, if used.

SKETCHES:

None

SAFETY PRECAUTIONS:

Pay no attention to numbers on cards in sorting or combining them.

QUESTIONS:

1. How does sorting first by hundreds speed up the process in the numeric system?
2. How does the numeric system compare with others in the amount of time required to keep it up?
3. What makes this system expensive to maintain?



Operation: FILING NUMERICALLY

OPERATION 0-17  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

TOOLS AND MATERIALS NEEDED:

Sorted cards  
Sorted correspondence  
Alphabetic card file, if needed.

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place card file and numeric file on desk.	a. In convenient positions
2. Place cards and correspondence on desk	a. Where you can read them easily. b. In easy reach.
3. File cards alphabetically	a. According to card filing procedure. b. Applying standard rules of indexing and filing.
4. Sort coded correspondence	a. By number b. Using small number of groups c. If unsorted.
5. File correspondence	a. In numbered folders b. In proper order.

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. In what order is correspondence filed in a numeric folder?
2. Why is it necessary to write the code number on each piece of correspondence?
3. For what purpose are unnumbered cards used in a numeric file?
4. What advantage is there in coding mail before matching or filing?
5. What type of businesses can use a numeric system to best advantage?

Operation: CODING TITLES (Triple Check)

OPERATION 0-18  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice..

TOOLS AND MATERIALS NEEDED:

Released correspondence  
Pencil  
30-period Triple Check chart.

OPERATION BREAKDOWN:

Steps

Key Points

- |   |  |
|---|--|
| 1. Place correspondence on desk or table                                    | a. In convenient position<br>b. Face up.   |
| 2. Pick up first piece of correspondence                                    | a. <b>With either hand</b>   |
| 3. Underline the filing units   | a. With pencil<br>b. According to standard rules for indexing and filing.  |
| 4. Write code numbers in upper right-hand corner of the sheet.              | a. First unit number from primary chart.<br>b. Second unit number from secondary chart.<br>c. Add 0 for second unit number if title contains no second unit. |
| 5. Turn sheet face down on desk   | a. In separate pile.   |
| 6. Repeat steps 2, 3, 4, and 5 for each succeeding piece of correspondence. |  |

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. How many numbers must there be in every complete coding of a sheet?
2. Is the Triple Check system suited to a small file?
3. Would you use a Triple Check system if your files were expanding rapidly?
4. For what are the numbers used in this system? The colors?
5. What would you do with cross reference sheets in this system?

Operation: SORTING (Triple Check)

OPERATION 0-19  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

TOOLS AND MATERIALS NEEDED:

Coded correspondence.

OPERATION BREAKDOWN

<u>Steps</u>	<u>Key Points</u>
1. Lay correspondence on desk or table	a. Face up. b. Within easy reach.
2. Pick up first sheet	a. With either hand.
3. Place in separate pile	a. By hundreds or 500s b. According to code number in upper right-hand corner
4. Repeat steps 2 and 3 for each succeeding sheet	a. Placing in proper pile b. By code number.
5. Sort each pile into exact numeric order	a. By code number
6. Combine piles consecutively	a. Keeping exact numeric order

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. Why does Triple Check sort by number?
2. What other use is made of numbers in this system?
3. Do you have to know the exact spelling of a name to handle it in this kind of filing?

Operation: FILING (Triple Check)

OPERATION 0-20  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

TOOLS AND MATERIALS NEEDED:

Coded correspondence  
File box with Triple Check index and folders

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place the file tray before you	a. In convenient position b. With guides easily seen.
2. Lay correspondence on desk or table	a. Neatly stacked b. Face up.
3. Pick up first sheet	a. With either hand
4. Locate proper guide	a. Considering first two alphabetic units b. In secondary position c. Behind primary guide.
5. Place in correct position	a. In folder b. Heading to your left c. Holding folder open with free hand.
6. Repeat steps 3, 4, and 5 with each succeeding piece of correspondence.	

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. If you were placing a sheet in a miscellaneous folder in which there were several other sheets, what would determine which one went first?
2. If you found four other letters under this same title in a miscellaneous folder, what would you do?
3. How many secondary guides are there behind each primary guide in Triple Check?
4. About how many folders should you control with a single guide?
5. How many pieces of correspondence should be carried in a single folder?
6. Of what materials are folders usually made?

Operation: CODING TITLES (Geographic)

OPERATION 0-21  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages.

Field: Office Practice.

TOOLS AND MATERIALS NEEDED:

Pencil  
Released correspondence

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place the correspondence on the desk	a. In convenient position b. Face up.
2. Select the most important location	a. From letterhead, address, or body of letter. b. According to the rules of geographic filing.
3. Underline important titles	a. Main title b. Mark subordinate title for cross reference, if needed. c. Mark firm titles if needed. d. On first sheet.
4. Prepare cross reference	a. If needed b. On card if for firm or alphabetic title. c. On sheet if for location.
5. Turn sheet face down on desk	a. In separate pile.
6. Repeat steps 2, 3, 4, and 5 for each succeeding piece.	

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. How you cross refer to a name differs in what what from cross referring to a location in geographic filing?
2. When would a permanent card cross reference be made instead of a sheet for a location?
3. If two pieces of correspondence had the same state and town, what would you mark as the next filing unit?
4. What two types of miscellaneous folders occur in this system?

Operation: FILING TITLES (Geographic)

OPERATION 0-22  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

**TOOLS AND MATERIALS NEEDED:**

Coded correspondence  
File box with geographic index

**OPERATION BREAKDOWN:**

<u>Steps</u>	<u>Key Points</u>
1. Place correspondence and filing tray on desk or table	a. In convenient position b. Where they can be easily seen.
2. Sort correspondence by states	a. According to coding b. Applying standard rules of indexing and filing. c. Into convenient piles.
3. Sort correspondence by cities	a. From state piles. b. In strict alphabetic order of towns.
4. Locate the proper guide	a. By state, then town b. With eye first.
5. Place correspondence in folder	a. Heading to the left. b. Moving five or more alike to another folder. d. Placing each sheet in turn.

**SKETCHES:**

None

**SAFETY PRECAUTIONS:**

None

**QUESTIONS:**

1. How many letters must you have from the same state and town before you move the correspondence to the miscellaneous town folder?
2. What divisions of a business find a geographic file most useful?
3. Could you file cards under a geographic system? If so, how?
4. What cross reference forms may be used in this system?

Operation: CODING TITLES (Subject)

OPERATION O-23  
Sheet

Title of Unit: FILING.

Page 1 of 1 Pages

TOOLS AND MATERIALS NEEDED:

Pencil  
Released correspondence  
Typewriter

List of subject classifications.  
(Use Progressive Indexing & Filing, p 83)  
Cross reference sheets

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place correspondence on desk	a. In convenient place
2. Determine subject of first piece	a. By reading the letter b. According to subject classification.
3. Determine secondary subject	a. If any b. For cross reference
4. Underline main and secondary headings	a. If secondary headings occur. b. Use pencil
5. Make needed cross references	a. On typewriter b. On appropriate cross reference form.
6. Turn first piece face down on desk	a. In separate pile b. With cross reference sheet, if one typed.
7. Repeat steps 2, 3, 4, 5, and 6 with each succeeding piece of correspondence.	

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. Is the usual subject file alphabetic?
2. When might subject material be filed on a numeric basis?
3. How is a subject file similar to an outline?

Operation: FILING (Subject)

OPERATION 0-24  
sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

TOOLS AND MATERIALS NEEDED:

Sorted correspondence  
File tray with subject index and folders.

OPERATION BREAKDOWN:

<u>Steps</u>	<u>Key Points</u>
1. Place file tray on desk or table	a. With guides easily seen b. In convenient position
2. Place correspondence on desk or table	a. Face up.
3. Pick up first piece	a. With either hand
4. Locate correct guide	a. With eye first b. According to main and subject-subordinate headings
5. Place correspondence in correct folder	a. Holding open with free hand. b. Using good handling technique.
6. Repeat steps 3, 4, and 5 with each succeeding piece.	a. Including cross reference sheets.

SKETCHES:

None

SAFETY PRECAUTIONS:

None

QUESTIONS:

1. What subject headings might an ordinary name file have in it?
2. If there were 50 guides in your file, how many miscellaneous folders would you have?
3. Which type of filing have you liked best?



Title of Unit: FILING

Page 1 of 2 Pages.

Field: Office Practice

Definitions:

Titles. In this course of study, all names are called "titles," whether they be the name of a person, a firm, a corporation, an institution, a country, a state, or a town.

Units. Units in a title are the parts of that title: they are the separate words or initials that make up the title.

Indexing. Indexing is what is done mentally to decide which unit in the title shall be considered first, which second, and so on, so that correct coding and filing may be done later. It is immediately followed by marking the units under some system of "coding." Indexing is based on certain definite rules which will be learned later. You must read the whole letter in order to know how to index.

Filing. Filing means the placing of letters, cards, and valuable papers in filing cabinets or drawers in correct order according to the coding done at the time of indexing. This keeps them safe and easily as well as quickly found when needed.

**ESSENTIAL FACTS, IDEAS, AND PROCEDURES.**

Example of Titles (Names)

- J. C. Adams
- John Morrell & Co.
- Topeka Iron Works
- Christ's Hospital
- Highway Department, Topeka, Kansas.
- Justice Department, U. S. Government, Washington, D. C.

Caution: Courtesy titles, such as Mr., Mrs., or Miss, and professional titles such as Dr., Rev., Judge, Capt., are not to be confused with titles as shown in examples above.

Examples of Units (Parts of the Name)

Titles Divided into Units

<u>Titles as Written</u>	<u>1st Unit</u>	<u>2nd Unit</u>	<u>3rd Unit</u>
Christ's Hospital	Christ	Hospital	
J. C. Adams	Adams	J.	C.
Highway Department, Topeka	Kansas	State	Highway
Justice Department, U. S. Government, Washington, D. C.	United	States	Government
J. Walter Thompson	Thompson	J.	Walter

Examples of Indexing and Filing Order:

Titles as Written:  
Topeka Water Dept.  
J. H. Abrahams  
Topeka Iron Works

Indexed and Filed:  
Topeka, City of, Water (Dept)  
Abrahams, J. H.  
Topeka Iron Works.

It will be noted that filing and indexing depend upon picking out the units in the title in the right order.

Importance of Proper Indexing and Filing Arrangement:

Before a student can file, he must know how to index. Before he can index, he must learn, understand, and be able to apply correctly the Standard Rules for Indexing and Filing, which will be studied in subsequent information sheets.

The value of correct filing cannot be overrated. Filing means not only placing material, but finding material once it has been filed. Much valuable time and effort can be spent trying to find something that has been indexed incorrectly and accordingly filed incorrectly, or that has been filed carelessly. An excellent memory may help a file clerk find something that has been incorrectly filed but if there is a lapse of memory or someone else is trying to find what has been filed, correct filing will save time and tempers--and often the job itself.

Pointers in Studying Filing:

1. Know your goal--which one of the systems of filing you are trying to master--and follow the definite outline provided for you. In this particular unit, you are going to learn alphabetic filing.
2. Develop a willingness to learn. The rules have been set up by experts in the field who have spent much time and thought developing them. Accept and apply the rules; argument will not change them.
3. Learn how to find what you need--knowledge of the field and knowledge of where to find information and how to acquire it.
4. Develop skill in the work you are preparing to do.

QUESTIONS:

1. What is "filing?"
2. What is a "title" in filing?
3. What is a "unit" in a title?
4. Explain indexing in your own words.
5. Why is it important to use Standard Rules for Indexing and Filing?

REFERENCES:

Denver Public Schools. Unit of Instruction in Filing. Related Information Sheets 1-3A. Denver, Dept. of Vocational Education, Emily Griffith Opportunity School.

Library Bureau Division, Progressive Indexing and Filing, pp. 1-6. Remington-Rand, Inc., Buffalo, New York, 1942.

These books are valuable to you and are available through your instructor.

Subject: RULES OF ALPHABETIZING

Related  
INFORMATION B  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

## DEFINITIONS:

The rules of alphabetizing are the standard rules of filing in all well-organized offices. They deal with the filing of individual names, firm names, and the names of government departments (cities, counties, states, and countries).

## ESSENTIAL FACTS, IDEAS, AND PROCEDURES

The basic rule for filing individual names is by last name first, then by first name or initial. In writing these names, the last name is placed first and is followed by a comma.

Examples of Individual Names:

Written:

E. B. Weaver  
Warren M. Crosby Col

Indexed and Filed:

Weaver, E. B.  
Crosby, Warren M., Company

Read Rules, 1, 1a, 3, 4, 12, 13, 13A, 13B, 15, 16, 20, 21, 23, 24, 25, 26, 28, 30, 31, 32, and 33 in Progressive Indexing & Filing, pp. 1-6. Notice the way special problems in individual names are handled.

Examples of Firm Names:

Written:

Santa Fe R. R.  
Thomas Clock Co.

Indexed and Filed:

Santa Fe Railroad  
Thomas Clock Company

Note that firm names are indexed and filed exactly as written. Read rules 2, 3, 5, 6, 7, 10, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33 in Progressive Indexing & Filing, pp. 1-6. These give procedures for handling firm names under all circumstances.

Examples of Government Units:

Written:

State Treasury Dept., Topeka  
City Water Dept., Topeka  
Interior Dept., U. S. Govt.

Indexed and Filed:

Kansas, State of, Treasury (Dept)  
Topeka, City of, Water (Dept)  
United States Government, Interior (Department)

Government units give first the name of the unit (such as Kansas), then tell what the unit is (city, county, state, nation). The word telling which it is becomes the second filing unit.

Read rules 7, 8, 9, 9a, 11, 15, 18, 19, 23, 24, 25, 27, 30, 31, 32 in your text, Progressive Indexing & Filing, pp. 1-6 for other procedures necessary.

QUESTIONS:

1. In a title such as "E-Z Cleaners" what is the first unit? What are the second and third units?
2. What words are written in a title but disregarded in indexing and filing?
3. What do you do with abbreviations in indexing and filing?
4. How are 's and s' handled in indexing and filing?
5. If you have as a title, "State Income Tax Division of the U. S. Treasury Dept.," what are the first three filing units?

REFERENCES:

Denver Public Schools. Unit of Instruction in Filing. Related Information Sheets b, d, and E. Denver, Dept. of Vocational Education, Emily Griffith Opportunity School.

Library Bureau Division, Progressive Indexing and Filing. Remington-Rand Inc. Buffalo, New York, 1942.

These books are helpful and are available to you through your instructor.

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

**DEFINITION:** The Content Analysis Chart is a form which has been developed for the purpose of organizing analyzed facts pertaining to a unit of instruction.

The parts of the Content Analysis Chart combine to make it a meaningful plan of action, which accomplishes a three-fold purpose: 1) names all the basic operations and items of related information; 2) establishes boundaries for the unit, showing where it begins and ends, and what it includes; 3) indicates the relationships between the various parts of the unit of instruction, tying them together in type jobs.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

When a Content Analysis Chart has been completed, the final determination has been made of:

1. Title of the unit of instruction, and estimate of total hours required to complete the unit.
2. Name of operations, the number times each operation should be repeated by the average student, and the operation numbers.
3. Items of related information and identification letters.
4. Type jobs and test jobs and their order, estimates of time needed by an experienced person and by the average student for doing the job, required accuracy, and cost of materials for each job.
5. The operations to be performed in doing each type job, their order, and the items of information that are related to each operation of each type job.
6. A final check and approval of the plan of the unit of instruction by the advisory committee or three other equally qualified authorities.

After the plan for the unit has been approved, the data are transferred to a final form which is known as a Content Analysis Chart and Individual Progress Record.

This final chart is the guide for both the instructor and the student wherein the learning procedure of the unit has been outlined and on which the achievement of an individual student can be recorded. The final chart is made up in two sizes. The standard notebook size is used by instructor and students as the work of the unit is carried forward. An enlarged model of the chart is usually made and put up on the wall for general reference.

in the following paragraphs:

How the Content Analysis Chart is developed and applied will be shown as its five principal parts are discussed

**PART ONE--OPERATIONS.** An operation is one of the basic skills which recur again and again in performing the work of a trade or an

occupation. The names of operations in a unit should be entered on the Content Analysis Chart in the slanting spaces at the top. The easier operations are usually entered at the left and the more difficult toward the right, but the order is not particularly important. The minimum number of times operations are to be repeated by the average student is shown by numbers entered in the spaces provided at the top of the chart.

**PART TWO--ITEMS OF RELATED INFORMATION.** Items of related information are technical knowledge and consist of facts, ideas, and procedures that the learner must know in order to do the type jobs, including trade terms, references, and specific problems of the occupation.

These items of related information, named briefly and clearly, are listed in the slanting spaces at the bottom of the Content Analysis Chart, and are entered as nearly as possible in the order in which they will first be used.

**PART THREE--TYPE JOBS.** A type job is a job commonly performed in business or industry. It provides for the student a carefully selected learning activity and includes a combination of two or more operations.

