SOCIOECONOMIC VERSUS EDUCATION INPUT VARIABLES AS RELATED TO GRADE VI ARITHMETIC ACHIEVEMENT IN RURAL NEWFOUNDLAND

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by

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The undersigned certify that they have read, and recommend for acceptance, a thesis entitled "Socioeconomic Versus Education Input Variables as Related to Grade VI Arithmetic Achievement in Rural Newfoundland" submitted by Raftus Colum Noel, B.A.Ed., B.A., in partial fulfillment of the requirements for the degree of Master of Education.

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students is gratefully acknowledged.

ABSTRACT

The primary purpose of this study was to determine whether socioeconomic variables were more highly related to arithmetic achievement among grade VI pupils of rural Newfoundland than were certain educational input variables. In addition, the relationships between arithmetic achievement and sex, intelligence, reading ability, mother's education, father's occupation, size of family, absenteeism, classroom enrolment, teachers' qualifications, and the age of the school building were investigated.

Data were collected, during the month of May, 1968, by means of two questionnaires and three standardized tests, from 77 teachers, 684 parents and 684 students; all resident in the two Electoral Districts of Trinity North and Trinity South.

Descriptive and statistical analyses were made of the data thus collected. The statistical procedures used to test the hypotheses included "t" tests, Pearson product-moment correlations, partial Pearson product—moment correlations and multiple correlations.

The major finding of this study revealed that the combined socioeconomic variables were more closely associated with and thus explained more of the variance on arithmetic achievement than did the combined educational variables.

Girls were found to score significantly higher than boys
on arithmetic problem solving but no significant difference
was found between the scores of these two groups on arithmetic
concepts. Intelligence, reading ability, mother's education
and father's occupation were all found to be significantly
related to pupils' scores on both measures of arithmetic
achievement. Size of family was found to be more closely
associated with the arithmetic achievement of girls than of
boys. No significant relationships were found between arith-
metic achievement and absenteeism. With the exception of
girls on arithmetic concepts, no significant relationships
were found between teachers' qualifications and arithmetic
achievement. Neither the classroom enrolment nor the age of
the school building showed any significant relationships with
arithmetic achievement. Intelligence and reading ability
were found to be the most important variables associated
with the arithmetic achievement of students used in the
study.

     The major finding suggest the need for educators
to consider, when devising or implementing any arithmetic
program, the socioeconomic background of the student popu-
lation to be served. Compensatory education should be pro-
vided for students who come from the lower socioeconomic
strata of society, and the present provincial government's

policy of providing adult continuation classes should be extended to all areas of the province.

Since the level of arithmetic achievement was found to depend to an important degree on the students ability to read, any improvement in this aspect of the curriculum should bring a corresponding improvement in the level of arithmetic achievement.

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CHAPTER I

THE PROBLEM

A brief review of the research carried out during the last fifty years in elementary arithmetic reveals very few studies which examine specifically the relationship between arithmetic achievement and the social, economic, and environmental conditions of the achiever's background. According to Erickson, a large proportion of the research is concerned with the arithmetic curriculum, teaching methods, and patterns of thinking in dealing with arithmetic concepts and operational skills.[1]

The variety of new arithmetic programs which have been developed for elementary grades in the last ten years is the tangible result of this research. In all these new programs the emphasis is on the understanding of arithmetic concepts and principles rather than the mere acquisition of computational skills. No doubt, this is a step in the right direction. However, the introduction of new arithmetic programs or teaching techniques is no guarantee of improving

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[1]Leland H. Erickson, "Certain Ability Factors and Their Effects on Arithmetic Achievement", Arithmetic Teacher, V (1958), pp. 287-93.

over-all arithmetic achievement. Such factors as ability, attitude, interest, aptitude, previous experiences and reading ability also enter the picture, and studies conducted elsewhere have shown that the socio-economic and environmental conditions of the learner's background play a big part in the development or retardation of these factors. Too often, as Linton and Swift say: "The assumption is commonly made that failure in the school system is primarily a product of low capacity in combination with an inadequate amount of academic motivation".[1] However, studies conducted in the United States by Rossi,[2] Havighurst and Janke[3] have shown that the failing group is likely to be drawn predominantly from the lower socio-economic groups in society; that is, there is a direct relationship between academic achievement and social position.

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[1] Thomas E. Linton and Donald F. Swift, "Social Class and Ninth Grade Educational Achievement in Calgary", Alberta Journal of Educational Research, IX (September, 1963), pp. 157-167.

[2] Peter H. Rossi, "Social Factors in Academic Achievement: A Brief Review", Education, Economy, and Society, J. H. Halsey, editor (Glencoe: The Free Press of Glencoe, Inc., 1961), pp. 269-272.

[3] R. Havighurst and Leota Lang Janke, "Relations Between Ability and Social Status in a Midwestern Community", The Journal of Educational Psychology, XXXVI (November, 1945), pp. 499-509, (Microfilm).

I. ARITHMETIC ACHIEVEMENT IN NEWFOUNDLAND

Studies and surveys conducted in Newfoundland schools
in recent years show that the level of academic achievement
is often below that of the norms supplied with the tests.
This is particularly so in the tool subjects of reading and
arithmetic.

A survey of the level of arithmetic achievement
among grade IX pupils in Newfoundland was conducted by the
Department of Education in 1964 using the Metropolition
Achievement tests. The survey showed that one third of the
pupils tested were not up to standard based on the norms
supplied with the test. It also revealed that pupils in
regional high schools and large all-grade schools scored
appreciably higher than those in central schools or small
all-grade schools.[1]

A study conducted by Sullivan, for the Royal Commis-
sion on Education and Youth, among grade eight students of
the Province revealed that the greatest weaknesses were
found in reading comprehension and arithmetic problem sol-
ving. Again this study reported that pupils outside St.

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[1]News Letter, Department of Education, St. John's,
XVI (February, 1965) and XVI (March, 1965).

John's, especially those from all-grade schools made, on the average, lower scores than other pupils. Sections of the Iowa Tests of Basic Skills were used in this study.[1]

Kitchen concluded, after a study of the relationships between demographic and socioeconomic factors and measures of educational outputs in the Atlantic Provinces, that low educational outputs and high retardation rates were related more to socioeconomic and demographic variables such as family size, non-employment and adult illiteracy than to such educative input variables as the qualifications and salaries of teachers. He further contended that, "in Newfoundland, correlations suggested the crux of lower educational productivity to be the non-literate environment provided by many of the smaller outports".[2]

II. PURPOSES OF THE STUDY

The major purpose of this study is to determine whether socioeconomic variables bear a higher relationship to arithmetic achievement than do certain educational

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[1]Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, I (St. John's, The Queen's Printer) pp. 38-41.

[2]H. Kitchen, "A Preliminary Study of Demographic and Socio-Economic Factors in the Atlantic Provinces and Their Relationship to Measures of Educational Output", (St. John's, October 1967), p. 1.

input variables. Several other questions will also be explored:

(1) What is the relationship between sex and arithmetic achievement?

(2) What is the relationship between verbal intelligence and arithmetic achievement?

(3) What is the relationship between reading ability and arithmetic achievement?

(4) What is the relationship between mother's education and pupil's arithmetic achievement?

(5) What is the relationship between father's occupation and pupil's arithmetic achievement?

(6) What is the relationship between the size of the family and arithmetic achievement?

(7) What is the relationship between the size of the school and achievement in arithmetic?

(8) Is there a relationship between pupil absenteeism and achievement in arithmetic?

(9) What is the relationship between teacher's qualifications and pupil's arithmetic achievement?

(10) Is there a relationship between the age of the school building and pupil's achievement in arithmetic?

III. SIGNIFICANCE OF THE STUDY

No systematic investigations, to the writer's knowl-

edge, have been carried out in Newfoundland to try to de-
termine the effects of social, economic and environmental
factors on arithmetic achievement. Consequently, an inten-
sive study such as this is now needed and in some rural
area of the Province.

In order to remedy any undesirable situation, ade-
quate and accurate information must be available. Not only
the causes, but the relative importance of each must be
ascertained. It is hoped that this study will provide some
of this information.

IV. OPERATIONAL DEFINITIONS

This section contains a brief description, oper-
ationally defined, of each of the variables used in the study.
Further details are contained in subsequent chapters.

Arithmetic Achievement

Arithmetic achievement refers to the scores obtained
by a pupil on the arithmetic section of The Canadian Tests
of Basic Skills. A copy of these tests is contained in
Appendices L and M.

Arithmetic Concepts

The raw score obtained by a pupil on the Arithmetic
Concept sub-test of The Canadian Tests of Basic Skills was

used as the indicator of achievement in arithmetic concepts.

Arithmetic Problem Solving

The raw score obtained by a pupil on the Arithmetic Problem Solving sub-test of The Canadian Tests of Basic Skills was used as the indicator of achievement in problem solving.

Verbal Intelligence

Verbal intelligence refers to a pupil's deviation intelligence quotient as determined by his score on The Lorge-Thorndike Intelligence Test, Form 3 AV. A copy of this test is contained in Appendix O.

Reading Ability

The combined raw score obtained by a pupil in the paragraph Comprehension sub-test and the Vocabulary sub-test of The Nelson Reading Test 1962 Revised Edition, Form A. A copy of this test is contained in Appendix N.

Father's Occupation

The occupation of the child's father or guardian was obtained from a questionnaire that was sent to the home. Occupations were then transformed into numbers, using the Blishen Occupational Class Scale. A copy of this scale is contained in Appendix P. This variable was used as a measure of socioeconomic status.

Mother's Education

Mother's education, a further indicator of socio-economic status, was rated on an 18 point scale based on the highest grade obtained in an institution of formal learning. A questionnaire was sent to the home to obtain the necessary information. A copy of the scale is contained in Appendix K.

Size of Family

The number of children who were under eighteen and living at home was used as the size of each pupil's family. The questionnaire shown in Appendix H was used to gather data on family size.

Absenteeism

Absenteeism means the number of days pupils were absent from September 6, 1967, to April 30, 1968, and was taken from the school register by the classroom teacher. See Appendix I.

Teacher's Qualifications

An eight-point scale based on the Newfoundland Department of Education grading system was used for teacher's qualifications. The required information was obtained by means of a questionnaire completed by the teacher. A copy of this questionnaire is contained in Appendix I.

Size of School

The indicator used for size of school was the enrol-
ment in grade six in each classroom used in the study as
reported in the teacher's questionnaire. See Appendix I.

Age of School

Age of school referred to the number of years the
school building had been in use and was obtained from the
teacher's questionnaire. See Appendix I.

V. DELIMITATIONS

Only students from one rural area of Newfouhdland
and only students from one specific grade are included in
this study. Furthermore, no attempt is made to exhaust all
the socieeconomic and environmental factors associated
with the students' background. Any interpretation of the
findings of this study must be undertaken with these de-
limitations in mind.

VI. ORGANIZATION OF THE REPORT

Chapter II presents the hypotheses to be tested and
the research literature supporting them. Chapter III con-
tains an outline of the procedures followed in conducting
the study and describes the methods of collecting and pro-
cessing the data. A descriptive analysis of the samples

and underlying variables is contained in Chapter IV.
Chapter V reports the statistical testing of the hypotheses
and the findings of this investigation. The final chapter
comprises a summary of the study, some conclusions, and some
recommendations for further research.

CHAPTER II

THE HYPOTHESES AND THE LITERATURE SUPPORTING THEM

This chapter is divided into sections reporting the
literature that underlies the hypothesized relationship be-
tween each of the input variables and arithmetic achieve-
ment. The major hypothesis of the study, that socioeconomic
inputs are more highly related to arithmetic achievement
than are educational inputs, follows the sections dealing
with the minor hypotheses.

I. THE EXPECTED RELATIONSHIP BETWEEN SEX AND ARITHMETIC ACHIEVEMENT

Hypothesis I

There will be no significant difference between the
performance of girls and boys on arithmetic concepts.

Hypothesis II

The performance of girls will be higher than that
of boys on arithmetic problem solving.

Support for these two hypotheses comes from the re-
search literature. The author of the Canadian Test of Basic
Skills, using a 12.5 per cent representative sample of their
norming population, found that overall differences between
the mean grade equivalent scores for girls and for boys
favoured the girls by two or three months. Greatest dif-
ferences were found to exist in the language skills. Dif-

ferences were very small or negligible in arithmetic con-
cepts. However, what appeared to be a substantial differ-
ence was found in favour of the girls in arithmetic prob-
lem solving.[1]

Stroud and Lindquist, in an article based on data
on sex differences in school achievement yielded by the
Iowa Every-Pupil Testing Program (high school) for the years
1932-1939, and the Iowa Every-Pupil Basic Skills Program
(grades III-VIII) for the year 1940, reported that girls
maintained a constant and, on the whole, a significant sup-
eriority over boys in all the subjects tested, except in
arithmetic, where small insignificant differences favoured
the boys. These findings, they contended, corroborate
previous investigations in both these aspects.[2]

Pritchard investigated the arithmetic achievement
of 975 grade V pupils in Alberta schools using the Iowa
Every-Pupil Test of Basic Skills, Form O, Advanced. He

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[1]Canadian Tests of Basic Skills. Manual for Admin-
istrators, Supervisors and Counsellors, (1968), p. 53.

[2]J. B. Stroud, and E. F. Lindquist, "Sex Differ-
ences in Achievement in Elementary and Secondary Schools",
Journal of Educational Psychology, XXXIII (December, 1942),
pp. 657-667. (Microfilm).

found in the ungraded rural sample that girls were slightly, but not significantly superior to boys. The boys of the urban sample had, however, significantly better mean scores than the girls in that sample. Except for the urban sample, there were no significant differences between arithmetic achievement of the boys and the girls.[1]

Thus, only one of these three studies lends support to hypothesis II. Nevertheless, considerable indirect support for this hypothesis may be found in the research literature. Numerous studies, some of which are reported in section three of this chapter, indicate a strong positive relationship between reading ability and mathematical achievement, especially problem solving. Furthermore, it is a well-established fact that girls at the elementary school level are better readers than boys. Therefore, it is only reasonable to expect girls at the grade VI level to out score grade VI boys in any test where the ability to read is imperative.

Because of the expected differences in achievement between sex, the hypotheses which follow will be tested for girls, for boys and for both groups combined.

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[1] Ralph O. Pritchard, "A survey of the Arithmetic Achievement of Grade Five Pupils in Alberta Schools" Alberta Journal of Educational Research, XI (March, 1956), pp. 41-48.

II. THE EXPECTED RELATIONSHIP BETWEEN VERBAL
INTELLIGENCE AND ARITHMETIC ACHIEVEMENT

Hypothesis III

There will be a positive relationship between pup-
ils' verbal intelligence scores and their scores on arith-
metic concepts.

Hypothesis IV

There will be a positive relationship between pup-
ils' verbal intelligence scores and their scores on arith-
metic problem solving.

Studies conducted by Coleman, [1] Gough,[2] Hieronymus,[3]
Curry,[4] and many others all show a positive relationship
between academic achievement and verbal intelligence. In

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[1]H. A. Coleman, "The Relationship of Socioeconomic
Status to the Performance of Junior High School Students",
Journal of Experimental Education, IX (September, 1940),
pp. 61-63.

[2]H. G. Gough, "Relationship of Socioeconomic Status
to Personality and Achievement Test Scores", Journal of
Educational Psychology, XXXVII (December, 1946), pp. 527-
537,(Microfilm).

[3]A. N. Hieronymus, "Study of Social Class Motiv-
ation", Journal of Educational Psychology, XLII (April, 1951)
pp. 193-205,(Microfilm).

[4]R.L. Curry, "The Effects of Socioeconomic Status
on The Scholastic Achievement of Sixth Grade Children",
British Journal of Educational Psychology, XXXII (May,
1962), pp. 46-49.

fact, from a review of the literature it seems reasonable to conclude, as Erickson suggested, that no one can successfully deny the importance of intelligence in learning anything requiring thought.[1]

Erickson, investigating in a midwestern city of the United States the effect of certain ability factors on grade VI arithmetic achievement, found the correlation coefficient between intelligence and total arithmetic score to be .72. That is, for his sample, intelligence alone accounted for 52 per cent of the variance in arithmetic achievement. The Iowa Test of Basic Skills, and the Otis-Quick Scoring Mental Ability Test were the instruments used in this study.[2]

A study designed to replicate that of Erickson, with the exception that third rather than sixth-grade children were used, was conducted by Rose and Rose. Their sample consisted of 456 pupils. One hundred of these were from a high socioeconomic suburban public school while the other 356 were from a middle-class Detroit public school. They found the correlation coefficient between intelligence and total arithmetic score for the 100 pupils to be .67 and for

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[1]Leland H. Erickson, "Certain Ability Factors and Their Effects on Arithmetic Achievement", Arithmetic Teacher, V (December, 1958), pp. 287-93.

[2]Ibid.

the 356 pupils to be .53. These correlation coefficients also are statistically significant.[1]

Because of the high expected relationships between verbal intelligence and arithmetic achievement, the hypotheses which follow will, when the correlations reach statistical significance, be tested both before and after partialling out verbal intelligence.

III. THE EXPECTED RELATIONSHIP BETWEEN READING ABILITY AND ARITHMETIC ACHIEVEMENT

Hypothesis V

There will be a positive relationship between pupils' reading ability and their scores on arithmetic concepts.

Hypothesis VI

There will be a positive relationship between pupils' reading ability and their scores on arithmetic problem solving.

Harootunian and Tate, investigating in suburban Philadelphia the relationship of certain selected variables to problem solving among grade seven and eight students, found that reading ability accounted for 54 per cent of the

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[1]Alvin W. Rose and Helen Rose, "Intelligence, Sibling Position, and Socio-cultural Background as Factors in Arithmetic Performance", Arithmetic Teacher, VIII (January, 1961), pp. 50-56.

variance in problem solving. It might be of interest to note that in the same study intelligence accounted for 46 per cent of the variance.[1]

Treacy, in a study of arithmetic achievement at the grade VII level, suggested that there was a marked relationship between proficiency in reading skills and arithmetic achievement.[2] Many other studies confirm these results. Lazerte put it very succinctly when he said:

> Pupils are handicapped in problem-solving if they are deficient in reading ability...The real problem meant to be conveyed often remains hidden until the printed sentences are properly interpreted. Even when the problem is clearly in mind, the relationship of part to part must be appreciated before a correct solution can be planned.[3]

IV. THE EXPECTED RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS, AS MEASURED BY FATHER'S OCCUPATION AND MOTHER'S EDUCATION, AND ARITHMETIC ACHIEVEMENT

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[1] Berj Harootunian and Merle W. Tate, "The Relationship of Certain Selected Variables to Problem Solving", Journal of Educational Psychology, LI (December, 1960), pp. 326-333.

[2] J. P. Treacy, "The Relationship of Reading Skills to the Ability to Solve Arithmetic Problems", Journal of Educational Research, XXXXIII (1949), pp. 86-96.

[3] M. E. Lazerte, "The Development of Problem Solving Ability in Arithmetic", Cited by R. J. C. Harper in "Reading and Arithmetic Reasoning", Alberta Journal of Educational Research, III (June, 1957), pp. 81-85.

Hypothesis VII

There will be a positive relationship between mother's education and pupils' scores on arithmetic concepts.

Hypothesis VIII

There will be a positive relationship between mother's education and pupils' scores on arithmetic problem solving.

Hypothesis IX

There will be a positive relationship between father's occupational status and pupils' scores on arithmetic concepts.

Hypothesis X

There will be a positive relationship between father's occupational status and pupils' scores on arithmetic problem solving.

Since the turn of the twentieth century the relationship between socioeconomic status and achievement has been the object of much research. According to Shaw, the earliest investigations dealt with relationships between home background and dropouts, retardation and persistence in school. They all showed a definite relationship between the level of home environment and progress and persistence in

school.[1]

Collins and Douglas investigated the effects of socio-
economic status upon 146 pupils of superior ability in North-
east Junior High School in Kansas City, Kansas. Each of
the 146 superior pupils had an intelligent quotient of one
hundred ten or more and were divided into three groups -
failure group, success group, and average group. After
the division, it was found that for each of the groups the
mean intelligent quotient was approximately equal. The re-
sults from the investigation of the homes of these three
groups seemed to indicate that the unfavourable home con-
ditions under which the failure group lived was a contribut-
ing factor of major importance in their unsatisfactory
school work. Furthermore, they stated that if the father's
occupation is considered as an index to the socioeconomic
status of the home, it would seem that pupils of the failure
group are coming from homes which are socially, economically
and educationally less favoured than are those of the success
group.[2]

[1]Duane Shaw, "Relations of Socioeconomic Status to
Educational Achievement in Grades Four to Eight, Journal of
Educational Research, XXXXVII (November, 1943), pp. 197-201.

[2]J. H. Collins and Harl R. Douglass, "The Socio-
economic Status of the Home as a factor in success in The
Junior High School", The Elementary School Journal, XXXVIII
(October, 1937), pp. 107-113.

Coleman reported his investigation of 4,784 students in the seventh, eight, and ninth grades. His population was drawn from all of the geographic regions of forty-three states. The total group was divided into four sub-groups on the basis of socioeconomic status and whether or not the parents received relief. Differences between Q_1, the median, and Q_3, were found to favour the high socioeconomic group for every grade in chronological age, intelligence scores, reading scores, geography scores, history scores and problem solving scores.[1]

Gough concluded from an investigation of the relation-ship between socioeconomic status and achievement test scores of 127 sixth-grade public school children in St. Cloud, Minnesota, that socioeconomic status showed a slight positive relationship to academic achievement.[2] However, his total population was quite high in intelligence and their socio-economic status somewhat above the national average. Had his population been larger and more representative of the national norm, then a much higher correlation might have been achieved.

Shaw investigated the relationship between socio-economic status and achievement among 248 pupils in the

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[1]Coleman, loc. cit.

[2]Gough, loc. cit.

fourth, fifth, sixth, seventh, and eighth grades of the public schools of Sheldon, Iowa, Socioeconomic status was measured by Sim's Score cards. She reported that, on the whole, evidence was obtained of a fairly substantial relationship between socioeconomic status and academic achievement. A coefficient of .41 was obtained between the scores on the Sim's Score cards and standard achievement.[1]

However, in 1962, Curry, after investigating the effects of socioeconomic status upon the scholastic achievement of 360 sixth-grade children drawn from 33 elementary schools in a large American city, concluded that socioeconomic status seems to have no effect upon the scholastic achievement of sixth-grade students when they have high intellectual ability. High intellectual ability, he argued, offsets any deficiency which may have been created by the lower social and economic conditions.[2] But, as Dale points out, within Curry's high intellectual ability groups the same trends were apparent as within his low ability groups, namely that in all cases the upper socioeconomic class gained superior scores. The lack of statistical significance

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[1]Shaw, loc. cit.

[2]Curry, loc. cit.

for these superior scores, Dale contends, may be due to the smallness of the sample.[1]

Hill and Giammatteo reported the findings of their research with 223 third-grade children from Western Pennsylvania. Their findings show a definite positive relationship between socioeconomic status and educational outputs. The following table shows the means and standard deviations for each of three socioeconomic groups on the arithmetic section of the Iowa Test of Basic Skills.

TABLE I

HILL AND GIAMMATTEO'S SCORES OF GRADE
THREE PUPILS ON ARITHMETIC TESTS

	High		Middle		Low	
	M	S.D.	M	S.D.	M	S.D.
Arithmetic Concepts	3.87	.11	3.69	.73	3.28	.69
Problem Solving	4.02	.23	3.51	.16	3.18	.35

These tests were administered in the eighth month of the third grade. Therefore, 3.80 would be the expected norm.

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[1] R. R. Dale, "A Brief Comment on the Effects of Socioeconomic Status on the Scholastic Achievement of Sixth Grade Children", The British Journal of Educational Psychology, XXXIII (February, 1963), p. 84.

However, the means obtained indicate the children from the high socioeconomic group are a full six months in advance of the lower group in arithmetic concepts. Problem solving shows an eleven month difference. In total scores, (not shown in the table) the high socioeconomic group with a mean score of 3.9 was seven months advanced over the 3.2 mean score of the low socioeconomic group.[1]

Burkhead, in a study of input and output variables in large city high schools, concluded that the most important finding of his study was that variation in educational outcomes in large city high schools, measured in terms of test scores, were almost wholly conditioned by the socioeconomic environment of the neighbourhood. Socioeconomic level was determined by the income of the bread winner of the family.[2]

Passey conducted a study of 1800 third grade children in the State of New York to evaluate the role of socioeconomic status in mathematics achievement. Three different programs of elementary mathematics were used, each of which had been in operation for four or more school years. Students

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[1]Edwin H. Hill and Michael C. Giammatteo, "Socio-Economic Status and Its Relationship to School Achievement in the Elementary School", Elementary English, XXXX (January, 1963), pp. 265-270 .

[2]Jesse Burkhead, Input and Output in Large City High Schools. (New York: Syracuse University Press, 1967).

in each of the three programs were tested with respect to reading ability, mental ability, the length of the child's attendance in the school district, and the teacher's experience in the district. No significance at the 2 per cent level was found with respect to these variables.

However, when socioeconomic status based on father's occupation was considered, significant difference in mathematical achievement at the 5 per cent level were found regardless of which program of instruction was used.[1]

V. THE EXPECTED RELATIONSHIP BETWEEN NUMBER OF CHILDREN IN THE FAMILY AND ARITHMETIC ACHIEVEMENT

Hypothesis XI

There will be an inverse relationship between the number of children in the family and pupils' scores on arithmetic concepts.

Hypothesis XII

There will be an inverse relationship between the number of children in the family and pupils' scores on arithmetic problem solving.

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[1]Robert A. Passey, "Socio-economic Status and Mathematics Achievement", The Disadvantaged Learner, S. W. Webster, editor, (San Francisco: Chandler Publishing Company, 1966).

Much research has been done on the relationship between family size and pupil achievement. Nisbit concluded, after studying the scholastic and mental achievement of four thousand Scottish children, that there was an inverse relationship between family size and the environmental aspects of mental development.[1] Kitchen, in a study already cited, showed evidence of a definite inverse relationship between size of family and educational output.[2]

VI. THE EXPECTED RELATIONSHIP BETWEEN GRADE SIX ENROLMENT AND ARITHMETIC ACHIEVEMENT

Hypothesis XIII

There will be a positive relationship between the classroom enrolment in grade six and pupils' scores in arithmetic concepts.

Hypothesis XIV

There will be a positive relationship between classroom enrolment in grade six and pupils' scores on arithmetic problem solving.

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[1] John Nisbit, "Family, Environment and Intelligence", Education Economy and Society, J.H. Halsey, editor, (Glencoe: The Free Press of Glencoe, Inc., 1961), pp. 273-287.

[2] H. W. Kitchen, "A Preliminary Study of Demographic and Socio-Economic Factors in the Atlantic Provinces and Their Relationship to Measures of Educational Output", (St. John's, October 1967).

It has long been recognized that education is an attribute of urban areas. Therefore, the larger the community the greater the likelihood of bigger schools, better facilities and more qualified teachers. Both Kitchen's[1] and Sullivan's[2] studies present evidence to support this contention. Since this study will be conducted in a rural area and practically all communities to be visited are small, the grade six enrollment will be used as an indicator of the size of the school.

VII. THE EXPECTED RELATIONSHIP BETWEEN PUPIL ABSENTEEISM AND ARITHMETIC ACHIEVEMENT

Hypothesis XV

There will be an inverse relationship between pupils' absenteeism and their scores on arithmetic concepts.

Hypothesis XVI

There will be an inverse relationship between pupils' absenteeism and their scores on arithmetic problem solving.

As Brace points out: "Learning is a continuous,

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[1] Kitchen, op. cit.

[2] Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, 1 (St. John's; The Queen's Printer).

developmental process. It proceeds from one level of development to another without definable breaks in the process"[1] How does pupil absenteeism effect this sequential development? In a study of the relationship between the history of school absence and test performance of 3,273 British born, primary school children, Douglas and Ross concluded that absence from school impaired a child's measured ability and frequent episodes of absence were more harmful than an occasional long one.[2]

VIII. THE EXPECTED RELATIONSHIP BETWEEN TEACHERS' QUALIFICATIONS AND ARITHMETIC ACHIEVEMENT

Hypothesis XVII

There will be a positive relationship between teachers' qualifications and pupils' scores on arithmetic concepts.

Hypothesis XVIII

There will be a positive relationship between teachers' qualifications and pupils' scores on arithmetic problem solving.

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[1]Alex T. Brace, "The Pre-School Child's Concept of Number" (Unpublished M.Ed. Thesis, University of Alberta, 1963).

[2]J.W.B. Douglas, and J.M. Ross, "The Effects of Absence on Primary School Performance", The British Journal of Educational Psychology, XXXV (February, 1965), pp. 28-40.

It is generally agreed that among the important
factors in the success of an education program are the qual-
ity and supply of teachers. But there is much less agree-
ment on the factors which constitute quality. Some factors
are intangible whereas others may be measured objectively.
One of the more objective factors is years of training. Univ-
ersities, teachers' associations and laymen stress the im-
portance of this factor.

Lindstedt, in a study of selected grade IX mathe-
matics teachers in Alberta, found significant relationships
between pupil achievement in mathematics and teacher train-
ing over four years.[1] Sullivan reported the same conclu-
sion in his study of grade VIII students in Newfoundland.[2]
Cheal found that the qualifications of elementary teachers
appear to have a greater effect on the holding power of
Canadian schools than qualifications of secondary teachers.[3]

IX. THE EXPECTED RELATIONSHIP BETWEEN THE AGE OF THE
     SCHOOL BUILDING AND ARITHMETIC ACHIEVEMENT

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[1]Sidney A. Lindstedt, "Teacher Qualifications and
Grade IX Mathematics", Alberta Journal of Educational Re-
search, VI (June, 1960), pp. 76-85.

[2]Province of Newfoundland and Labrador, loc. cit.

[3]J. E. Cheal, Investment in Canadian Youth, (Tor-
onto: The Macmillan Company of Canada Ltd., 1963), p. 58.

Hypothesis XIX

There will be an inverse relationship between the age of the school building and pupils' scores on arithmetic concepts.

Hypothesis XX

There will be an inverse relationship between the age of the school building and pupils' scores on arithmetic problem solving.

Learning situations are undoubtedly improved if building and classrooms are up to date, particularly, as Burkhead points out, where recent trends in building construction like flexibility in classroom size, moveable partitions and easy student access to library are incorporated in the construction.[1]

X. THE EXPECTED RELATIONSHIP OF SOCIOECONOMIC VARIABLES VERSUS EDUCATIONAL VARIABLES AND ARITHMETIC ACHIEVEMENT

Hypothesis XXI

Socioeconomic variables will bear a higher relationship to pupils' scores on arithmetic concepts than do educational variables.

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[1] Burkhead, op. cit., p. 29.

Hypothesis XXII

Socioeconomic variables will bear a higher relat-
ionship to pupils' scores on arithmetic problem solving
than do educational variables.

Support for these hypotheses come from research pro-
jects which have been carried out in recent years.

Burkhead, in a study conducted among the high schools
of Chicago and Atlanta City using multiple regression anal-
ysis, reported that for Chicago and Atlanta schools the
socioeconomic variables were of the greatest importance
in determining differences in school outputs. The out-of-
school variables, he contended, were far more significant
than the in-school variables.[1]

The Coleman study which surveyed more than 645,000
pupils from 4,000 schools in the third, sixth, ninth and
twelfth grades of the U.S.A., has this to say about the
relation of achievement to school characteristics:

> The first finding is that the schools are re-
> markably similar in the effect they have on the
> achievement of their pupils when the socioeconomic
> background of the students is taken into account.
> It is known that socioeconomic factors bear a
> strong relation to academic achievement. When
> these factors are statistically controlled, how-
> ever, it appears that differences between schools

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[1]*Ibid.*, pp. 56, 72.

account for only a small fraction of difference in pupil achievement.[1]

Thus, educational inputs such as age of school, teacher qualifications, class enrolment and libraries showed a much smaller relationship to achievement than the socio-economic background of the students involved.

Kitchen, in his study of the Atlantic Provinces of Canada, reported that educational productivity was more highly related to socioeconomic variables than to variations in educational inputs.[2]

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[1]J. Coleman, _Equality of Educational Opportunity_, U.S. Department of Health, Education and Welfare. (Washington: 1966), p. 21.

[2]Kitchen, _op. cit._ p. 1.

CHAPTER III

RESEARCH DESIGN

This chapter describes the procedures followed in carrying out the study. Separate sections will deal with the background of the study, collection of data, samples, instruments, administering and scoring tests, and data processing.

I.   BACKGROUND OF THE STUDY

This study resulted from the decision of the graduate students in Educational Administration at Memorial University, Newfoundland, in 1967-68, to concentrate their research projects in the field of elementary education. Consequently, after much deliberation and many research seminars, it was decided by three of the graduate students to select some rural area of Newfoundland and investigate the relationship between the variables previously mentioned in this study and student achievement in the fundamental areas of reading, language and arithmetic. Although the three investigators use the same population, three separate theses will be presented.[1]

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[1]Hector A. Pollard "Socioeconomic Versus Educational Inputs as Related to Grade Six Reading Achievement in Rural Newfoundland", and Stuart Ralph "Socioeconomic Versus Educational Inputs as Related to Grade Six Language Achievement in Rural Newfoundland", (Masters' Theses in Process, Memorial University of Newfoundland, St. John's, 1970).

In the selection of the area to be studied certain minimal conditions had to be met. The area should be representative of rural Newfoundland and, to keep within a meagre budget, readily accessible from the city by road. The pupil population should be large enough to yield statistically significant results, and the boards of education, principals, teachers and parents would have to be willing to co-operate. The two electoral districts of Trinity North and Trinity South were selected as coming closest to meeting these conditions.

Because only two elementary school grades in Newfoundland at the time namely, five and six, were not experimenting with a new mathematics program and because grade six was the terminating grade in many small elementary schools, it was decided that grade six pupils would be the subjects of the study.

II.   COLLECTION OF DATA

In January, 1968, permission was received from Denominational Superintendants of Education at the Department of Education, Newfoundland, to contact the school boards in the area to be studied. Appendices A to E contain the correspondence.

The names and addresses of the chairmen of the school boards in Trinity Bay were obtained from the same source.

A letter (Appendix G) was sent to each of the school board
chairmen explaining the nature and purpose of the study,
and inviting replies from those who needed further clari-
fication of the study or who objected to its being carried
out in the schools under their jurisdiction. No objection
was received nor clarification required.

In early April, 1968, a tentative testing schedule
was devised based on Department of Education data about
grade six enrolment and the schools in the area. On April
26, a visit was made to all schools from Sibley's Cove to
George's Brook to discuss the testing program with teachers
and principals, to make arrangements for testing centers
and the transportation of pupils to them, and to finalize
the testing schedule. A similar visit was made on May 13
to the schools from Trinity to Elliston. Excellent co-
operation was received from all concerned. Appendix U in-
dicates the testing centers used, the testing schedule, and
the arrangements for transportation.

During the month of May, 1968, tests were adminis-
tered to the pupils as shown in Appendix U, and questionnaires
were completed by teachers and parents. The tests were hand
scored and the results, along with the information from the
teacher and parent questionnaires were entered on coding
forms. The coded information was taken to the Computer

Center at Memorial University of Newfoundland for processing in the 1620 I.B.M. Computer. A detailed description of the procedure followed is presented below.

III. SAMPLES

Teacher Sample

The records of the Department of Education revealed that on January 31, 1968, there were 78 classrooms in 77 schools in the two districts under study. These schools were located in 64 communities. However, because one classroom was not in session during the time of study, one teacher was not contacted. The Department's records also showed that teacher qualifications in the teacher sample would range from emergency supply to a grade three teaching certificate. This was later confirmed by data collected directly from the teachers.

Pupil Sample

The records of the Department of Education had shown a total enrolment of 805 grade six students in the two districts on January 31, 1968. However, as already reported regarding the teacher sample, one classroom which housed 14 students was closed during the time of testing and thus the actual enrolment in the classrooms contacted was 791. Out of this number, tests and questionnaires used in this

study were administered partially or completely to 770 students. The other 21 students were absent at the time of testing for a variety of reasons including illness, bereavement and weather conditions. The number who wrote the arithmetic tests was 761.

Parent Sample

The parent sample consisted of the parents or guardians of the pupils used in this study. All parents whose son or daughter had written the complete battery of tests returned questionnaires.

IV. INSTRUMENTS

Five instruments were used to produce the data presented in this study; a teacher questionnaire, a parent questionnaire, a verbal intelligence test, a reading test and an arithmetic test. The following five sections will discuss each in detail.

Teacher Questionnaire

The teacher questionnaire was designed to obtain information on the qualifications of teachers, the number of grade six pupils enrolled in each classroom, the number of days each pupil was absent between September 6, 1967 and April 30, 1968, and the age of the school building. Data on enrolment and absenteeism were taken from the class

register by the teacher. Information on age of school and teacher qualifications as reported by the teacher was checked, where convenient, with the principal and found to be accurate. A copy of the questionnaire is contained in Appendix I.

Parent Questionnaire

Each pupil in the population was given a questionnaire to take home to his parent or guardian seeking the following information: mother's education, father's occupation, and the number of children in the family 18 years of age and under who were living at home. Where possible, the information received on these questionnaires was verified by the teachers and principals. Appendix H contains a copy of this questionnaire.

Verbal Intelligence Test

The Lorge-Thorndike Intelligence Test, Form 3AV was used in this study. The verbal I.Q. obtained from this test is a deviation I.Q. designed to have the same mean and standard deviation at each grade level. For the Lorge-Thorndike Intelligence Test the mean is set at one hundred and the standard deviation at 16. Jones in reviewing the test recommends it highly. He contends that this 1957 version of the Lorge-Thorndike Intelligence Test is among

the best group test available from the point of view of psychological constructs upon which it is based and that of statistical standardization.[1] Another reviewer states that these tests are well designed, easily administered, and scored, and that the uses recommended for them are reasonable and defensible.[2]

The split-half reliability coefficient of the tests had been found to be .94, and the stability coefficient .79. The reliability coefficient arrived at for form 3 AV as a result of a standard error of measurement in points of I.Q. at selected raw score levels for 2,659 cases had been found to be .92.[3]

The statistical validity of the Lorge-Thorndike Intelligence Tests has been well established as a result of studies measuring their relationship with other criteria such as the Iowa Test of Basic Skills, the Standford Inter-mediate, the Iowa Every Pupil Grade Equivalent, and California Achievement Tests, and also with other intelligence

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[1]Oscar K. Buros. (editor), The Fifth Mental Measure-ments Yearbook, (New Jersey: The Grypton Press, 1960), p.479.

[2]Ibid., p. 481.

[3]Irving Lorge and Robert L. Thorndike, The Lorge-Thorndike Intelligence Tests Technical Manual (Boston: Houghton Mifflin Company, 1962), p. 9.

tests such as the <u>California</u> <u>Mental</u> <u>Maturity</u>, the
<u>Kuhlmann-Anderson</u>, and the <u>Otis</u>. The correlations between
the <u>Lorge-Thorndike</u> I.Q. and the <u>Kuhlmann-Anderson</u> I.Q. was
.81.[1] Appendix O contains a copy of this test.

Reading Test

The <u>Nelson</u> <u>Reading</u> <u>Test</u> <u>1962</u> <u>Revised</u> <u>Edition</u>, Form
A, was used as a measure of reading achievement, and the
combined raw scores on the vocabulary sub-test and the
paragraph comprehension sub-test were used as an independ-
ent variable in this study.

Robinson in reviewing the test contends that this
test is an effective measure of reading achievement. He
further states that the standarization procedure was metic-
ulous and comprehensive.[2] Appendix N contains a copy of the
reading test used.

Arithmetic Tests

The arithmetic sections of the <u>Canadian</u> <u>Test</u> <u>of</u>
<u>Basic</u> <u>Skills</u> were used as a measure of arithmetic achieve-
ment. The raw scores on the arithmetic concepts sub-test,
and the arithmetic problem solving sub-test were used as

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[1]<u>Ibid</u>., pp. 15-22.

[2]Buros, <u>op</u>. <u>cit</u>., p. 1082.

dependent variables. The concepts sub-test is composed of 45 items to be completed in 30 minutes. The problem solving sub-test is composed of 31 problems and requires 30 minutes of working time.

The Canadian Tests of Basic Skills is a Canadian version of The Iowa Test of Basic Skills widely used in the U.S.A. and very favourably reviewed in The Fifth Mental Measurement Yearbook. The authors of the tests have this to say:

> The Canadian Tests of Basic Skills have been developed from the extensive work in test construction carried out at the University of Iowa for over thirty-five years. Fourteen editions of the "broad-level" form of the Iowa Every-Pupil Tests of Basic Skills were constructed and used in the Iowa Testing program. All that had been learned through this extensive experience was utilized in the construction of the multi-level editions and in the Canadian Tests.[1]

Also, Canadian students from all types of English speaking schools and from all ten Provinces were used in standardizing these tests. Furthermore, the authors contend that all commonly used principles in the validation of test content were applied in the preparation of individual test items.[2]

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[1] A. N. Hieronymus, Ethel M. King, and E. F. Lindquist, Canadian Tests of Basic Skills Manual (Thomas Nelson & Sons (Canada) Limited, Houghton Mifflin Company, 1968), p. 6.

[2] Ibid. p. 6.

The split-half reliability coefficient of the concept-sub-test grade six had been found to be .83 and the split-half reliability coefficient of the problem solving sub-test had been found to be .79.[1]

The directions for administering these tests are clear and concise, and the administration time is not unduly long. The arithmetic sub-test sections give, in the writer's opinion, a fair if not an adequate coverage of the grade-six arithmetic course as prescribed by the Newfoundland Department of Education for use in all schools in the Province. Appendices L and M contain a copy of these tests.

V. ADMINISTERING AND SCORING TESTS

The tests were administered in conjunction with other batteries of tests, and in co-operation with the two co-workers who were gathering data on the same sample, as previously mentioned, for research projects in reading and language achievement. Detailed instructions for administering the test were used to insure uniformity of procedure. The schedule was arranged in such a way that not more than a morning or an afternoon was used for testing in one day with a given group of pupils and all tests were given

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[1] Ibid., p. 42.

in the same sequence to all students. Appendix V contains the schedule of tests administration. A rest period of 15 minutes was given between the language sub-tests and the arithmetic sub-tests and there were short rest periods between the other tests.

The testing program was carried out by the three co-workers involved during the period between May 1, 1968 and May 21, 1968. Thirty-three test centres were used for the testing program, and pupils were transported to these centres where necessary. Appendix U gives the names of centres and types of transportation used. More than 75% of the pupils were tested in groups of 20-25, and in no case did a group include fewer than 8 or more than 57. A copy of the parent questionnaire was left with each pupil at the end of the first session. This was to be returned at the second session. From these questionnaires information on mother's education, father's occupation and the number of children in the family was received. A copy of the teacher's questionnaire was left with the teacher during the first session for completion and return. From these questionnaires information was obtained on teachers' qualifications, class enrolment, age of building and absenteeism. From these two questionnaires complete information on all variables

was obtained for 684 pupils.

To convert the scores on the <u>Lorge-Thorndike</u> <u>Intelligence</u> <u>Test</u> the so called 'deviation I.Q.' obtained from a table furnished by the authors was used. These I.Q.'s have a norm of 100 and a standard deviation of 16. I.B.M. 805 answer sheets were used with this test, and a right scoring mask was used for hand scoring.

The answer sheets used with <u>The</u> <u>Nelson</u> <u>Reading</u> <u>Test</u> were self-scoring, and the total raw score was used as an independent variable.

The answer sheets used with the arithmetic tests were scored by hand using a right scoring mask. The raw scores obtained on the concept sub-test and the problem solving sub-test were used as dependent variables.

VI. DATA PROCESSING

All data from the questionnaires and tests were transferred to intermediate sheets, coded, and punched on I.B.M. cards. An example of the tabulation of these data is shown in Table II. The statistical procedures used to analyze the data and to test the hypotheses included a computer programme to obtain Pearson product-moment correlation coefficients. Partial Pearson product-moment correlation coefficients, multiple correlation coefficients, F-Tests and

TABLE II

TABULATION OF DATA FROM TESTS AND QUESTIONNAIRES

Pupil Computer no.	Mother's Education	Father's Occupation	Size of Family	Days Absent	I.Q.	Concepts	Problems	Reading	No. in Class	Teacher qualifications	Age of School
001	09	464	01	60	110	21	14	65	34	03	51
065	02	321	09	20	089	32	21	72	06	01	06

Note:

Under father's occupation 464 means 46.4 because it has been multiplied by 10 to clear decimals. Similarly the 60 under days absent really means 6 days absent.

t-Tests were also used in the analysis.   A detailed des-
cription of these statistical procedures as they were
applied to the data is given in Chapter V.

CHAPTER IV

DESCRIPTIVE ANALYSIS

This chapter gives an overall view of the distribution of pupils classified by each of the several variables used in the study. Classification will follow in this order: sex, intelligence, reading, mother's education, father's occupation, size of family, absenteeism, classroom enrolment, teacher's qualification, age of school, arithmetic concepts, and arithmetic problem solving. The testing of hypotheses will be carried out in chapter five.

I. SEX

As shown in Table III, 761 pupils in 77 classrooms wrote the arithmetic tests. Of this number 356 were girls and 405 were boys. However, complete information on all variables was obtained for only 684 pupils. Because of limitations imposed by computer programs, only those students

TABLE III

PUPILS CLASSIFIED BY SEX

	Number Writing Arithmetic Tests	Number for Whom Complete Information was Obtained
Girls	356	323
Boys	405	361
Total	761	684

for whom complete data were obtained could be used in the statistical analysis. Consequently, each section of this chapter and each section of Chapter V will report data on 684 pupils.

II. INTELLIGENCE

In Table IV pupils have been classified into a frequency distribution, both on the basis of sex and as

TABLE IV

PUPILS CLASSIFIED BY INTELLIGENCE

Class Interval (I.Q.'s)	Boys	Girls	Both Sexes	Normal Distribution
	%	%	%	%
130 and over	1.7	3.7	2.8	3.0
120 - 129	2.8	5.0	3.8	7.6
110 - 119	8.3	11.1	9.6	16.0
100 - 109	14.5	22.3	18.2	23.4
90 - 99	26.1	30.6	28.2	23.4
80 - 89	28.3	18.6	23.7	16.0
70 - 79	13.3	6.8	10.2	7.6
Below 79	5.0	1.9	3.5	3.0
Median	91	97	94	100
Mean	92	98	95	100
S.D.	15	15	15	16

one group. The table indicates a considerable difference between the mean I.Q.'s for girls and for boys as well as between the median I.Q.'s of these groups. The girls are

much nearer the norming population on both the mean and the median I.Q. The mean I.Q. of the total sample was five points below (median six points below) that of the U.S. pupils comprising the norming population. Scores from the present study compared favourably with those of American pupils in below average socioeconomic communities. For means, boys were eight points below total norms and the girls two points; for medians the differences were nine and three, respectively.[1]

III. READING

The Nelson Reading Test was used as a measure of reading ability. The total combined raw scores on the vocabulary sub-test and the paragraph comprehension sub-test was used as an independent variable. Table V presents a classification of pupils on the basis of their reading scores. Again, as in the case of intelligence, the table indicates a considerable difference between the mean reading scores for girls and for boys as well as between the median reading scores of these two groups. Furthermore, the median reading scores of the grade-six pupils used in

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[1] The norming population consisted of 136,000 children in 22 American States, from a random sample of 44 communities stratified according to socioeconomic criteria. See Irving Lorge and Robert L. Thorndike, The Lorge-Thorndike Intelligence Tests Technical Manual, pp. 5-7.

this study were appreciably below American national norms.[1]
A comparison of the grade equivalent norms shows that the
average boy used in the present study had a grade equivalent
of 5.4, the average girl had a grade equivalent of 6.0 and
the average student, with both sexes combined, had a grade
equivalent of 5.7.   Since the pupils were tested in May, the

TABLE V

CLASSIFICATION OF PUPILS BY TOTAL READING SCORE

Class Intervals (Raw Scores)	Boys	Girls	Both Sexes
	%	%	%
135 and up		.3	.1
120 – 134	.8	2.1	1.5
105 – 119	2.8	6.4	4.5
90 – 104	5.2	5.9	5.6
75 – 89	16.3	31.4	23.4
60 – 74	30.3	32.3	31.2
45 – 59	28.5	16.7	23.0
30 – 44	12.5	4.3	8.8
15 – 29	3.4	.6	1.9
Median	62	73	67
Mean	63	73	68

[1]M. J. Nelson, The Nelson Reading Test Examiner's
Manuel (Boston: Houghton Mifflin Company, 1962),pp. 13
and 17.

ninth month of grade six, the expected grade equivalent was
6.9. This means the average boy is fifteen months behind
the median American child in the norming population, the
average girl is nine months behind and for both sexes the
deficit is twelve months.

IV. MOTHER'S EDUCATION

The number of years of attendance in an institution
of formal learning was used as a measure of mother's edu-
cation. The necessary information was obtained from a
questionnaire which each parent or guardian was asked to
complete. This information was then quantified according
to an eighteen point scale.[1] Table VI classifies students
on the basis of mother's education. As the table indicates,
the average mother had seven and a half years of formal
training. The mothers of more than 67 per cent of the stu-
dents tested had eight years or less of formal training,
and only 12 per cent of the pupils had mothers who had com-
pleted high school. More than 25 per cent of the pupils
had mothers who were classified as functionally illiterate;
that is, had no more than grade-five education. Thus it
would appear that students from these two districts are
at a serious disadvantage when it comes to seeking parental

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[1] See Appendix K.

assistance with home studies. Furthermore, it is generally recognized that parents with low educational background are not so apt to impress upon their children the necessity of

TABLE VI

CLASSIFICATION OF PUPILS BY MOTHER'S EDUCATION

Points	Number of Pupils	%
14	3	.5
13	4	.6
12	32	4.6
11	43	6.3
10	53	7.7
9	88	12.9
8	134	19.6
7	67	9.8
6	82	12.0
5	64	9.4
4	66	9.6
3	28	4.1
2	16	2.3
1	4	.6
Median	7.5	
Mean	7.4	
Total	684	100.0

obtaining a sound education. Malik puts it this way:

> "The education of the mother plays a signif-
> icant role in the socialization of the child. It

is usually the mother to whom the child brings
his school problems. If the mother is educated
and able to help with school work, the child is
encouraged and takes a greater interest in stud-
ies and develops motivation for success and
achievement. On the other hand, if the mother
is uneducated and cannot help, the child may
lose interest in education at a young age and may
be an early drop out from school".[1]

V. FATHER'S OCCUPATION

Descriptions of father's occupation were obtained
by means of a questionnaire and then quantified by means of
the Blishen Scale.[2] Table VII presents a classification
of pupils on the basis of the seven occupational categories
of the scale. The most striking feature revealed by this
table is that 90.6 per cent of all pupils have fathers
whose occupational status falls in the three lowest cate-
gories. This means that less than 10 per cent of the stu-
dents have fathers in the highly skilled, managerial and
professional categories. Since most of the research liter-
ature presented in Chapter II used the father's occupation
as the key index in determining the socioeconomic status
of the family and since all these studies showed a positive
relationship between academic achievement and socioeconomic

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[1]Mukhtar A. Malik, "School Performance of Children
in Families Receiving Public Assistance in Canada". The
Canadian Welfare Council, (Ottawa, September, 1966), pp.
60 and 61.