The type jobs are listed on the Content Analysis Chart in the horizontal spaces at the left-hand side of the main body of the chart. The easiest job is placed at the top, followed by the other type jobs in order of difficulty, with the most difficult one last.

**PART FOUR--TEST JOBS.** The test job samples the ability of the learner to perform, on his own, the operations included in a group of related type jobs. The names "Test No. 1," "Test No. 2" and so on are entered on the Content Analysis Chart under the specific series of type jobs on which the student should be tested.

**PART FIVE--KEY TO VARIOUS RELATIONSHIPS.** The operation that is performed first in doing a type job is marked with the number "1." The number "1" is placed on the line on which the type job is entered and in the space directly under the operation to be performed. The second operation to be performed is indicated by placing the number "2" in the appropriate square, and so on.

In each of these squares that carry numbers, letters are added if certain items of related information should be known by the learner in order to do the operation successfully in the type job in question. For example, if in doing the operation marked "1", the item of information identified as "A" is needed by the learner, the letter "A" will be entered in the same square with the "1." Examples follow:

: 1	: 2	:	: 3	: 5	: 4 :
:	:	:	:	:	:
: A	: C	:	: F H	: G	: I M :

These relationships show what is to be done and when it is to be done. The answers to such questions as HOW a job is to be done, and WHY it is to be done, are obtained by the student as he successfully completes one type job after another and finishes the unit of instruction.

**QUESTIONS:**

1. What is the purpose of a Content Analysis Chart?
2. What are the essential parts of a Content Analysis Chart?
3. How are type jobs keyed to operations and items of related information?

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

## DEFINITION:

Material typed for filing consists of cards, cross reference sheets, or labels.

## ESSENTIAL FACTS, IDEAS, AND PROCEDURES

Cards: Cards should be arranged in a neat pile where you can reach them easily. They may be placed on either side of the machine, depending on whether you use your right hand or left hand most easily.

Cards should be flipped into the machine. This technique will save a great amount of your time in the course of a long job. This is done by snapping the roller knob between the thumb and second finger of one hand while you hold the card in position with the other.

Most cards are lined, hence it is of particular importance that you straighten them before typing if they have not come up exactly straight after the flip.

Once the card is properly placed in the machine, the left marginal stop should be set. Lock it two spaces in from the left edge of the card. This saves you time in filing or finding by keeping all titles in a direct line.

Cards contain the name of the filing title on the line (Two spaces down from the top) and the address immediately underneath (one space). This is true whether the cards are numbered or are not. Hence, your card file is an automatic mailing list of those with whom you deal.

Other information is also added to the cards in various businesses. Find out what your own office uses, if anything.

Cross reference cards are typed in just the same way as any other alphabetic card.

Cross reference sheets: (Illustration p 30, Progressive Indexing & Filing)

These are temporary forms of the same size as your usual correspondence in the file. In preparing them, you type the less important title at the top and opposite it the number (if used).

Under "Regarding" you type a very brief explanation of what the correspondence is about and fill in the date.

Under "See" you type the most important title, directing the reader's attention to the place in the file under which the correspondence is filed.

Labels: Many firms use gummed strips punched to size when preparing new folders

or tabs. This avoids the awkwardness of typing or writing directly on the folder or tab.

In using them, type the exact filing title upon the label and then tear off the label and paste it on the new folder or tab.

Labels are usually typed for new folders under two circumstances: when you are moving a title out of the miscellaneous folder into its own individual folder, and at the beginning of the year when the old folders have been transferred out of the file into the storage equipment.

Sometimes it is desirable to type the address immediately under the title. This varies from system to system and from business to business. Find out what your company does.

**QUESTIONS:**

1. What is the advantage in using gummed labels for folders or tabs?
2. What difference is there between a numbered and an unnumbered card as far as the typing of titles is concerned?
3. Which name is typed at the top of a cross reference sheet?
4. Why should you type all cards at the same distance from the left edge of the card?

**REFERENCES:**

None.



Subject: ALPHABETIC SORTING

Related  
INFORMATION # E  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

**DEFINITION:**

Alphabetic sorting is sorting by letters or units.

**ESSENTIAL FACTS, IDEAS, AND PROCEDURES**

Purpose: Sorting saves large amounts of time and insures greater accuracy in filing. It prevents material from getting into the files by mistake.

In sorting without the use of special equipment, it has been found most effective to avoid making too many piles of material.

Two or even three sortings of large quantities of cards or sheets can be done much faster and more accurately than if you try to get everything exactly sorted the first time. It enables concentration on a few classifications that are easy to keep in mind. Also, you can often sit instead of standing and can take advantage of a smaller amount of table or desk space.

Mechanical Sorting: In large, well-established file departments, various types of sorters are used. These are divided into compartments. The file clerk drops the card or correspondence into the sorter in much the same way as they are placed in the file. They are then removed from the sorting compartments in consecutive order just as you pick up piles consecutively after sorting on a desk.

Most of these sorters divide into about 10% of the number of divisions in the file for which they are used.

Types of Sorters: (1) Probably the most common type of compartment sorter is the horizontal type used by post offices. They are marked into large alphabetic divisions and the clerk moves along and drops them into the various compartments.

(2) There are also vertical types of sorters which may be square or in the form of a tub or wheel. With these, the file clerk handles the sorting equipment exactly as if it were a file. The material being sorted is placed behind the several divisions the same as it is in a file.

(3) Some offices use a desk sorter of leather with compartments into which material may be slipped. All of these make sorting easier and faster.

ILLUSTRATIONS: Picture of a horizontal leather compartment sorter on page 102 of Progressive Indexing and Filing. Other types on page 20.

**QUESTIONS:**

1. Why is it faster to sort large quantities of correspondence several times than to try to do it all in one operation?

2. If you had 200 guides in your file, into how many piles would you make your first sorting?
3. Name some business in Topeka and tell what kind of mechanical sorter it uses.
4. What is the purpose of sorting?

Sorting is a process of putting things into piles or groups. It is done to make things easier to find and to save space. For example, if you have a lot of papers, you might sort them into piles by date or by topic. This makes it easier to find what you need. In a business, sorting is used to organize files, records, and materials. It helps to keep things in order and makes it easier to manage them. Sorting is also used in libraries, schools, and homes to keep things organized. The purpose of sorting is to make things easier to find and to save space. It is a simple but important task that helps us to manage our things better.

There are many different ways to sort things. One way is to sort by color, size, or shape. Another way is to sort by date or by topic. In a business, sorting is often done by department or by project. For example, a company might have a filing system where all the papers for a particular project are kept together. This makes it easy to find all the information you need for that project. Sorting is also used in libraries to organize books by author, title, or subject. In schools, sorting is used to organize papers and books. In homes, sorting is used to organize clothes, toys, and other things. The purpose of sorting is to make things easier to find and to save space. It is a simple but important task that helps us to manage our things better.

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Title of Unit: FILING

Field: Office Practice

## DEFINITION:

File handling is the use of correct technique in handling guides and/or folders in the placing or finding of material in the files. This embraces speed of location on the one hand and preservation of equipment on the other.

## ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Titles must be read first and then the correct guide located with the EYE. Hands must be kept still until the eye has located the proper division.

When the guide is located, the hands are moved directly down the sides without any fingering of other guides or fumbling en route. One hand is free, and it may be inserted into the exact place you are to find until the card or sheet may be inserted or withdrawn. If necessary, fingering may be done within this division.

Side fingering within the division is much faster than the "hunt and poke", one-finger method sometimes used by untrained file clerks. Tests show it to be at least twice as fast. Hence, it saves you from doing unnecessary work.

There is another reason for using the side-fingering method from the start. Guides and folder tabs are more or less brittle. Constant pulling will soon crack or break them off. This wastes your time in looking for a title and runs up the cost of maintaining your file.

Removing Folders: In removing folders from the file, it is again important not to handle the tabs or "ears." Back and front edges of a folder should be held firmly between thumb and forefinger which takes hold from the side. Then the folder may be lifted directly up with no danger of tearing off a tab or spilling material from inside.

## QUESTIONS:

1. Why is it necessary that you handle guides and folders from the side?
2. What advantage is there in locating guides with the eye before moving the hands toward the section you want?
3. What is the proper way of removing folders from the file?
4. What are the dangers of the "hunt and poke" technique of handling file guides and folders?

## REFERENCES:

None

Subject: THE HOUSING OF CARDS

Related  
INFORMATION G

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

**DEFINITION:** The housing of cards is concerned with the various types of equipment in which cards are protected and stored.

**ESSENTIAL FACTS, IDEAS, AND PROCEDURES.**

Separate units: (1) Desk boxes are wooden or metal units which may stand upon a desk or table. There may be one unit or as many as four combined. The latter are called solid card tray cabinets. (See illustrations pp 85, 99, 100, Progressive Indexing and Filing.)

(2) Visible units put cards where they can be seen easily and referred to more quickly. (See illustrations p 110, Progressive Indexing and Filing.)

(3) Drawers which have separate places in built-in or other cabinets. (See illustration p 41, Progressive Indexing and Filing.)

Combination units: In these units, cards may be combined with correspondence or other filed material. These are called "horizontal" units. They are made up by stacking the various units on top of each other according to size. (See illustration p 98, Progressive Indexing and Filing.)

**QUESTIONS:**

1. What is a horizontal filing unit?
2. What is the purpose of visible units?
3. If you wanted to keep several boxes of cards stacked on your desk, what kind of a unit would you use?

**REFERENCES:**

Library Bureau Division, Progressive Indexing and Filing, pp. 41, 98-100, 110. Remington-Rand Inc., Buffalo, New York, 1942.

Subject: GUIDES

Related  
INFORMATION H

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

**DEFINITION:** Guides are marked cards inserted into files which make it easy to find the different divisions. They are like sign posts on a well-marked highway. They get you where you want to go without any fumbling or loss of time if they are properly used.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

**Construction:** Guides are made of very heavy card stock, usually manilla or pressboard. They are heavy enough to offer support to folders and correspondence in addition to marking the various divisions.

Some guides are celluloided at the tips or "tabs." Others have metal instead of celluloid. Some of them are moveable and adjustable to any position. Many are slanted to make reading easier. Some have provision for removable labels.

**Markings:** There are two schemes of marking used on guides and folders:

- (1) The "open" or single notation system of marking simply marks the beginning of a division.

Example of "open" or single guide notations:

An	100
Al	110

- (2) The double or "closed" notation system of marking shows the beginning and the end of a division.

Example of double or "closed" guide notations:

Al-An	100-110
-------	---------

Not all offices find the same system most desirable. If certain sections of your file are expanding rapidly, certainly it would be easier and cheaper to use the "open" or single notation. For instance, if the "Al" to "An" section had to control too many cards or too many folders, it would be a simple matter to insert one guide bearing the notation "An."

Some file clerks think the single marking is less confusing and faster. Others think that you have to look at two guides in order to find out where the section begins and where it ends.

**Kinds of Markings:** The alphabetic is probably the most commonly used. Sometimes numbers are used, either separately or combined with the alphabetic markings. Sometimes there are subject markings--for instance, a guide might be marked "Screws" or even "Screws, wood." Others may be marked with names of states or towns.

In all cases, the purpose is the same--to get you where you want to go in the file, quickly, easily, and with no danger of getting lost.

Arrangement: Guides always occur ahead of the cards or folders in the file. Guides may also be arranged in various positions across the drawer (left to right). The Variadex and the Triple Check use guides in the first two positions from the left and use the extreme right-hand position for the insertion of special classification guides to handle very heavy correspondence or other material frequently referred to. Others reverse this arrangement.

All such schemes have for their purpose the rapid and easy location of filed material.

Cuts: Common cuts for guides are second, third, and fifth cuts. (See illustration p 7, Progressive Indexing and Filing. There are a number of variations for special purposes. (See illustrations, Ibid. pp. 87-8, 103).

**QUESTIONS:**

1. What is a single notation guide?
2. Give an illustration of a double notation guide behind which your name might be filed.
3. Of what materials are guides usually made?
4. What is meant by "second position of fifth cut?"

**REFERENCES:**

Library Bureau Division, Progressive Indexing and Filing, pp. 7, 87-8, 103. Buffalo, New York, Remington-Rand, Inc. 1942.

Subject: SOUNDEX SYSTEM OF FILING.

Related  
INFORMATION I  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages

DEFINITION: The soundex System of filing is a system used almost entirely for cards. It is phonetic in nature, using code numbers 1 to 6 with certain key letters and their equivalents. Other letters of the alphabet are disregarded in coding. As a result, all names that sound alike, regardless of how spelled, are grouped under one code number.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Purpose and Use:

The system was originated and perfected by the Library Bureau, a division of Remington-Rand, Inc., Buffalo, New York. It is copyrighted and sold exclusively by that company.

The system received its widest publicity when it was adopted by the Social Security Board of the government for the filing of millions of names. It was found that in filing large numbers of names alphabetically, related names were separated, whereas this system brought them together in one place for easy filing and finding.

Alphabetic filing is not to be discounted, however, and in the Soundex System the student uses alphabetic filing also. Standard Rules for Indexing and Filing titles must be strictly observed in this and all systems of filing.

Since the adoption of the system by the Social Security Board, newspapers and magazines have had many ably written articles about this unusual and practical way of arranging names for rapid finding. The public was naturally very much interested in these provisions to safeguard the rights of so large a number of our citizens who were paying a part of their income into the Board.

Commercial houses and institutions with large name indexes put the system into use and today social agencies, automobile license bureaus, insurance companies, credit information files, and many others check names and locate information quickly and easily through the Soundex System.

Spelling and Accuracy Versus Pronunciation

One-third of our population is of English origin. Yet one-half of our people bear English names, America, the melting pot, is becoming American by label. Name changes occur by accident and design. They may be made legal if pronunciation is retained. As a result, spelling is now a most uncertain avenue of reference to an index, file, or record.

Where, for instance, will you look for "Burke?" Was the original interpretation "Berk?" Was it "Bourke?" Or might it have been "Birk?" Can you think of ten variations of "Burke?" Having failed to locate the record you want, are you certain it isn't somewhere in the file? Hundreds of unrelated names may separate the first spelling from the last when indexes are arranged alphabetically. Reference is often tedious, roundabout and slow. (How many variations are there to your own name? Write them out and see.)

Related Information Sheet I ; Page 2 of 2 Pages.

Alphabetic indexing places heavy responsibility for accurate finding upon the shoulders of the operator. You must depend upon her imagination to discover other spellings. You are at the mercy of a memory and searching skill which, however willing, cannot give unlimited time to searching. Alphabetic indexing causes losses and mistakes because it demands far more time than the skilled brain can profitably spare.

All surnames can be spelled in at least two ways, but "Bailey" is spelled 22 different ways. "Kelley" has 14 variations. There are 8 ways to spell "Miller" and fourteen for "Sherman." The five-letter "Meyer" has 10 separate spellings, "Baer" has 36 and "Schneider" has 29. Yet no matter how you arrange the letters, pronunciation is much the same.

From the penmanship standpoints, even the expert produces "a's" that look like "o's" and "u's" that cannot be told from "o's." The combination "ci" and "ei" are easily confused. "M" and "n" are hard to distinguish. The same writer does not always write legibly. Two writers often produce two results.

The typewriter is a machine which also permits mistakes. The very design of its keyboard contributes to indexing errors. "X" often takes the place of the nearby "s." An "i" and "v" are frequently interchanged, and the reason lies in their location on the keyboard. Transpositions like "ly" and "yl" are frequent keyboard errors.

QUESTIONS:

1. Define the Soundex System of Filing.
2. By whom was it originated?
3. Name some types of offices that would use this system?
4. How many variations of the spelling of your own name do you know?
5. Give some common names that have many variations in spelling.
6. How do you use Standard Rules for Indexing and Filing in this system?
7. State some of the advantages to the file clerk in using this system of Filing.

REFERENCES:

Denver Public Schools, Dept. of Vocational Education, "Unit of Instruction in Filing." Denver, Colorado, The School. 1943. Related Information Sheet N, pp 1-3.



Subject: RELEASED FOR FILING

Related  
INFORMATION J  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages.

Field: OFFICE PRACTICE.

DEFINITION: Released for filing means that the material when it reaches the file room bears an indication that it is ready to be filed.

ESSENTIAL FACTS, IDEAS, and PROCEDURES.

Indications and Methods of Release

It is not difficult for the file clerk to determine if the material he is about to file has been released for the file. Some indications in general usage are as follows:

1. A carbon copy of an outgoing letter, attached to an original letter.
2. A copy of an invoice attached to an original order.
3. The name or the initials of the person whose duty it was to handle the piece of mail (usually in the opper left-hand corner).
4. Rubber stamp reading something like this:

Released for File
By _____
Date _____

(Filled in, of course, by the person releasing the mail with his name and the date).

The file clerk should be careful to inspect each piece of mail to see that it has been released. Filing material not bearing a release might result in filing orders that had not been filled or letters that had not been answered. Inspect before you sort and you may easily avoid this.

If no release is indicated on the mail, the file clerk should return it to the person whose duty it was to handle that particular piece of mail.

QUESTIONS:

1. What is meant by release for the file?
2. What are some of the indications that the piece of material you are filing has been released?
3. In what manner would a firm lose reputation and business if the file clerk were not careful to secure release before filing mail?
4. What steps should be taken by a clerk if the material bears no indication of release?

REFERENCES: Denver Public Schools, Division of Vocational Education, Unit of Instruction in Filing. 1942. Denver, Colorado, The School. Related Information Sheet I, pp 1-2.

Subject: GENERAL FILING PROCEDURES

Related  
INFORMATION K  
Sheet

Title of Unit: Filing

Page 1 of 2 Pages

Field: Office Practice.

**DEFINITION:** General filing procedure is the accepted routine followed in the file room in handling vertical files for correspondence, out guides, miscellaneous folders, and cards.

**ESSENTIAL FACTS, IDEAS, AND PROCEDURES.**

1. The number of pieces of mail in a vertical files should not average more than 75. The ordinary folder capacity is 100 pieces.
2. When correspondence from one individual or firm is less than five letters, it is classed as miscellaneous and should be filed in a miscellaneous folder bearing the same tab designation as the guide behind which it is placed.
3. The contents of all drawers should be kept compressed at all times except during actual filing operations. This promotes orderliness, flattens creased papers, and prevents contents falling forward when the drawer is open.
4. When filing, you should leave a minimum of four inches of working space in each drawer. A drawer of correspondence ordinarily cannot contain over 4,000 pieces and still work well.
5. One person should be responsible for the entire operation of the file department. If two or more people are employed in the department, one should have supervision over all others.
6. One operator can normally handle the filing and finding in thirty to seventy-five drawers. There are many factors that may cause this to vary somewhat and, because of this, the correct answer in each case must be determined by a study of the operation. The file clerk may at times be called upon to perform other duties which would take him away from the files. This also has to be taken into consideration.
7. Out guides should be provided and every paper leaving the file department should be charged out with the guide inserted at the place from which the record was removed.
8. The general rule in a file department is that no one except the file clerk is permitted to remove papers from the files. This varies, however, as many workers must have access to the files and it is a very difficult matter to have ironclad rules, but certainly those allowed to use the files should know the system and abide by the general rules of the file room.

CARDS:

1. One card guide should be used to control an average of 20 cards. Occasionally a few more may be handled temporarily.

2. Allow about 125 medium-weight cards to one inch, 100 heavy-weight cards to the inch, and about 80 extra heavy-weight cards to the inch. These card estimates do not include the guides. Of course, it is understood that the more the guides, the easier to find the card.
3. A minimum of three inches should be allowed for working space in a card index.

QUESTIONS:

1. Why should you limit the number of pieces of mail to a folder?
2. Why is it best to wait for an accumulation of four or more pieces of mail before making up a folder?
4. What working space should be left in a file drawer? In a card index?
5. What do you understand about "out guides?" When should they be used?

REFERENCES:

Library Bureau Division, Progressive Indexing and Filing, pp. 19-24.  
Buffalo, New York, Remington-Rand, Inc. 1942.

Denver Public Schools, Dept. of Vocational Education, Unit of Instruction in Filing. Related Information Sheet H. Denver, Colorado, The School, 1943.

Subject: CORRESPONDENCE IDENTIFICATION

Related  
INFORMATION L  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

DEFINITION: Identifying correspondence means the process of determining whether the piece of mail to be filed is an original letter, carbon copy, telegram, purchase order, requisition, credit memo, order, invoice, waybill, bill of lading, service ticket, or the like.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES

1. Original letter - Is the incoming letter, usually addressed to the person or concern for whom the file clerk is working.
2. Carbon copy - Is a copy of the original letter from the person or concern for whom the file clerk works. It is generally considered the office copy and is filed in the office.
3. Telegram - Is a communication by wire and a typed copy is delivered to the person to whom it is addressed.
4. Purchase order - Is an order given by one person or concern to another ordering merchandise or service.
5. Requisition - Is a form of order authorizing the seller to deliver the material ordered.
6. Credit memo - Is a receipt given for merchandise when it is returned for credit.
7. Order - Is a written or verbal request to purchase merchandise. If given verbally, it is usually followed with a written order marked "Confirmation."
8. Invoice - Is an itemized statement of merchandise shipped or sent to a purchaser. The statement shows the quantity, price, how shipped, and terms of payment.
9. Waybills, bills of lading, express receipts, etc. - Are receipts issued by railroad companies, express companies, or truck lines for merchandise being shipped. These receipts show:
  - Consignor - Party shipping the goods
  - Consignee - Party receiving the goods
  - Quantity, weight, and routing.
10. Packing slip - Is a memorandum showing the merchandise shipped and the name of the party packing the shipment. It is usually made in triplicate. One copy accompanies the shipment, one is mailed to the consignee, and one is retained in the office as an office copy.

QUESTIONS:

1. What is meant by a "Confirming Copy?"
2. What is meant by "Office Copy?"
3. What advantage is there in using a packing slip?
4. What three titles would show on a waybill, a bill of lading, or an express receipt?

REFERENCES:

Denver Public Schools, Dept. of Vocational Education. Unit of Instruction in Filing. Denver, Colorado, The School, 1942. Related Information Sheet G.

Subject: RULES FOR SOUNDEX FILING

Related  
INFORMATION M  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages

Field: Office Practice.

DEFINITION: Rules for Soundex Filing are the rules used in coding and filing titles in the Soundex Method of Filing.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Rules for Coding

1. The letters a, e, i, o, u, w, y, and h are not coded, but act as separators between key letters and equivalents.
2. The last name or surname of the individual is the name to be coded. The first indexing unit of the name of a firm, corporation, or institution is the unit to be coded.
3. The first letter of the indexing unit in any title is not coded. It acts as an alphabetic guide.
4. When an equivalent occurs in a name, the key letter for that equivalent is used, and not the equivalent.
5. If the names do not contain 3 key letters or equivalents, ciphers are added to make 3 code numbers. All code numbers must have three digits. Example: Bird codes out RD-630.
6. Only the first three key letters or equivalents in a name are coded. Long names often have more, but only the first three are used. Example: Christenson codes out RCD-623.
7. If all letters in the name code out, three ciphers are used. Example: May codes out 000, and as a key letter, the "M" is used. If the name is "Fay," then F-000 would be used. If the indexing unit of a firm is a letter, such as B & B Cleaning Company, the first "B" is the first indexing unit, and such a name would simply code out B-000.
8. When the same two key letters come together in a name, only one of them is used. Example: Bell codes out B-400.
9. If the same two key letters come at the beginning of a name, the second key letter is disregarded. Example: Lloyd codes out L-300.
10. If two equivalents or a key letter and its equivalent come at the beginning of a name, the second letter of the name is disregarded. Example: Schneider is coded NDR-536.
11. If a key letter and its equivalent come together within a name or at the end of a name, only one letter is used. Example: Hardtman codes out RDM-635, Brandt RMD-653.
12. If more than two of the same key letters or more than two of the same equivalents come together, only one of such letters is used. Example:

Skaggs is coded C-200.

15. If two key letters or a key letter and its equivalent are separated by "h" or "w" they are coded as one letter. (There are very few such names)  
Example: Ashcraft is coded CRB-261.

### Rule for Filing

There is only one rule for filing. It must be strictly observed in all cases.

14. Between key letter guides, the cards must be filed alphabetically by the given name, if an individual; and by the second unit if a firm or a governmental title.

### Correct Filing Arrangement

Back of the Guide 000 in the "M" section of an index, the cards would be filed as follows:

May Company (The)  
M & D Transportation Company  
May, Edward  
My Shop  
Moe, William

This method of filing makes finding easy and quick. The telephone directory carries more than 700 "Johnson's" that can be spelled "sen," "son," "sin", and the like; but all would code out the same MCM-525. To locate a Johnson, the first step would be to find the Guide 525 in the "J's", then look to the given name to find the specific Johnson. The given names filed in alphabetic order would give quick results.

### QUESTIONS:

1. What would be the result if a title was coded incorrectly?
2. In what manner will you use Standard Rules for Indexing and Filing in this system of filing?
3. How many digits must every code number have?
4. What would be the highest numbers that you could have in a code number? Can you give an example of a name that would cover your answer?
5. This system of filing is termed a "phonetic" system. Why can't you file by sound and disregard the rules for coding?
6. In the filing of cards under this system, what is the function of the first letter of the coding name?
7. What do you understand by "Key letter guides"?
8. Give the rule for filing and state why the titles are filed in this manner.

### REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School. Related Information Sheet Q. 1943.

Subject: FOLDERS

Related  
INFORMATION N  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages.

Field: OFFICE PRACTICE.

DEFINITION: A folder is a container for correspondence.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Folders:

Folders are made of heavy sheets of paper folded once so that the back is about one inch higher than the front. They are usually made about one inch larger than the material that is to be filed in them. The back half serves as a tab for writing the title. It can be cut in the desired position. Manila and pressboard are the two most common materials from which they are made.

The Individual Folder

The individual folder holds the correspondence of an individual or firm. The title of such individual or firm is written on the tab or a label is made and pasted over the tab. The folder is placed behind the guides in accordance with the system used.

The Miscellaneous Folder

When fewer than five letters have been written to or received from a person or a concern, these letters, in most alphabetic filing systems, are placed in a folder that also contains letters with other persons or concerns with whom an equally limited correspondence has been carried on. The tab on such miscellaneous folders bears an alphabetic caption such as "A" or "A-Al," and so on. Therefore, in one miscellaneous folder are filed letters with those correspondents whose names are in the alphabetic range indicated by the caption on that folder. They are kept in date order with the latest date on top if there are two or more letters from the same person or concern. Otherwise, the arrangement is alphabetic.

Special Folders

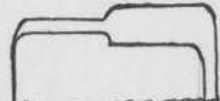
Folders designated as "Special Folders" are used in almost every filing system. They have special captions on the tabs such as "Application," Branch Office," and so on. For easy identification, folders of different colors are used in some systems. Their function is to prevent placing folders in the wrong section or to designate the particular types of business or persons.

Cut of Folders or Tabs

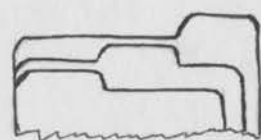
The drawings following indicate how folders may be cut in many positions. The titles are usually printed on the tabs or written on gummed labels and pasted on the tabs.



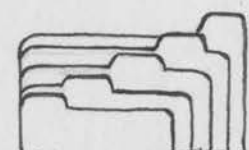
Straight cut



One-half cut



One-third cut



One-fifth cut.

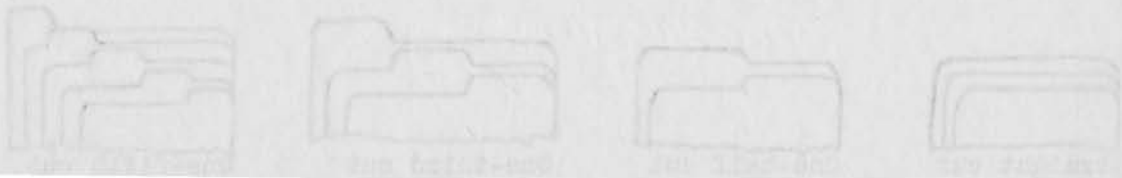


QUESTIONS:

1. What is meant by an individual folder?
2. What is meant by a miscellaneous folder?
3. When would correspondence be removed from a miscellaneous folder?
4. For what are special folders in a filing system used?

REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943. Related Information Sheet K.



Subject: STUDENT WORK PLAN

Related  
INFORMATION 0  
Sheet

Title of Unit: FILING

Page 1 of 2 pages

Field: Office Practice.

DEFINITION: The Student Work Plan is a form used by the student in planning the work to be done in a type job. It is developed in detail by the student, under the supervision of the instructor, and includes: a list of operations in the order they are to be performed, a list of items of related information that must be known and used, a statement of the limits of time and accuracy within which the type job should be done, the student's estimate of the time it will take him to do the operations, and a subdivision of the plan into logical groups of operations or "parts" of the job. In many cases, one or more parts can be completed in one class period. Details are worked out for each part of the plan before that part of the job is performed.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES

In planning a job of any consequence, the skilled worker follows a definite procedure. First, he considers the job directions and specifications as a whole and develops an overall plan for doing the job. Next, he divides the job into parts and determines the order in which they are to be done. Having completed the overall planning, he proceeds to work out the technical details of the first part of the job. He makes necessary sketches, measurements, and computations; lists tools and materials needed; and studies special information that must be applied in doing this part of the job.

As a result of this detailed planning, he is ready to do the first part of the job, and proceeds with its performance. Each part of the job is treated in like manner. STUDY AND PLANNING ALWAYS PRECEDE DOING THE JOB.

The student develops HIS plan under the supervision of the instructor in much the same way.

The student makes a general outline for the job and subdivides it into parts as his first approach to the problem. The student's work plan serves as a guide and helps him make use of operation sheets, such as O-1, O-2, and O-3. He then proceeds to work out in detail the plan for the first part of the job before he does it. This activity is carried on in class periods devoted to related instruction when instructional aids such as books, charts, and forms are available for use.

It should be noted that thorough planning embraces instruction in reading and following job directions and specifications.

Some instructors believe that the planning a student does in terms of the time he allows himself to perform a part of the job is of great importance. It enables the student to check the accuracy of his estimates and to gauge the speed with which he must work. Checking accuracy is also essential and of special interest to the student who is anxious to do his work according to business and industrial standards.

The three major purposes for requiring a student to plan his order of procedure in doing a job are:

TO PREPARE A PLAN OF ACTION THAT WILL RESULT IN THE DEVELOPMENT OF SKILLS: It is at this point in the training of the students that the relationship of type jobs, operations and their repetition, and items of information outlined in the Content Analysis Chart and Individual Progress Record begin to possess meaning to him. He subdivides the job into parts that are to be planned and done one at a time. He must now study the type job directions. He must list the operations he will perform in correct order, study the steps and key points involved, and indicate where he will need the instruction. The items of information related to the type job and operations will need to be examined critically.

TO PROVIDE PRACTICE IN ANALYZING AND PLANNING JOBS. The planning of a job and carrying it through to completion incorporates all the elements involved in the scientific method of solving problems. In fact, it is REFLECTIVE THINKING at its best. Thus workers learn to identify problems in situations, formulate hypotheses, plan solutions, draw sound conclusions, and act in accordance with the conclusions reached.

Careful planning results in a saving of time, effort, and materials. It is a deliberate, specific part of the student's training until, through practice, the habit of preparing such plans becomes thoroughly established.

TO ENABLE THE INSTRUCTOR TO FOLLOW THE STUDENT'S PROGRESS IN DOING THE JOB: After the first few type jobs have been performed, the members of a class are seldom working on the same steps, operations, or type jobs at any one time. The student's work plan, therefore, becomes a distinct aid to both instructor and student in determining what they are to do, or perhaps have accomplished, and what remains to be done in order to complete the job.

Under the careful guidance of an instructor, a student can gradually develop the ability of self-direction in doing his work. This ability is all-important if he is to reach a maximum level of proficiency as a skilled worker.

#### QUESTIONS:

1. Why should the student prepare a work plan?
2. What are the principal items listed on the student Work Plan?
3. On what basis is the Student Work Plan subdivided into parts?
4. What details must commonly be worked out by the student before he can do one part of a job.
5. What general characteristic does a student develop as a result of practice in planning his work?

#### REFERENCES:

A Unit of Instruction, How to Organize and How to Teach It. p. 56  
Denver Public Schools, Denver, Colorado, 1943.

Subject: LETTERS, EQUIVALENTS, AND CODE NUMBERS

Related  
INFORMATION P  
Sheet

Title of Unit: FILING.

Page 1 of 1 Pages

Field: Office Practice.

DEFINITION: Key letters, equivalents and code numbers are the symbols used in coding titles under the Soundex System of Filing.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

The Soundex System of Filing recognizes certain basic sounds which are uttered by the human voice. They are represented by six fundamental key letters.

B - C - D - L - M - R.

These six letters comprise the Soundex Alphabet. Certain other consonants are equivalent to them.

The Soundex System disregards the vowels, for vowels play little part in word formation. "W" and "y", often treated as vowels, are also not regarded. Only one consonant, the letter "h" is not considered, and this is because "h" merely defines breathing and suggests no real sound.

The six key letters and their equivalents form a simple numeric code. Here is the Soundex Alphabet, and with corresponding code numbers:

<u>Key Letters</u>	<u>Equivalents</u>	<u>Code Numbers</u>
B . . . . .	P F V . . . . .	1
C . . . . .	SKGJQXZ . . . . .	2
D . . . . .	T . . . . .	3
L . . . . .	No equivalent . . . . .	4
M . . . . .	N . . . . .	5
R . . . . .	No equivalent . . . . .	6

While this system of filing is considered a phonetic system and is based on sound, few people are experts in phonetics. It is impossible, therefore, to file by sound. The file clerk must learn the rules, apply them in coding, and file according to rules given.