[2]See Appendix P.

TABLE VII

CLASSIFICATION OF PUPILS BY FATHER'S OCCUPATION

Class	Number of Pupils	%
1	3	.4
2	39	5.7
3	7	1.0
4	16	2.3
5	107	15.6
6	210	30.8
7	302	44.2
Mean	43.2	
Total	684	100.0

status, it appears, again, as in the case of mother's education, that most of the pupils of the area under study find themselves at a disadvantage coming from the lower socioeconomic strata of society.

However, as will be reported later, the Blishen scale was found to be much too coarse a measure of the occupational status of the wage earners of Trinity Bay. All fishermen, for example, were given the same occupational status rating, whereas it was quite obvious to the investigator that substantial differences existed between the levels of income, and thus the other amenities of life,

even among fishermen in the same community. Some fisher-
men owned and operated expensive boats and equipment which
yielded moderately high returns, whereas other fishermen
owned very little, if anything, and their returns were not
sufficient to keep body and soul together.

VI.   SIZE OF FAMILY

Information on size of family was obtained from the
parent questionnaire. Only children eighteen years of age
and under were counted. In Table VIII pupils have been
classified by the number of children in the family. As
the table indicates, the majority of the grade-six pupils
in Trinity Bay came from extremely large families. Some
33 per cent of the total sample came from families in
which there were six or more children under eighteen. Less
than 20 per cent of the pupils came from homes where there
were 2 children or fewer per family. The number of chil-
dren in the median family in this study was almost twice
as large as the provincial average of 2.7 and two and one-
half times as large as the national average of 1.9.[1]   Thus,

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[1]H. Kitchen, "A Preliminary Study of Demographic and
Socio-Economic Factors in the Atlantic Provinces and Their
Relationship to Measures of Educational Output". (St. John's,
October, 1967), p. 12. It should be noted that Kitchen's
findings are based on all families whereas this study in-
cludes only those families who have children in grade six.

the large size family added to the low levels of parental
education and occupation provides for the students of Trin-
ity Bay what would appear to be an educationally deprived
home environment.

TABLE VIII

CLASSIFICATION OF PUPILS BY SIZE OF FAMILY

Number of Children	Number of Pupils	%
1	49	7.2
2	79	11.5
3	125	18.4
4	100	14.6
5	105	15.4
6	80	11.7
7	51	7.5
8	45	6.6
9	27	3.9
10	11	1.5
11+	12	1.7
Median	4.5	
Total	684	100.0

VII. ABSENTEEISM

Table IX classifies pupils on the basis of days
absent from school. This information was obtained by means
of the teacher's questionnaire. Operationally, it has been

defined as the number of days pupils were absent from September 6th, 1967, to April 30th, 1968.

TABLE IX

CLASSIFICATION OF PUPILS BY ABSENTEEISM

Number of Days Absent	Number of Pupils	%
40.0 - 44.5+	9	1.3
35.0 - 39.5	7	1.0
30.0 - 34.5	4	.6
25.0 - 29.5	8	1.2
20.0 - 24.5	25	3.7
15.0 - 19.5	52	7.6
10.0 - 14.5	107	15.6
5.0 - 9.5	189	27.6
0 - 4.5	283	41.4
Median	6.45	
Total	684	100.0

As can be seen from the table, the attendance record for the period under study was extremely good. Exactly 69 per cent of the pupils lost less than 10 days and only 15 per cent lost more than 14.5 days. The median for days lost was 6.45

VIII.   ENROLMENT IN CLASS

The number of pupils per classroom was used as an

index of the size of school. The necessary information was obtained by means of the teacher's questionnaire. It can be seen from Table X that 52 out of the 77 classrooms visited housed 15 or fewer students per classroom.

TABLE X

CLASSIFICATION OF PUPILS
BY CLASSROOM ENROLMENT

Number in Class	Number of Classrooms	Number of Pupils	%
31 - 33	2	62	9.1
28 - 30	4	106	15.5
25 - 27	2	42	6.1
22 - 24	4	83	12.1
19 - 21	2	26	3.8
16 - 18	1	17	2.5
13 - 15	9	88	12.9
10 - 12	8	99	14.5
7 - 9	10	64	9.4
4 - 6	15	58	8.4
1 - 3	20	39	5.7
Median		15.3	
Total	77	684	100.0

Approximately 50 per cent of the students were found in these classrooms. Only 8 classrooms housed 25 or more stu-

dents. These facts reveal that most of the grade-six students used in this study were attending multi-grade classrooms, in which one teacher was struggling with as many as six grades and trying to teach six to eight courses per grade.

IX. TEACHER'S QUALIFICATIONS

The teaching certificate or licence held by a teacher was used as a measure of his qualifications. This information was obtained by means of a questionnaire and quantified on the basis of an eight point scale.[1] Table XI reveals that 48.7 of the teachers used in the sample have

TABLE XI

CLASSIFICATION OF PUPILS BY
TEACHER'S QUALIFICATION

Number of Points	Teachers %	Number of Pupils	%
8+			
7	6.5	44	6.5
6	12.9	163	23.7
5	32.4	238	34.7
4	6.5	54	7.7
3	2.7	23	3.5
2	28.6	118	17.4
1	10.4	44	6.5
Total	100.0	684	100.0

[1]See Appendix J.

less than the equivalent of one year's university training. Although teachers in these first four categories make up approximately one half the teacher sample, they teach only 38.4 per cent of the pupils. On the other hand 19.5 per cent of the teachers have two or more years of university training. Yet, these more highly qualified teachers instruct 30.5 per cent of the student sample. These findings suggest that the more highly-qualified teachers are associated with the larger schools.

X. AGE OF SCHOOL

The age of the school referred to the number of years the school building had been in use and was obtained from the teacher's questionnaire. Table XII presents a classification of pupils by age of school. The table reveals that the majority of grade VI pupils in Trinity Bay were accommodated in relatively new school buildings. Approximately 22 per cent of the student sample were attending schools which were not more than 5 years old, 39 per cent were found in schools which were not more than 10 years old and more than 75 per cent were found in buildings which were not more than 20 years old. This means that less than one quarter of the students were housed in relatively old buildings. However, it should be pointed out that, except for the physical comforts, most of the newer buildings were,

from an educational point of view, just as inflexible and
disfunctional as were the old.

TABLE XII

CLASSIFICATION OF PUPILS BY AGE OF SCHOOL

Age of School (Years)	Number of Pupils	%
41 and up	11	1.6
36 - 40	2	.3
31 - 35	19	2.8
26 - 30	25	3.7
21 - 25	102	14.9
16 - 20	102	14.9
11 - 15	156	22.8
6 - 10	115	16.8
1 - 5	152	22.2
TOTAL	684	100.0

XI. ARITHMETIC CONCEPTS

A measure of the pupils' knowledge of arithmetic
concepts was obtained by administering the arithmetic con-
cepts sub-test of the Canadian Tests of Basic Skills. Con-
cepts involving currency, decimals, equations, fractions,
geometry, measurement, numerals and number systems, per cent,
ratio and proportion, and whole numbers are represented in
this test. The test contains forty-five items and requires

thirty minutes of working time. In Table XIII pupils have
been classified into a frequency distribution, both on the
basis of sex and as one group.

TABLE XIII

CLASSIFICATION OF PUPILS BY ARITHMETIC CONCEPTS SCORES

Raw Scores	Boys %	Girls %	Both Sexes %	G E[a]
45 - 49	0.0	0.0	0.0	10.1+
40 - 44	1.1	.9	1.0	9.2 - 9.8
35 - 39	3.0	2.5	2.8	8.2 - 8.9
30 - 34	6.4	7.7	7.0	7.5 - 8.0
25 - 29	11.1	8.7	9.9	6.7 - 7.3
20 - 24	19.7	23.5	21.5	6.0 - 6.6
15 - 19	25.2	26.3	25.8	5.0 - 5.8
10 - 14	26.6	24.8	25.8	4.0 - 4.8
5 - 9	6.6	5.6	6.1	3.1 - 3.8
0 - 4	.3		.1	2.5 - 3.0
Median	17.6	18.2	17.9	
Mean	19.0	19.1	19.0	

Source: MRC Scoring Mask, Canadian Test of Basic Skills

A transformation of the median scores of both sexes
into the grade equivalent, also shown in the table, reveals
that the median grade-six student used in this study had
a grade equivalent of 5.6. The expected grade equivalent
was 6.9, since all tests were administered during the ninth

month of the school year. Thus, the average grade six student in Trinity Bay on arithmetic concepts was a full 13 months behind his counterpart in the norming population.[1] Even worse, only 16 per cent of the norming population did as badly as the average student used in this study. This is a disturbing situation and certainly calls for immediate action on the part of educational authorities.

XII. ARITHMETIC PROBLEM SOLVING

A measure of the pupils' knowledge of arithmetic problem solving was obtained by administering the arithmetic problem solving sub-test of the Canadian Test of Basic Skills. This test contains thirty-one items and requires thirty minutes of working time. A copy of this test is found in Appendix M. Table XIV presents a distribution of pupils on the basis of their raw scores and grade equivalents on this test.

A glance at the table reveals that the girls scored appreciably higher than the boys on the problem solving test. This might be accounted for by the fact that the girls scored considerably higher than did the boys on both the verbal

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[1]The norming population consisted of 25,123 children drawn as a stratified random sample of Canadian Schools in which English was the language of instruction. See "Manual For Administrators, Supervisors and Counsellors", Canadian Test of Basic Skills, pp. 50 - 51.

intelligence test and the reading test. However, both groups were much nearer the expected grade equivalent of 6.9 on the problem solving test than they were on the concept test. The median score for both sexes showed a grade equivalent of 6.3 which was 6 months, or more than a half year, behind their counterpart in the norming population.

TABLE XIV

CLASSIFICATION OF PUPILS BY ARITHMETIC
PROBLEM SOLVING SCORES

Class Interval Raw Scores	Boys %	Girls %	Both Sexes %	G E[a]
28+	1.1	2.5	1.6	9.2 - 9.7
25 - 27	1.7	5.9	3.7	8.6 - 9.0
22 - 24	6.1	6.1	6.1	7.9 - 8.4
19 - 21	6.1	11.4	8.6	7.3 - 7.7
16 - 18	11.6	18.5	14.9	6.8 - 7.1
13 - 15	16.1	16.1	16.1	6.3 - 6.6
10 - 12	26.0	19.1	22.8	5.6 - 6.1
7 - 9	17.5	11.5	14.6	4.5 - 5.3
4 - 6	11.9	7.7	10.0	3.4 - 4.1
1 - 3	1.9	1.2	1.6	2.6 - 3.1
Median	11.70	14.50	13.10	
Mean	12.47	14.65	13.50	

[a]Source: MRC Scoring Mask, Canadian Test of Basic Skills.

XIII. SUMMARY

The descriptive analysis presented in this chapter showed the distribution of pupils when classified by each of the variables used in the study. It was found that of the 684 students used 323 were girls and 361 were boys. The mean I.Q. of these students was found to be considerably below average, and, in fact, placed them in the same category with the low average and below average socioeconomic groups in the U.S. norming population. On the reading test the pupils' median performance was found to be 1.2 grades below the U.S. norms.

The median for mother's education was 7.5 years of formal schooling. Approximately, 90 per cent of the fathers pursued occupations which were found in the lower three classes of the Blishen Scale. The median sized family, defined as the number of children 18 years of age and under living at home, was 4.5. The median number of days lost per pupil was 6.45.

The educational input variables showed: (1) that the median size grade-six class was approximately 15, (2) that teachers' qualifications ranged from emergency supply to grade three with the median being B licence, (3) that the majority of pupils attended schools which were less than 15 years old.

The median student's performance on arithmetic concepts was 1.3 grades below the Canadian national norm and .6 grades below on arithmetic problem solving.

CHAPTER V

STATISTICAL ANALYSIS

This chapter tests the hypotheses of the study as established in Chapter II. The first nine sections deal with the hypotheses specifying relationships between the various input variables and arithmetic achievement. The tenth section tests the major hypothesis, namely, that socio-economic variables are related more closely to arithmetic achievement than are educational input variables. The .05 level of statistical significance will be used throughout.

I. SEX

Hypothesis I predicted that there would be no signif-icant difference between the performance of girls and boys on arithmetic concepts, while hypothesis II predicted that girls would score higher than boys on arithmetic problem solving. Using a one-tailed t-test for independent samples, after F-tests had revealed homogeneity of variance and after ascertaining from scanning the frequency distribution of tables XIII and XIV that the distributions were approx-imately normal, it was found as predicted that the mean scores of girls on arithmetic concepts were not statis-tically different from the mean scores of the boys at the .05 level. Also as predicted, the mean scores of girls on arithmetic problem solving was significantly greater than

that of the boys. Table XV sets forth the data.

TABLE XV

A COMPARISON OF MEANS AND STANDARD DEVIATIONS OF CRITERIA AND PREDICTORS FOR 361 BOYS AND 323 GIRLS

Variables	Boys	Girls	t	Standard Deviations Boys	Girls	F-ratio
Criteria						
Arithmetic Concepts	18.97	19.10	.23	7.59	7.21	1.10
Arithmetic Problem Solving	12.47	14.65	4.74*	5.66	6.29	1.23
Predictors						
Intelligence	92.28	98.35	5.32*	14.81	14.88	1.01
Total Reading	63.46	73.28	6.59*	19.42	19.90	1.00
Mother's Education	7.36	7.30	0.06	2.69	2.51	1.15
Father's Occupation	43.33	43.09	0.47	6.41	6.91	1.16
Size of Family	4.72	4.60	0.67	2.45	2.31	1.12
Absenteeism	7.72	9.14	2.15*	8.70	8.62	1.02
Enrolment in Class	18.27	17.07	1.65	9.56	9.43	1.03
Age of School	13.90	15.50	2.06*	9.20	10.91	1.41*
Teacher's Qualifications	4.50	4.37	1.00	1.72	1.74	1.02

*Significant at the .05 level. For degrees of freedom greater than 120 a t of 1.96 is significant at the .05 level, one of 2.57 at the .01 level. See George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw Hill, 1966), p. 167 and, for the case of unequal variance, p. 171.

II. INTELLIGENCE

Hypotheses III and IV predicted that positive re-
lationships would be found between verbal intelligence on
the one hand and arithmetic concepts and arithmetic problem
solving on the other. To test these hypotheses Pearson
product moment correlation coefficients were calculated and
are set forth in Table XVI. As hypothesized, the correlation

TABLE XVI

CORRELATION COEFFICIENTS BETWEEN INTELLIGENCE
AND ARITHMETIC ACHIEVEMENT

(a) Raw Correlations

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.66	.001	.55	.001
Girls	323	.70	.001	.67	.001
Both Sexes	684	.67	.001	.62	.001

(b) Correlation Coefficients with Reading Partialled out.

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance
Boys	361	.36	.001	.27	.01
Girls	323	.30	.01	.21	.05
Both Sexes	684	.33	.001	.23	.01

[a]Where N exceeds 100, a r of .16 is required for
significance at the .05 level, .23 at the .01 level and .32
at the .001 level. See George A. Ferguson, _Statistical
Analysis in Psychology and Education_, (New York: McGraw
Hill, 1966), p. 413.

coefficients between intelligence and arithmetic concepts of .66 for boys and .70 for girls are statistically signif- icant. Similarly, the correlation coefficients between in- telligence and problem solving of .55 for boys and .67 for girls, although smaller, are also statistically significant. These correlations are similar to those reported in the studies of chapter II.

Another observation regarding the data of table XVI seems noteworthy; namely, that I.Q. is related more to concepts than to problem solving in all comparisons. The differences in the size of the correlation coefficients are statistically significant in three of the four cases.[1]

Although the relationship between problem solving and I.Q. is significantly greater for girls than for boys, the statistical significance disappears with reading partial- led out.

For greater precision and when applicable, subsequent hypotheses will be tested with intelligence partialled out.

III. READING ABILITY

Hypotheses V and VI predicted that positive relation- ships would be found between reading ability and arithmetic

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[1]See Ferguson, op. cit., pages 187-189 for methods of testing the difference between correlation coefficients.

concepts, and between reading ability and arithmetic problem solving. Table XVII presents the Pearson product moment correlation coefficients both before and after intelligence is partialled out.

As hypothesized, the correlation coefficients show statistically significant positive relationships between reading ability and both measures of arithmetic achievement. The correlation coefficients are higher for concepts than for problem solving and vice versa with I.Q. partialled out. However, none of these differences is statistically significant.

Again, although the relationships between concepts and reading ability and between problem solving and reading ability are significantly greater for girls than for boys, the statistical significance disappears with I.Q. partialled out.

Thus, hypothesis V and VI were supported. However, the considerable overlap between verbal intelligence and reading ability should be noted. It appears that an increase in a pupil's reading ability would bring a corresponding increase in his verbal intelligence, as well as an increase in the level of his arithmetic achievement. The Royal Commission on Education and Youth sums it up this way:

"Reading remains the fundamental educational skill: without it, no student can perform adequately in school".[1]

TABLE XVII

CORRELATION COEFFICIENTS BETWEEN READING
ABILITY AND ARITHMETIC ACHIEVEMENT

(a) Raw Correlations

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.63	.001	.59	.001
Girls	323	.73	.001	.69	.001
Both Sexes	684	.66	.001	.65	.001

(b) Correlation Coefficients with intelligence partialled out

Boys	361	.25	.01	.31	.01
Girls	324	.32	.001	.33	.001
Both Sexes	684	.28	.01	.33	.001

[a]Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

IV. MOTHER'S EDUCATION

Hypotheses VII and VIII predicted that positive re-

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[1]Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, 1 (St. John's; The Queen's Printer), pp. 38-41.

lationships would be found between the mother's education and pupils' scores on both arithmetic concepts and arithmetic problem solving. Mother's education was obtained by means of the parent questionnaire and was quantified on the basis of an eighteen point scale.[1] Pearson product moment correlation coefficients were then calculated between the reported education of the mother and the two measures of arithmetic achievement. These correlations both before and after intelligence is partialled out are reported in Table XVIII.

The raw correlations between mother's education and pupils' scores on arithmetic concepts of .24 for boys, .21 for girls and .22 for both sexes are all statistically significant. The raw correlations between mother's education and pupils' scores on arithmetic problem solving of .20 for boys, .19 for girls and .19 for both sexes are also statistically significant.

However, with intelligence partialled out, the statistical significance of the relationship between mother's education and pupils' arithmetic achievement is removed. This suggests that the association between mother's education and

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[1]See Appendex K.

pupils' arithmetic achievement is almost totally included in the measure of verbal intelligence or that differences in mother's education are associated both with differences in verbal intelligence and with differences in reading achievement. However, the limited range of mother's education should be noted. As table VI, Chapter IV reveals, 66 per cent of the mothers used in the study had eight years or

TABLE XVIII

CORRELATION COEFFICIENTS BETWEEN MOTHER'S
EDUCATION AND ARITHMETIC ACHIEVEMENT

(a) Raw Correlations					
Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.24	.01	.20	.05
Girls	324	.21	.05	.19	.05
Both Sexes	684	.22	.05	.19	.05
(b) Correlation Coefficients with intelligence partialled out					
Boys	361	.01	NS	.005	NS
Girls	324	.003	NS	.017	NS
Both Sexes	684	.010	NS	.016	NS

[a]Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

less of formal training. Had the level of mother's edu-
cation been more evenly distributed over the eighteen point
scale quite different correlation might have been obtained,
even with intelligence partialled out.

V. FATHER'S OCCUPATION

Positive relationships between father's occupation
on the one hand and arithmetic concepts and arithmetic prob-
lem solving on the other were predicted by hypotheses IX
and X respectively. Father's occupation was obtained by
means of the parent questionnaire. These occupations were
then quantified by means of the Blishen Scale. Correlation
coefficients were calculated between the total point value
given these occupations and both measures of arithmetic
achievement. Table XIX reports these correlations both
before and after intelligence is partialled out.

As Table XIX indicates, the correlations for hypoth-
esis IX were .26 for boys and .28 for girls and for hypothesis
 X .21 for boys and .23 for girls, all being statistically
significant. However, with intelligence partialled out,
the statistical significance of the relationships between
father's occupation and the pupils' arithmetic achievement
is removed.

The dropping of these correlation coefficients to

non-statistical significance seems to suggest that father's occupation as such has very little effect upon arithmetic achievement, that only by virtue of its association with intelligence does it reach a significant level. Yet, the fault may be not so much with father's occupation per se as with the operational definition employed. As previously mentioned, the Blishen occupational class scale is of limited

TABLE XIX

CORRELATION COEFFICIENTS BETWEEN FATHER'S
OCCUPATION AND ARITHMETIC ACHIEVEMENT

(a) Raw Correlations

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.26	.01	.21	.05
Girls	323	.28	.01	,23	.01
Both Sexes	684	.27	.01	.22	.05

(b) Correlation Coefficients with intelligence partialled out

Boys	361	.13	NS	.09	NS
Girls	323	.09	NS	.03	NS
Both Sexes	684	.12	NS	.06	NS

[a]Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

validity in the study of local areas such as Trinity Bay, where many men, particularly fishermen, although of very different socioeconomic standing occupationally, neverthe-less receive the same score. The employment of a more locally valid index with finer powers of discrimination might have revealed stronger and more unique relationships between father's occupation and pupils' arithmetic achieve-ment.

VI.   NUMBER OF CHILDREN IN THE FAMILY

Hypotheses XI and XII predicted negative rela tion-ships between the number of children in the family and both measures of arithmetic achievement. The number of children in the family eighteen years of age and under was obtained by means of the parent questionnaire. Correlation coeffic-ients we're computed between the number of children in the family and each measure of arithmetic achievement. These correlation coefficients are presented in Table XX both before and after intelligence is partialled out.

As indicated in the table, all the raw correlation coefficients between number of children in the family and arithmetic achievement are in the direction hypothesized. However, the number of children in the family appears to have a much greater effect on the arithmetic achievement of

girls than of boys. The correlation coefficient of -.23 for girls between number of children and arithmetic concepts is statistically significant at the .01 level and the coefficient of -.15 for girls between number of children and arithmetic problem solving, although not statistically significant, is just on the border line. The corresponding correlations for boys are -.06 and -.05, neither of which is significant.

TABLE XX

CORRELATION COEFFICIENTS BETWEEN NUMBER OF CHILDREN
IN THE FAMILY AND ARITHMETIC ACHIEVEMENT

(a) Raw Correlations

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	-.06	NS	-.05	NS
Girls	323	-.23	.01	-.15	NS
Both Sexes	684	-.13	NS	-.10	NS

(b) Correlations with intelligence partialled out.

Boys	361	.04	NS	.05	NS
Girls	323	-.12	NS	-.03	NS
Both Sexes	684	-.07	NS	.001	NS

[a]Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

With intelligence partialled out, none of the corre-
lations is statistically significant.

VII. ABSENTEEISM

An inverse relationship between pupil absenteeism
and both measures of arithmetic achievement was predicted
by hypotheses XIII and XIV. The information on pupils'
absenteeism was obtained by means of the teacher's quest-
ionnaire and was taken directly from the class registers.
Correlations were computed between absenteeism and both
measures of arithmetic achievement. Table XXI reports these
correlations.

TABLE XXI

CORRELATION COEFFICIENTS BETWEEN ABSENTEEISM
AND ARITHMETIC ACHIEVEMENT

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	-.11	NS	-.03	NS
Girls	323	-.12	NS	-.09	NS
Both Sexes	684	-.12	NS	-.05	NS

[a]Where N exceeds 100, a r of .16 is required for
significance at the .05 level, .23 at the .01 level and .32
at the .001 level.

Although none of the correlation coefficients re-

ported in Table XXI is statistically significant, all are
in the hypothesized direction. The lack of statistical sig-
nificance may be due in part to the operational definition.
The eight month period for which the record of absenteeism
was obtained was probably insufficient time to detect the
association of this variable with arithmetic achievement.
Furthermore, as Table IX, Chapter IV reveals, pupil attendance
record for the period under study was extremely good. Of
course, it must be remembered that all pupils used in this
sample came under the compulsory school attendance laws.

VIII. CLASS ENROLMENT

Hypotheses XV and XVI predicted a positive relat-
ionship between the size of class and each of the measures
of arithmetic achievement. The size of class was obtained
by means of the teacher's questionnaire and was used as an
index of the size of the school. Table XXII reports the
correlation coefficients which were computed between the
number in class and each of the arithmetic achievement
test.

As is shown in the table, the correlation coeffic-
ients of .07 for boys and .15 for girls between size of class
and arithmetic achievement are not statistically significant;
neither are the coefficients of -.03 for boys and .06 for
girls between size of class and arithmetic problem solving.

TABLE XXII

CORRELATION COEFFICIENTS BETWEEN CLASS
ENROLMENT AND ARITHMETIC ACHIEVEMENT

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.07	NS	-.03	NS
Girls	323	.15	NS	-.06	NS
Both Sexes	684	.10	NS	-.004	NS

[a]Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

IX. TEACHER'S QUALIFICATIONS

Hypotheses XVII and XVIII predicted that positive relationships would be found between teachers' qualifications and both measures of arithmetic achievement. Teachers' qualifications were obtained by means of the teacher's questionnaire and quantified on the basis of an eleven point scale.

With the exception of .16 for girls between teachers' qualifications and arithmetic concepts, not one of the correlations reported in Table XXIII is statistically significant. Nevertheless, with the exception of -.02 for boys between teacher's qualification and problem

solving, all of the correlations are in the hypothesized direction. It appears that teachers' qualifications may have a greater effect upon girls than upon boys. However, it should be noted that the girls scored higher than boys on verbal intelligence and reading ability.