QUESTIONS:  
None

REFERENCES;

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado. The School, 1943.  
Related Information Sheet P.

Subject: THE HOUSING OF CORRESPONDENCE

Related  
INFORMATION Q  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages.

Field: Office Practice.

DEFINITION: The housing of correspondence is the storing and protecting of filed material or stored material in various types of equipment made for that purpose.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Separate units

Vertical or upright units are cabinets with the file drawers one above another. Units can be joined side by side to form batteries.

There are four heights for these cabinets: (1) The two-drawer unit, sometimes called "the executive type." (2) The three-drawer units, sometimes called "counter height," which are often used as combined filing cabinets and counters. Topeka High School's office has this arrangement. (3) The four-drawer unit which usually contains drawers of the same size. It stands about four feet high or a little over. These are widely used in General filing.

(4) The five-drawer height is commonly equipped with five drawers of the same size. It is used when floor space is rather limited. Since they are about five feet two inches high, they offer a problem for small girls to reach the top drawer for filing or finding.

Illustrations of these units will be found on pages 97 and 98 of Progressive Indexing and Filing. Your classrooms are also equipped with built-in two-drawer correspondence files.

Combination units

The combination unit, in which members are stacked one on top of the other, has one or more correspondence-sized drawers, with card units of the solid-cabinet type stacked on top of them.

Illustration of this unit is on Page 98, Progressive Indexing & Filing.

QUESTIONS:

1. What is the common name of the three-drawer filing unit?
2. Two-drawer filing units are often called what?
3. Point out at least two differences between horizontal and vertical filing units.

REFERENCES:

Library Bureau Division, Remington-Rand, Inc., Progressive Indexing & Filing. Buffalo, N. Y., Remington-Rand, Inc., 1942. Pp 97-98.

Title of Unit: FILING

Page 1 of 2 Pages.

Field: Office Practice.

**DEFINITION:** Cross reference in filing means making reference from one title in the file to another title, both of which deal with the same or related subject matter. Each title is filed in its own correct alphabetic place.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Rule) The title of a married woman should be indexed and filed under her  
1. ) legal name (her own name and her married last name) and cross reference made to the husband's name if it is known.

Example

Mrs. Mary A. Little

Indexed and Filed:Little, Mary A. (Mrs.)  
(Mrs. Robert L.)Cross Reference:Little, Robert A. (Mrs.)  
See: Little, Mary A. (Mrs.)

Rule) It is frequently advisable to cross reference the name of a firm  
2. ) with the name of the manager or proprietor. However, if this is overdone, it will result in crowded files and much duplication of information.

ExampleWilliam Bowen, President  
National Biscuit Co.Indexed and Filed:National Biscuit Co.  
(Bowen, Wm., President)Cross Reference:Bowen, William (President)  
National Biscuit Co.

**NOTE:** In cases where your first indexing unit changes, cards, folders, or labels have to be made for both titles, as in the above example, and one card filed under "Bowen" and the other under "National."

Rule) When a firm sells out to another interest, a cross reference should  
3. ) be made to the new firm, but the folder for the old firm must be carried as long as deemed necessary. Current mail is carried in the active (new) folder.

Example

Southwick Auto Supply Co.

Indexed and Filed:National Motor Parts Co.  
(Successor to:  
Southwick Auto Supply Co.)

Cross Reference:

Southwick Auto Supply Co.  
(Succeeded by:  
National Motor Parts Co.)

Rule ) When corporations or individuals have receivers, trustees, or  
4 ) guardians, they should be cross referenced as follows:

Example

The Denver & Rio Grande  
Western Railroad  
Swann & McCarthy, Trustees

Indexed and Filed

Denver & Rio Grande Western  
Railroad (The)  
(Swann & McCarthy, Trustees)

Cross Reference:

Swann & McCarthy, Trustees  
Denver & Rio Grande Western  
Railroad (The)

Types of Cross Reference.

Unnumbered cards are used for cross reference in numeric systems. Cards are also used to cross refer to names when material is filed geographically.

Alphabetic systems such as Variadex, Triple Check and others use sheets for temporary cross reference. So does the Geographic. (See illustration p 30, Progressive Indexing and Filing). Permanent cross reference is made on a manilla-tabbed cross reference form (See illustration p 68, Progressive Indexing and Filing.)

In any case, material is filed under the most important title and cross references are made to the less important.

QUESTIONS:

1. Why is cross reference essential in good filing?
2. Whose responsibility is it to see that the files are correctly cross-referenced?
3. Which name is placed at the top of a cross-reference sheet or card?
4. How can you cross refer to names (titles) in a geographic file?

REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943.  
Related Information Sheet F.

Library Bureau Division, Remington-Rand, Inc., Progressive Indexing and Filing. Buffalo, New York, Remington-Rand, Inc., 1942. p 30, 68

Title of Unit: FILING

Page 1 of 2 Pages.

Field: Office Practice.

DEFINITION: Numeric filing is filing by numbers. A separate alphabetic card control is maintained and unclassified material is temporarily housed by itself, in many cases.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Numeric filing is used when the material to be filed groups itself around a definite case, such as a contract, project, job, subject, or client.

It is generally used by professional people and many political units such as county, state, and Federal courts. Contractors, architects, lawyers, doctors, and research men generally use it.

Many government offices use a form of numeric filing assigned to subjects. This system is used by railroads and also by many wholesale houses where merchandise is sold through dealers. Filing by number is also used for papers which are duplicates of others in the file, such as orders or requisitions.

When a number is assigned to a definite case or job and all material related to it is coded with the same number, all related correspondence, regardless of the title, will come together in one file.

For example:

We contract to have stationery printed. In the plant, the order will be assigned a number. During the progress of the job, many orders for such things as ink, paper, lithographing, etc., will be added.

If correspondence regarding this job should be filed in alphabetic order and scattered through the file, it would be difficult to get together and the information needed to bill us for the completed job.

It is therefore coded in the upper right-hand corner with the number that has been assigned to this job and placed in that file in date order, the last date on top.

Cards are often pre-numbered and the next unused card taken for the new title. Others are numbered at the time of use and often a record kept of the title to which numbers were assigned in an "originating ledger."

When a job or case is finished, all material is removed and the control card stamped "Inactive" to indicate that it has been transferred.

QUESTIONS:

1. When is a numeric system of filing used?
2. Name some professional people who use this system.
3. Name some of the lines of business using this system.
4. What advantages can you see in this system of filing?



REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943. Related Information Sheets R, S.

ESSENTIAL FACTS, LINE, AND PRODUCTION.

Materials filing is used when the material is to be filed through the file. It is a definite card, such as a contract, project, job, subject, or object.

It is generally used by professional people and any official who has to do with the filing of material. Contractors, architects, lawyers, doctors, and engineers are generally the users.

Many government offices use a form of material filing and also use this system. This system is used by collectors and also by many business houses. Where responsibility is held through business, filing by number is also used. The papers which are filed in the file, such as contracts or regulations.

When a number is assigned to a definite card or job and all material related to it is noted with the same number, all related correspondence, regulations of the file, will come together in one file.

FOR EXAMPLE:

As contracts are made sequentially, in the file, the order will be sequential. Listing the progress of the job, many orders for work which are in the paper, correspondence, and will be added.

If correspondence regarding this job should be filed in the order and material related to this, it will be difficult to get together and the information needed to fill in for the completed job.

If it is therefore noted in the paper right-hand corner with the number that has been assigned to this job and placed in that file in that order, the first date on job.

Jobs are often pre-numbered and the card must also have the number. Orders are numbered at the time of the job and often a record kept of the file to which numbers were assigned to an organizing job.

When a job is finished, all material is removed and the material is filed in the file. It is then ready to be used again.

CONCLUSION:

It is then in a separate system of filing work. This system is used by many professional people and any official who has to do with the filing of material. Contractors, architects, lawyers, doctors, and engineers are generally the users. The papers which are filed in the file, such as contracts or regulations.

Subject: NUMERIC FOLDERS

Related  
INFORMATION T  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages.

Field: Office Practice.

DEFINITION: A numeric folder is a container for correspondence or any material that is to be filed by number and not by name.

ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Folders for numeric filing differ in some offices from the regular folders as outlined in alphabetic filing. However, many offices use the regular three- or five-position cut folder staggered across the drawer.

In legal offices, because many important documents are filed, the folder is replaced by a heavy envelope with a tie that fastens the envelope. This of course is to prevent the loss of valuable papers. In some of them the papers are folded before being filed; in others they are filed flat.

Doctors use an envelope that will accommodate the X-ray plates when such plates are a part of the record.

The number for either the folder or the envelope should be in bold letters, either on the tab of the folder or on the upper right-hand corner of the envelope.

QUESTIONS:

1. What is meant by a three- or five-position cut in a folder?
2. What is meant by folders being staggered across the drawer?
3. What is the advantage of using a three- or five-position cut?
4. What advantage is there in using the envelope type of folder?
5. Where are the numbers on the folders placed?
6. Where should the numbers on an envelope be placed?

REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943.  
Related Information Sheet U.

Subject: NUMERIC GUIDES.

Related  
INFORMATION U  
Sheet.

Title of Unit: FILING

Page 1 of 1 Pages.

DEFINITION: A numeric guide is a breakdown by numbers.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Guides, as learned in alphabetic filing, are letter breakdowns. In Soundex filing they are code numbers and key letters. In numeric filing they are numbers, usually beginning with 100 and the guides staggered across the drawer--110, 120, 130, 140, and so on.

They serve the same purpose in this system as in the other systems--they are signposts guiding the clerk to the file being sought. The more guides in a system, the easier it is to locate the number or folder being sought.

Numeric guides are of the same general type of material as any others. Manilla is the cheaper grade, pressboard better and higher priced.

#### QUESTIONS:

1. What is the advantage in having guides staggered across the drawer in three- or five-position cut?
2. What is the purpose of the guides?

#### REFERENCES:

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943.  
Related Information Sheet V.

unit, a 0 is added from the subdivision or secondary chart. This makes the code number 60.

Numbers are used only for sorting and checking.

### Sorting

Sorting is done by number. Two or even three sorts may be necessary to keep the groups small enough to be handled easily. The first sort may be in piles of 100 or 500 and the second or third may put them into exact order. This numeric sorting is simple and rapid.

### Checking

The numbers on coded correspondence are compared with the numbers on the folders to provide one check. The colors of the folders (Tan, green, and yellow) cover a third of the alphabet each and constitute the second check in each alphabetic division. The alphabetic filing itself is the third check.

### Filing

Filing is done alphabetically using the first two units. For instance, in the illustration above, "John E. Lund" would be filed first under "L" on the primary guide, then under "J" on the secondary.

Filing is much simplified under this system. All you usually need to know are the first two letters of the first two units and never more than three letters of any unit. If there is only one unit in the title, you have to know only the first few letters of the first name, as single names are filed in front of those having two or more units in accordance with the rules of alphabetizing you already know.

### QUESTIONS:

1. For what purpose are the numbers used in Triple Check filing?
2. What are the three checks of the Triple Check system?
3. How much of the spelling of a name do you usually have to know in this system?
4. How are the colors arranged in the Triple Check system?

Subject: TRIPLE CHECK FILING.

Related  
INFORMATION V  
Sheet

Title of Unit: FILING

Page 1 of 2 Pages.

Field: Office Practice.

**DEFINITION:** Triple Check filing is an alphabetic means of filing names on the basis of the first few letters of the first two filing units. It embodies a numeric code for sorting and checking and uses a three-color scheme to further check filed material.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

##### Guides

Triple Check guides are marked with alphabetic divisions and also with numbers following the alphabetic notations. Primary or first-position guides are marked with alphabetic divisions and with numbers which are multiples of ten. Secondary or second-position guides are marked with alphabetic divisions and exact numbers ending from 0 to 9. A special classification guide is sometimes inserted in fifth position to take care of very heavy correspondence. When so used, it bears the title of the heavy material so controlled.

See illustration, page 55, "Progressive Indexing & Filing."

##### Folders:

Triple Check Folders are in two positions:

1. Miscellaneous folders in third position of the left to right arrangement. Tab markings are first in numbers corresponding to those on the guides next to them and then in alphabetic divisions. They are colored tan, green, or yellow according to the sections of the alphabet.
2. Individual folders are in fourth position from left to right and have the number first, then the name of the individual, firm or government unit. They employ the same three-color scheme as the miscellaneous folders, but are always in front of them in front to back arrangement.

##### Coding

Charts of various sizes are used according to the number of divisions in the file. This system is not practical for less than four drawers of correspondence. It also requires a type of material that does not expand too rapidly. For instance, one of the largest oil companies in the country uses it as a dealer-customer file.

The first two units of the title are used in coding. For instance, in coding from a 30-period chart, "John E. Lund" would be coded 15- from "Lund" on the primary chart and -5 on the secondary, giving the code number 155. If the name were "Crosby"'s, the code would be 6-. Since there is no second

Subject: GEOGRAPHIC FILING

Related  
INFORMATION W  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

**DEFINITION:** Geographic filing is filing by geographic locations.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

For information on geographic filing, refer to Chapter 11, page 71, of Progressive Indexing and Filing. This chapter is to be studied with the practice set and 75 practice letters before you.

This chapter will require careful study and thought.

The textbook may be taken from the classroom only by special arrangement with your instructor, but any questions on the chapter will be gladly answered by the instructor.

#### QUESTIONS:

1. What is the principle of geographic filing?
2. Under what conditions are geographic files necessary?
3. What two states do you have set up in the practice set?
4. What is the difference in their arrangement?
5. Why is New York City treated as it is in this system?
6. If you had the State of Kansas set up for filing, what towns would you break down?

#### REFERENCES:

Library Bureau Division, Remington-Rand, Inc., Progressive Indexing and Filing. Buffalo, New York. Remington-Rand, Inc., 1942. Pp. 71-73.

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943. Related Information Sheet W.

Subject: SUBJECT FILING

Related  
INFORMATION X  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

**DEFINITION:** Subject filing is filing by subject. When the content of a piece of correspondence is more important than who wrote it or where it came from, it is filed by subject.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

Subject filing is an alphabetic system, but the emphasis is on the subject instead of upon the title name.

All files may have some subject headings in them, but in the case of libraries, scholars, scientists, and research workers, it is often much more useful to know what information is contained in a particular title than it is to know the person involved. They find a need to group material around a subject.

Study the subject classification on page 82 of Progressive Indexing and Filing for an explanation of the subject classification you will use with your letters.

The main and secondary divisions of your guides are really an outline of what is in your file, with the main divisions corresponding to the main divisions of an outline and the secondary divisions to the minor divisions of an outline.

Often materials such as supplies are easier to handle under a system of this kind. Your classroom stock record is set up on this basis. See also pp. 113-14, Progressive Indexing and Filing for the handling of stock records and purchase records.

#### QUESTIONS:

1. Why are letters filed by subjects?
2. Explain why all companies, regardless of their size, would have some subject filing.
3. Think of the business of John Morrell & Company and tell some subjects under which it would place mail.
4. A contractor using the numeric system of filing would have some subject filing. What headings do you think he might have.

#### REFERENCES:

Library Bureau Division, Remington-Rand, Inc., Progressive Indexing and Filing. Buffalo, New York, Remington-Rand, Inc., 1942. Pp 82, 113-14.

Denver Public Schools, Department of Vocational Education, Unit of Instruction in Filing. Denver, Colorado, The School, 1943.  
Related Information Sheet X.

Subject: TRANSFER METHODS

Related  
INFORMATION Y  
Sheet

Title of Unit: FILING

Page 1 of 1 Pages

Field: Office Practice.

**DEFINITION:** Transfer is the act of taking out of the files material that is not active and hence very seldom used if at all.

#### ESSENTIAL FACTS, IDEAS, AND PROCEDURES.

##### Kinds

There are two general kinds or systems of transfer--the perpetual and the periodic.

Under the perpetual system, material is held in the file, often for long periods, until the case, the plan, the blueprint, or other material is no longer useful or is completed. Then it is transferred to store room equipment.

Periodic transfer is performed either at one period, in two periods, or on a maximum-minimum period basis.

Read carefully the explanation given on pages 74-76 of Progressive Indexing and Filing of these various systems of transfer.

##### QUESTIONS:

1. Under what circumstances is the maximum-minimum type of transfer used?
2. In what system of filing is perpetual transfer most likely to be used?
3. Why is the two-period system frequently preferred where space and equipment permit?
4. Why is transfer necessary?

##### REFERENCES:

Library Bureau Division, Remington-Rand, Inc., Progressive Indexing and Filing. Buffalo, New York, Remington-Rand, Inc., 1942. Pp. 74-76.





Test 1--Filing. Find the following names and pull the cards as rapidly as you can. Give to instructor when you have them all pulled.

- |  |  |
|--|--|
| 1. Citizens Realty Trust<br>Cincinnati, O. | 2. Rev. Wilbur G. Chaffee                    |
| 3. Thomas H. Chaffee                       | 4. Centennial Copper Mining Co.              |
| 5. William H. Chafe                        | 6. Cartwright & Hurley                       |
| 7. James A. Cartwright,<br>Sales Mgr.      | 8. Citizens' National Bank<br>Cincinnati, O. |
| 9. Carpenters' Council of                  | 10. City Cash Market                         |
| 11. Cohen, Rubinstein & Co.                | 12. Coal Conservation Co.                    |
| 13. The Braemore                           | 14. C. H. Cobb                               |
| 15. Cobb, Bates & Yerxa Co.                | 16. J. S. Conkling                           |
| 17. Baptist Home                           | 18. Ashton-de-Veer, Inc.                     |
| 19. Beach-Russ Co.                         | 20. Buff & Buff Manufacturing Co.            |
| 21. Barker's Kandy Kitchen                 | 22. J. Dellinger Barney                      |
| 23. Bell's Market                          | 24. John F. Bruton                           |
| 25. T. Frederick Brunton                   | 26. Bender Shoe Co.                          |
| 27. Rev. James L. Barton                   | 28. Barton & Ellis Co.                       |
| 29. Basco Switch-Service<br>Station        | 30. Bassett & McGlinchy                      |
| 31. Bilodeau Ball Bearing Works            | 32. Cambridge Furniture Exchange             |
| 33. Quintin N. Candy                       | 34. A. & V. Shoe Trimming Co.                |
| 35. A. J. Constantine                      | 36. John J. Grimmins                         |
| 37. G. W. Cutting & Sons                   | 38. M. J. Darcy                              |
| 39. N. G. Davison                          | 40. John M. Devine                           |
| 41. Howard S. Fahey                        | 42. Buckley, Neil & Co.                      |
| 43. G. A. R. Hall, Post 40                 | 44. Gilmour, Rothery & Co.                   |
| 45. Glines Express Co.                     | 46. Katherine A. Good                        |
| 47. W. M. Gould                            | 48. The Goulds Mfg. Co.                      |
| 49. Effenson Bros.                         | 50. Elmwood Stables & Garage Co.             |

Test 2--Filing. Get the Teachers' Guide from your instructor. Pull the first thirty-five letters as shown there, beginning with number 1.

When all letters have been pulled, separate those you would transfer if you were using a maximum-minimum plan. You may assume that your file has not been cleared for the preceding eighteen months.

Bring the two sets of pulled letters to the instructor's desk.

-----

Test 3--Filing. Get the Teachers' Guide from your instructor. Pull all letters checked in red, beginning with letter 75 first and work backwards to the first one.

Bring the pulled letters to the instructor's desk and tell him what plan of transfer would be used had you been removing these letters for transfer to storage.

-----

Test 4--Filing. Get the Teachers' Guide from your instructor. Pull thirty-five letters, beginning with letter 36 and ending with letter 75.

Bring the pulled letters to the instructor's desk and tell him how many letters you would have left in the active section of your file if you were using a two-period plan of transfer, based on six months.

-----

Test 5--Filing. Get the Teachers' Guide from your instructor. Pull the first twenty letters as you come to them.

Bring the pulled letters to the instructor's desk.

Test No. 7. --Filing.

Get the teacher's photostatic copies of your set. Pull by subject the twenty letters designated for this test.

When letters are pulled, separate all letters relating to employees and hand the two groups to your instructor.

---

## LIST OF COOPERATING TOPEKA EMPLOYERS AND ADVISORY COMMITTEE.

Advisory Committee:

C. L. Carlson, Merchants National Bank, V. P.  
J. H. Abrahams, Security Benefit Association, Nat'l. Secy.  
R. V. Owen, Santa Fe Railroad, Passenger Traffic Dept.  
A. E. Larson, Standard Clerks Union, Santa Fe Railroad  
Clara Koenig, Kansas Supreme Court, Secretary  
A. C. Pepper, John Morrell & Co., Office Manager  
C. E. Garvin, Topeka Body & Radiator Co., Office Manager  
Leonard Sheafor, Victory Life Insurance Co., Cashier

Cooperating Firms:

Berkson's  
Buechner Grocery  
Central Kansas Telephone Co.  
Council of Social Agencies  
Harry Endlich  
Grayce Shops  
Industrial Savings & Loan Co.  
Kansas Press Association  
John Morrell & Co.  
Pelletier's  
Sears, Roebuck & Co.  
Securities Acceptance Corp.  
Security Benefit Association  
State Board for Vocational Education, Rehabilitation Division  
Thacher, Inc.  
Topeka State Bank  
Victory Life Insurance Co.  
W. T. Grant Co.  
Warren Williams  
F. W. Woolworth Co.

## EXHIBIT E.

National Clerical Ability Filing Test, series of 1941.

LARGEST STOCK IN AMERICA WIRE CONDUIT AND CONDUIT FITTINGS

**THE M. B. AUSTIN COMPANY**

108 TO 116 SOUTH DESPLAINES STREET

CHICAGO

MANUFACTURERS

*The Austin Line*

CONDUIT FITTINGS - WIRING DEVICES

GREEN COVERED WIRE & CABLE  
PAPER & CAMBRIC INSULATIONS  
LEAD COVERED & ARMORED CABLES  
LUBRICATED & GALVANIZED CONDUIT

RAZE 8 INSULATED COPPER WIRE  
CONDUIT BUSHINGS & FITTINGS  
WIREMOLD AND WIREDUCT  
ELECTRIC SPECIALTIES

8

May 14, 1941

Mr. Ralph A. Adams  
Adams & Brown  
12 Main Street  
Springfield, Illinois

My dear Mr. Adams:

The enclosed envelope was returned to us marked  
"Unclaimed".

Is Mr. William C. Austin still in your employ? If  
not, will you please send us the name of the man  
who has taken his place. We would like to add his  
name to our Binder mailing list so that he may be  
sure to receive copies of all AUSTIN Line Distributors'  
Price Sheets.

Very truly yours,

THE M. B. AUSTIN COMPANY

*D. A. Morgan*  
Sales Manager

D. A. Morgan  
bc

**CO-OPERATIVE EXTENSION WORK**  
IN  
**AGRICULTURE AND HOME ECONOMICS**  
STATE OF NEW YORK

NEW YORK STATE COLLEGE OF AGRICULTURE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
ERIE COUNTY BOARD OF SUPERVISORS  
BUFFALO HOME BUREAU, CO-OPERATING

DIVISION OF EXTENSION  
HOME DEMONSTRATION WORK

HEADQUARTERS:  
220 FRANKLIN ST., BUFFALO, N. Y.  
TELEPHONE, BEVELA 0566

BUFFALO, NEW YORK

6

January 19, 1941

Mr. K. L. Cole, Advertising Manager  
Adams & Brown  
12 Main Street  
Springfield, Illinois.

My dear Mr. Cole:

The week of April 22 - 28 is Better Homes Week. You have con-  
sented very kindly to display in one of the windows of your store  
an exhibit of electrical equipment for Better Homes.

Mr. Jacobs, Art Director of the Public Schools, has designed a  
poster for your display. Since the Better Homes Committee is  
made up of members from the different educational organizations,  
we have no money to finance the making of these posters, and any  
expense incurred will have to be borne by those using them in their  
windows. We are leaving the contribution entirely to you.

We thank you very much for your cooperation in arousing interest  
in Better Homes Week.

Very truly yours,

STATE OF NEW YORK, CO-OPERATIVE EXTENSION WORK  
IN AGRICULTURE AND HOME ECONOMICS

*Katherine N. Stott*

Chairman for Better Homes Week Committee

Katherine N. Stott:vd

Exhibit E.--Sample of Letters Used in National  
Clerical Ability Filing Test, series 1941.

Prepared by  
 Joint Committee on Tests  
 National Office Management Association  
 and the  
 National Council for Business Education

Distributed by  
 Addison-Wesley Press Inc.  
 Kendall Sq. Bldg.  
 Cambridge 42, Mass.  
 (Please reorder by Number)

## Filing Ability Test

### TO THE TESTEE

This is a test of ability to do acceptably the kind of filing work required in any reasonably large office.

Two hours are allowed for the test. Plan to use the full time in doing and checking your work, but if you finish and wish to hand in your papers before the expiration of the time allowed, you may do so.

There are several Parts to this test. Be sure to read the directions at the head of each Part. All answers are to be made in the test booklet. Do not spend too much time on any one item. If you cannot complete an item, go on to the next. Then when you have finished the test you can go back and complete the items left undone.

When the signal is given to begin, turn the page, read the instructions for Part I and complete this Part as directed. Then proceed to deal with the remaining Parts. Note that you are not required to do both Part IV and Part V. Look them over and choose one of them, but do not answer both.

### For Use in Rating Paper

	Score	
	Perfect	Testee's
Part I	50	
Part II	46	
Part III	54	
Cross Reference	4	
Part IV	26	
Cross Reference	1	
OR		
Part V	27	
SCORE	181	

Name
Your School or Employer
Your City or Town
<div style="display: flex; justify-content: flex-end; align-items: center;"> <div style="text-align: right; margin-right: 10px;">                 TOTAL SCORE Do not mark in this space             </div> <div style="border: 1px solid black; width: 100px; height: 50px; margin-left: 10px;"></div> </div>



In the following lists, the names in List A are alphabetically arranged. Draw a line between any names in List A where the names in List B should be filed and place the number of the name to be inserted at the end of the line. The first one is done for you.

## List A

- |                                  |                             |
|----------------------------------|-----------------------------|
| 1. I. & M. Iron Co.              | 40. K. & B. Soda Co.        |
| 2. I. P. W. Stores               | 41. K. V. Co.               |
| 3. Ideal Cafe                    | 42. Kahn, Nathan, Jr.       |
| 1- 4. <u>Ike's Inc.</u>          | 43. Kaiser, Ladle & Co.     |
| 5. Ikerman, Joseph A.            | 44. Kalmbach Travel Service |
| 6. Ilario Coal Co.               | 45. Kay's Barber Shop       |
| 7. Innes, Stephen G.             | 46. Kaylor Ice Co.          |
| 8. Innis, R. F.                  | 47. Keough Home             |
| 9. Irvin, Warner R.              | 48. Keown, Homer A.         |
| 10. Irvine, R. Otis              | 49. Kreis, Helen M.         |
| 11. Irwin, R. Beverly            | 50. Krieger's Market        |
| 12. Isle of Champagne            | 51. L. & L. Mfg. Co.        |
| 13. Isler, Fred J.               | 52. L. W. D. Auto Co.       |
| 14. J. A. S. Shop                | 53. Lackland, Frederick M.  |
| 15. J. & S. Shop                 | 54. LaCrosse, Bessie        |
| 16. Jack's Auto Works            | 55. Lamb, Sara (Miss)       |
| 17. Jack & Autrey                | 56. Lambert & Houston       |
| 18. Jacketty, Frank              | 57. LaMotte, George, & Son  |
| 19. Jackson, G. D.               | 58. Larned, Glen H.         |
| 20. Jackson & Garner             | 59. LaRoche, Fred V.        |
| 21. Jacksons, Edith (Mrs. David) | 60. Lavender, Myrtle        |
| 22. Jacoway Machine Co.          | 61. Lawless, H. E.          |
| 23. Jacqueline's Salon           | 62. Lawrance, Katie W.      |
| 24. Jameson, Wm., & Co.          | 63. Lawrence, A. C.         |
| 25. Jamison, Walter, Inc.        | 64. Linder, Janie P.        |
| 26. Jansen & Pfister             | 65. Lindgren, Edgar F.      |
| 27. Janssen, Lawrence C.         | 66. Lindholm, Alex          |
| 28. Jansson, L. Thomas           | 67. Lochridge Insulator Co. |
| 29. Jensen, Ray G.               | 68. Locke, H. B., & Co.     |
| 30. Jentzen, John A.             | 69. Lockett & Brown         |
| 31. Jobson, Pearl O.             | 70. M. R. M. System         |
| 32. Johnson & Oneal & Son        | 71. M. System Stores        |
| 33. Johnson & O'Neil             | 72. Mac's Restaurant        |
| 34. Johnson, O'Neill & Co.       | 73. MacArthur, S. V.        |
| 35. Johnson, P. H.               | 74. Macaulay, Esther G.     |
| 36. Johnston, Olga T.            | 75. MacDonald, Chas. A.     |
| 37. Johnstone, O. Thomas         | 76. Mack & Mack             |
| 38. Joiner, Roger M.             | 77. Mackay, Florence I.     |
| 39. Joyce, Mathew C.             | 78. MacKay, G. Gordon       |

- 79. Macon, Dublin & Co.
- 80. Macy, Anne G.
- 81. Madison Theatre
- 82. Maeger, Roy C.
- 83. Maffett, Carl O.
- 84. Magbee, Thos. G.
- 85. Magbee & Thorn
- 86. Magee, Russell M.
- 87. Mathews, W. Jerome, Jr.
- 88. Matthews, Ince Co.
- 89. McAlister, G. M.
- 90. McAllister, F. A.
- 91. McArthur, Luther W.
- 92. McCall Co. (The)
- 93. McCall Corp.
- 94. McCulloch, Edwina O.
- 95. McCullough Bros.
- 96. McDonald, J. T., & Co.
- 97. Medlock's Pharmacy
- 98. Meehan, Roger J.
- 99. Meeks, James H.
- 100. Megahee & Tomlinson

List B

- 1. Ikelheimer Co.
- 2. Arthur L. Maass
- 3. Bertha V. Lawrason, Inc.
- 4. Joyce Bros.
- 5. Jamison-Walsh & Co.
- 6. Thomas Meffert & Son
- 7. I. N. Hardware Co.
- 8. Jackie Frocks Corp.
- 9. L. M. Clothing Co.
- 10. Max Magdoff
- 11. Fred Mackasey & Co.
- 12. Locker Paint Co.
- 13. Lindenbaum & Seymour
- 14. Eugenie P. Isler
- 15. Herbert D. Lamb-Erherth
- 16. Kay Bee Hats Co.
- 17. Inness, Brown & Co.
- 18. Medlock & Pharnam
- 19. Jacmore Co.
- 20. MacDonald, Charlton & Co.
- 21. Johnston's Chocolates Inc.
- 22. Mrs. John B. Jentzen (Helen)
- 23. Matthews, Inc.
- 24. Mae's Dress Shop
- 25. Lam-Nit Sportswear Co.
- 26. Dr. J. Kepper
- 27. Joyce & Mattis
- 28. N. D. Lamorte
- 29. McArthurs & Lothar Co.
- 30. Madame Louise
- 31. E. Ralph Macauley
- 32. Linen Thread Co.
- 33. J. & A. Luncheonette
- 34. Peter T. Janson
- 35. Jac-Jo Bar & Grill
- 36. Med-Realty Corp.
- 37. Frank L. Lautenschlager
- 38. E. Russell McCulloch
- 39. Adolph C. Kreisberg
- 40. Jacquelin & Walters
- 41. Jo-Ho Dress Co.
- 42. Meier & Frank Co.
- 43. K. & W. Art Co.
- 44. Il Corriere Italiano Pub. Co.
- 45. McCullough & Broter
- 46. Paul H. Lacques
- 47. J. S. Machinery Co.
- 48. John-Williams Press
- 49. Henry I. Kriegshaber
- 50. Irvin-Warren Clothes Inc.
- 51. Kaiser's Ladies Apparel, Inc.

PART II

Section 1

Use the initial letters, as indicated in the following key, to answer the questions in this section:

- C for Code
- X for Cross Reference
- F for Follow-up
- R for Release
- T for Tickler

- 1. What shows that a letter is ready to be filed? \_\_\_\_\_
- 2. What shows that a letter is to be returned to a designated person at a future date? \_\_\_\_\_
- 3. What shows that the material has received the necessary attention? \_\_\_\_\_
- 4. What does the file clerk put on all letters received for filing? \_\_\_\_\_
- 5. What does the person answering the letter put on some letters? \_\_\_\_\_
- 6. What should be looked for first when letters are received by the file clerk? \_\_\_\_\_
- 7. What does the file clerk do with some letters, not necessary for all? \_\_\_\_\_
- 8. What should the person answering a letter put on that letter? \_\_\_\_\_

Section 2

Use the initial code letter given in the following key to answer the questions in this section:

- A for alphabetic (by name)
- C for chronological (time)
- G for geographic
- N for numeric
- S for subject

Which method of filing is preferred, or commonly used, for

1. Files in which the majority of letters are written by hand? \_\_\_\_\_
2. Situations where the material comes from a variety of sources on the same subject or event? \_\_\_\_\_
3. When what is said is more important than who said it? \_\_\_\_\_
4. For shop orders which are duplicates of other papers in the file? \_\_\_\_\_
5. For information about articles which may be purchased, for example, by a Purchasing Agent? \_\_\_\_\_
6. For the expirations of insurance policies or subscriptions? \_\_\_\_\_
7. For recipes? \_\_\_\_\_
8. For a "tickler" file? \_\_\_\_\_

Section 3

Answer the following questions. One word will usually be sufficient.