TABLE XXIII

CORRELATION COEFFICIENTS BETWEEN TEACHERS'
QUALIFICATIONS AND ARITHMETIC ACHIEVEMENT

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	.12	NS	-.02	NS
Girls	323	.16	.05	.14	NS
Both Sexes	684	.13	NS	.05	NS

[a]Where N exceeds 100, a r of .16 is required for significance at .05 level, .23 at the .01 level, and .32 at the .001 level.

It should be pointed out that these low correlations might have resulted from the narrow range of the data on teachers' qualifications. No teacher had more than three years of university training or its equivalent.

X.   AGE OF SCHOOL BUILDING

Hypotheses XIX and XX predicted an inverse relat-

ionship between the age of the school building and both measures of arithmetic achievement. The age of school building was obtained by means of the teacher's questionnaire.

As hypothesized, all of the correlations presented in Table XXIV are in the hypothesized direction but none of them are statistically significant. It appears that for the grade-six pupils of Trinity Bay the age of the school building is unrelated to their arithmetic achievement.

TABLE XXIV

CORRELATION COEFFICIENTS BETWEEN AGE
OF SCHOOL AND ARITHMETIC ACHIEVEMENT

Sex	N	Concepts	Level of Significance	Problem Solving	Level of Significance[a]
Boys	361	-.09	NS	-.06	NS
Girls	323	-.06	NS	-.006	NS
Both Sexes	684	-.08	NS	-.013	NS

[a]Where N exceeds 100, a r of .16 is required for significance at .05 level, .23 at the .01 level, and .32 at the .001 level.

XI. SOCIOECONOMIC VERSUS EDUCATIONAL INPUTS

This section tests the major hypotheses of this study, namely that socioeconomic variables will be more closely related to arithemtic achievement than educational variables.

Two procedures will be used to test these hypotheses. First, there will be set forth a comparison of the size of the correlation coefficients between socioeconomic variables and both measures of arithmetic achievement and the size of the correlation coefficients between educational input variables and both measures of arithmetic achievement. Secondly, there will be set forth a comparison of the size of the multiple correlation coefficients between socioeconomic variables and both measures of arithmetic achievement and the size of the multiple correlation coefficients between educational input variables and both measures of arithmetic achievement. The multiple correlation coefficient between intelligence plus reading ability on the one hand and both measures of arithmetic achievement on the other will also be set forth.

Correlation Coefficients

Considerable support for the major hypotheses comes from Table XXV where the correlations between socioeconomic inputs and both arithmetic concepts and arithmetic problem solving were noticeably higher than the correlations between educational inputs and both measures of arithmetic achievement. In fact 13 out of the 24 or 54 per cent of the socioeconomic input correlations were significant at the .05 level or higher, whereas only one or 6 per cent of

the educational input correlation was statistically sig-

nificant.

TABLE XXV

COEFFICIENTS INDICATING THE CORRELATION OF
SOCIOECONOMIC AND EDUCATIONAL INPUT VARIA-
BLES WITH ARITHMETIC ACHIEVEMENT

	Concepts			Problem Solving		
	Boys,	Girls,	Total	Boys,	Girls,	Total
Socioeconomic Inputs						
Mother's Education	.24	.21	.22	.20	.19	.19
Father's Occupation	.26	.28	.27	.21	.23	.22
Size of Family	-.06	-.23	-.13	-.05	-.15	-.10
Absenteeism	-.11	-.12	-.12	-.03	-.09	-.05
Educational Inputs						
Teachers' Qualifications	.12	.16	.13	-.02	.14	.05
Classroom Enrolment	.07	.15	.10	-.03	.06	.004
Age of School	-.09	-.06	-.08	-.06	-.006	-.01
Intelligence	.66	.70	.67	.55	.67	.62
Reading Ability	.63	.73	.66	.59	.69	.65

Where N exceeds 100, a r of .16 is required for
significance at .05 level, .23 at the .01 level, and .32
at the .001 level.

However, the very high correlations between arith-

metic achievement on the one hand and verbal intelligence

and reading ability on the other, as shown in the table, should be noted. It should be noted also that when intelligence was partialled out none of the correlation coefficients between arithmetic achievement and the socioeconomic or educational input variables was statistically significant.

Multiple Correlation Coefficients

Multiple correlation coefficients were calculated between the four socioeconomic input variables and both measures of arithmetic achievement, between the educational input variables and both measures of arithmetic achievement and between verbal intelligence plus reading ability and both measures of arithmetic achievement. Table XXVI reports these correlations. Aitken's numerical solution method was used to compute these coefficients.[1] An example of the numerical calculations is to be found in Appendix I.

A multiple correlation coefficient is, according to Ferguson, amenable to the same general type of interpretation as any other correlation coefficient. "It is", says Ferguson, "the correlation between a criterion variable and the weighted sum of the predictors, the predictors

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[1]George A. Ferguson, Statistical Analysis in Psychology and Education. (New York: McGraw Hill, 1966), p. 298.

being weighted in order to maximize that correlation".[1]

TABLE XXVI

COEFFICIENTS INDICATING THE MULTIPLE CORRELATION
OF SOCIOECONOMIC EDUCATIONAL AND INTELLIGENCE
PLUS READING WITH ARITHMETIC ACHIEVEMENT

	Concepts			Problem Solving		
	Boys,	Girls,	Total	Boys,	Girls,	Total
Socioeconomic Variables	.32*	.38*	.33*	.25*	.30*	.27*
Educational Variables	.15	.18	.15	.08	.14	.05
Intelligence plus Reading	.69**	.77**	.71**	.61**	.72**	.70**

*Significant at the .05 level.

**Significant at the .01 level.

One kind of interpretation is in terms of the multiple correlation coefficient squared, usually designated as R^2. This R^2 tells us the proportion of variance in X, the criterion, that is dependent upon, associated with, or predicted by X_2, X_3, etc., combined with the regression weights used. Once calculated, an F ratio may be used to test whether the observed multiple correlation coefficient

[1]Ibid., p. 301.

is significantly different from zero.[1]

All the multiple correlation coefficients reported in Table XXVI between the socioeconomic variables and both measures of arithmetic achievement are statistically significant. On the other hand, none of the multiple correlation coefficients between the educational variables and arithmetic achievement is statistically significant. Socioeconomic variables account for 10 per cent of the variance in arithmetic concepts for boys, 14 per cent for girls and 11 per cent for both groups. The corresponding per cents for the educational input variables are 2 for the boys, 3 for the girls and 2 for both groups. The socioeconomic variables account for 6 per cent of the variance in arithmetic problem solving for the boys, 9 per cent for the girls and 7 per cent for both groups, whereas educational variables account for less than 1 per cent for the boys, 2 per cent for the girls and less than 1 per cent for both groups. Thus, hypotheses XXI and XXII were supported. It should be noted that both socioeconomic variables and educational variables are more highly related to arithmetic concepts than to arithmetic problem solving and are higher for girls than for boys on both measures of arithmetic achievement.

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[1] Ibid, p. 301.

Also to be noted, (although no hypothesis was set up), is the very high multiple correlation coefficients between intelligence plus reading on the one hand and both measures of arithmetic achievement on the other. These two variables account for 47 per cent of the variance in arithmetic concepts for boys, 59 per cent for girls and 51 per cent for both groups. The corresponding per cents for arithmetic problem solving are 37 for boys, 53 for girls and 49 for both groups.

XII. SUMMARY

In Trinity Bay, no statistically significant difference was found between the achievement of grade VI boys and grade VI girls on arithmetic concepts. However, a statistically significant difference was found between their achievement on arithmetic problem solving. Statistically significant relations were found between verbal intelligence and both measures of arithmetic achievement and between reading ability and both measures of arithmetic achievement. Also, statistically significant relationships were found between mother's education and both measures of arithmetic achievement and between father's occupation and both measures of arithmetic achievement. However, with intelligence partialled out, the statistically significant relationships between mother's education and arithmetic achievement and between father's occupation and

arithmetic achievement disappeared. With the exception
of girls on arithmetic concepts, no statistically signifi-
cant relationships were found between the number of children
in the family and arithmetic achievement. No statistically
significant relationships were found between absenteeism
and arithmetic achievement. No statistically significant
relationships were found between the size of the school and
arithmetic achievement. With the exception of girls on
arithmetic concepts, no statistically significant relation-
ships were found between teachers' qualifications and
arithmetic achievement. No statistically significant re-
lationships were found between the age of the school build-
ing and arithmetic achievement.

All multiple correlation coefficients between the
four socioeconomic input variables and arithmetic achieve-
ment were found to be significantly different from zero.
On the other hand, none of the multiple correlation coef-
ficients between the three educational input variables and
arithmetic achievement was found to be significantly dif-
ferent from zero. All of the multiple correlation coef-
ficients between intelligence plus reading ability and both
measures of arithmetic achievement were found to be signif-
icantly different from zero.

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

I. SUMMARY

The Problem

The major purpose of this study was to determine whether, among pupils of Trinity Bay, socioeconomic variables were more highly related to arithmetic achievement, as measured by an arithmetic concept test and arithmetic problem solving test, than were educational input variables. As sub-problems the relationships between arithmetic achievement and sex, verbal intelligence, reading ability and each of the socioeconomic and educational variables were investigated. Twenty two hypotheses were set up to examine these relationships. Hypothesis I predicted that there would be no significant difference between the performance of girls and boys on arithmetic concepts, while hypothesis II predicted that girls would score higher than boys on arithmetic problem solving. Hypotheses III to XX were concerned with the direction and significance of the relationships between arithmetic achievement and verbal intelligence, reading ability, and each of the socioeconomic and educational variables. The two major hypotheses XXI and XXII predicted that the socioeconomic variables combined would be more highly related and thus explain or

account for more of the variance on both measures of arithmetic achievement than would the combined educational variables.

Experimental Design

The selection of the area in which this research was carried out was made after much deliberation. Apart from the social and economic structure of the area, the more practical problems of accessibility by road, size of student population, cost of conducting the study, and the willingness of the people involved to cooperate were given careful attention. The two Electoral Districts of Trinity North and Trinity South came closest to meeting these considerations.

The grade VI population of the two districts was 805. Owing to absences and one school's not being in session when the testing was done, 761 pupils wrote the arithmetic tests. Because of limitations imposed by the computer programs available, only the 684 students for whom complete information was obtained were used in the study. The teachers and parents of these students became the teacher sample and parent sample respectively.

Instrumentation

The instruments consisted of two questionnaires

and three standardized tests. The teacher questionnaire requested the respondent to give his or her teaching grade, the number of grade VI pupils in his or her class, the number of days each pupil was absent from school and the age of the school building. The parent questionnaire requested the respondent to give the mother's education, the father's occupation, and the number of children in the family living at home. The Lorge-Thorndike Intelligence Test, Form 3AV, was used to measure verbal intelligence. The intelligence quotients supplied with the test were used in the analysis. The Nelson Reading Test 1962 Revised Edition, Form A, was used to measure reading ability. The raw scores were used as an independent variable. The concept sub-test and the problem solving sub-test of the Canadian Tests of Basic Skills were used to measure arithmetic achievement. The raw scores were used in the analysis.

The testing program was carried out from May 1, 1968 to May 21, 1968 in cooperation with two co-workers who were gathering data on the same population for other research projects.

Statistical Analysis

The data relevant to the study, were extracted from the questionnaires and answer sheets, coded and punched on IBM cards. Mean scores for girls, for boys and for both

groups were calculated, with the aid of the computer, on each of the variables used in the study. The t-test was used to test the significance of the difference between means. Pearson product-moment correlations and partial Pearson product-moment correlations were also used. Multiple correlation coefficients were used to test the major hypotheses.

II. CONCLUSIONS AND IMPLICATIONS

On the basis of the findings of this study a number of conclusions might be drawn and implications made.

Conclusion I

Girls were found to be ahead of boys on arithmetic problem solving at the grade-six level. Although there was very little difference in the level of achievement of girls and boys on arithmetic concepts, the low level of achievement compared to the norming population was disturbing.

Implication. These findings suggest the need for educators in the area to take a close look at their arithmetic program for the elementary grades. More individualized instruction and a more individualized arithmetic program appears to be a dire necessity. However, under the present set up in the area with so many multi-grade classrooms this

is almost an impossibility. There seems to be a need, wherever feasible, for the consolidation of these small elementary schools.

The introduction of a new arithmetic program already brought into operation all over the Province does not in itself guarantee overall improvement in arithmetic. The environmental and social background of the student population must be considered. Furthermore, each school board should adopt a policy of providing at least one mathematics consultant for its district.

Conclusion 2

As reported in the research literature and as predicted, verbal intelligence was found to be very highly related to arithmetic achievement. Intelligence alone accounted for 49 per cent of the variance on arithmetic concepts for girls and 44 per cent for boys, while the corresponding figures on problem solving were 45 per cent for girls and 30 per cent for boys. However, it is generally recognized that verbal intelligence as measured by a standardized verbal intelligence test is not pure innate ability, but rather a combination of innate ability and its development or lack of development by one's environment. This was borne out by the drastic reduction in the size of the correlation coefficients when the effects of reading ability were statis-

tically controlled.

Implications. Since students with different levels of
verbal intelligence achieve at different rates in arith-
metic, more attention must be given to grouping where feas-
ible and to the program offered. To expect a student with
an I.Q. of 75 to progress and to absorb the same material
at the same rate as a student with an I.Q. of 120 is no
different from asking the teacher to out-race an automobile.

Conclusion 3

Reading ability was found to be as influential as
verbal intelligence in explaining the variance in arithmetic
achievement. Even with the effects of intelligence partial-
led out all correlation coefficients were statistically
significant at the .01 level or higher.

Implication. It is generally agreed that the ability to
read is the crucial educational skill required to assure
success in any academic subject and arithmetic is no
exception. Therefore, at the elementary school level and
even in the higher grades the reading program should be
given top priority. That there is a need for reading
specialists, inservice training, workshops, and conferences
is axiomatic.

Conclusion 4

Mother's education and father's occupation were found to be positively associated with arithmetic achievement. Approximately the same influence was exerted by each variable.

Implication. These findings suggest the need for closer co-operation between the home and school and the necessity of providing compensatory education for those students who come from homes where the mother has little or no formal education and where the father is employed in the lower occupational categories. The extension of the present provincial government's policy of adult continuation classes to all rural areas of the province would be a step in the right direction. The university extension department might become active in this area as well.

Conclusion 5

Inverse relationships were found to exist between arithmetic achievement and the size of the family. But only in the case of girls on arithmetic concepts was a statistically significant relationship found.

Implication. Since large families are usually associated with the less educated and low income groups, the home environment provided is not likely to be conducive to study and learning. The opening of school buildings in the evenings could help compensate for the lack of facilities at home.

Perhaps the idea of family planning might be discussed
with parents in the area.

Conclusion 6

Absenteeism was found to be of very little impor-
tance in explaining the variance in arithmetic achievement
in the area under study. It should be pointed out, how-
ever, that the period for which absentee records were ob-
tained was relatively short and therefore the full effect
of this variable was probably not ascertained.

Conclusion 7

No statistical significant relationships were found
between the number of grade VI pupils enroled per classroom
and arithmetic achievement. The large percentage of multi-
grade classrooms found in the area might have obscured the
real significance of this variable.

Conclusion 8

No statistical significant relationships were found
between arithmetic achievement and teachers' qualifications
when boys and girls were combined as one group. However,
the analysis on the basis of sex revealed that teachers'
qualifications were more highly related to arithmetic
achievement for girls than for boys. However, it should
be noted that no attempt was made to measure specifically

the teachers' qualifications to handle the mathematics pro-
gram.

Implication. These findings seem to suggest that elementary
teachers relate more to girls than to boys or that the
elementary school itself is organized and conducted in such
a way as to favour the girls. What is needed as far as
arithmetic is concerned is not less well qualified teachers
but rather more highly specialized individuals - more highly
specialized in the sense that they are very conversant with
the new arithmetic program and the philosophy underlying
it and are dynamic enough to make the program come to life.

Conclusion 9

No statistically significant relationships were
found between the age of the school building and arithmetic
achievement. The low range in the age of schools and the
similarity of the various classrooms should be noted.

Conclusion 10

The multiple correlation analysis revealed that
the out-of-school socioeconomic variables were of greater
importance in explaining variance in grade VI arithmetic
achievement scores than were the educational input vari-
ables used in this study.

Implication. These findings suggest again, as was pointed

out earlier in the chapter, the absolute necessity for
close co-operation between the home and the school. If
the school is to perform effectively, it cannot be an
island unto itself. Compensatory educational programs
appear to be advisable for children from low socioeconomic
background. These findings also pose a thorny problem with
regard to the allocation of financial resources for education.
Should governments give top priority to the development of
the out-of-school variables or educational variables? A
concentration on both at the same time would be the ideal,
but this is more than most provincial governments can afford
to do effectively at the present time. Thus, federal
assistance to education as well as to the economic develop-
ment of low socioeconomic areas appears to be imperative
if Canadian children are to enjoy any semblance of equal
educational opportunity.

III. RECOMMENDATIONS FOR RESEARCH

Several suggestions can be made concerning further
research with regard to arithmetic achievement:

1. Research aimed at explaining why girls out-score boys
   on arithmetic problem solving but not on arithmetic
   concepts might prove very fruitful.
2. The relationships between reading ability and arith-
   metic achievement need to be researched in greater depth

to determine which aspects of reading are most closely
associated with arithmetic achievement.

3. The Blishen scale seems to an important degree to be
   outdated for research in 1968, and too urbanized for
   study in rural Newfoundland. Research aimed at pro-
   ducing a discriminating occupational scale for rural
   areas would be most beneficial.

4. A similar study carried out in an area that has a more
   heterogeneous socioeconomic level is needed at this time.

5. The relationships between the various educational in-
   put variables and arithmetic achievement need to be
   studied in greater depth.

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APPENDIX A

COPY OF LETTER SENT TO SUPERINTENDENTS

> Memorial University
> of Newfoundland,
> St. John's,
> March 5, 1968,

Dear Sir,

The three undersigned graduate students in Educational Administration at Memorial University are contemplating conducting, under the auspices of the Faculty of Education of the University, a study involving all the Grade Six students in all the schools in the electoral districts of Trinity North and Trinity South in the Province of Newfoundland.

We are, therefore, asking your permission to allow us to contact the school boards, principals, and teachers involved. We wish to contact them for permission to enter the schools on a pre-arranged date to administer the required examinations. If the necessary permissions are given we shall be giving examinations in reading, arithmetic, and language, as measures of school achievement. In addition we shall administer both a verbal and a non-verbal I.Q. test, and collect data on class size and teacher qualifications.

Please accept our thanks in advance for any help and co-operation you can give us.

> Yours truly,
>
> R. Noel
> H. Pollard
> J. S. Ralph

APPENDIX B

COPY OF LETTERS FROM ANGLICAN SUPERINTENDENT

St. John's,
March 8, 1968,

Mr. R. Noel, Mr. Pollard, and Mr. Ralph,
P. O. Box 81,
Education Building,
Memorial University,
St. John's, Nfld.,

Dear Mr. Noel, Mr. Pollard and Mr. Ralph:

You hereby have my blessing to contact our School Boards and principals in Trinity North and Trinity South. I am also enclosing a memorandum which you might find useful, in case some School Board or principal is reluctant to co-operate.

Yours truly,

C. Roebothan,
Superintendent of Education
(Anglican)

CR/hnb
Encl:

St. John's,
March 8, 1968,

Memorandum to:
Anglican School Boards and Principals,
in Trinity North and Trinity South:

Mr. R. Noel, Mr. H. Pollard, and Mr. J. S. Ralph, three graduate students in Educational Administration at Memorial University, are undertaking a study involving the Grade VI students in all of the schools in Trinity North and Trinity South.

I have given my support to their project, and I am hereby suggesting that our Anglican School Boards and principals co-operate with these gentlemen in every way possible. Their study is an integral part of their Master's program at the University, but the results of it should contain data and information which will be important to all of us.

Thank you for your anticipated co-operation.

Yours truly,

Cecil Roebothan,
Superintendent of
Education (Anglican)

CR/hnb

APPENDIX C

COPY OF LETTER FROM PENTECOSTAL SUPERINTENDENT

                                        St. John's,
                                        March 7, 1968

Mr. R. Noel, Mr. Pollard, and Mr. Ralph,
P. O. Box 81,
Education Building,
Memorial University,
St. John's, Nfld.,

Dear Mr. Noel, Mr. Pollard and Mr. Ralph:

        Permission gladly granted to contact Pentecostal
Committee Chairman and Principals.

                                        Yours truly,

                                        E. Shaw,
                                        Superintendent of Edu-
                                            cation (Pentecostal)

APPENDIX D

COPY OF LETTER FROM ROMAN CATHOLIC SUPERINTENDENT

St. John's,
March 7, 1968,

Mr. R. Noel,
P. O. Box 81,
Education Building,
Memorial University,
St. John's, Nfld.,

Dear Sir:

This is in reply to your letter of March 5, regarding the research project you propose to carry out in the schools of Trinity North and Trinity South. Rest assured of my fullest co-operation.

With every good personal wish,

I remain,

Sincerely yours,

F. R. Kennedy,
Superintendent of Education

FRK/cm

APPENDIX E

COPY OF LETTER FROM SALVATION ARMY SUPERINTENDENT

St. John's,
March 15, 1968

Messrs. Noel, Pollard, Ralph,
P. O. Box 81,
Education Building,
Memorial University,
St. John's, Nfld.,

Dear Sirs:

In reply to your letter of March 5th, I may say
that I am happy to grant permission to you to contact
the School Boards, Principals and teachers involved in
the district mentioned in your letter. I understand that
this is necessary so that you can complete graduate work
in educational research.

Yours sincerely,

W. C. Woodland,
Superintendent of
Education, S.A.,

WCW/ms

APPENDIX F

COPY OF LETTER FROM UNITED CHURCH SUPERINTENDENT

March 8, 1968

Mr. R. Noel,
P. O. Box 81,
Education Building,
Memorial University,
St. John's, Newfoundland,

Dear Mr. Noel:

In reply to your letter of March 5, I wish to inform you that I would have no objection to your contacting the school boards of your choice for the purpose of conducting studies in connection with your Master's program. If you require any kind of specific letter I would be happy to provide it to you, if this letter is not suitable for your purposes.

Yours truly,

John Acreman,
Superintendent of
Education,
(United Church)

JA/hab

APPENDIX G

COPY OF LETTER TO SCHOOL BOARDS

> Memorial University
>   of Newfoundland,
> March 26, 1968

Dear Sir:

In co-operation with our faculty advisor, Dr. H. W. Kitchen, we, a group of three graduate students in Educational Administration at Memorial University of Newfoundland, are intending to collect information having to do with achievement and other factors related to all Grade 6 students of Trinity North and Trinity South. The purpose of the proposed study is to discover relationships between achievement in Grade 6 and certain selected social and environmental factors.

To gather the necessary information for the study we hope to be working in each of your schools which have Grade 6 students for approximately one day. Soon we plan to contact the principals of the schools involved to arrange a visitation and examination schedule. We have already received approval for this project from your superintendent at the Department of Education.

If you have any questions concerning the proposed study, or reservations about our contacting your principals, Grade 6 teachers, and students, we would certainly appreciate hearing from you.

> Sincerely yours,
>
> R. Noel
>
> H. Pollard
>
> J. S. Ralph

APPENDIX H

PARENT QUESTIONNAIRE

P. O. Box 81,
Arts and Education Building,
Memorial University of Nfld.,
St. John's, Newfoundland ,

Dear Parent or Guardian:

As part of the requirements for our M.Ed. programs in Educational Administration we are conducting studies in the fields of reading, language, and arithmetic among the Grade Six pupils in Trinity North and Trinity South.

Your co-operation in completing this pupil questionnaire and returning it to your child's teacher will be greatly appreciated.

Yours truly,

. . . .
R. Noel

. . . .
H. A. Pollard

. . . .
J. S. Ralph

1. TO THE MOTHER (OR GUARDIAN): How many years of schooling do you have? Circle the number showing the highest grade completed:

      1 2 3 4 5 6 7 8 9 10 11 12

University or Trade school, or other training beyond high school: 1 2 3 4 5 6 7 8 years.

2. TO THE FATHER (OR GUARDIAN): What do you usually do for a living? For example: brakeman with the C.N.R., a fisherman, a captain, drives a taxi, teaches school, salesman for a life insurance company, etc. Give as many details as you can _____

_____

3. How many children do you now have who are 18 years of age or under and living at home? _____
Pupil's name _____

APPENDIX I

TEACHER QUESTIONNAIRE

1. Teacher's Name _____

2. Name of School _____

3. School Address _____

4. What is your Teaching Licence / Grade?

    _____ (1) Licence; _____ (2) Grade

5. How many pupils are enrolled in Grade Six in your class-
    room? _____

6. What is the age of the school building in which you
    teach? _____

7. Please list below the names of your Grade Six Pupils,
    and after each name indicate the number of days he (or
    she) was absent between September 6, 1967 and April 30,
    1968.