1. How many letter-size drawers are in the largest standard vertical cabinet? \_\_\_\_\_
2. What name is given to cabinets which are three letter-size drawers high? \_\_\_\_\_
3. Is a cross reference filed under the more important or the less important name? \_\_\_\_\_
4. How many guides are in a 240 division alphabetic name file? \_\_\_\_\_
5. How many alphabetic miscellaneous folders are in a 650 division set? \_\_\_\_\_
6. How are typewritten names usually put on folder tabs? \_\_\_\_\_
7. What device may be used to distinguish an order folder from a correspondence folder for the same firm? \_\_\_\_\_
8. At the transfer period, when material for which there is little further reference is moved to the Transfer Files, what is transferred? \_\_\_\_\_
9. Of what material is the usual better grade guide made? \_\_\_\_\_
10. What metal is used for some guides? \_\_\_\_\_
11. Name two materials from which most folders are manufactured. \_\_\_\_\_

Section 4

Answer the following questions by one of these key words:

Name	Number	City (includes town)	Date
------	--------	----------------------	------

When there are several letters in a folder, how are they correctly arranged:

1. In an active folder of an alphabetic name file? \_\_\_\_\_
2. In an active folder marked only with a number? \_\_\_\_\_
3. In a folder marked with a subject caption? \_\_\_\_\_
4. In an application folder marked with the name of a job? \_\_\_\_\_
5. In a geographic file folder marked with a city or town name? \_\_\_\_\_
6. In a geographic file folder marked only with a letter of the alphabet? \_\_\_\_\_
7. In a geographic file folder marked with a state name? \_\_\_\_\_
8. In a geographic file folder marked with the name of a city and a letter of the alphabet? \_\_\_\_\_
9. In the miscellaneous folder of an alphabetic name file? \_\_\_\_\_

Section 5

From the names in the first column, choose the one described by the statements in the second column and put the identifying letter for your answer in the third column:

- |                                 |   |       |
|---------------------------------|---|-------|
| A Counter-height files          | 1. Equipment used to house the less active material to which reference may be made            | _____ |
| B Five-drawer letter-size files | 2. Equipment which provides analysis of information filed, with instant reference to any item | _____ |
| C Horizontal or sectional files | 3. Equipment used to hold cards within a larger drawer  | _____ |
| D Reference shelf               | 4. Equipment used to hold papers while arranging them, preparatory to filing                  | _____ |
| E Shannon Files                 | 5. Equipment which provides convenient working space between clerk and customer               | _____ |
| F Sorters                       | 6. Equipment which provides for additional filing space without additional floor space        | _____ |
| G Transfer cases                | 7. Equipment which is used to hold papers while filing others                                 | _____ |
| H Trays                         | 8. Equipment which expands vertically and requires a top and base for the drawers separately. | _____ |
| J Visible files                 |   |       |

ALPHABETIC FILING PRACTICE

You are to consider yourself as the File Clerk for the firm of Adams & Brown, 12 Main Street, Springfield, Illinois. The accompanying fifty pieces of correspondence represent the correspondence received by the file operator on May 31, 1941. These are both old and new communications. The old pieces, bearing earlier dates, were withdrawn from the files and are returned at this time for re-filing. Only original letters which are initialed are released for filing. If you find pieces which are not initialed, make a check mark (✓) after each number when you enter it in the chart for recording your filing results. (It is recognized that in actual office work, these letters would be returned to their respective departments to be released. For our examination purposes they should be listed in proper alphabetic order on the chart.)

Prepare each letter for filing, coding each by underscoring the first filing unit of the name under which the letter is to be filed. Do not underscore more than the first unit. Use pencil for coding; then, if you change your mind, you can correct it more easily. Example of coding: Tom Brown

Since there is a variance with respect to some filing rules, this office requires that the following rules be observed:

- a. Each part of a compound geographic name shall be treated as a separate filing unit.
- b. Each part of a hyphenated firm name shall be treated as a separate filing unit.
- c. The words "City" and "State" shall be considered as filing units when alphabetizing names such as City of Akron. These words should not be put in parentheses.

Cross reference pieces 2, 24, 41, and 48. Cross reference blanks will be given to you and should be made out in proper index form. Code cross references in the usual manner and file them.

List on the chart which follows, opposite each number, the identification number on each piece of correspondence in the exact order in which you have arranged it, listing the letter on top opposite number 1, the piece next below opposite number 2, etc. Use X to indicate cross reference sheets. As you list the numbers, remove cross reference sheets. Clip together and hand in with your test booklet.

Chart for Reporting Results of Sorting Correspondence Alphabetically

1	15	29	43
2	16	30	44
3	17	31	45
4	18	32	46
5	19	33	47
6	20	34	48
7	21	35	49
8	22	36	50
9	23	37	51
10	24	38	52
11	25	39	53
12	26	40	54
13	27	41	
14	28	42	

PART IV

Sorting for Triple Check Automatic Filing

Use first twenty-five pieces only.

Prepare for filing, using the following chart, and sort in correct order for filing in the Triple Check Automatic Index, the first twenty-five pieces of correspondence. Cross reference piece 8. Hand in this cross reference with your test booklet.

30-Division Triple Check Automatic Chart

A 1	C 5	F 9	I-J 13	M 16	N 19	S 23	U-V 27
B 2	Co 6	G 10	K 14	Me 17	O 20	Si 24	W 28
Bi 3	D 7	H 11	L 15	Mo 18	P-Q 21	St 25	Wi 29
Br 4	E 8	Ho 12			R 22	T 26	XYZ 30

Key to Subdivisions

0	1	2	3	4	5	6	7	8	9
Single Name or Subject	A-B	C	D-F	G-I	J-L	M-O	P-R	S-T	U-Z

In this chart the ciphers at right of main guide numbers are omitted.

List on the chart below, opposite each number, the code number and the identification number on each piece of correspondence in the exact order in which you have it arranged, listing the letter on top opposite number 1, the piece next below opposite number 2, etc.

Chart for Reporting Results of Triple Check Automatic Arrangement of Correspondence

	Code No.	Identifi- cation No.		Code No.	Identifi- cation No.		Code No.	Identifi- cation No.
1			10			19		
2			11			20		
3			12			21		
4			13			22		
5			14			23		
6			15			24		
7			16			25		
8			17			26		
9			18					

PART V

Code the following names according to the Soundex Index. Place the code number opposite each name in the space provided. Following is the Soundex Chart:

Soundex Chart

1. b,f,p,v
2. c,g,j,k,q,s,x,z
3. d,t
4. l
5. m,n
6. r

<u>No.</u>	<u>Name</u>	<u>Code No.</u>	<u>No.</u>	<u>Name</u>	<u>Code No.</u>
1.	Nathan Mlotok	_____	10.	Robert Brkovich	_____
2.	William Scott Co.	_____	11.	Lockwood's Grocery	_____
3.	Fred R. Pfanner	_____	12.	Earl W. deBisschop	_____
4.	John H. Hoffmann	_____	13.	Grace E. Banghart	_____
5.	Fro-Joy Ice Cream Co.	_____	14.	Clarence W. Avery	_____
6.	Vincent Grzybowski	_____	15.	H. Charlotte Franzell	_____
7.	Dr. I. L. Scruggs	_____	16.	Frank W. Drechsler	_____
8.	Mrs. C. J. McGonigal	_____	17.	Clara M. Doxstater	_____
9.	Jonathan P. Twohey	_____			

State whether the following statements are true or false by writing "T" in the space provided if true, and "F" if false:

1. Soundex filing is only used for filing cards. \_\_\_\_\_
2. Soundex filing is based wholly on the consonant sounds, spelling is not important. \_\_\_\_\_
3. Soundex filing is a good system to use in a large office where many letters are called for over the phone for reference. \_\_\_\_\_
4. When there are several identical code numbers, and when the given name and initial are the same, strict alphabetic arrangement should be followed. \_\_\_\_\_
5. When using the Soundex system, even though a surname contains seven consonants, the code combinations are never carried beyond three key letters. \_\_\_\_\_
6. All cards coded with the same number should be arranged alphabetically according to the given name or the second name of a firm. \_\_\_\_\_
7. Various spellings of the same name are brought together in one place by the Soundex system. \_\_\_\_\_
8. Names which contain no consonants will have no numeric code numbers. \_\_\_\_\_
9. Department stores use the Soundex system for verifying charge account customers quickly. \_\_\_\_\_
10. Soundex is a good system to use for a large visible file. \_\_\_\_\_

# OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY

By ARTHUR S. OTIS, PH.D.  
and THOMAS N. BARROWS, A.B.

193

## HIGHER EXAMINATION: FORM D For High Schools and Colleges

20

Score.....

*Read this page. Do what it tells you to do.*

*Do not open this paper, or turn it over, until you are told to do so. Fill these blanks, giving your name, age, birthday, etc. Write plainly.*

Name.....Age last birthday.....years  
First name, initial, and last name

Birthday.....Teacher.....Date.....19....  
Month Day

Grade.....School.....City.....

This is a test to see how well you can think. It contains questions of different kinds. Here is a sample question already answered correctly. Notice how the question is answered:

*Sample:* Which one of the five words below tells what an apple is?  
1 flower, 2 tree, 3 vegetable, 4 fruit, 5 animal..... ( 4 )

The right answer, of course, is "fruit"; so the word "fruit" is underlined. And the word "fruit" is No. 4; so a figure 4 is placed in the parentheses at the end of the dotted line. This is the way you are to answer the questions.

Try this sample question yourself. Do not write the answer; just draw a line under it and then put its number in the parentheses:

*Sample:* Which one of the five things below is round?  
1 a book, 2 a brick, 3 a ball, 4 a house, 5 a box.....( )

The answer, of course, is "a ball"; so you should have drawn a line under the words "a ball" and put a figure 3 in the parentheses. Try this one:

*Sample:* A foot is to a man and a paw is to a cat the same as a hoof is to a — what?  
1 dog, 2 horse, 3 shoe, 4 blacksmith, 5 saddle.....( )

The answer, of course, is "horse"; so you should have drawn a line under the word "horse" and put a figure 2 in the parentheses. Try this one:

*Sample:* At four cents each, how many cents will 6 pencils cost?.....( )

The answer, of course, is 24, and there is nothing to underline; so just put the 24 in the parentheses.

If the answer to any question is a number or a letter, put the number or letter in the parentheses without underlining anything. Make all letters like printed capitals.

The test contains 75 questions. You are not expected to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to begin. Try to get as many right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

*Do not turn this page until you are told to begin.*



## EXAMINATION BEGINS HERE.

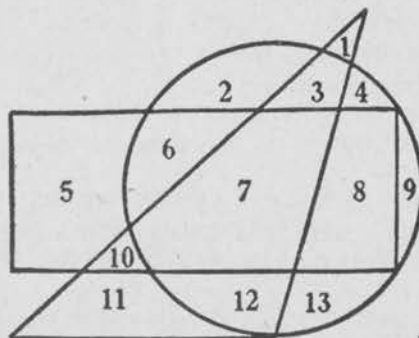
1. The opposite of familiar is (?)  
 1 friendly, 2 old, 3 strange, 4 aloof, 5 different..... (Do not write on these dotted lines) ( )
2. If 4 pencils cost 10 cents, how many pencils can be bought for 50 cents?..... ( )
3. A man does not always have (?)  
 1 arteries, 2 hair, 3 muscle, 4 skin, 5 blood..... ( )
4. What letter in the word WASHINGTON is the same number in the word (counting from the beginning) as it is in the alphabet?..... ( )
5. If the following words were arranged to make the best sentence, the last word of the sentence would begin with what letter? Make it like a printed capital.  
 tests children intelligence hundreds have of taken..... ( )
6. A word meaning the same as change is (?)  
 1 endure, 2 cause, 3 result, 4 alter, 5 anticipate..... ( )
7. Copper is cheaper than gold because it is (?)  
 1 duller, 2 more plentiful, 3 harder, 4 uglier, 5 less useful..... ( )
8. An egg is related to a bird in the same way that a (?) is related to a plant.  
 1 shell, 2 leaf, 3 root, 4 feather, 5 seed..... ( )
9. If 10 boxes full of oranges weigh 600 pounds, and each box when empty weighs 6 pounds, how many pounds do all the oranges weigh?..... ( )
10. The opposite of skillful is (?)  
 1 lazy, 2 clumsy, 3 weak, 4 slow, 5 novice..... ( )
11. Which one of the six statements below explains the following proverb? "Kill not the goose that lays the golden eggs."  
 1. A conscientious worker needs no prodding.  
 2. Geese that lay golden eggs are too tough to eat.  
 3. In dire distress, any aid is acceptable.  
 4. Don't destroy the things that do you good.  
 5. A willing horse should be whipped lightly.  
 6. Ships should not venture out to sea in stormy weather.
12. Which statement above explains this proverb? "Any port in a storm."..... ( )
13. Which statement above explains this proverb? "Don't spur a willing horse."..... ( )
14. In general it is safer to judge a woman's character by her (?)  
 1 face, 2 cooking, 3 clothes, 4 deeds, 5 speeches..... ( )
15. An ellipse is related to a circle as a diamond is to a (?)  
 1 ring, 2 square, 3 rectangle, 4 oval, 5 cube..... ( )
16. A mare is always (?) than her colt.  
 1 faster, 2 sleeker, 3 bigger, 4 older, 5 stronger..... ( )
17. The opposite of wasteful is (?)  
 1 wealthy, 2 quiet, 3 stingy, 4 economical, 5 extravagant..... ( )
18. One number is wrong in this series. What should that number be?  
 1 5 2 6 3 7 4 9 5 9..... ( )
19. Such things as looks, dress, likes, and dislikes indicate one's (?)  
 1 character, 2 wisdom, 3 personality, 4 gossip, 5 reputation..... ( )
20. A picnic consisted of a minister, six deacons and their wives, and three children in each of the deacons' families. How many were there at the picnic?..... ( )
21. At a dinner there is always (?)  
 1 soup, 2 wine, 3 food, 4 waiters, 5 dishes..... ( )
22. The idea that the earth is flat is (?)  
 1 absurd, 2 misleading, 3 improbable, 4 unfair, 5 wicked..... ( )
23. Which word is needed to begin the following sentence?  
 — a geometrical figure has three straight sides, it is a triangle.  
 1 Although, 2 If, 3 Since, 4 Now that, 5 Because..... ( )
24. If the first two statements following are true, the third is (?) All residents in this block are Republicans. Smith is not a Republican. Smith resides in this block.  
 1 true, 2 false, 3 not certain..... ( )
25. The opposite of seldom is (?)  
 1 never, 2 many, 3 invariably, 4 always, 5 frequently..... ( )

Do not stop. Go on with the next page.