Pupils' Names	Days Absent	Pupils' Names	Days Absent
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

APPENDIX J
TEACHER'S QUALIFICATION SCALE

Department of Education grade or licence	Training	Point Value
D Licence	High School with no professional training	1
P and C Licences	One six-week summer School of Professional Training	2
B Licence	Two six-week Summer Schools of Professional Training (No longer granted)	3
A Licence	A University year of professional training minus one course	4
First Grade	A University Year of professional training	5
Second Grade	Two complete years of professional training or the equivalent	6
Third Grade	Three complete years of professional training or the equivalent	7
Fourth Grade	Four complete years of professional training or the equivalent	8
Fifth Grade	Five complete years of professional training or the equivalent, including an education Degree or Diploma	9
Sixth Grade	Six oomplete years of professional training or equivalent, in an Education Degree and one other Degree	10
Seventh Grade	Seven complete years of professional training or equivalent, including two Bachelor's Degrees or a Bachelor's Degree and a Education Diploma, and a Master's Degree.	11

APPENDIX K

MOTHER'S EDUCATION SCALE

FORMAL EDUCATION	POINTS
No formal education	0
Grade I	1
Grade II	2
Grade III	3
Grade IV	4
Grade V	5
Grade VI	6
Grade VII	7
Grade VIII	8
Grade IX	9
Grade X or grade IX and one year vocational school	10
Grade XI or grade IX and two years vocational or technical school; or grade X and one year vocational or technical school	11
Grade XI and one year University, two summer schools at University, one year vocational school, or one year technical school, or Dg. 12.	12
Grade XI and two years of University, vocational, or technical school or equivalent	13
Grade XI and three years University, vocational, or technical school, or equivalent	14
Grade XI and four years University, vocational, or technical school, or equivalent	15
Grade XI and five years of higher education	16
Grade XI and six years of higher education	17
Grade XI and seven years of higher education	18

APPENDIX L

ARITHMETIC CONCEPT TEST

6 GRADE 6 BEGIN HERE

52. Which of these fractions has the largest denominator?

1) $\frac{2}{5}$

2) $\frac{3}{8}$

3) $\frac{8}{7}$

4) $\frac{5}{4}$

53. How would you read 420,700?

1) **Four hundred twenty thousand seven hundred**

2) **Four million two hundred seven thousand**

3) **Four million twenty thousand seven hundred**

4) **Forty-two thousand seven hundred**

54. In the exercise below, why is the figure 2 in the number 642 placed under the figure 8 in the number 1284?

1) **Because mathematics books do it that way**

2) **So that the 6 will be under the 1**

3) **Because the 2 and 8 both mean tens**

4) **Because it looks neater that way**

$$\begin{array}{r} 321 \\ \times\ 24 \\ \hline 1284 \\ 642\ \ \\ \hline 7704 \end{array}$$

55. Which of these addition exercises is worked correctly?

1) $\frac{2}{3}+\frac{1}{3}=\frac{3}{3}$

2) $\frac{1}{2}+\frac{1}{2}=\frac{1}{4}$

3) $\frac{1}{5}+\frac{2}{5}=\frac{3}{10}$

4) $\frac{3}{8}+\frac{4}{8}=\frac{7}{8}$

56. Judy bought a valentine for 13¢ and gave the clerk a half dollar. How would the clerk count Judy's change?

1) **13¢, 14¢, 15¢, 25¢, 50¢**

2) **13¢, 38¢, 39¢, 40¢, 50¢**

3) **13¢, 23¢, 24¢, 25¢, 50¢**

4) **13¢, 14¢, 15¢, 40¢, 50¢**

57. Which of these dates does <u>not</u> appear on the calendar?

1) **February 28**

2) **September 30**

3) **March 31**

4) **June 31**

58. Jack's foreign car weighs 1600 pounds. How does this weight compare with a ton?

1) **400 pounds less**

2) **400 pounds more**

3) **900 pounds less**

4) **600 pounds more**

59. What is the quotient for the division $4\overline{)820}$?

1) **20**

2) **25**

3) **205**

4) **250**

60. In which of these numbers does the numeral 3 represent 3 hundred thousand?

1) **537,105**

2) **3,192,684**

3) **943,027**

4) **1,368,572**
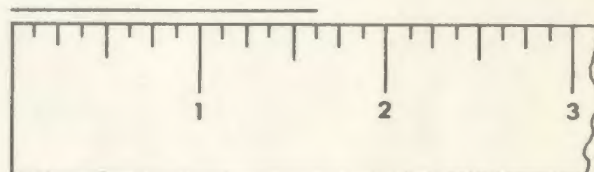
61. In the picture, how long is the line above the ruler?

1) $2\frac{3}{8}$ **in.**

2) $1\frac{5}{8}$ **in.**

3) $1\frac{3}{4}$ **in.**

4) $1\frac{1}{2}$ **in.**

62. Which of these is a unit of dry measure?

1) **Bushel**

2) **Gallon**

3) **Dozen**

4) **Ton**

63. In which of these multiplication exercises do you change ones to a ten or carry a ten?

1) $\begin{array}{r}132\\\times 2\\\hline 264\end{array}$

2) $\begin{array}{r}126\\\times 3\\\hline 378\end{array}$

3) $\begin{array}{r}231\\\times 3\\\hline 693\end{array}$

4) $\begin{array}{r}374\\\times 2\\\hline 748\end{array}$

64. Which of these fractions has the smallest denominator?

1) $\frac{2}{9}$

2) $\frac{5}{7}$

3) $\frac{1}{12}$

4) $\frac{3}{16}$

65. Joan estimated the answer for each of these examples by first rounding the numbers to the nearest ten and then multiplying. For which example did she multiply 30×50?

1) **27 × 44**

2) **24 × 53**

3) **28 × 51**

4) **32 × 58**

Go on to next page ▶

66. Which of these is the best estimate of the average for the numbers 3, 5, 7, and 9?

   1) **A number smaller than 3**
   2) **A number larger than 9**
   3) **A number between 3 and 9**
   4) **The sum of the four numbers**

67. Trains going in one direction have even numbers. Those going in the opposite direction have odd numbers. Which of these trains goes in the same direction as No. 130?

   1) **No. 111**   3) **No. 207**
   2) **No. 172**   4) **No. 293**

68. Ned estimated answers for these subtraction exercises by first rounding the numbers to the nearest hundred. In which exercise did he subtract 200 from 500?

   1) **489**   2) **597**   3) **433**   4) **544**
      −214   **−322**   **−158**   **−269**
      275   **275**   **275**   **275**

69. What part of this rectangle is shaded?

   1) $\frac{3}{8}$
   2) $\frac{3}{4}$
   3) $\frac{3}{5}$
   4) $\frac{3}{3}$
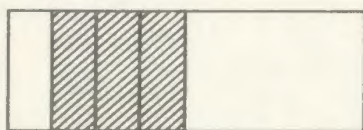
70. One factor of 10 is 2. Which of these numbers is the other factor?

   1) **20**   3) **8**
   2) **12**   4) **5**

71. In which of these sets of fractions is $\frac{1}{5}$ the largest?

   1) $\frac{1}{8}, \frac{1}{5}, \frac{1}{3}$ 3) $\frac{1}{4}, \frac{1}{5}, \frac{1}{6}$
   2) $\frac{1}{5}, \frac{1}{6}, \frac{1}{8}$ 4) $\frac{1}{2}, \frac{1}{3}, \frac{1}{5}$

      A   B   C   D

72. Which of the pictures above shows that $\frac{1}{4} = \frac{2}{8}$?

   1) **A**   3) **C**
   2) **B**   4) **D**

---
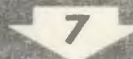
73. Which of the subtraction exercises below is worked correctly?

   1) $\frac{3}{8}$ 3) $\frac{5}{6} = \frac{5}{6}$
      $-\frac{1}{4}$ $-\frac{2}{3} = \frac{4}{6}$
      $\overline{\frac{2}{4} = \frac{1}{2}}$ $\overline{\frac{1}{6}}$

   2) $\frac{3}{10}$ 4) $\frac{3}{4} = \frac{3}{4}$
      $-\frac{1}{5}$ $-\frac{1}{2} = \frac{2}{4}$
      $\overline{\frac{2}{10} = \frac{1}{5}}$ $\overline{\frac{1}{8}}$

74. How would you write thirteen billion two million five hundred thousand in numerals?

   1) **13,2,500,000**   3) **13,020,500,000**
   2) **13,002,500,000**   4) **13,200,500,000**

75. Which of these fractions can be expressed as a mixed number?

   1) $\frac{5}{6}$ 3) $\frac{8}{12}$
   2) $\frac{4}{4}$ 4) $\frac{7}{5}$

76. What must be done to the fraction $\frac{3}{4}$ to form the fraction $\frac{12}{16}$?

   1) **Subtract 4 from numerator and denominator**
   2) **Divide numerator and denominator by 4**
   3) **Add 4 to numerator and denominator**
   4) **Multiply numerator and denominator by 4**

77. Which of these fractions is <u>not</u> equal to the other three?

   1) $\frac{2}{3}$ 2) $\frac{8}{12}$ 3) $\frac{3}{4}$ 4) $\frac{4}{6}$

      A   B   C   D
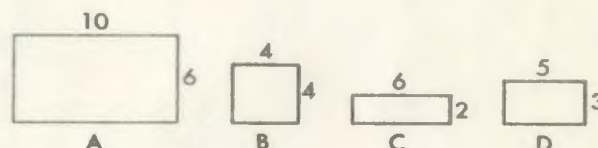
78. Which of the figures above does <u>not</u> have a perimeter of 16?

   1) **A**   3) **C**
   2) **B**   4) **D**

79. Which of these fractions is greater than $\frac{1}{6}$ but less than $\frac{1}{3}$?

   1) $\frac{1}{9}$ 3) $\frac{1}{4}$
   2) $\frac{1}{2}$ 4) $\frac{1}{8}$

80. Mrs. Schultz bought 12 ounces of cheese. What part of a pound was this?

   1) $\frac{1}{2}$ 2) $\frac{3}{5}$ 3) $\frac{2}{3}$ 4) $\frac{3}{4}$

81. Which of these is a correct way to find a fraction equivalent to $\frac{9}{12}$?

1) $\frac{9}{12} = \frac{9+3}{12+3} = \frac{12}{15}$ 3) $\frac{9}{12} = \frac{9-3}{12-3} = \frac{6}{9}$

2) $\frac{9}{12} = \frac{9 \div 3}{12 \times 3} = \frac{3}{36}$ 4) $\frac{9}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4}$

82. Which of these ways could be used to find the number of square feet of area in the figure below?

1) $6 + 8$
2) 6×8
3) $8 \div 6$
4) $6 + 8 + 6 + 8$

[figure: rectangle labeled 8 ft. wide and 6 ft. high]

8 ft.
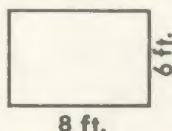
83. In which of these statements did Mary use the wrong unit of measure?

1) "Baby brother weighs 12 ounces."
2) "I sleep 8 hours each night."
3) "We get 3 quarts of milk at each delivery."
4) "My school room is 28 feet long."

84. Which of these is the best way to estimate the answer to the example $2\frac{3}{4} \times 6\frac{1}{8}$?

1) 2×6 3) 3×6
2) 3×7 4) 2×7

Train	Time Due	Remarks
No. 7 Flyer	11:52 A.M.	(20 Minutes Late)

85. The Train Bulletin in the depot shows the information above. At what time will the train probably arrive?

1) 12:12 P.M.   3) 12:20 P.M.
2) 11:32 A.M.   4) 11:52 A.M.

86. In which pair are the fractions equivalent?

1) $\frac{5}{6}, \frac{5}{12}$ 3) $\frac{3}{7}, \frac{4}{7}$
2) $\frac{2}{3}, \frac{8}{12}$ 4) $\frac{3}{5}, \frac{9}{10}$

87. Which set of three numerals can be arranged to represent the largest number?

1) 1, 0, 9   3) 3, 8, 8
2) 2, 5, 8   4) 4, 2, 6

88. Which of these addition exercises can be explained by the picture below?

1) $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$
2) $\frac{1}{4} + \frac{3}{8} = \frac{5}{8}$
3) $\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$
4) $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$

[figure: rectangle divided into sections, shaded]

89. In which set are the numbers arranged in order of size from smallest to largest?

1) 2.9, $\frac{3}{10}$, $2\frac{4}{5}$, 3   3) $\frac{3}{10}$, $2\frac{4}{5}$, 3, 2.9
2) $2\frac{4}{5}$, 2.9, 3, $\frac{3}{10}$ 4) $\frac{3}{10}$, 3, 2.9, $2\frac{4}{5}$

90. In 129,635, what numeral represents ten thousands?

1) 1   2) 9   3) 6   4) 2

91. In which of these ways could you use the information in the table below to find the number of yards in a mile?

1) $5280 - 5\frac{1}{2}$
2) 5280×3
3) $5280 \div 3$
4) $3 \times 5\frac{1}{2} \times 320$

3 ft.	= 1 yd.
$5\frac{1}{2}$ yd.	= 1 rd.
320 rd.	= 1 mi.
5280 ft.	= 1 mi.

92. How should you think of 3 lb. 5 oz. in working this division example?

1) 53 oz.
2) 47 oz.
3) $3\frac{1}{2}$ lb.
4) 2 lb. 21 oz.

$6 \overline{)\ 3\ \text{lb. 5 oz.}}$

93. The copyright information in a world atlas reads as follows: "Copyright MCMXLIX by Rand McNally and Company. All Rights Reserved." In what year was the atlas copyrighted?

1) 1949   3) 1859
2) 1911   4) 1841

94. Bill found an approximate equivalent fraction for $\frac{387}{625}$ by rounding the terms to the nearest hundred. What was the fraction?

1) $\frac{3}{7}$ 3) $\frac{4}{7}$
2) $\frac{1}{2}$ 4) $\frac{2}{3}$

95. Which of these is a common denominator for the fractions $\frac{3}{8}$, $\frac{5}{12}$ and $\frac{7}{16}$?

1) 16   3) 32
2) 24   4) 48

96. Which of these examples can have its meaning explained by the picture below?

1) $\frac{1}{4}$ of $\frac{3}{4}$
2) $\frac{1}{2}$ of $\frac{1}{4}$
3) $\frac{1}{8}$ of $\frac{1}{4}$
4) $\frac{1}{4}$ of $\frac{1}{2}$

[figure: circle divided, portions shaded]
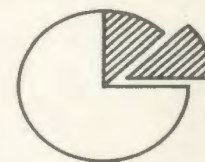
APPENDIX M

ARITHMETIC PROBLEM SOLVING TEST

33. When the temperature in Windsor was 76 degrees, the temperature in Timmins was 50 degrees. How many degrees cooler was it in Timmins?

1) **20**
2) **26**
3) **126**
4) (Not given)

34. The snowfall for one season in Revelstoke was 23 inches in November, 11 in December, 16 in January, 13 in February, 26 in March, and 1 inch in April. How many inches of snow fell that season in Revelstoke?

1) **80**
2) **90**
3) **91**
4) (Not given)

35. One year Sudbury had 238 days that were cloudy or partly cloudy. How many days were clear that year in Sudbury? (365 days = 1 year)

1) **127**
2) **133**
3) **137**
4) (Not given)

> **Make no marks in this booklet.**

36. Mr. Brown and his children, Larry and Mary, built a puppet theatre. They paid $1.99 for plywood, $.84 for hinges, $1.78 for curtain material, and $.95 for paint. How much in all did the material for the puppet theatre cost?

1) **$5.46**
2) **$5.56**
3) **$5.57**
4) (Not given)

37. The Browns used part of the $15.00 they saved by building their own theatre to buy puppets. The puppets cost $9.87. How much money did the Browns have left?

1) **$5.13**
2) **$5.23**
3) **$6.13**
4) (Not given)

38. Larry saw hand puppets priced at $1.79 each. How much would 4 such puppets cost?

1) **$5.96**
2) **$6.16**
3) **$7.06**
4) (Not given)

39. Mary found a group of hand puppets on sale at 3 for $4.59. How much would each puppet cost?

1) **$1.53**
2) **$1.50**
3) **$1.13**
4) (Not given)

GRADE 4
STOP HERE
4 STOP

---

6 GRADE 6 BEGIN HERE

40. At the Christmas season, the Boy Scouts cut 83 Christmas trees and sold them for $3.50 each. How much did the Scouts receive for the trees?

1) **$260.50**
2) **$289.50**
3) **$290.50**
4) (Not given)

41. The Boy Scouts also sold Christmas wreaths and holly. Including express charges, they paid $57.60 for 36 Christmas wreaths. How much did each wreath cost the Scouts?

1) **$1.32**
2) **$1.60**
3) **$1.65**
4) (Not given)

42. The Scouts sold 72 packages of holly at 65¢ per package. How much did the Scouts receive for the holly?

1) **$44.80**
2) **$46.70**
3) **$46.80**
4) (Not given)

---

43. Jim's father bought materials to make hamster cages. He paid $9.47 for wire, $27.59 for plywood, $5.63 for wood strips, and $4.88 for hinges and hooks. How much did he pay in all for the materials?

1) **$37.57**
2) **$46.57**
3) **$47.47**
4) (Not given)

44. Last month Jim's father sold 24 golden hamsters at $1.37 each. How much did he receive for the hamsters?

1) **$32.88**
2) **$32.78**
3) **$31.88**
4) (Not given)

45. Jim's father bought a dozen water bottles for $5.35 and a 25-pound bag of hamster food for $7.49. He paid the clerk with a 20-dollar bill. How much change did he receive?

1) **$7.06**
2) **$7.16**
3) **$7.26**
4) (Not given)

46. Jim measured the length of a mother hamster and the length of a baby hamster. The mother hamster was 6 inches long and the baby $2\frac{1}{2}$ inches long. How much longer in inches was the mother?

1) $3\frac{1}{2}$
2) $4\frac{1}{2}$
3) $8\frac{1}{2}$
4) (Not given)

47. Mr. King went to work by train. He paid $26.95 each month for a monthly railroad commuter's ticket. How much did his tickets cost for the 12 months he worked last year?

   1) **$313.40**   3) **$323.40**
   2) **$322.40**   4) (Not given)

48. Each working day Mr. King spent 96 minutes on the train. How many hours did he spend on the train in a 5-day work week? (60 min. = 1 hr.)

   1) **5**   3) **16**
   2) **8**   4) (Not given)

49. Mr. King's brother drove his car to work. His car expenses were $17.04 for a week in which he made 6 trips. What was the average cost of each trip that week?

   1) **$2.74**   3) **$2.90**
   2) **$2.84**   4) (Not given)

---

50. Mr. and Mrs. Ward and their son Andy spent 8 days of their summer vacation at the WT Guest Ranch in Alberta. The 8-day rate was $132.00 apiece for Mr. and Mrs. Ward and $97.50 for Andy. How much did it cost the Ward family to stay at the ranch?

   1) **$361.50**   3) **$229.50**
   2) **$351.50**   4) (Not given)

51. While at the ranch, Mr. Ward and Andy took a 3-day pack trip into the mountains. There was an additional charge of $23.75 per day for a pack animal and guide. How much extra did the 3-day pack trip cost?

   1) **$61.25**   3) **$71.25**
   2) **$70.25**   4) (Not given)

52. Two of the fish that Andy caught weighed $2\frac{1}{4}$ and $3\frac{1}{2}$ pounds. What was the total weight in pounds?

   1) **5**   3) **7**
   2) **6**   4) (Not given)

53. The WT Guest Ranch has an elevation of 4257 feet above sea level. Mt. Assiniboine, which can be seen from the ranch, has an elevation of 11,870 feet. How many feet higher than the ranch is Mt. Assiniboine?

   1) **17,393**   3) **7613**
   2) **8979**   4) (Not given)

54. The Wards' total expenses during the 8 days at the ranch were $491.60. What was the average cost per day?

   1) **$61.45**   3) **$60.20**
   2) **$61.32**   4) (Not given)

GRADE 5
STOP HERE
5 STOP

---

7 GRADE 7 BEGIN HERE

55. Mr. Witt built a table for table tennis. He paid $16.65 for the plywood top, $3.96 for the lumber to build the base, and $3.12 for paint. What was the total cost of material for the table?

   1) **$23.73**   3) **$22.73**
   2) **$23.63**   4) (Not given)

56. To make the base for the table, a board $7\frac{5}{8}$ inches wide was sawed into two pieces, one of which was $4\frac{3}{4}$ inches wide. If no allowance is made for sawing, how wide in inches was the other piece?

   1) $2\frac{7}{8}$ 3) $3\frac{7}{8}$
   2) $3\frac{1}{2}$ 4) (Not given)

57. According to the rules, the top surface of the table had to be 30 inches above the floor. If the legs were placed under the $\frac{5}{8}$-inch plywood top, how long in inches did Mr. Witt cut the legs?

   1) $30\frac{5}{8}$ 3) $29\frac{3}{8}$
   2) $29\frac{5}{8}$ 4) (Not given)

58. Mr. Witt worked $6\frac{1}{4}$ hours on Saturday building the table and finished it in $2\frac{1}{2}$ hours on Monday evening. How many hours did it take to build the table?

   1) $8\frac{1}{4}$ 3) $9\frac{1}{4}$
   2) $8\frac{3}{4}$ 4) (Not given)

---

59. Mrs. Lewis redecorated Wanda's room. She bought $5\frac{1}{3}$ yards of blue drapery material at $1.29 per yard to make drapes for the window. What was the total cost of the drapery material?

   1) **$5.88**   3) **$10.75**
   2) **$6.88**   4) (Not given)

60. It took $10\frac{3}{4}$ yards of white corduroy to make a bedspread and $2\frac{2}{3}$ yards of the same material for a dressing table skirt. How many yards of this material did Mrs. Lewis need?

   1) $12\frac{5}{12}$ 3) $13\frac{5}{12}$
   2) $12\frac{5}{7}$ 4) (Not given)

61. The ceiling of Wanda's 12 ft. by 14 ft. room was given one coat of paint. If one quart of paint would cover 125 sq. ft. of surface, how many quarts of paint did Mrs. Lewis need to buy for the ceiling?

   1) **1**   3) **3**
   2) **2**   4) **4**

62. Mrs. Lewis bought 3 cotton rugs at $3.27 each, a vanity mirror for $7.45, and a boudoir chair for $15.69. What was the total cost?

   1) **$32.85**   3) **$26.41**
   2) **$31.95**   4) (Not given)

Go on to next page

·· MAIN STREET MARKET ··
608 EAST MAIN STREET

TURKEYS
16-22 LBS.
27¢ LB.

GROUND BEEF
3 LBS. $1.44

HAM
49¢ LB
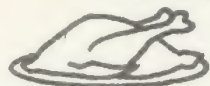
ROAST BEEF
59¢ LB.

JUICE ORANGES
3 DOZEN $1.00

GRAPEFRUIT
10 FOR 49¢
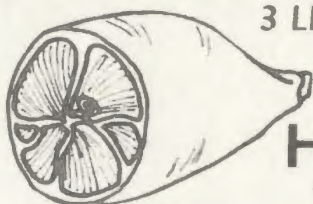
PEAS 2 CANS 39¢

RED SALMON 85¢

SOUP 3 CANS 57¢

CELERY
2 LARGE STALKS
29¢

PEACHES
4 CANS 89¢

GREEN BEANS 6 CANS 96¢

SUGAR
10 LB. BAG 99¢

To work problems 63 – 70, look at the picture above to find the prices of things. Do **not** allow for sales tax.

8 GRADE 8 BEGIN HERE

63. What is the difference in cost between 3 pounds of ground beef and a 3-pound roast of beef?
1) 13¢   2) 23¢   3) 85¢   4) (Not given)

64. Mrs. Parks agreed to pay ⅓ of the cost of the turkey for Thanksgiving dinner. If the turkey weighed 16 pounds, how much was her share of the cost?
1) $1.11   2) $1.33   3) $1.44   4) (Not given)

65. How much would 5 grapefruit cost?
1) 49¢   2) 25¢   3) 10¢   4) (Not given)

66. Mrs. Davis made the shopping list given below:

> 4 pounds, roast beef
> 1 can red salmon
> 2 stalks, celery
> 4 cans, peaches
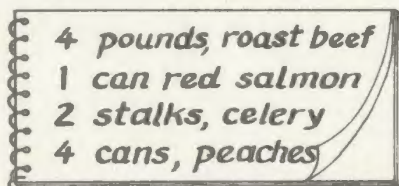
How much would the groceries cost?
1) $4.39   2) $4.29   3) $2.62   4) (Not given)

67. Mrs. White sent John to the store to buy a 7-pound ham. She gave him a 5-dollar bill. How much change should he receive?
1) $3.43   2) $2.57   3) $1.57   4) (Not given)

68. How much would 2 pounds of ground beef cost?
1) $1.44   2) 96¢   3) 72¢   4) (Not given)

69. How much would Mrs. Adams pay for 1 can of soup and 1 can of green beans?
1) 35¢   3) 96¢
2) 51¢   4) $1.53

> Make no marks
> in this booklet.

70. How much would Mrs. Jones save by buying the 10-pound bag of sugar instead of 10 pounds in 1-pound boxes at 14¢ each?
1) 41¢   3) 85¢
2) 51¢   4) (Not given)

GRADE 6
STOP HERE
6 STOP

APPENDIX N

READING TEST

The Nelson
READING TEST

REVISED EDITION

VOCABULARY · PARAGRAPH COMPREHENSION

Grades 3–9
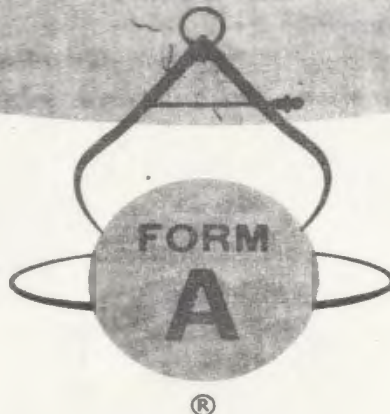
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PART ONE • Vocabulary

DIRECTIONS TO STUDENTS

A. Do not turn this page of the test booklet until you are told to do so.

B. There are 100 questions in this part of the test but you are not expected to know the answers to all of them. Try to do as many as you can in the amount of time given.

C. During the test, do not make marks of any kind in the test booklet. You are to mark your answers on a separate answer sheet.

D. The practice exercises below will show you how to do this part of the test.

PRACTICE EXERCISES

1. John is the name of a
(1) school (2) girl (3) boy (4) river (5) flower .... 1.

*Which word tells what John is? John is the name of a boy, so **boy** is the answer. What is the number of this word? The number of this word is **3**. Look at your answer sheet or answer card and you will see that for Practice Exercise 1 a heavy black mark has been made in the third space to show that answer **3** is best.*

2. Bread is something to
(1) wear (2) play with (3) write on (4) eat (5) sew .... 2.

*Find the row of spaces for Practice Exercise 2 and mark the space on the answer sheet or answer card that has the same number as the answer you picked. You should have marked the fourth space because answer number **4, eat,** is best.*

E. You will have 10 minutes for this part of the test. When you have finished the first page, turn over to the next page and do as many pages as you can before you are told to stop. If you finish early, go back and check your work. Do not go on to the next part of the test.

1. **A rabbit is an**
(1) apple (2) oak (3) office (4) animal (5) orange .... 1.

2. **Most dogs can**
(1) fly (2) bark (3) talk (4) shoot (5) sew .... 2.

3. **A farmer raises**
(1) crops (2) metals (3) oil (4) rocks (5) ink .... 3.

4. **Tiny means**
(1) great (2) old (3) sorry (4) safe (5) small .... 4.

5. **Railroads are used for**
(1) shade (2) travel (3) printing (4) shoes (5) respect .... 5.

6. **Twelve o'clock at night is called**
(1) evening (2) noon (3) midnight (4) forenoon (5) morning .... 6.

7. **Cows feed in a**
(1) saw (2) park (3) street (4) tunnel (5) pasture .... 7.

8. **Silk is something to**
(1) wear (2) eat (3) sing (4) burn (5) fish .... 8.

9. **Tuesday is the name of a**
(1) country (2) railroad (3) day (4) month (5) girl .... 9.

10. **A merry person is**
(1) sad (2) foolish (3) pretty (4) happy (5) angry .... 10.

11. **One may lie down on a**
(1) drill (2) tear (3) pencil (4) top (5) sofa .... 11.

12. **Purple is the name of a**
(1) measure (2) style (3) color (4) concert (5) fern .... 12.

13. **Easter is the name of a**
(1) year (2) street (3) holiday (4) month (5) painter .... 13.

14. **A mighty person is**
(1) small (2) weak (3) sleepy (4) sorry (5) strong .... 14.

15. **An alley is a narrow**
(1) street (2) board (3) rake (4) gate (5) state .... 15.

16. **A boss is a**
(1) player (2) pearl (3) brute (4) rule (5) master .... 16.

17. **One sometimes sits on a**
(1) bench (2) shade (3) file (4) belt (5) soda .... 17.

18. **A season is part of a**
(1) bridge (2) dairy (3) sentence (4) surface (5) year .... 18.

19. **We take medicine when we are**
(1) ill (2) hungry (3) thirsty (4) cold (5) sleepy .... 19.

20. **Many insects are called**
(1) beasts (2) bugs (3) birds (4) flowers (5) buds .... 20.

Go on to next page →

21. **To allow is to**
    (1) eat (2) stand (3) permit (4) forget (5) sing   **21.**

22. **To frighten is to make**
    (1) progress (2) fearful (3) calm (4) poetry (5) humble   **22.**

23. **A hare is a small**
    (1) chest (2) shipment (3) animal (4) pitcher (5) base   **23.**

24. **A handsome lady is**
    (1) ugly (2) sad (3) large (4) lively (5) attractive   **24.**

25. **A thing that is marvelous is**
    (1) cheap (2) wonderful (3) dear (4) stupid (5) hard   **25.**

26. **A model is a**
    (1) dairy (2) strike (3) pattern (4) reply (5) chum   **26.**

27. **Fever is a form of**
    (1) idea (2) brace (3) grit (4) illness (5) habit   **27.**

28. **A person who likes to give to others is**
    (1) stingy (2) selfish (3) jealous (4) generous (5) wicked   **28.**

29. **To dread is to**
    (1) begin (2) remove (3) scratch (4) fear (5) fail   **29.**

30. **The traveler reached his**
    (1) destination (2) obligation (3) comment (4) expectation (5) memorial   **30.**

31. **An author is a**
    (1) speaker (2) writer (3) dancer (4) clerk (5) child   **31.**

32. **Dramas are usually presented in the**
    (1) laundry (2) factory (3) station (4) automobile (5) theater   **32.**

33. **A calm person is**
    (1) rough (2) quiet (3) jealous (4) strict (5) prompt   **33.**

34. **To complain is to find**
    (1) aid (2) places (3) fortune (4) refreshment (5) fault   **34.**

35. **A thing done thoroughly is done**
    (1) well (2) badly (3) too often (4) fast (5) easily   **35.**

36. **To proceed is to**
    (1) prospect (2) include (3) continue (4) destroy (5) assist   **36.**

37. **Voters elect the**
    (1) driver (2) officers (3) queen (4) worker (5) term   **37.**

38. **Workers usually receive**
    (1) launches (2) ships (3) hospitals (4) wages (5) levels   **38.**

39. **To attempt means to**
    (1) look out (2) address (3) iron (4) try (5) account   **39.**

40. **When a thing is accomplished, it is**
    (1) done (2) seen (3) just begun (4) polished (5) hot   **40.**

41. **A remedy is something that**
    (1) stings   (2) hurts   (3) bleeds   (4) shoots   (5) helps .... 41.

42. **A capable person is one having**
    (1) doubts   (2) property   (3) ability   (4) humor   (5) faults .... 42.

43. **A timid person is**
    (1) bold   (2) shy   (3) tired   (4) quick   (5) loud .... 43.

44. **A pamphlet is a small**
    (1) tree   (2) ball   (3) book   (4) dish   (5) plain .... 44.

45. **A corporation is a business**
    (1) guarantee   (2) obligation   (3) official   (4) organization   (5) exhibition ...... 45.

46. **Irrigation promotes**
    (1) literature   (2) agriculture   (3) sentiment   (4) reading   (5) kindergartens ... 46.

47. **Method refers to**
    (1) facts   (2) position   (3) system   (4) justice   (5) volume .... 47.

48. **To omit is to**
    (1) leave out   (2) stop   (3) call to   (4) ask   (5) play .... 48.

49. **When you urge, you try to**
    (1) forget   (2) appear   (3) be quiet   (4) clean   (5) persuade .... 49.

50. **An accurate account is**
    (1) wrong   (2) large   (3) lost   (4) correct   (5) untrue .... 50.

51. **Temporary means that which is not**
    (1) excellent   (2) familiar   (3) similar   (4) automatic   (5) permanent ...... 51.

52. **An abundance is**
    (1) a little   (2) a sore   (3) a dance   (4) plenty   (5) a few .... 52.

53. **An appropriate gift is**
    (1) unwelcome   (2) small   (3) foolish   (4) unusual   (5) suitable ...... 53.

54. **A fortunate person is**
    (1) wicked   (2) unhappy   (3) lucky   (4) hurt   (5) powerful .... 54.

55. **An industrious person has**
    (1) sympathy   (2) ambition   (3) authority   (4) opposition   (5) benefits ...... 55.

56. **To acquire is to**
    (1) lose   (2) sweat   (3) measure   (4) get   (5) ask .... 56.

57. **To support is to**
    (1) search   (2) encourage   (3) wander   (4) receive   (5) retire .... 57.

58. **An inexhaustible supply is one that cannot be**
    (1) burned   (2) uncovered   (3) used up   (4) found   (5) opened ...... 58.

59. **Things that are in accord**
    (1) agree   (2) disagree   (3) move away   (4) measure   (5) applaud .... 59.

60. **An exhibition is a public**
    (1) privilege   (2) showing   (3) obligation   (4) executive   (5) opinion ... 60.

61. **To adjust means to make a**
(1) profit   (2) settlement   (3) lecture   (4) verse   (5) gain .... 61.

62. **An associate is a**
(1) chump   (2) companion   (3) store   (4) bore   (5) meeting .... 62.

63. **Obviously means**
(1) easily   (2) graciously   (3) always   (4) evidently   (5) carelessly .... 63.

64. **A quart is a measure of**
(1) enthusiasm   (2) opportunity   (3) capacity   (4) temperature   (5) geometry   64.

65. **Rural refers to**
(1) kindness   (2) value   (3) defeat   (4) retail   (5) country .... 65.

66. **Moderate means**
(1) careless   (2) assured   (3) favored   (4) limited   (5) compared .... 66.

67. **When fears are allayed, they are**
(1) calmed   (2) increased   (3) ignored   (4) expressed   (5) joined .... 67.

68. **A vulgar person is**
(1) offensive   (2) cultured   (3) refined   (4) polite   (5) rich .... 68.

69. **The summit is the**
(1) side   (2) bottom   (3) middle   (4) edge   (5) top .... 69.

70. **Efficiency means**
(1) seriously   (2) capability   (3) studiousness   (4) unable   (5) care .... 70.

71. **Juniper is a**
(1) fern   (2) vine   (3) tree   (4) goat   (5) weed .... 71.

72. **To falsify is to**
(1) season   (2) destroy   (3) lie   (4) plant   (5) beg .... 72.

73. **A cowl is generally worn by a**
(1) mason   (2) miner   (3) woman   (4) boy   (5) monk .... 73.

74. **An animated person is**
(1) beastly   (2) hateful   (3) divorced   (4) lively   (5) cheap .... 74.

75. **To harass is to**
(1) annoy   (2) defame   (3) locate   (4) appease   (5) salute .... 75.

76. **Idolatry involves**
(1) worship   (2) masonry   (3) laziness   (4) thieving   (5) preaching .... 76.

77. **A rampart is a**
(1) ramrod   (2) tower   (3) ditch   (4) barrier   (5) dungeon .... 77.

78. **To anticipate is to**
(1) injure   (2) help   (3) expect   (4) surround   (5) destroy .... 78.

79. **An incompetent person is**
(1) young   (2) selfish   (3) unable   (4) stingy   (5) boastful .... 79.

80. **To mangle is to**
(1) mend   (2) mix   (3) crush   (4) disdain   (5) weave .... 80.

81. **An illiterate person is**
    (1) unwary   (2) unskillful   (3) unwise   (4) unschooled   (5) sick . . . . 81.

82. **An ominous cloud is**
    (1) high   (2) fleecy   (3) black   (4) stationary   (5) threatening . . . . 82.

83. **To sever is to**
    (1) detach   (2) stoop   (3) count   (4) glean   (5) be stern . . . . 83.

84. **A momentous question is**
    (1) temporary   (2) important   (3) silly   (4) small   (5) poor . . . . 84.

85. **An infidel rejects**
    (1) science   (2) government   (3) medicine   (4) militarism   (5) religion . . . . 85.

86. **Ecstasy generally refers to excessive**
    (1) appetite   (2) grief   (3) drinking   (4) care   (5) joy . . . . 86.

87. **To investigate means to make**
    (1) apology   (2) inquiry   (3) discount   (4) sacrifice   (5) remittance . . . . 87.

88. **Insignificant means**
    (1) faithful   (2) descriptive   (3) critical   (4) trivial   (5) informal . . . . 88.

89. **A punctilious person is one who is**
    (1) precise   (2) puny   (3) punished   (4) witty   (5) pugilistic . . . . . . 89.

90. **An indictment is a**
    (1) charge   (2) statute   (3) commission   (4) warning   (5) proclamation . . . . 90.

91. **A man of perseverance is**
    (1) low-bred   (2) yielding   (3) antagonistic   (4) trained   (5) steadfast . . . . 91.

92. **A commodious box is**
    (1) strong   (2) watertight   (3) tricky   (4) porous   (5) roomy . . . . 92.

93. **Omnipotent means**
    (1) all-powerful   (2) intolerant   (3) forgiving   (4) all-wise   (5) harmonious . . 93.

94. **To insinuate is to**
    (1) devise   (2) err   (3) convict   (4) hint   (5) officiate . . . . 94.

95. **A spontaneous reply is one that is**
    (1) well considered   (2) impulsive   (3) fierce   (4) provoking   (5) erroneous . . . 95.

96. **A verdant plant is**
    (1) wilted   (2) decayed   (3) green   (4) injurious   (5) woody . . . . 96.

97. **To consecrate is to**
    (1) publish   (2) proclaim   (3) hallow   (4) free   (5) pardon . . . . 97.

98. **Disepalous is a term most used in**
    (1) medicine   (2) art   (3) music   (4) millinery   (5) botany 98

99. **A sedulous person is one who is**
    (1) unhappy   (2) happy   (3) quiet   (4) alluring   (5) diligent 99

100. **Chimerical means**
    (1) fanciful   (2) realistic   (3) drugged   (4) laughable   (5) momentous 100

PART TWO · Paragraph Comprehension

PRACTICE EXERCISES

Paul was sitting in the big chair before the fireplace. He had finished his arithmetic and language homework before supper and was now reading the paper. After reading a while, he glanced down at the column of "Locals" until he came to this one:

"Joseph Grant is spending the week-end at the home of his sister, Mrs. Corson, of this city." Paul and Joseph had been great friends in the lower grades when the Grants moved to a larger city.

1. **Which word tells how Paul felt after reading this news?**
   (1) happy   (2) sad   (3) tired   (4) angry

   Happy *is the answer. The number of this word is 1, and you will see on your answer sheet or answer card that for Practice Exercise 1 a mark has been made in the first space. Now read the next two practice exercises and mark them on your answer sheet or card.*

2. **What do you think Paul did next?**
   (1) telephoned to Joseph   (2) went to a show   (3) burned the newspaper
   (4) sat up all night

3. **What time of day was it?**
   (1) morning   (2) evening   (3) midnight   (4) noon

   You should have marked answer number 1 for Practice Exercise 2 and answer number 2 for Practice Exercise 3.

D. You will have 20 minutes for this part of the test. When you have finished the first page, turn over to the next page and do as many pages as you can before you are told to stop.

1.

2.

3.

A.

What fun it would be to have a dog, thought Paul, as he sat on the front steps of his home. In a little while he saw his father coming down the street with a little black bundle under his arm. Paul ran to meet him. Soon he saw that the little bundle was a puppy. "Why, Father! Where did you get him?" asked Paul. "I bought him at the pet shop, and he is yours," said Father.

1. What do you think Paul did next?
(1) played with his dog   (2) chased the dog away   (3) ran away
(4) scolded his father ...... **1.**

2. What color was the dog?
(1) white   (2) brown   (3) black   (4) tan ...... **2.**

3. What did Paul wish for?
(1) a father   (2) a dog   (3) a cat   (4) a brother ...... **3.**

B.

Edna was having such fun hiding from her brother, Joe. She wanted so much to get home through the little woods before Joe could see her. But here was Joe coming near the bush where she was hiding. Carefully she started to move to the other side, but just then a stick she stepped on broke with a loud bang.

4. Edna and Joe were
(1) playing   (2) fighting   (3) working   (4) cutting trees ...... **4.**

5. Where was Edna hiding?
(1) behind a tree   (2) at home   (3) behind a bush   (4) in the top of a tree ...... **5.**

6. What do you think happened next?
(1) Joe walked home   (2) Edna fell down   (3) the bush caught fire
(4) Joe found Edna ...... **6.**

C.

At last it had come, Johnny rejoiced as he walked home from school with his head high and his turned-up, freckled nose held proudly in the air. How proud his father and mother would be, he thought, as with hands in his pockets he strode through Jensen Alley into his own back yard. He was late enough so that both Mother and Father would be at home. His monthly report cards had not been such a joy, but lately he had been working hard, and this one was perfectly splendid. Though he carried it in his back pocket, in his imagination he could see its every detail.

7. Where was Johnny going?
(1) to school   (2) downtown   (3) home   (4) visiting ...... **7.**

8. What do you think Johnny did next?
(1) hid his report card   (2) sneaked away   (3) scolded his mother
(4) showed his report card to his parents ...... **8.**

9. How did Johnny feel?
(1) happy   (2) sad   (3) distressed   (4) afraid to go home ...... **9.**

D.

As he hurried to his home in Ohio, George decided he did not want to take a journey through the wild forests again. The Indians had not been very friendly, and every minute for many miles he had expected to meet one or hear an arrow singing past his ears. But nothing moved except George; no other living creature stirred. Gradually George became certain that the Indians had gone from this woodland. What a comfort it was!

10. How far did George have to go to get home?
(1) one mile   (2) a few feet   (3) a few yards   (4) many miles   ......   **10.**

11. How did George feel toward the Indians?
(1) friendly   (2) happy   (3) afraid   (4) sad   ....   **11.**

12. What do you think George did next?
(1) kept on going toward home   (2) turned back   (3) shot an Indian   (4) fell down   **12.**

E.

Barbara stopped short. Her face paled with fright as the tiger came closer. She was alone in the forest and too far from any cabin to make herself heard. With a trembling hand she grasped the knife at her belt and stood ready. But what was that she heard in the bushes beside her? She turned to find a man hiding there, facing the tiger with a powerful gun held firmly in his right hand.

13. What do you think happened next?
(1) the tiger killed Barbara   (2) the man shot the tiger   (3) the tiger ran away
(4) the man shot Barbara   ....   **13.**

14. What word tells how Barbara felt?
(1) lonesome   (2) tired   (3) frightened   (4) gay   ....   **14.**

15. Where was the man crouching?
(1) in the cabin   (2) beside the tiger   (3) in a tree   (4) in the bushes   **15.**

F.

Bernice had seen just one horned toad, and ever since seeing it, she had wanted one for a pet. "Sometime," said Father, "I'll try to get one for you, but I don't know just when it will be." One evening Father brought home a big suitcase and said: "This suitcase was checked in our railroad station and has been there for a long time. Since no one claimed it, it was auctioned along with a great many other things. I bid a couple of dollars for it and it was sold to me." "What's in it?" asked Bernice. "I don't know," said Father, "but we'll open it after dinner." Bernice wondered so much about the suitcase that she could hardly eat her dinner. When it was finally opened, they found, among other things, a small box. Imagine their surprise when they opened it, and a small horned toad jumped out. He had lived in the box for months without food, water, or fresh air.

16. How did Bernice feel about the suitcase?
(1) sad   (2) not interested   (3) curious   (4) angry   ....   **16.**

17. What do you think happened next?
(1) Bernice threw the toad away   (2) the toad died   (3) Father killed the toad
(4) Bernice got the toad   ....   **17.**

18. **How many dollars did Father pay for the suitcase?**
    (1) one   (2) two   (3) three   (4) four . . . . **18.**

G.

John was taking a week's production of cream to town to sell it. After fastening the large can in the small truck, he started out. The road was smooth and he got along very nicely until he came to a corner about halfway to town. There the rope holding the can broke, and the cream spilled on the ground.

19. **What do you think happened next?**
    (1) John went home to tell his folks   (2) John went to the creamery   (3) a tire blew out
    (4) the price of cream went up . . . . **19.**

20. **What caused the loss?**
    (1) the road was rough   (2) the rope was too weak   (3) the can was too light
    (4) John drove too fast . . . . **20.**

21. **How far had he gone before losing the cream?**
    (1) about a mile   (2) one-third of the way   (3) to the first schoolhouse
    (4) about halfway . . . . **21.**

H.

The two cars were badly smashed. The car from the north, according to eyewitnesses, was traveling at seventy-five or eighty miles per hour just before the collision. The car from the east, while traveling at a moderate speed, almost passed the crossing before its rear wheels and seat were demolished by the bigger car.

22. **What caused the accident?**
    (1) liquor   (2) fast driving   (3) mud   (4) slippery streets . . . . **22.**

23. **Which car was the bigger?**
    (1) the Cadillac   (2) the car from the north   (3) the car from the east
    (4) the slow-moving car . . . . **23.**

24. **What do you think happened next?**
    (1) the fire truck was called   (2) school was dismissed   (3) the small car drove on
    (4) a crowd gathered . . . . **24.**

J.

John threw a snowball at Warren. Warren ducked, but the snowball hit him on the shoulder and brought a laugh from the rest of the boys. Warren's face grew red as he made a snowball and threw it with all his might at John. John dodged it, but in so doing slipped and fell into a puddle of water. In a rage John got up, picked up some snow and, as they ran, put it inside Warren's collar. Warren turned around and gave John a big shove.

25. **What made John fall into the water?**
    (1) Warren pushed him   (2) he threw so hard   (3) he tried to dodge a snowball
    (4) he slipped purposely . . . . **25.**

26. **What do you think happened next?**
    (1) the boys walked home   (2) Warren apologized to John
    (3) the two boys had a fight   (4) the other boys left . . . . **26.**

27. **How did the boys feel?**
    (1) angry   (2) friendly   (3) tired   (4) ashamed . . . . **27.**

K.

It was the afternoon of that fateful day and the tramp-tramp of the moving men had finally ceased. As the red-lettered, yellow van was disappearing down the street, the family had eaten a hurried lunch, and now Phyllis was sitting in a corner of the clean-swept living room floor with the telephone in her lap. She was saying a last tearful good-bye to one of her friends, for while she was the one who regretted least their departure for the country, she was the one to show it most. Before she had finished, Aunt Meg came hurrying in to say that they must start at once in order to reach their new home ahead of the van.

28. **What do you think happened next?**
    (1) the family drove to the country   (2) they stayed in the city   (3) they called friends
    (4) it stopped raining . . . . **28.**

29. **Where did Phyllis sit?**
    (1) on a chair   (2) on the davenport   (3) on the stairs   (4) on the floor . . . **29.**

30. **How did the family feel about leaving the city?**
    (1) happy   (2) willing   (3) sad   (4) unconcerned . . . . **30.**

L.

The joyous family had just gathered about the holiday table and the father was about to return thanks for the many blessings which the day had brought them, when a hesitant knock was heard. The door was opened and a small, kindly old man came in accompanied by a gust of rain. When he was able to recover his voice, he related how, as a traveler in this part of the country, he had been attracted to their light and had deemed it best to seek shelter before night should descend upon him. While he removed his coat and dried his clothing before the huge fireplace, he brought news of many persons with whom the members of the family were acquainted, for they had themselves resided in the traveler's city not many years before. Suddenly, the father remembered that the once steaming dinner was rapidly cooling.

31. **What kind of man came into the house?**
    (1) a robber   (2) a drunkard   (3) a friendly man   (4) an enemy of the family   31.

32. **What kind of family is told about?**
    (1) sad   (2) small   (3) ugly   (4) thankful   32.

33. **What do you think happened next?**
    (1) the old man was sent away   (2) the rain stopped
    (3) the father invited the man to dinner   (4) the fire went out   33.

M.

Smith, first witness for the state, testified that while he was driving at the maximum speed allowed on the narrow street the defendant passed him like a flash on the wrong side of the street. He was so surprised that he watched the car until it collided with another at a crossing two blocks ahead, and turned over. Patrolman Jones testified that when he arrived, there was trace of a broken bottle in the wrecked car and a strong odor of alcohol about the defendant who was unconscious. Perry, the driver of the other wrecked car, testified that on seeing the defendant approach, he had drawn over to the curb but could not avoid the swaying car.

34. **To what does the evidence point?**
    (1) defendant was driving lawfully   (2) defendant was driving while intoxicated
    (3) defendant was slow driver   (4) defendant was suffering from rheumatism   34.

35. **Barring other evidence, what probably resulted?**
    (1) the case was dismissed   (2) defendant was acquitted
    (3) defendant was sentenced for driving while under the influence of liquor
    (4) the case was postponed   35.

36. **Who was driving the car wrecked by the defendant?**
    (1) Perry   (2) Smith   (3) Brown   (4) Jones   36.

N.

After the furious storm of the night before, the day had cleared and the sun shone upon a fresh world. Tom and Jack, laden with dripping willow branches, hurried along through the wet meadow to the little creek in its center. Today the creek was swollen from the recent rain and it gurgled along over the rocks and nearly covered the stepping stones which had at one time projected about two feet above the water. Tom tried to cross, but as the stones were wet and smooth, he slipped and fell in. Of course the water was not deep enough to do him any harm, but as the current was swift, he called to the much excited Jack for help.

37. **Which word tells how Tom felt?**
    (1) angry   (2) happy   (3) frightened   (4) proud   37.

38. **What word describes the condition of the trees and grass?**
    (1) wet   (2) dry   (3) dead   (4) yellow   38.

39. **What do you think Jack did next?**
    (1) threw a stone to Tom   (2) took off his rubbers
    (3) reached a willow branch to Tom and pulled him to shore
    (4) pulled the boat ashore   39.

O.

Shortly after take-off, he noticed that the stars were invisible. Then he realized that Stan had pulled on the stick and they were climbing to get above the thick banks of mist. Higher and higher they mounted, and when Jack could see the stars again, although all was a gray void below, he breathed more easily. He could see by the stars that they were headed right and, although he knew Stan could keep their course by instruments, he welcomed the additional guidance of the Big Dipper. After several hours the mists suddenly cleared; the sun arose in the east; and Jack's home town appeared lying directly below them.

40. **When was most of the trip taken?**
(1) at dawn   (2) at night   (3) at dusk   (4) by day .... 40.

41. **What do you think they did next?**
(1) landed   (2) watched the sun come out   (3) watched the stars
(4) jumped in a parachute .... 41.

42. **What were they doing?**
(1) flying   (2) sailing   (3) driving a car   (4) hiking .... 42.

P.

I was sitting on the edge of the bed, loosening the heel of one of my rubber boots with the toe of the other preparatory to an early retirement, when suddenly through the darkness and stillness of the sleeping town, from the powerhouse half a mile away came a low and rising note — the great siren's whistle. Almost fascinated, I listened as the great note rose higher and more shrill and died away again. One blast meant a fire in town; two blasts, fire in the buildings at the mine; and three blasts, the most terrible of all, a disaster or trouble in the mine. Once more, after what seemed to be a long pause, the sound came again; once more rose and died away. I did not move, but there was a sudden coldness that came over me as once more, the deep note broke out on the quiet air.

43. **What time of day was it?**
(1) midnight   (2) noon   (3) evening   (4) mid-afternoon .... 43.