26. Which one of these things is most unlike the other four?  
 1 bean, 2 cherry, 3 pea, 4 carrot, 5 beet. . . . . ( )
27. A sewing machine is related to a needle as a typewriter is to (?)  
 1 a pin, 2 a cloth, 3 ink, 4 a pen, 5 a page. . . . . ( )
28. The two words repentant and reluctant mean (?)  
 1 the same, 2 the opposite, 3 neither same nor opposite. . . . . ( )
29. The opposite of brave is (?)  
 1 intrepid, 2 weak, 3 treacherous, 4 cowardly, 5 fragile. . . . . ( )
30. Count each Z in this series that is followed by an F next to it if the F is not followed by an S next to it. Tell how many Z's you count.  
 Z F Z S E Y Z F S Y F Z F F S Y S Z F E Z F S F Z Y F Z F Y. . . . . ( )
31. If a boy can run 2 feet in  $\frac{1}{10}$  of a second, how many feet can he run in 10 seconds? . . . . . ( )
32. Which one of the six statements below explains the following saying? "Curiosity killed the cat." . . . . . ( )
1. Chickens are easier to count than eggs.
  2. People tend to associate with others like themselves.
  3. Prying into the affairs of others may bring trouble.
  4. Birds fly in large flocks.
  5. Don't rely too much on your anticipations.
  6. Cats are often too curious.
33. Which statement above explains this proverb? "Don't count your chickens before they are hatched." . . . . . ( )
34. Which statement above explains this proverb? "Birds of a feather flock together." . . . . . ( )
35. If the words below were arranged to make a good sentence, the fourth word of the sentence would begin with what letter?  
 best hard road the work success to is. . . . . ( )
36. If the first two statements are true, the third is (?)  
 Frank is older than George, James is older than Frank. George is younger than James.  
 1 true, 2 false, 3 not certain. . . . . ( )
37. One who says things he knows to be wrong is said to be (?)  
 1 careless, 2 misled, 3 conceited, 4 untruthful, 5 prejudiced. . . . . ( )
38. The opposite of create is (?)  
 1 sustain, 2 evolution, 3 transform, 4 explode, 5 abolish. . . . . ( )
39. If  $3\frac{1}{2}$  yards of cloth cost \$9, how many dollars will 7 yards cost? . . . . . ( )
40. Which of the five things following is most unlike the other four?  
 1 nail, 2 hammer, 3 screw, 4 bolt, 5 tack. . . . . ( )
41. Darkness is to sunlight as (?) is to sound.  
 1 noise, 2 brightness, 3 air, 4 echo, 5 quiet. . . . . ( )
42. The opposite of gentle is (?)  
 1 strong, 2 careless, 3 humane, 4 thoughtless, 5 rough. . . . . ( )
43. If the first two statements following are true, the third is (?) Some members of this club are Baptists. Some members of this club are lawyers. Some members of this club are Baptist lawyers.  
 1 true, 2 false, 3 not certain. . . . . ( )
44. If  $4\frac{1}{2}$  yards of cloth cost 90 cents, how many cents will  $3\frac{1}{2}$  yards cost? . . . . . ( )
45. A line is to a point as a surface is to (?)  
 1 flat, 2 line, 3 solid, 4 square, 5 plane. . . . . ( )
46. The two words precise and indefinite mean (?)  
 1 the same, 2 the opposite, 3 neither same nor opposite. . . . . ( )
47. When two windows have the same shape, the dimensions of one are (?) the dimensions of the other.  
 1 equal to, 2 greater than, 3 less than, 4 proportional to, 5 double. . . . . ( )
48. Suppose that the first and second letters of the alphabet were interchanged, also the third and fourth, the fifth and sixth, etc. Write the letter which would then be the sixteenth letter of the series. . . . . ( )
49. If a strip of cloth 32 inches long will shrink to 28 inches when washed, how many inches long will a 48-inch strip be after shrinking? . . . . . ( )
50. Which one of the five words following is most unlike the other four?  
 1 was, 2 came, 3 have, 4 stay, 5 here. . . . . ( )
51. A city always has (?)  
 1 street cars, 2 mayor, 3 traffic officers, 4 residents, 5 churches. . . . . ( )

Do not stop. Go on with the next page.

52. A word meaning the same as congratulate is (?)  
 1 felicitate, 2 commemorate, 3 reward, 4 console, 5 promote..... ( )
53. Find the two letters in the word CANAL which have just as many letters between them in the word as in the alphabet. Write the one of these two letters that comes first in the alphabet. ( )
54. The mandates of a dictator are (?)  
 1 obsolete, 2 arbitrary, 3 omnipotent, 4 conditional, 5 optional..... ( )
55. Which one of the five words below is most like these three: love, hate, joy?  
 1 memory, 2 taste, 3 anger, 4 health, 5 life..... ( )
56. A gulf is to the ocean as a (?) is to a continent.  
 1 mountain, 2 river, 3 land, 4 peninsula, 5 island..... ( )
57. If all the even-numbered letters in the alphabet were crossed out, the twelfth letter left not crossed out would be what letter? *Do not mark the alphabet.*  
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z..... ( )
58. Write the letter of the alphabet which is the third to the right of the letter which is midway between O and S..... ( )
59. A hotel serves a mixture of 2 parts cream and 3 parts milk. How many pints of milk will it take to make 15 pints of the mixture?..... ( )
60. Which of the following is a trait of character?  
 1 reputation, 2 wealth, 3 influence, 4 fickleness, 5 strength..... ( )
61. A man who spends his money lavishly for non-essentials is considered to be (?)  
 1 fortunate, 2 thrifty, 3 extravagant, 4 generous, 5 economical..... ( )
62. One number is wrong in the following series. What should that number be?  
 1 4 9 16 25 36 45 64..... ( )
63. Democracy is to monarchy as corporation is to (?)  
 1 board of directors, 2 stockholders, 3 partnership, 4 general manager, 5 individual enterprise..... ( )
64. How many of the following words can be made of the letters in the word CELEBRATE, using any letter twice?  
 create better traceable erect tattle rabble crated prattle barter..... ( )
65. If George can ride a bicycle 60 feet while Frank runs 40 feet, how many feet can George ride while Frank runs 60 feet?..... ( )
66. If the words below were arranged to make a good sentence, the fifth word in the sentence would begin with what letter?  
 choose care man A friends should with his..... ( )
67. If the first two statements following are true, the third is (?) It takes a good sense of balance to become a tight-rope walker. John has a good sense of balance. John will become a tight-rope walker.  
 1 true, 2 false, 3 not certain..... ( )
68. If a wire 40 inches long is to be cut so that one piece is  $\frac{2}{3}$  as long as the other piece, how many inches must the longer piece be?..... ( )
69. Find the letter which in this sentence itself appears a third time nearest the beginning..... ( )
70. Which of the five things following is most like these three: cotton, snow, ivory?  
 1 soot, 2 milk, 3 ice, 4 ebony, 5 water..... ( )
71. One number is wrong in the following series. What should that number be?  
 1 2 4 7 11 16 22 28..... ( )
72. What number is in the space which is in the rectangle but not in the triangle or in the circle?.... ( )



73. What number is in the same geometrical figure or figures (and no others) as the number 12? ( )
74. How many spaces are there which are in any one but only one geometrical figure?..... ( )
75. The opposite of because is (?)  
 1 but, 2 since, 3 hence, 4 for, 5 and..... ( )

*If you finish before the time is up, go back and make sure that every answer is right.*

NATIONAL CLERICAL ABILITY TESTS

Prepared and Administered by  
Joint Committee on Tests  
of the

National Office Management Association and the National Council for Business Education

**Fundamentals Test - - Series 1941**

The Fundamentals Test is designed to measure command of certain fundamentals, such as correct spelling, proper use of words, background of business knowledge, and the solving of simple business arithmetic problems.

All answers to questions are to be made on the accompanying answer sheet. Use the special pencil.

**Directions for Recording Responses**

Read each question and its numbered answers. When you have decided which answer is correct, blacken the corresponding space on the answer sheet with the special pencil. Make your mark as long as the pair of dotted lines, and move the pencil up and down firmly to make a heavy black line. If you change your mind, erase your first mark completely. Make no stray marks on the answer sheet; they may count against you.

Examples:	1. Chicago is a city.	1	T	F	
					T = True
					F = False
	2. Chicago is a (1) country		1	2	3
	(2) state	2			
	(3) city				

In the first example the space marked "T" is blackened, because the statement is true.  
In the second example the space marked "3" is blackened because the right answer is Nr. 3, "city."

**DO NOT MARK ANSWERS ON THIS BOOKLET**  
**USE THE ANSWER SHEET**

## I. ENGLISH

### A. Spelling

Below are forty-five sentences designed to test your knowledge of spelling. In each sentence are two spellings of a word, and a space for a third spelling. If you think the spelling numbered 1 is correct, blacken *on the answer sheet* the space marked 1 for that sentence. If you think the spelling numbered 2 is correct, blacken the answer sheet space numbered 2. If you think *neither* spelling is correct, blacken the answer sheet space marked N.

Note that on the answer sheet the numbers under "A. Spelling" refer to the numbers of the sentences below.

1. (1. Autommatic) machinery is rapidly taking  
(2. Automatic)  
(N)  
the place of hand labor.
2. Investment is quite (1. different) from specula-  
(2. differant)  
(N)  
tion.
3. A business enterprise will not (1. succede) unless  
(2. succeed)  
(N)  
it is well managed.
4. The filing of letters according to their dates is  
called (1. chronological) filing.  
(2. chronologic)  
(N)
5. It is difficult to (1. estimate) one's expenses.  
(2. estemate)  
(N)
6. The (1. ratios) are different for different com-  
(2. ratioes)  
(N)  
binations.
7. This job must be given (1. preceedence) over  
(2. precedence)  
(N)  
the other.
8. The department store is a good (1. illustration)  
(2. ilustration )  
(N)  
of a mercantile establishment.
9. The (1. Traffic) department of a business  
(2. Trafic)  
(N)  
handles all matters that have to do with the  
movement of goods to or from the business.
10. Many people will (1. benifit) from the national  
(2. benefit)  
(N)  
defense program.
11. These figures should be typed in (1. tabuler)  
(2. tabular)  
(N)  
form.
12. In his letter of application he gave three  
(1. referrences)  
(2. references)  
(N)
13. In a budget there should be provisions for  
(1. miscellaneous) items.  
(2. miscelaneous)  
(N)
14. In (1. antiscipation) of your coming I purchased  
(2. anticipation)  
(N)  
extra supplies.
15. A salesman should avoid (1. irritating) a cus-  
(2. iritating)  
(N)  
tomer.
16. When machinery becomes (1. obsalete) it  
(2. obselete)  
(N)  
should be discarded.
17. (1. Ocupational) information is necessary to a  
(2. Occupational)  
(N)  
wise choice of a vocation.
18. The profits of a business often depend on the  
successful (1. marketting) of its products.  
(2. marketing)  
(N)
19. The (1. instalation) of the telephone was de-  
(2. installation)  
(N)  
layed.
20. There are many risks in the (1. operation) of a  
(2. operatation)  
(N)  
business.
21. (1. Competent) workers are required in every  
(2. Competant)  
(N)  
business.

# N.C.A. FUNDAMENTALS TEST - SERIES A

I. ENG. \_\_\_\_\_  
 II. B. I. \_\_\_\_\_  
 III. B. A. \_\_\_\_\_

REGISTRATION NUMBER \_\_\_\_\_

PLEASE PRINT  
 NAME LAST FIRST MIDDLE CITY SCHOOL  
 DATE \_\_\_\_\_

SCHOOL \_\_\_\_\_  
 AGE (YEARS, MOS.) \_\_\_\_\_ SEX M. OR F. \_\_\_\_\_  
 (ATTENDING OR LAST ATTENDED)

1	1	2	N
1	1	2	N
2	1	2	N
3	1	2	N
4	1	2	N
5	1	2	N
6	1	2	N
7	1	2	N
8	1	2	N
9	1	2	N
10	1	2	N
11	1	2	N
12	1	2	N
13	1	2	N
14	1	2	N
15	1	2	N
16	1	2	N
17	1	2	N
18	1	2	N
19	1	2	N
20	1	2	N
21	1	2	N
22	1	2	N
23	1	2	N
24	1	2	N
25	1	2	N
26	1	2	N
27	1	2	N
28	1	2	N
29	1	2	N
30	1	2	N

**B. APOSTROPHE**

46	1	2	3
47	1	2	3
48	1	2	3
49	1	2	3
50	1	2	3
51	1	2	3
52	1	2	3
53	1	2	3
54	1	2	3
55	1	2	3

31	1	2	N
32	1	2	N
33	1	2	N
34	1	2	N
35	1	2	N
36	1	2	N
37	1	2	N
38	1	2	N
39	1	2	N
40	1	2	N
41	1	2	N
42	1	2	N
43	1	2	N
44	1	2	N
45	1	2	N

56	1	2
57	1	2
58	1	2
59	1	2
60	1	2
61	1	2
62	1	2
63	1	2
64	1	2
65	1	2
66	1	2
67	1	2
68	1	2
69	1	2
70	1	2
71	1	2
72	1	2
73	1	2
74	1	2
75	1	2
76	1	2
77	1	2
78	1	2
79	1	2
80	1	2

1	T	F	31	T	F
2	T	F	32	T	F
3	T	F	33	T	F
4	T	F	34	T	F
5	T	F	35	T	F
6	T	F	36	T	F
7	T	F	37	T	F
8	T	F	38	T	F
9	T	F	39	T	F
10	T	F	40	T	F
11	T	F	41	T	F
12	T	F	42	T	F
13	T	F	43	T	F
14	T	F	44	T	F
15	T	F	45	T	F
16	T	F	46	T	F
17	T	F	47	T	F
18	T	F	48	T	F
19	T	F	49	T	F
20	T	F	50	T	F
21	T	F	51	T	F
22	T	F	52	T	F
23	T	F	53	T	F
24	T	F	54	T	F
25	T	F	55	T	F
26	T	F	56	T	F
27	T	F	57	T	F
28	T	F	58	T	F
29	T	F	59	T	F
30	T	F	60	T	F

1	1	2	3	4	N
2	1	2	3	4	N
3	1	2	3	4	N
4	1	2	3	4	N
5	1	2	3	4	N
6	1	2	3	4	N
7	1	2	3	4	N
8	1	2	3	4	N
9	1	2	3	4	N
10	1	2	3	4	N
11	1	2	3	4	N
12	1	2	3	4	N
13	1	2	3	4	N
14	1	2	3	4	N
15	1	2	3	4	N
16	1	2	3	4	N
17	1	2	3	4	N
18	1	2	3	4	N
19	1	2	3	4	N
20	1	2	3	4	N

22. Be careful to spell the (1. suffixs) correctly.  
(2. suffixes)  
(N)
23. It was found that the (1. aproppriation) was not  
(2. appropriation)  
(N)  
large enough.
24. One should not place a (1. mortgage) on his  
(2. morgage)  
(N)  
home if he can avoid it.
25. Three (1. companys) are competing in this city.  
(2. companies)  
(N)
26. A business needs plenty of (1. capitol) to be  
(2. capital)  
(N)  
successful.
27. A trade (1. acceptance) may be discounted at a  
(2. acceptence)  
(N)  
bank.
28. One's (1. initial) job is less important than his  
(2. enitial)  
(N)  
ultimate goal.
29. Systematic saving is a good way to  
(1. acumulate) money.  
(2. accumulate)  
(N)
30. A firm cannot afford to (1. lose) money every  
(2. loose)  
(N)  
year.
31. He was (1. wholely) wrong in the argument.  
(2. wholly)  
(N)
32. Much correspondence is (1. neccessary) in con-  
(2. necessary)  
(N)  
ducting a business.
33. The (1. achievement) of a reputation for  
(2. acheivement)  
(N)  
honesty will help any business.
34. The new law became (1. effective) at once.  
(2. affective)  
(N)
35. His (1. perserverance) has won him a new  
(2. perseverance)  
(N)  
position.
36. Every fire insurance policy should contain a  
(1. lightening) clause.  
(2. lightning)  
(N)
37. Do not give his name as a reference without his  
(assent).  
(ascent)  
(N)
38. It is not easy to measure the (1. affects) of  
(2. effects)  
(N)  
advertising.
39. The notice of his (1. insolvency) appeared in  
(2. insolvancy)  
(N)  
the paper today.
40. He sent me a (1. complementary) ticket for the  
(2. complimentary)  
(N)  
exhibition.
41. Business (1. stetistics) are used extensively by  
(2. stattistics)  
(N)  
large corporations.
42. His failure caused him much  
(1. embarrassment)  
(2. embarassment)  
(N)
43. A (1. syndacate) terminates when the purpose  
(2. syndecate)  
(N)  
for which it is organized has been completed.
44. The thief (1. effected) an entrance through the  
(2. affected)  
(N)  
kitchen window.
45. It is not (1. permissable) to make changes.  
(2. permissible)  
(N)

Do not wait. If finished, go on to Section B.

## B. Use of the Apostrophe

In this section are presented ten sentences which are designed to test your use of possessives. One of the alternative forms best completes each sentence. Indicate the number of the correct form by filling in the proper space on the answer sheet. Note that on the answer sheet the numbers under "B. Apostrophe" refer to the numbers of the statements below.

46. I am sure that (1. its ) too late now.  
(2. it's)  
(3. its')
47. The couple will stop at the home of the  
(1. bride's) parents.  
(2. brides )  
(3. brides')
48. He was unable to tell us (1. its ) name.  
(2. it's)  
(3. its')
49. The (1. companies) profits were small.  
(2. companys')  
(3. company's)
50. The average (1. man's) expenses are higher  
(2. mans')  
(3. mans )  
than they need be.
51. The (1. chaperones ) beads were small, but  
(2. chaperone's)  
(3. chaperones')  
were beautifully strung.
52. That money is (1. yours ).  
(2. yours')  
(3. your's)
53. That is a good return for a (1. years') efforts.  
(2. year's)  
(3. years )
54. It is not more than a (1. stone's) throw from  
(2. stones')  
(3. stones )  
here to my home.
55. (1. The mens ) expenses are higher this year.  
(2. The mens')  
(3. The men's)

## C. Word Usage

Below are listed 25 sentences designed to measure your knowledge of the correct use of words. One of the alternative answers best completes each sentence. Indicate the correct answer by marking the appropriate space on the answer sheet. Note that on the answer sheet the numbers under "C. Word Usage" correspond to the numbers of the sentences below.

56. I am afraid they can't do (1. anything) about  
(2. nothing )  
the matter.
57. He said that he (1. hadn't) hardly had time to  
(2. had )  
recover from his illness.
58. We shall have to hurry, for the first bell has  
already (1. rang).  
(2. rung)
59. After walking all the way home he was  
(1. very) tired.  
(2. real )
60. You should (1. accept) his apology.  
(2. except)
61. Of these two possibilities, I prefer the  
(1. later ).  
(2. latter)
62. It is doubtful whether (1. us ) people in  
(2. we)  
America get accurate news about this.
63. If he (1. had ) let his fear overcome him,  
(2. would have)  
he would probably be dead today.
64. You may (1. lay) the book on that table.  
(2. lie )
65. (1. Emigration ) tends to increase our labor  
(2. Immigration)  
supply.
66. Depressions are usually followed (1. by )  
(2. with )  
periods of good business.
67. There were (1. less ) boys in the parade this  
(2. fewer)  
year than last.
68. I vote against (1. their ) giving information to  
(2. them)  
the editor.

Do not wait. If finished, go on the Section C.



69. The committee consists of White, Evans, and  
(1. I ).  
(2. me)
70. A (1. desert ) is hard to cross without a guide.  
(2. dessert)
71. Each of the men (1. has ) some faults.  
(2. have)
72. She doesn't like these social affairs, but usually  
attends, looking very (1. handsomely).  
(2. handsome )
73. I don't know (1. if ) I can go.  
(2. whether)
74. The hostess (1. laid) the table for six.  
(2. lay )
75. I (1. laid) the book on the table.  
(2. lay )

76. I (1. infer ) from what you said that you think  
(2. imply)  
I am wrong.
77. His work is quite different (1. than) his  
(2. from)  
brother's work.
78. He was (1. appraised) of the dangers he would  
(2. apprised )  
meet.
79. I thought his remark was (1. innate).  
(2. inane )
80. She left a message for the people (1. who )  
(2. whom)  
she thought would call during her absence.

Do not wait. If finished, go on the Part II.

## II. BUSINESS INFORMATION

Below are presented sixty statements designed to measure your background of business knowledge. Some of these statements are true; some are false. Indicate whether a statement is true or false by marking the appropriate space on the answer sheet. Note that on the answer sheet the numbers under "II. Business Information" correspond to the numbers of the statements listed below.

1. A person who is named in a will to see that its provisions are carried out is called an executor.
2. Laws governing the establishment of corporations are the same in all states.
3. A certificate of stock represents ownership in a corporation.
4. All that is necessary in forming a corporation is that the incorporators shall agree among themselves to do business as a corporation.
5. A federal agency referred to as the HOLC is the government's organization for collecting taxes.
6. Clerical work is a good life work because salaries for it are high.
7. The federal income tax law allows deductions for dependents other than wife (or husband) and children.
8. The stock exchange is owned and operated by the United States government.
9. If it becomes physically impossible for one to do what he has agreed to do, he is excused from fulfilling his contract.
10. In the United States all persons over 21 years of age are required to pay a federal income tax.
11. The tax on real estate is based on the purchase price of the property.
12. A contingent liability is an amount resulting from past transactions which may become a liability in the future under certain defined circumstances.
13. Public utilities are owned and controlled by the public.
14. An economic system of free enterprise is one under which any individual or group of individuals may organize and manage a business for private profit.
15. A stockholder in a corporation is individually liable for the debts of the corporation.
16. A company that has been incorporated for a certain number of years may have its charter revoked within that time.
17. A country has a "favorable trade balance" when its exports exceed its imports.
18. The present value of gold is \$20.67 an ounce.
19. When the employees of a company refuse to continue work pending the settlement of a dispute with the employer, a lockout is said to exist.
20. The national debt of the United States has reached forty billion dollars.
21. Bonds issued by the government are not secured by liens or mortgages.
22. An infant's contracts usually are said to be valid.

23. Endowment life insurance policies require payment of premiums from the time the policy is taken out until the death of the insured.
24. The debtor who is discharged in bankruptcy has but six years within which to pay his debts.
25. During a period of inflation, the prices of commodities rise.
26. To be insolvent a business must necessarily have liabilities exceeding assets.
27. An agent is liable for his malicious acts while performing his duties as the agent of another person.
28. Any contract may be oral unless there is a specific statute applicable to the situation.
29. The seller of goods is sometimes called the vendee.
30. The United States has always been on a bi-metallic money standard.
31. The sum on which interest is calculated is called the rate.
32. The person who makes a will is called the testator.
33. The textile manufacturing industry, once centered largely in the New England States, has been moving gradually into the South and West.
34. To be a legal and enforceable contract, an offer of a job need not be put in written form.
35. Gross profit is profit above what the business man is entitled to.
36. A partner cannot sell his share of a business without affecting the partnership.
37. A promise made by a corporation to repay a given sum of money at a certain future date, with interest paid at a definite rate, is called a dividend.
38. A manufacturer is called a consumer because he buys raw materials for use in making his products.
39. "Old age security" is a guarantee by the federal government that no person over sixty years of age will be in want.
40. A merchant's total capital is the value of all the property he owns.
41. Most office workers are paid wages which vary according to the amount of work they do.
42. "F. O. B. Shipping Point" means that a buyer in a distant city pays transportation charges.
43. Upon failure of a mortgagor to pay the interest on the mortgage when it is due, the mortgagee may take the property simply by notifying the mortgagor that he intends to do so.
44. The selling price of a share of corporate stock on any given day is its par value.
45. A trade acceptance is a bill of exchange, drawn by an individual or firm on a bank, payable on demand.
46. One who learns a trade through study and practice in a school shop is said to have learned it by the apprenticeship method.
47. Money which is worth more as money than as merchandise is called fiduciary money.
48. When an extra fee of ten cents is paid for the special delivery of a piece of mail, it is said to be insured.
49. The chief purpose of *Consumers' Research* is to investigate the consumer market for business houses.
50. Net profits earned by a corporation usually are distributed to stockholders in the form of dividends.
51. The tax on a home owned by an individual is called a real property tax.
52. A post-dated note in negotiable form becomes a negotiable instrument as soon as it has been properly signed.
53. A promise of any kind to pay money to a designated person is called a note.
54. A person who is employed to answer letters received by a firm is called a secretary.
55. The purpose of posting to the ledger is to determine the accuracy of the books.
56. In general, all bond holders of a corporation do not receive a share of the dividends.
57. A record of money received and spent is called a budget.
58. A book copyrighted in the United States may be published by some one in some other country without the author's consent.
59. A firm or individual that buys and sells in large quantities is called a wholesaler.
60. A bank statement is a form used by a bank to provide a record of a checking account.

Do not wait. If finished, go on to Part III.

### III. BUSINESS ARITHMETIC

In this section are presented twenty problems dealing with business arithmetic. Use the blank pages following to compute the answer for each problem. Compare your answer with the four answers furnished. Indicate the number of the correct answer by marking the appropriate space on the answer sheet. If none of the answers furnished is correct, mark the space labelled *N* on the answer sheet. Note that the numbers under *Arithmetic* on the answer sheet correspond to the numbers of the problems listed below.

- |  |     |     |                         |  |  |  |  |
|--|-----|-----|-------------------------|--|--|--|--|
| <p>1. At <math>57\frac{1}{2}\text{¢}</math> a pair, how many pairs of children's gloves can be bought for \$23?</p>  | 1.  | (1) | 35                      |  |  |  |  |
|  |     | (2) | 39                      |  |  |  |  |
|  |     | (3) | 40                      |  |  |  |  |
|  |     | (4) | 41                      |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>2. If a profit of \$41 is wanted on the sale of an article costing \$205, what per cent higher than cost will you have to charge?</p>   | 2.  | (1) | $20\%$                  |  |  |  |  |
|  |     | (2) | $25\%$                  |  |  |  |  |
|  |     | (3) | $30\%$                  |  |  |  |  |
|  |     | (4) | $33\frac{1}{3}\%$       |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>3. The rate for a certain station-to-station telephone call is \$2.15 for the first three minutes, and the rate for each additional minute is 30¢. The government tax on calls costing \$2.00 or more is 20¢. How much will a call lasting six minutes cost?</p>  | 3.  | (1) | \$2.75                  |  |  |  |  |
|  |     | (2) | \$3.05                  |  |  |  |  |
|  |     | (3) | \$3.25                  |  |  |  |  |
|  |     | (4) | \$3.55                  |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>4. A certain grocery store sells 20 oranges for 25¢. What is the price per dozen?</p>   | 4.  | (1) | $12\frac{1}{2}\text{¢}$ |  |  |  |  |
|  |     | (2) | 15¢                     |  |  |  |  |
|  |     | (3) | 16¢                     |  |  |  |  |
|  |     | (4) | 20¢                     |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>5. The City of B has a tax rate of \$40.60 a thousand. What will Mr. Lester's taxes be on property assessed at 80% of its value of \$12,500?</p>  | 5.  | (1) | \$ 40.60                |  |  |  |  |
|  |     | (2) | \$406.00                |  |  |  |  |
|  |     | (3) | \$446.00                |  |  |  |  |
|  |     | (4) | \$507.50                |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>6. Four dozen suits were bought for \$1,800. To make a gross profit of 30% on the cost of each suit, how much should each suit be marked?</p>   | 6.  | (1) | \$37.50                 |  |  |  |  |
|  |     | (2) | \$45.00                 |  |  |  |  |
|  |     | (3) | \$48.50                 |  |  |  |  |
|  |     | (4) | \$47.75                 |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>7. Mr. Allen insured \$4,000 worth of his merchandise for three-fourths of its value. The yearly premium at 24¢ per \$100 is</p>  | 7.  | (1) | \$ 3.60                 |  |  |  |  |
|  |     | (2) | \$ 7.20                 |  |  |  |  |
|  |     | (3) | \$ 9.60                 |  |  |  |  |
|  |     | (4) | \$72.00                 |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>8. Mrs. Jones bought a refrigerator for \$265, paying \$50 cash and agreeing to pay the balance in 10 equal installments. If 6% of the unpaid balance is charged for interest, etc., how much will each installment be?</p>   | 8.  | (1) | \$12.90                 |  |  |  |  |
|  |     | (2) | \$21.79                 |  |  |  |  |
|  |     | (3) | \$21.97                 |  |  |  |  |
|  |     | (4) | \$22.79                 |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>9. A company sells \$12,487 worth of merchandise in November and makes a net profit of \$1,748.18. What was the per cent of profit?</p>   | 9.  | (1) | $16\%$                  |  |  |  |  |
|  |     | (2) | $15\%$                  |  |  |  |  |
|  |     | (3) | $14.5\%$                |  |  |  |  |
|  |     | (4) | $14\%$                  |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>10. Mrs. Williams bought 3 pounds of meat, but found that 8 ounces of it was bone. The per cent of bone was</p>   | 10. | (1) | $12\frac{1}{2}\%$       |  |  |  |  |
|  |     | (2) | $16\frac{2}{3}\%$       |  |  |  |  |
|  |     | (3) | $20\%$                  |  |  |  |  |
|  |     | (4) | $37\frac{1}{2}\%$       |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>11. A bill of goods amounting to \$3,689 was delivered to Mr. Watson on April 19 and paid for on April 23. If the terms were 3/5, n/30, how much did Mr. Watson pay?</p>  | 11. | (1) | \$3,578.33              |  |  |  |  |
|  |     | (2) | \$3,578.43              |  |  |  |  |
|  |     | (3) | \$3,568.33              |  |  |  |  |
|  |     | (4) | \$3,689.00              |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>12. A married man with two children earns \$3,700 annually. According to the income tax law, he is allowed exemption of \$2,500 as head of the family, and \$400 for each child. He has no other exemptions. Compute his tax on a basis of 4% for the first \$100 of taxable income and <math>3\frac{1}{2}\%</math> for each additional \$100</p> | 12. | (1) | \$ 26.50                |  |  |  |  |
|  |     | (2) | \$130.00                |  |  |  |  |
|  |     | (3) | \$ 14.50                |  |  |  |  |
|  |     | (4) | \$ 28.50                |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>13. Mr. Day uses 14 tons of coal to heat his house during the winter, and buys it at \$15.10 a ton as he needs it. If he bought it all at once in September, he could get it for \$12.75 a ton. How much could he save by following the latter plan?</p>  | 13. | (1) | \$23.50                 |  |  |  |  |
|  |     | (2) | \$28.90                 |  |  |  |  |
|  |     | (3) | \$32.10                 |  |  |  |  |
|  |     | (4) | \$33.90                 |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |
| <p>14. A certain city board of health reports that there have been 189 cases of measles reported so far this year as against 140 at this time last year. This is an increase of</p>  | 14. | (1) | $135\%$                 |  |  |  |  |
|  |     | (2) | $74\%$                  |  |  |  |  |
|  |     | (3) | $49\%$                  |  |  |  |  |
|  |     | (4) | $35\%$                  |  |  |  |  |
|  |     | (N) |                         |  |  |  |  |

15. A telephone company bought enough wire to reach one mile. At  $3\frac{1}{2}\text{¢}$  a foot, how much did the wire cost?

15. (1) \$183.80  
 (2) \$138.80  
 (3) \$149.80  
 (4) \$184.70  
 (N)

16. A farmer sold 3,440 gallons of milk for  $4\frac{1}{2}\text{¢}$  a quart. How much did he receive for it?

16. (1) \$6,192.00  
 (2) \$ 619.20  
 (3) \$ 387.00  
 (4) \$ 154.80  
 (N)

17. On April 1, 1900, Mr. Baxter bought life insurance in the amount of \$10,000. His annual net premium was \$32 a thousand. April 1, 1940, he received \$8,750.55 as the cash value of the policy. How much did he pay the company for 40 years' protection?

17. (1) \$ 4,049.45  
 (2) \$ 4,054.60  
 (3) \$ 4,409.45  
 (4) \$12,800.00  
 (N)

18. Mr. Simpson purchased 50 yards of ribbon at  $15\text{¢}$  a yard and sold it at a profit of 20%. On Tuesday, he sold the following amounts of ribbon: 3 yds., 5 ft., 2 ft., 2 ft., 2 yds.,

18. (1) \$1.50  
 (2) \$1.65  
 (3) \$1.85  
 (4) \$1.98  
 (N)

4 ft., and 5 ft. How much did he get for the ribbon sold that day?

19. Six years ago, Mr. Brown purchased a truck for \$887. If he sells it now at 42% of the original cost, what will the average annual depreciation have been?

19. (1) \$60.42  
 (2) \$62.09  
 (3) \$65.91  
 (4) \$85.91  
 (N)

20. Jones has his choice of two methods of paying the \$360. balance after down payment on a used car. He can (a) add 6% of the unpaid balance for interest, etc., and pay off the total in six equal monthly payments; or (b) borrow the \$360 on his personal note at 6%, renewing the note every month for an amount \$60 less than the preceding month, but at the same interest rate. How much will Jones save in adopting method (b)?

20. (1) \$15.30  
 (2) \$10.80  
 (3) \$ 6.30  
 (4) nothing  
 (N)

If finished, spend the time that remains looking over your work.

# Exhibit H

## NATIONAL CLERICAL ABILITY TESTS

194

Program of 1941

### Tables of Centiles

CENTILE	ENGLISH	ARITHMETIC	BUS. INF.	GEN. INF.	STENOGRAPHY	COMPOSITE
99	78	20	45	113	277	1242
90	73	17	35	85	221	1051
80	70	16	30	74	196	944
70	68	15	27	67	176	881
Deadlines or minimum passing grades					159	825
60	66	14	23	61	159	817.5
BOOKKEEPING						
99	66	20	49	118	200	1302
90	70	19	40	93	199	1225
80	66	17	34	82	195	1191
70	64	16	31	74	190	1153
60	61	15	28	68	184	1111
40	55	14	21	55	152	979
Deadlines or Minimum passing grades					137	918.6
30	52	13	17	48	137	909
TYPEWRITING						
99	77	20	44	101	144	1241
90	71	17	33	79	122	1061
80	67	16	27	69	112	995
70	65	15	23	60	106	932
60	63	14	19	54	97	897
40	58	11	13	44	84	788
Deadlines or minimum passing grades					81.5	769.5
35	56	10	11	41	81	764
MACHINE CALCULATIONS						
99	74	20	45	116	125	3244
90	68	17	35	74	115	2945
80	65	16	28	63	107	2740
70	62	15	23	57	98	2530
60	58	14	19	52	90	2380
40	54	11	13	42	79	2093
Deadlines or minimum passing grades					76.5	2048.5
35	52	11	12	39	76	2020
MACHINE TRANSCRIPTION						
99	76	19	46	107	125	815
90	71	16	33	78	102	696
80	67	15	27	69	92	648
70	64	14	24	63	82	607
60	63	12	21	55	72	574
50	62	11	17	51	63	556
Deadlines or minimum passing grades					60	523.5
45	60	11	15	49	59	535
FILING						
99	77	20	40	116	167	1561
90	72	18	34	78	156	1467
80	70	16	31	73	152	1406
70	68	15	28	66	148	1369
60	65	15	24	58	142	1321
40	60	13	16	19	133	1312
Deadlines or minimum passing grades					120.5	1208.4
35	58	12	14	46	130	1185

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