44. **Which word best describes how the writer felt?**
(1) angry   (2) annoyed   (3) frightened   (4) relieved .... 44.

45. **What did the writer probably do?**
(1) went to bed   (2) rushed to the mine   (3) dressed carefully and walked to the mine
(4) asked his wife if that were the noon whistle .... 45.

Q.

Wilbur recalled the old fable that a wild beast cannot stand the gaze of the human eye, and he stood at the edge of the clearing gazing steadily at the wildcat. But the snarls only grew louder. He did not like the looks of it at all. On the other hand, he had not the slightest intention of going back to camp without water. Wilbur advanced into the clearing, deciding that, whether the creature moved or not, he would now be so near that he couldn't miss her with his revolver. When he was very close, she snarled more fiercely and crouched ready to spring.

46. How did Wilbur feel?
(1) alarmed (2) happy (3) sleepy (4) peevish .... 46.

47. What do you think happened next?
(1) Wilbur went home (2) Wilbur shot the wild creature
(3) Wilbur jumped from the boat (4) Wilbur petted the cat .... 47.

48. What animal did Wilbur see?
(1) a lion (2) a tiger (3) a dog (4) a wildcat .... 48.

R.

The little group of children huddled close to the stove. It was already seven o'clock, and the blizzard that had been raging outside our little one-room school had by no means spent its force, though it did seem to be subsiding somewhat. We had managed to get word to the nearest farmer and he had promised to come as soon as he cared for his stock. I dared not let any of the children start on foot for their homes. Soon the stove would be growing cold, I thought, as I put the last chunk of coal into it. What would we do then? Just as I was pondering this question, the farmer came to the door and informed me that he was ready.

49. What do you think happened next?
(1) the farmer took us home (2) the farmer drove off alone
(3) the pupils came to school (4) the snow melted .... 49.

50. At what time did the farmer come?
(1) just before seven (2) at noon (3) at six o'clock (4) after seven o'clock ... 50.

51. How do you think I felt before the farmer came?
(1) happy (2) tired (3) worried (4) pleased .... 51.

S.

After their tedious tramp of more than ten miles, the boys were extremely tired. Yet, when at length they reached the cabin, they were so happy and excited that it was but a short time before the fire was built and the blanket rolls deposited in a neat row along the side of the room. At John's suggestion, they decided to set their traps before dark, as the snow was already falling and it promised to be a good night for their expedition. On their return from the woods they found the cabin lighted and an old man seated by the fire, apparently very much at home. None of the boys recognized him as they peered through the windows, but they soon decided to find out who he was.

52. What do you think happened next?
(1) the fire went out (2) the boys went home
(3) the boys entered the cabin and spoke to the man (4) the snow stopped falling ... 52.

53. Why did the boys come to the cabin?
(1) to fish (2) to play golf (3) to do some trapping (4) to see the snow ...... 53.

54. When did the boys get to the cabin?
(1) noon (2) midnight (3) morning (4) evening .... 54.

T.

With extreme caution Paul slipped from his hiding place and proceeded to conceal himself in the bushes behind the conspirators. Not at all fearful, despite his proximity to the two villains, either one of whom would gladly have taken his life, Paul listened intently. The larger of the two men was extracting a promise from the smaller that, if the secret hiding place were revealed to him, he would not disclose the information. The smaller man took a sacred oath that the secret should forever remain in his possession. Then the larger man turned and showed his companion a stump about twenty yards to the right. "At the base of that stump, between the two projecting roots at the south end, lies your fortune and mine; but we must wait until tomorrow evening so that we can throw suspicion on the other man." Then they went away. Paul knew they had been talking about his uncle's treasures which had been stolen a week before!

55. What do you think happened next?
(1) Paul chased the robbers (2) Paul threw a stone at the men
(3) Paul picked nuts from the bushes and put them in his pocket
(4) Paul went home and told his uncle what he had heard   55.

56. What kind of boy was Paul?
(1) brave (2) cowardly (3) unhappy (4) stupid   56.

57. What was hidden under the stump?
(1) the men (2) Paul (3) a gun (4) money   57.

U.

The voyages of discovery by explorers from England, Spain, and Portugal gave to each of these countries valid claims to territory in the New World. In 1524, Francis I of France resolved to have his share in these discoveries and in the benefits that might result from them. "What!" said he to his courtiers, "shall the kings of Spain and Portugal divide all America between them, without suffering me to take a share as their brother? I would fain see the article in Adam's will that bequeaths that vast inheritance to them."

58. What word do you think best describes Francis I?
(1) generous (2) tall (3) covetous (4) old   58.

59. What do you think Francis I did next?
(1) he took the next train to Spain (2) he sent explorers to America
(3) he helped Portugal get more land (4) he sold his ships to England   59.

60. Over what country was Francis I the ruler?
(1) England (2) Spain (3) Portugal (4) France   60.

V.

Early on that eventful Monday the 45,000 residents of the city slept peacefully and there was nothing to portend the impending disaster. Soon there came from the distance a curious singing sound that grew louder and louder, until finally the ground underfoot rose and fell in undulating waves. Even before the people could jump from their beds, the stone and brick buildings were lifted bodily, to be set down again and ground to dust. Streets and sidewalks were heaved upward or curled by the subterranean forces. Finally, with a terrific roar, an avalanche of masonry and splintered timbers crashed to the earth.

61. The disaster happened
    (1) at noon   (2) late at night   (3) early in the morning   (4) in the evening   61.

62. What do you think happened to the people?
    (1) many were killed or injured   (2) all escaped unhurt
    (3) they were blown into the sea   (4) they were happy about it all   62.

63. A good title for this story would be
    (1) The Flood   (2) The Tornado   (3) The Earthquake   (4) The Buildings   63.

W.

A noted entomologist relates a fascinating account of some of the activities of one type of female sand wasp. To perpetuate her kind, she constructs a little domed house of coarse sand by building a series of concentric rings, each diminishing in circumference, but with a hole left in the top. Into this edifice she deposits a species of small caterpillars which she stings into paralysis but does not kill, for these will become the food of her unborn offspring. Next she begins to seal the dome with a substance she secretes, but first she lays an egg in the dome, suspended by a thread of this same secretion. When the egg hatches, a tiny grub is born which spins a tiny thread on which it can descend to eat and also find its way back to the top.

64. What happens to the grub?
    (1) It is eaten by the caterpillars   (2) It remains in the little house for life
    (3) It starves to death   (4) It becomes a wasp   64.

65. A suitable title for this paragraph is:
    (1) Caterpillars   (2) Reproduction of the Sand Wasp   (3) House Building
    (4) Grubs   65.

66. What is the shape of the grub's first home?
    (1) square   (2) oblong   (3) spherical   (4) conical   66.

X.

There can no longer be any question about the feasibility of travel to the moon, although such travel will likely be far from commonplace. But what of travel to other planets? Although there are countless planets in outer space, most of the speculation has concerned those which, like earth, belong to the solar system. All of these, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto, have come in for some speculation but more interest has been shown in Mars than in any of the others. Scientists now believe that Mars, some thirty-five million miles or more from earth, is not inhabited. However, life for humans would probably be easier than on other planets for there is probably some plant life and the temperatures may not be too severe for, like earth, Mars turns so that all sides are warmed by the sun. Although the poles must be very cold with temperatures of 50 to 100 degrees below zero, daytime readings at the equator are probably much like ours. Because Mars is much smaller than earth, the atmosphere is very thin and oxygen very limited. Vegetation is probably limited to the types found in our deserts and water is probably very scarce so that life would be harder than on our worst deserts.

67. **A good title for this article would be**
   (1) Life on the Planets   (2) A Trip to Mars   (3) Conditions on Mars
   (4) The Solar System   67.

68. **Why does the writer think that life for humans might be easier on Mars than on other planets?**
   (1) Mars is closer to earth   (2) Mars is larger than earth
   (3) Mars is smaller than earth   (4) the climate is more like ours   68.

69. **When does the writer expect a trip to Mars will be made?**
   (1) in a year   (2) very soon   (3) never   (4) he doesn't say   69.

Y.

"To land King Robert lightly sprung,
And thrice aloud his bugle rung
With note prolonged and varied strain
Till bold Ben-Ghoil replied again.
Good Douglas then and De la Haye
Had in a glen a hart at bay,
And Lennox cheered the laggard hounds,
When waked that horn the greenwood bounds.
'It is the foe!' cried all, who came
In breathless haste with eyes of flame —
'It is the foe! — Each valiant lord
Fling by his bow and grasp his sword!' "

70. **What were the men doing when the bugle blew?**
   (1) fighting   (2) hunting   (3) resting   (4) sleeping   70.

71. **With which weapons did they fight?**
   (1) guns   (2) cannons   (3) spears   (4) swords   71.

72. **What do you think happened next?**
   (1) the men went home   (2) the hounds were killed   (3) the airplane crashed
   (4) the men gathered for battle   72.

Z.

Durovitch had a strange sort of eccentricity: he was disinclined to recapitulate any incident he had formerly related. If asked to do so, he would interpolate so as to make the original impossible of recognition. Yet so garrulous was he that on more than one occasion did he take so little cognizance of the words which flowed over his tongue in his efforts to regale his select coterie, that his hearers were able to worm from him essential repetitions. Such was the case one bitter winter evening when, recovering from an inordinate carousal, the village jokesmith was desirous of hearing a tale which Durovitch, himself a bit befuddled, had once produced out of his copious stock. Durovitch fixated the most timid of his hearers with that ghoulish gaze which one who would be regaled must learn to forbear, and the assembled company knew that the jokesmith had met with success.

73. What kind of man was Durovitch?
(1) timid (2) quarrelsome (3) wicked (4) talkative .... **73.**

74. What kind of evening was it?
(1) sultry (2) cold (3) warm (4) rainy .... **74.**

75. What do you think happened next?
(1) Durovitch went home (2) Durovitch told a brand new story
(3) the jokesmith made everyone laugh
(4) Durovitch repeated a story he had told before .... **75.**

End of test.

APPENDIX O

VERBAL INTELLIGENCE TEST

LEVEL 3 • FORM A • VERBAL BATTERY

(Do not write in this booklet. The blank space below is for school use only.)

THE LORGE-THORNDIKE H—M TESTS INTELLIGENCE TESTS

AV 4-6
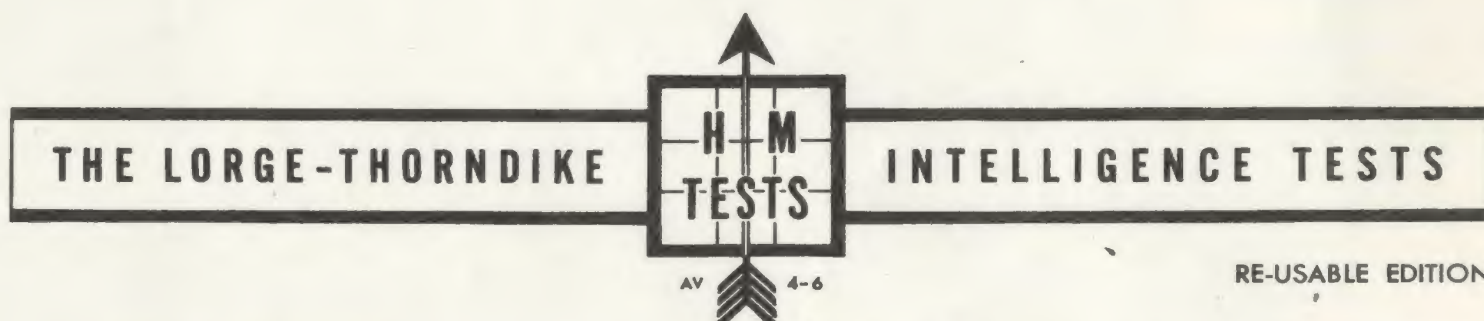
RE-USABLE EDITION

DIRECTIONS: This booklet contains four short tests which will give you a chance to show what you know and how well you think. You are to mark your answers to all the questions in this booklet on the separate answer sheet which has been given you. The questions are followed by five choices, only one of which is the right answer.

Look at the first sample question below. It is correctly marked on the answer sheet. Study it carefully to see for yourself just how you are to mark your answers.

1. Choose the word which has the same meaning, or most nearly the same meaning, as the word in dark type at the beginning of the line.

dog   **A** afraid   **B** song   **C** animal   **D** large   **E** fly

Now look at the next two samples. Choose the right answer and then, on the answer sheet, make a heavy black pencil mark in the dotted answer space that has the same letter as the answer you picked.

2. In the group of choices lettered **F** to **K**, find the word that will make the best, the truest, and the most sensible complete sentence.

The sun always rises in the ————.

F east   **G** wind   **H** night   **J** rain   **K** water

3. Choose the right answer to this problem and mark the answer space.

A boy bought a pencil for 10 cents and some paper for 10 cents. How much did he spend?

L 5 cents   **M** 10 cents   **N** 15 cents   **P** 20 cents   **Q** none of these

If you wish to change an answer, erase your mark completely, and then make another mark in the right answer space.

You may find some of the questions very easy and some of them rather hard. Try to answer every question, but do not spend too much time on those that you find very hard. Do those that you can, and then, if you still have time left, go back and do those that you skipped. You are not expected to be able to answer all the questions correctly. Always do your very best.

At the beginning of each short test there are directions that tell you what to do. Wait until you are told to begin before turning the page.

3 A V

AV 4-6
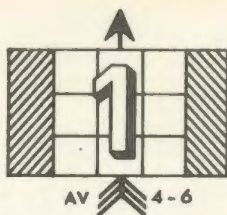
One word has been left out of each sentence on these two pages. Choose the word that will make the best, the truest, and the most sensible complete sentence. Look at sample sentence 0.

0. Hot weather comes in the ————.

    A fall   **B** night   **C** summer   **D** winter   **E** snow

The best answer is **summer.** The letter before **summer** is **C,** so you should make a heavy black pencil mark in the **C** answer space for sentence 0.

Now look at sentence 00.

00. ———— bark at cats.

    F Cows   **G** Mice   **H** Cats   **J** Hens   **K** Dogs

The best answer is **Dogs,** so you should make a heavy black pencil mark in the **K** answer space for sentence 00.

Do all the sentences on these two pages in the same way. Try every sentence.

---

1. Boys will become ————.
    A infants   **B** little   **C** intelligent   **D** stupid   **E** men

2. We see ———— only at night.
    F children   **G** plants   **H** stars   **J** houses   **K** trees

3. Fred was six years old. There were six ———— on his birthday cake.
    L candles   **M** boys   **N** girls   **P** parties   **Q** children

4. Not every cloud gives ————.
    R weather   **S** shade   **T** sky   **U** climate   **V** rain

5. Coal is ————; snow is white.
    A blue   **B** white   **C** red   **D** green   **E** black

6. In the spring the buds form on the branches of the ————.
    F trees   **G** rivers   **H** bugs   **J** leaves   **K** animals

7. The ———— must bend when the wind blows upon it.
    L ground   **M** house   **N** path   **P** grass   **Q** sky

8. There is an old ————, "An apple a day keeps the doctor away."
    R talk   **S** saying   **T** reader   **U** book   **V** man

9. Nothing out of its place is good and nothing in its place is ————.
    A there   **B** bad   **C** right   **D** shelved   **E** simple

10. The ragged ———— may prove a good horse.
    F puppy   **G** child   **H** calf   **J** lamb   **K** colt

---

     Go right on to the next page.

11. I know of no way of judging the ———— but by the past.

    L former   **M** future   **N** priority   **P** morn   **Q** decline

12. Caterpillars spin ———— for themselves in the fall.

    R webs   **S** around   **T** moths   **U** cocoons   **V** butterflies

13. How far the little ———— throws its beams!

    A candle   **B** cake   **C** sky   **D** puppy   **E** night

14. When a dove begins to associate with crows, its feathers remain ———— but its heart grows black.

    F black   **G** white   **H** dirty   **J** spread   **K** good

15. Good company on a journey makes the ———— seem shorter.

    L feast   **M** way   **N** joy   **P** work   **Q** care

16. How the ———— roses flush up in the cheeks!

    R white   **S** pretty   **T** small   **U** yellow   **V** red

17. The important thing is not so much that every child should be taught, as that every child should be given the wish to ————.

    A learn   **B** play   **C** hope   **D** reject   **E** teach

18. The person who ———— another must make good the damages.

    F reforms   **G** improves   **H** instructs   **J** injures   **K** delights

19. It must be ————: I've done it from my youth.

    L right   **M** wrong   **N** factual   **P** rude   **Q** kind

20. Cause and effect, means and ends, seed and ———— cannot be severed.

    R caution   **S** thought   **T** fruit   **U** science   **V** philosophy

21. No matter how harsh advice may be, it ———— no one.

    A injures   **B** helps   **C** pays   **D** delights   **E** respects

22. The only stable state is the one in which all men are ———— before the law.

    F just   **G** right   **H** equal   **J** guiltless   **K** natural

23. It is ———— to be generous with other people's property.

    L desirable   **M** necessary   **N** good   **P** important   **Q** easy

24. Reason is founded on the ———— of our senses.

    R love   **S** confusions   **T** abuse   **U** evidences   **V** brutality

25. Think long when you may ———— only once.

    A abstain   **B** live   **C** die   **D** decide   **E** eat

Look at sample question 0.

0. rose   daisy   violet

    A red   B garden   C sweet   D grow   E lily

The words in dark type in question 0 are the names of flowers. On the next line only **lily** is the name of a flower. The letter before **lily** is **E**, so you should make a heavy black pencil mark in the **E** answer space for question 0.

Now look at question 00. Think in what way the words in dark type go together. Then find the word on the line below that belongs with them.

00. go   run   walk   move

    F think   G dream   H march   J sing   K seem

The right answer is **march**. You should make a heavy black pencil mark in the **H** answer space for question 00.

Do all the questions on these two pages in the same way. Try every question.

---

1. **horse   cow   lamb**
    A farm   B forest   C canary   D pig   E beast

2. **Ed   Dick   Pete**
    F Benjamin   G Ted   H Harold   J Melvin   K Arthur

3. **dish   cup   glass**
    L fork   M food   N plate   P drink   Q meal

4. **bean   carrot   spinach**
    R orange   S pea   T seed   U vegetable   V lunch

5. **Sarah   Clara   Joan**
    A Ben   B Freddy   C Louise   D Sam   E Ronald

6. **violet   rose   poppy**
    F cherry   G apple   H garden   J tulip   K hemlock

7. **pencil   chalk   crayon**
    L paper   M letter   N easel   P pen   Q paint

8. **hand   chin   eye   toe**
    R glove   S shoe   T hair   U touch   V forehead

9. **pot   kettle   broiler   skillet**
    A sink   B stove   C tumbler   D tray   E pan

10. **corn   rye   wheat   barley**
    F rice   G carrots   H cucumber   J bean   K tomato

---

11. **bird   kite   airplane   butterfly**
   L insect   **M** bat   **N** animal   **P** ship   **Q** train

12. **book   magazine   letter**
   R newspaper   **S** movie   **T** radio   **U** lecture   **V** read

13. **chess   checkers   dominoes   lotto**
   A pool   **B** lacrosse   **C** bingo   **D** croquet   **E** cricket

14. **star   moon   planet**
   F sky   **G** solar   **H** planetarium   **J** telescope   **K** sun

15. **intelligent   keen   acute   sharp**
   L prudent   **M** poised   **N** rational   **P** sophisticated   **Q** bright

16. **pumps   sneakers   Oxfords   sandals**
   R skis   **S** hose   **T** gloves   **U** moccasins   **V** skates

17. **volunteer   neophyte   inexperienced   beginner**
   A contract   **B** amateur   **C** unimportant   **D** common   **E** profession

18. **trousers   breeches   knickers   pants**
   F shorts   **G** skirts   **H** kilts   **J** coats   **K** mackinaws

19. **ignition   motor   generator   clutch**
   L gasoline   **M** sedan   **N** garage   **P** chauffeur   **Q** brake

20. **pepper   clove   cinnamon   nutmeg**
   R onion   **S** salt   **T** beet   **U** relish   **V** soup

21. **brush   mop   vacuum cleaner   carpet sweeper**
   A rag   **B** washing machine   **C** towel   **D** broom   **E** cleaner

22. **crest   insignia   escutcheon   shield**
   F favor   **G** genealogy   **H** uniform   **J** steed   **K** coat of arms

23. **cloak   mantle   greatcoat   ulster**
   L jersey   **M** dress   **N** shawl   **P** overcoat   **Q** gabardine

24. **captain   general   major   lieutenant**
   R ensign   **S** admiral   **T** colonel   **U** sergeant   **V** corporal

25. **Jupiter   Juno   Minerva   Venus**
   A Diana   **B** Thor   **C** Odin   **D** Balder   **E** Satyr

---

Page 5   ***Stop!** Wait until you are told to go ahead to Test 3.*

Look at sample problem 0.

0. If candy costs a cent a piece, how much will nine pieces cost?

    A 1¢   **B** 7¢   **C** 8¢   **D** 9¢   **E** none of these

The right answer is **9¢**. The letter before it is **D**, so you should make a heavy black pencil mark in the **D** answer space for problem 0.

Now look at problem 00.

00. Mrs. Jones bought a pound of potatoes for 10¢ and a pound of spinach for 15¢. How much did she spend?

    F 5¢   **G** 10¢   **H** 15¢   **J** 20¢   **K** none of these

The right answer is **25¢**. The answers at **F, G, H,** and **J** are wrong. You should make a heavy black pencil mark in the **K** answer space because "none of these" is the best answer for problem 00.

Do all the problems on these two pages in the same way. Try every problem.

---

1. Jim bought a candy bar for 5 cents and a piece of gum for 2 cents. How much did he pay for both?

    A 3¢   **B** 7¢   **C** 10¢   **D** 52¢   **E** none of these

2. Helen bought a pad for 5 cents, some candy for 12 cents, and a pen for 6 cents. How much did she spend altogether?

    F 21¢   **G** 22¢   **H** 23¢   **J** 33¢   **K** none of these

3. A pad costs 5 cents. How much will 4 pads cost?

    L 9¢   **M** 16¢   **N** 18¢   **P** 25¢   **Q** none of these

4. John bought some peanuts for 10 cents. He gave the man 25 cents. How much change should he get back?

    R 35¢   **S** 25¢   **T** 20¢   **U** 15¢   **V** None of these

5. Dick wants to buy some 5¢ pencils. How many can he buy for 25 cents?

    A 5   **B** 20   **C** 25   **D** 30   **E** none of these

6. Jane had 36 cookies. She gave away 21 of them. How many did she have left?

    F 14   **G** 15   **H** 17   **J** 57   **K** none of these

7. A classroom has 5 rows of seats with 7 seats in each row. How many children can be seated in the room?

    L 2   **M** 12   **N** 35   **P** 57   **Q** none of these

DO NOT WRITE IN THIS BOOKLET. USE OTHER PAPER FOR ANY FIGURING YOU NEED TO DO.

8. Mary bought a comic book for 10 cents, some gum for 5 cents and a candy bar for 5 cents. How many cents did she spend in all?

    R 15¢   **S** 20¢   **T** 25¢   **U** 50¢   **V** none of these

9. There are 20 children in a class. Each gives the teacher 10 cents for milk. How much does the teacher get in all?

    A 10¢   **B** 30¢   **C** $1.00   **D** $2.00   **E** none of these

10. It takes Mary 20 minutes to walk to school. Sue can walk to school in half the time it takes Mary. How many minutes does it take Sue to walk to school?

    F 10   **G** 20   **H** 30   **J** 40   **K** none of these

11. A hostess needs enough ice cream to serve 30 persons. How many quarts should she order if one quart will serve 6 persons?

    L 6   **M** 24   **N** 36   **P** 180   **Q** none of these

12. Every time Mr. Dwyer draws a check, his bank charges him 5¢. How much does the bank charge him during one month for 23 checks?

    R $.25   **S** $.28   **T** $1.05   **U** $1.15   **V** none of these

13. There are 321 children in a school. One day 104 went on a trip. How many children were left in school?

    A 425   **B** 227   **C** 217   **D** 207   **E** none of these

14. Mr. Ronald told Peggy that he would give her $1200 to pay for her first year at college. If he gave her $480 to start with and the rest in eight monthly payments, how much was she to receive each month?

    F $80   **G** $90   **H** $133⅓   **J** $720   **K** none of these

15. Sam gets 20% of the price for each magazine subscription that he sells. He wants to earn $50 during the summer. What is the value of the subscriptions he will have to sell?

    L $10   **M** $40   **N** $50   **P** $200   **Q** none of these

For the questions on this page, you are to choose the word which has the same meaning, or most nearly the same meaning, as the word in dark type at the beginning of the line. Look at sample question 0.

0. loud   A quick   B noisy   C hard   D heavy   E weak

The best answer is **noisy**. The letter before **noisy** is **B**, so you should make a heavy black pencil mark in the **B** answer space for question 0.

Do all the questions on this page in the same way. Try every question.

1. **land**   A ground   B town   C roof   D river   E grass
2. **toss**   F drink   G add   H sum up   J lower   K throw
3. **elephant**   L bird   M zoo   N snake   P animal   Q fish
4. **last**   R hope   S shoe   T back   U end   V king
5. **enter**   A place   B play   C try out   D leave   E go in
6. **beside**   F lay siege   G over   H how   J close to   K few
7. **single**   L one   M many   N some   P all   Q few
8. **carpenter**   R ruin   S red carpet   T building   U clam   V workman
9. **torture**   A toper   B total   C law   D labyrinth   E torment
10. **mix**   F combine   G skip   H reach   J color   K lose
11. **fasten**   L fix   M divide   N feed   P loosen   Q grease
12. **whistle**   R small thing   S song   T bird   U serpent   V shrill sound
13. **dew**   A storm   B moisture   C drop   D honey   E fog
14. **sob**   F prejudice   G solemn   H sigh   J joy   K kind
15. **adjust**   L parole   M account   N disturb   P regulate   Q render
16. **heavily**   R lightly   S solidly   T feverish   U goodly   V weakly
17. **grip**   A grate   B grow   C gyrate   D grasp   E grin
18. **recipe**   F catch   G share   H formula   J narrative   K payment
19. **detail**   L sale   M insurance   N item   P bookkeeper   Q poison
20. **hairy**   R light   S beguiled   T divested   U shaggy   V unique
21. **exclamation**   A supplication   B outcry   C uplift   D calamity   E persecution
22. **hunger**   F food   G famine   H frustration   J fake   K force
23. **patent**   L officer   M client   N license   P head   Q sheen
24. **agile**   R nervous   S antiseptic   T nimble   U pugnacious   V terrified
25. **tangible**   A ghostly   B substantial   C pungent   D obstructive   E twisting

Page 8   *Turn over your test booklet and wait for further instructions.*

APPENDIX P

BLISHEN SCALE

BLISHEN OCCUPATIONAL CLASS SCALE

APPENDIX

Table 1 - Occupations Ranked and Grouped According to
         Combined Standard Scores for Income and Years
         of Schooling, by Sex, Canada, 1951[a]

Occupation	Sex	Score[b]
Class 1		
Judges	M	90.0
Dentists	M	82.5
Physicians and Surgeons	M	81.2
Lawyers	M	78.8
Engineers, chemical	M	77.8
Actuaries	M	77.6
Engineers, mining	M	77.4
Engineers, electrical	M	75.2
Engineers, civil	M	75.0
Architects	M	73.2
Class 2		
Statisticians	F	72.9
Engineers, mechanical	M	72.6
Professors	M	72.0
Stock and bond brokers	M	70.9
Veterinarians	M	69.8
Business service officers	M	69.5
Statisticians	M	68.8
Mining Managers	M	67.9
Finance Managers	M	67.7
Osteopaths and chiropractors	M	67.3
Dietitians	F	67.0
Professors	F	66.7
Chemists and metallurgists	M	65.8
Officers, armed forces	M	65.1
Air pilots	M	65.0
Chemists and metallurgists	F	64.8
Agricultural professionals	M	64.8
Electricity, gas and water officials	M	64.7
Other professions, Hockey players	M	64.0

Occupation	Sex	Score[b]
Construction managers	M	63.8
Wholesale trade managers	M	63.5
Librarians	F	63.4
Authors, editors and journalists	M	63.4
Manufacturing managers	M	63.0
Community service workers	M	62.4
Social welfare workers	F	62.2
Osteopaths and chiropractors	F	62.2
School teachers	M	62.2
Librarians	M	62.0
Accountants and auditors	M	61.8
Authors, editors and journalists	F	61.4
Clergymen	M	61.0
Designers, clothing	M	60.6
Gov't. service officials	M	60.6
Transportation managers	M	60.1
Farmers	F	59.4
Community service workers	F	59.1
Dispatchers, train	M	58.5
Designers, cloth	F	58.2
Insurance agents	M	58.2
Foremen, communication	M	58.1
Advertising agents	M	58.0
Managers N.E.S.[c]	M	57.7
School teachers	F	57.6
Artists and teachers of art	M	57.6
Nurses, graduate	F	57.4
Real estate agents and dealers	M	57.0
Social welfare workers	M	57.0
Retail trade managers	M	57.0

Class 3

Occupation	Sex	Score
Actors, models	F	56.9
Commercial travellers	M	56.7
Advertising agents	F	56.6
Forestry managers	M	56.5
Artists, commercial	F	56.4
Radio announcers	M	56.4
Laboratory technicians N.E.S.[c]	F	56.0
Artists, commercial	M	56.0
Draughtsmen	M	56.0
Brokers, agents and appraisers	M	56.0
Inspectors, communication	M	55.0
Artists and teachers of art	F	55.0

Occupation	Sex	Score[b]
Surveyors	M	55.0
Recreation service officers	M	54.8
Purchasing agents	M	54.8
Agents, ticket station	M	54.3
Laboratory technicians N.E.S.[c]	M	54.2
Stenographers and typists	F	54.1
Conductors, railway	M	54.1
Radio operators	M	54.0
Locomotive engineers	M	54.0
Photo-engravers	M	54.0
Music teachers	M	53.7
Teachers N.E.S.[c]	F	53.6
Office appliance operators	F	53.4
Teachers N.E.S.[c]	M	53.4
Retail trade managers	F	53.3
Telegraph operators	F	52.9
Foremen, mining	M	52.8
Window-decorators	F	52.3
Nurses, graduate	M	52.2
Actors	M	52.1
Stenographers	M	52.0

Class 4

Occupation	Sex	Score
Book-keepers and cashiers	F	51.9
Forewomen, communication	F	51.8
Foremen, manufacturing	M	51.8
Photographers	M	51.8
Inspectors, construction	M	51.7
Window-decorators	M	51.6
Telegraph operators	M	51.6
Petroleum refiners	M	51.6
Toolmakers	M	51.6
Engravers, except photo-engravers	M	51.4
Undertakers	M	51.3
Office Clerks	F	51.2
Locomotive firemen	M	51.2
Book-keepers and cashiers	M	51.2
Brakemen, railway	M	51.1
Power station operators	M	51.0
Office appliance operators	M	51.0
Doctor, dentist attendants	F	50.8
Motion picture projectionists	M	50.8
Radio repairmen	M	50.8
Captains, mates, pilots	M	50.7

Occupation	Sex	Score[b]
Foremen, transportation	M	50.7
Foremen, commercial	M	50.6
Personal service officers	M	50.5

Class 5

Occupation	Sex	Score
Patternmakers	M	50.4
Compositors	M	50.4
Inspectors, metal	M	50.4
Paper-makers	M	50.4
Photographers	F	50.2
Policemen	M	50.2
Office clerks	M	50.2
Mechanics, airplane	M	50.1
Inspectors, metal products	F	50.0
Music teachers	F	50.0
Firemen, fire department	M	49.8
Pressmen and plate printers	M	49.8
Telephone operators	F	49.6
Electricians	M	49.6
Machinists, metal	M	49.6
Linemen and servicemen	M	49.4
Engineering officers (on ships)	M	49.4
Baggagemen	M	49.4
Transportation Inspectors	M	49.4
Rolling millmen	M	49.4
Auctioneers	M	49.3
Inspectors and graders	M	49.2
Farmers	M	49.2
Photographic occupations N.E.S.[c]	M	49.2
Collectors	M	49.1
Dental mechanics	M	49.1
Sulphite cookers	M	49.0
Wire drawers	M	46.9
Other ranks, armed forces	M,F	46.8
Electroplaters	M	46.8
Plumbers	M	46.8
Motormen	M	46.7
Quarriers	M	46.6
Machine operators, metal	M	46.5
Paint makers	M	46.4
Filers	M	46.4
Upholsterers	M	46.3
Knitters	M	46.3
Wood Inspectors	M	46.3

Occupation	Sex	Score[b]
Opticians	F	47.6
Bus drivers, taxi	M	47.6
Heat treaters	M	47.6
Religious workers N.E.S.[c]	F	47.6
Photographic workers N.E.S.[c]	F	47.4
Machine operators, metal	F	47.4
Boilermakers	M	47.3
Jewellers and watchmakers	F	47.2
Other bookbinding workers N.E.S.[c]	M	47.2
Sales Clerks	M	47.2
Hoistmen, cranemen	M	47.2
Welders, general trade	M	47.2
Mechanics N.E.S.[c]	M	47.2
Mechanics, railroad	M	47.2
Fitters, metal	M	47.2
Cutters, textile goods	M	47.2
Millmen	M	47.2
Wire drawers	F	47.1
Core makers	F	47.1
Riggers	M	47.1
Sheetmetal workers	M	47.1
Shipping clerks	M	47.0
Logging foremen	M	45.4
Labellers	M	45.3
Nurses, in training	F	45.2
Meat canners	M	45.2
Farm managers	M	45.2
Plasterers	M	45.2
Textile Inspectors	M	45.1
Other pulp and paper workers	F	45.1

Class 6

Occupation	Sex	Score
Winders and warpers	F	45.0
Carders and drawing frame workers	F	45.0
Sales clerks	F	45.0
Moulders, metal	M	45.0
Nurses, practical	M	45.0
Cutters, textile goods	F	44.9
Elevator tenders	F	44.8
Tailoresses	F	44.8
Textile Inspectors	F	44.8
Potmen	M	44.8
Timbermen	M	44.7
Prospectors	M	44.7

Occupation	Sex	Score[b]
Barbers	F	46.2
Milliners	F	46.2
Tobacco products workers	F	46.2
Furnacemen	M	46.2
Furriers	M	46.2
Brothers (religion)	M	46.1
Paper box makers	M	46.1
Other bookbinding workers N.E.S.[c]	F	46.0
Coremakers	M	46.0
Vulcanizers	M	46.0
Liquor and beverage workers	M	46.0
Postmen	M	45.9
Meat canners	F	45.9
Other upholstering workers N.E.S.[c]	F	45.8
Bookbinders	F	45.8
Transportation, storage, communication workers	F	45.8
Polishers, metal	M	45.8
Furriers	F	45.6
Structural Iron workers	M	45.6
Mechanics, motor	M	45.6
Textile Inspectors	M	45.6
Cabinet and furniture makers	M	45.5
Loom fixers	M	45.5
Weavers, textile	F	45.4
Butchers	M	45.4
Miners	M	45.4
Assemblers, electrical equipment	F	48.9
Operators, electric street railway	M	48.8
Stationary engineers	M	48.7
Bookbinders	M	48.6
Tire and tube builders	F	48.4
Canvassers	M	48.2
Telephone operators	M	48.2
Switchmen and signalmen	M	48.2
Opticians	M	48.2
Jewellers and watchmakers	M	48.2
Personal service workers	F	48.1
Assemblers, electrical equipment	M	48.1
Tire and tube builders	M	48.1
Millwrights (repairs machinery in mills)	M	48.0
Religious workers N.E.S.[c]	M	48.0
Fitters, metal	F	47.9
Milliners	M	47.8
Construction foremen	M	47.7

Occupation	Sex	Score[b]
Oilers, power plant	M	44.7
Liquor and beverage workers	F	44.6
Paper box makers	F	44.6
Kiln burners	M	44.6
Brick and stone masons	M	44.6
Construction machine operators	M	44.5
Canvassers	F	44.4
Service station attendants	M	44.4
Painters and decorators	M	44.4
Hat and cap makers	M	44.4
Bleachers and dyers	M	44.4
Spinners and twisters	F	44.3
Rubber shoe makers	F	44.2
Porters	M	44.2
Tobacco products workers	M	44.2
Millers	M	44.2
Nurses, practical	F	44.1
Finishers, textile	F	44.0
Blacksmiths	M	44.0
Tailors	M	43.8
Bakers	M	43.8
Weavers	M	43.8
Rubber shoe makers	M	43.7
Labellers	F	43.6
Other personal service workers	F	43.6
Barbers	M	43.6
Truck drivers	M	43.6
Packers and wrappers	M	43.6
Finishers, textile	M	43.6
Tanners	M	43.6
Finishers, wood	M	43.5
Hat and cap makers	F	43.5
Cutters, leather	M	43.5
Commercial packers and wrappers	F	43.4
Teamsters	M	43.4
Stone cutters	M	43.4
Riveters and rivet heaters	M	43.4
Butter and cheese makers	M	43.3
Chauffeurs	M	43.3
Boiler firemen	M	43.3
Spinners	M	43.3
Inspectors N.E.S., graders[c]	F	43.2
Postmen	F	43.2
Waiters	M	43.2
Carpenters	M	43.2
Sewers and sewing machine operators	M	43.2

Occupation	Sex	Score[b]
Forest rangers	M	43.2
Lock keepers, canalmen	M	43.1
Wood turners	M	43.1
Labourers, mines and quarries	M	43.1
Sewers and sewing machine operators	F	43.0
Brick and stone masons	M	43.0
Textile inspectors	F	42.8
Machine operators, boot and shoe	F	42.8
Knitters	F	42.8
Guards, commissionaires	M	42.8
Winders, warpers, reelers	M	42.8
Glove makers	M	42.7
Cutters, leather	F	42.6
Elevator tenders	M	42.5
Bakers	F	42.4
Machine operators, boot and shoe	M	42.4
Launderers	M	42.4
Firemen, on ships	M	42.4
Cement and concrete finishers	M	42.4
Dressmakers and seamstresses	F	42.3
Carders and drawing frame tenders	M	42.3
Box and basket makers	F	42.2
Coopers	M	42.2
Sailors	M	42.1
Harness and saddle markers	M	42.0
Nuns	F	41.8

Class 7

Cooks	M	41.8
Janitors	M	41.6
Laundresses, cleaners and dyers	F	41.4
Sectionmen and trackmen	M	41.4
Charworkers and cleaners	M	41.3
Paper box, bag and envelope makers	M	41.3
Sawyers	M	41.2
Longshoremen	M	41.2
Waitresses	F	41.2
Glove makers	F	41.2
Labourers	M	40.8
Cooks	F	40.5
Messengers	M	40.2
Shoemakers	M	40.2
Ushers	M	40.1
Janitors	F	40.0
Hawkers	M	39.3
Housekeepers and matrons	F	38.9

Occupation	Sex	Score[b]
Hotel cafe and household workers	M	38.8
Newsboys	M	38.7
Guides	M	38.8
Hotel cafe and household workers	F	37.8
Farm labourers	M	37.5
Lumbermen	M	37.4
Charworkers and cleaners	F	37.4
Fishermen	M	36.9
Bootblacks	M	36.8
Fish canners, curers and packers	M	36.2
Hunters and trappers	M	32.0
Fish canners, curers and packers	F	36.0

a. Canada, Dominion of Statistics, Census of Canada, V, Table 21 and IV, Table 11 (Ottawa, 1953), Canada, Dept. of Internal Revenue, Taxation Statistics, 1951 (Ottawa, 1953) Additional Information supplied by D.B.S. Census Analysis Section.

b. The mean of the scores = 50, the standard deviation = 10 (calculated separately for each sex).

c. N.E.S. = not elsewhere specified.

APPENDIX Q

CORRELATION MATRIX - GIRLS (N = 323)

AC = Arithmetic Concepts
AP = Arithmetic Problems
ME = Mother's Education
FO = Father's Occupation
NC = Number of Children in Family
DA = Days Absent
AS = Age of School
CE = Classroom Enrolment
TQ = Teacher's Qualification
IQ = Verbal Intelligence
RA = Reading Ability

AC	AP	ME	FO	NC	DA	AS	CE	TQ	IQ	RA	
100	71	21	28	-23	-12	-06	15	16	17	73	AC
	100	19	23	-15	-09	-01	06	14	68	69	AP
		100	30	-08	-19	01	17	13	30	27	ME
			100	-05	-10	-07	11	09	31	26	FO
				100	07	13	-10	03	-20	-28	NC
					100	01	-07	-09	-16	-11	DA
						100	-30	-08	-04	-05	AS
							100	42	21	15	CE
								100	15	07	TQ
									100	80	IQ
										100	RA

Decimal points are omitted.

Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

APPENDIX R

CORRELATION MATRIX - BOYS (N = 361)

AC = Arithmetic Concepts
AP = Arithmetic Problems
ME = Mother's Education
FO = Father's Occupation
NC = Number of Children in Family
DA = Days Absent
AS = Age of School
CE = Classroom Enrolment
TQ = Teacher's Qualifications
IQ = Verbal Intelligence
RA = Reading Ability

AC	AP	ME	FO	NS	DA	AS	CE	TQ	IQ	RA	
100	73	24	26	-06	-11	-09	07	12	66	63	AC
	100	20	21	-05	-03	-06	-03	-02	55	59	AP
		100	34	-002	-09	01	04	05	35	32	ME
			100	-08	-07	-15	19	14	26	33	FO
				100	04	-02	-02	01	-15	-16	NC
					100	02	01	-03	-13	-11	DA
						100	-29	-01	-03	-02	AS
							100	36	05	-002	CE
								100	14	07	TQ
									100	77	IQ
										100	RA

Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

APPENDIX S

CORRELATION MATRIX - BOYS AND GIRLS (N = 684)

AC = Arithmetic Concepts
AP = Arithmetic Problems
ME = Mother's Education
FO = Father's Occupation
NC = Number of Children in Family
DA = Days Absent
AS = Age of School
CE = Classroom Enrolment
TQ = Teacher's Qualifications
IQ = Verbal Intelligence
RA = Reading Ability

AC	AP	ME	FO	NC	DA	AS	CE	TQ	IQ	RA	
100	70	22	27	-13	-12	-08	10	13	67	66	AC
	100	19	22	-10	-05	-01	004	05	62	65	AP
		100	32	-04	-14	01	10	08	32	28	ME
			100	-07	-09	-11	15	12	27	29	FO
				100	05	05	-05	02	-17	-19	NC
					100	02	-04	-06	-13	-09	DA
						100	-30	-05	-01	-01	AS
							100	39	11	05	CE
								100	13	05	TQ
									100	79	IQ
										100	RA

Where N exceeds 100, a r of .16 is required for significance at the .05 level, .23 at the .01 level and .32 at the .001 level.

APPENDIX T

CALCULATION OF MULTIPLE R BETWEEN SOCIOECONOMIC VARIABLES AND ARITHMETIC CONCEPTS - GIRLS (N=323)

X_1 Arithmetic Concepts
X_2 Mother's Education
X_3 Father's Occupation
X_4 Number of Children in Family
X_5 Absenteeism

	X_2	X_3	X_4	X_5					
X_2	100	30	-08	-19	-1	.	.	.	03
X_3	30	100	-05	-10	.	-1	.	.	15
X_4	-08	-05	100	07	.	.	-1	.	-06
X_5	-19	-10	07	100	.	.	.	-1	-22
X_1	21	28	-23	-12	.	.	.	.	14
	1099	910	-026	-043	300	-1	.	.	14
		100	-029	-047	330	-1099	.	.	154
		-026	994	055	-080	.	-1	.	-058
		-043	055	964	-190	.	.	-1	-214
		217	-213	-080	210	.	.	.	134
		1007	993	054	-071	-029	-1	.	-053
			1000	054	-072	-029	-1007	.	-053
			054	962	-176	-047	.	-1	-207
			-207	-070	139	238	.	.	100
			1043	959	-172	-045	054	-1	-204
				1000	-179	-047	056	-1043	-213
				-059	124	232	-208	.	089
Beta Coefficients					113	229	-205	-062	076

Decimal points are omitted

$$R = \sqrt{.024 + .063 + .047 + .008} = .377$$

APPENDIX U

SCHOOLS FROM WHICH PUPILS TESTED

Number, Place and School	Enroll-ment	Test Centre Number	Researcher	Transport and Distance	Dates of Testing May, 1968
1. Bellevue, R.C.	19	1	Pollard		6, 7
2. Blaketown, Ang.	4	2	Ralph		2, 3
3. Bonaventure, Ang.	9	3	"		15, 16
4. Burgoyne's Cove, Ang.	8	4	"		14, 15
5. Britannia, U.C.	2	5	"		10, 13
6. Brownsdale, U.C.	5	6	Noel		1, 10
7. Butter Cove, Ang.	6	26	"	Car, 2mi.	8, 9
8. Catalina, Ang.	29	8	Pollard		14, 15
9. Catalina, U.C.	15	8	Noel		14, 15
10. Catalina, R.C.	5	8	Noel		14, 15
11. Cavendish, U.C.	10	28	"	Bus, 7mi.	2, 3
12. Champney's East, Ang.	4	59	Pollard	Bus, 3mi.	15, 16
13. Chance Cove, Ang.-S.A.	18	13	"		6, 7
14. Chapel Arm, Ang.	15	14	Noel		6, 7
15. Chapel Arm, R.C.	11	15	"		6, 7
16. Clarenville, S.A.	15	16	Ralph		8, 9
17. Clarenville, U.C.	57	17	"		8, 9
18. Deep Bight, U.C.	3	16	"	Bus, 5mi.	8, 9
19. Dildo, S.A.	23	19	Pollard		2, 3
20. Dunfield, Ang.	4	70	Noel	Car, 4mi.	15, 16
21. Dunfield, U.C.	4	70	"	Car, 4mi.	15, 16
22. Elliot's Cove, U.C.	2	35	Ralph	Car, 15mi.	10, 13
23. Elliston, U.C.	14	23	Pollard		13, 14
24. English Harbour, Ang.	2	59	"	Bus, 4mi.	15, 16
25. George's Brook, U.C.	3	62	"	Car, 6mi.	8, 9
26. Gooseberry Cove, Ang.	5	26	Noel		8, 9
27. Green's Harbour, S.A.	3	28	"		2, 3
28. Green's Harbour, U.C.	21	28	"		2, 3

29.	Hant's Harbour, Amalg.	12	29	Noel		1,	10
30.	Harcourt, U.C.	8	4	Ralph	Car, 10mi.	14,	15
31.	Hatchet Cove, Ang.	2	36	Pollard	Car, 8mi.	8,	9
32.	Heart's Content, Ang.	10	32	"		1,	10
33.	Heart's Desire, R.C.	13	33	Ralph		1,	21
34.	Hickman's Harbour, S.A.	3	35	"	Car, 1mi.	10,	13
35.	Hickman's Harbour, U.C.	7	35	"		10,	13
36.	Hillview, U.C.	7	36	Pollard		8,	9
37.	Hodge's Cove, Ang.-U.C.	15	37	Ralph		6,	7
38.	Hopeall, U.C.	6	28	Noel	Bus, 4mi.	2,	3
39.	Islington, Ang.	23	39	Ralph		1,	3
40.	Lady Cove, U.C.	2	35	"	Car, 10mi.	10,	13
41.	Little Cataline, U.C.	34	41	Noel		13,	14
42.	Little Heart's Ease, S.A.	15	42	"		8,	9
43.	Long Beach, Ang.-U.C.	2	69	Ralph	Car, 4mi.	6,	7
44.	Long Cove, U.C.	22	44	Noel		6,	7
45.	Lower Lance Cove,	6	5	Ralph		10,	13
46.	Markland, Ang.	5	73	Ralph	Car, 6mi.	2,	3
47.	Markland, U.C.	9	73	"	Car, 4mi.	2,	3
48.	Melrose, R.C.	14	8	Noel	Bus, 3mi.	14,	15
49.	Milton, U.C.	1	62	Pollard	Car, 5mi.	8,	9
50.	New Chelsea, Pent.	2	6	Noel	Bus, 4mi.	1,	10
51.	New Chelsea, U.C.	4	6	Noel	Bus, 4mi.	1,	10
52.	New Harbour, Ang.	23	52	Pollard		2,	3
53.	New Perlican, Ang.	11	32	"	Car, 3mi.	1,	10
54.	New Melbourne, U.C.	5	29	Noel	Car, 3mi.	1,	10
55.	Norman's Cove, U.C.	25	55	"		6,	7
56.	North West Brook, Ang.	1	36	Pollard	Taxi 3mi.	8,	9
57.	North West Brook, U.C.	7	36	"	Taxi 3mi.	8,	9
58.	Old Shop, Ang.	6	2	Ralph	Car, 7mi.	2,	3
59.	Port Rexton, Ang.	14	59	Pollard		15,	16
60.	Port Union, U.C.	10	8	Noel	Car, 2mi.	14,	15
61.	Petley, Ang.	7	5	Ralph	Car, 6mi.	10,	13
62.	Shoal Harbour, U.C.	31	62	Pollard		8,	9

63.	Sibley's Cove, U.C.	6	6	Noel	Car, 2mi.	1,	10
64.	South Dildo, S.A.	2	2	Ralph	Car, 4mi.	2,	3
65.	South Dildo, U.C.	3	2	Ralph	Car, 4mi.	2,	3
66.	South Port, U.C.	3	26	Noel	Car, 2mi.	8,	9
67.	St. Jones Within, U.C.	3	36	Pollard	Car, 12mi.	8,	9
68.	Sunnyside, Ang.	7	69	Ralph		6,	7
69.	Sunnyside, U.C.	11	69	Ralph		6,	7
70.	Trinity, Ang.	10	70	Noel		15,	16
71.	Trinity, East, Ang.	3	59	Pollard	Car, 2mi.	15,	16
72.	Weybridge, U.C.	1	35	Ralph	Car, 13mi.	10,	13
73.	Whitbourne, Ang.	27	73	"		2,	3
74.	Whitbourne, R.C.	7	73	"		2,	3
75.	Whiteway, U.C.	5	28	Noel	Bus, 3mi.	2,	3
76.	Winterton, S.A.	28	76	Pollard		1,	10

TOTAL 791

*Note:- The test centre number is the same as the number for the school unless the pupils transported to another school to be tested. If they were transported the test centre number refers to the number for the school to which they were transported.

Under transport and distance car refers to the car belonging to the researcher doing the testing, while the bus and taxi were hired vehicles.

APPENDIX V

SCHEDULE FOR BATTERIES OF TESTS
ADMINISTERED TO PUPIL SAMPLE

Time	Tests	Administration Time
	CANADIAN TESTS OF BASIC SKILLS	
Morning	Language Tests:	
9:30 a.m. to 12:30 p.m.	L-1 Spelling	12 minutes
	L-2 Capitalization	15 "
	L-3 Punctuation	20 "
	L-4 Language Usage	20 "
	Mathematics Tests:	
	M-1 Mathematics Concepts	30 "
	M-2 Mathematics Problem Solving	30 "
Afternoon	THE NELSON READING TEST 1962 REVISED EDITION	
2:00 p.m. to 4:00 p.m.	Vocabulary	10 minutes
	Paragraph Comprehension	20 minutes
	LORGE-THORNDIKE INTELLIGENCE TESTS	
	Test 1	9 minutes
	Test 2	8 "
	Test 3	10 "
	Test 4	7 "