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THE RELATION
OF
MENTAL AGE
TO
PROBLEM-SOLVING ABILITY
IN
ARITHMETIC

By

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CHAPTER I

THE PURPOSE OF THE STUDY

The aim of the study to be described here was to discover the relation of mental age to problem-solving ability in arithmetic through an investigation of the typical attainment of elementary school children under present conditions of teaching. The ultimate purpose of the study was to facilitate for the classroom teacher the adaptation of teaching to the individual differences of mental development in pupils of the same school grade or chronological age.

There was no attempt made in this study to determine the absolute mental age limitations in reasoning ability in arithmetic. Such a purpose would have necessitated the employment of a special technique involving an intensive and adequate preliminary training of all subjects in the different types of problems included in the testing program. The practical value of the employment of such a technique is highly questionable in view of the sociological and administrative

objections to the inclusion of such extensive training in arithmetic in ordinary classroom procedure. One of the checks to be described in the discussion of the organization of the present investigation helped, it is believed, to realize the main advantages of this technique as modified to fit actual classroom procedure, without entailing the inconveniences of the employment of such a procedure in its extreme and useless form.

The specific outcome planned for the present study was a proper gradation in teaching units of the types of reasoning difficulty involved in 427 arithmetic problems specially devised to involve a given difficulty or combination of difficulties as revealed by a logical analysis of the fundamental processes now commonly regarded as constituting the field of elementary arithmetic.

CHAPTER II

AN HISTORICAL SURVEY OF PREVIOUS EFFORTS
AT GRADATION OF DIFFICULTIES IN ARITHMETIC

Education is fast becoming a science. Its progress in this direction depends ultimately on the ability and the zeal of educators to devise and to apply in their field of endeavor more and more perfect instruments of precision. To the same extent and under the same conditions will the teaching of arithmetic approach the status of a science. The scientific literature on arithmetic reveals the fact that an excellent beginning has been made, but a scrutiny of the nature of the measuring sticks thus far devised and the method of their application in the field of arithmetic reveals the possibility and the need of far greater precision before the teaching of arithmetic can be considered a scientific procedure.

By the very nature of the case early scientific investigators in arithmetic have been led to concentrate their forces on the more tangible and more easily measurable elements of the sub-

ject. Consequently there is evident in the literature of the subject an undue preponderance of attention devoted to the fundamentals processes as such rather than to the more important, but far more complex, phase of arithmetic dealing with the reasoning processes involved in the application of those fundamentals processes in the solution of verbal problems.

As far as the improvement of the classroom teaching of arithmetic is concerned probably the task of most vital importance is the discovery of the relative difficulty of the various elements comprised in the subject. It is not strange, then, to find that the attack upon the problem of gradation of difficulties has been made in various ways from various angles by various investigators practically without interruption ever since the inauguration of scientific measurement in education and in arithmetic by the startling revelations of the discoveries of J. M. Rice in 1902.

The "inventor of educational measurements" through his report in the Forum of the unsatisfactory conditions revealed by his measurement of the achievement of 6000 school children, and through his forceful plea for adequate supervision based on objective measurement of results,

awakened the American educational world to the necessity of more scientific management in education. *Stone in 1908, (18) and Courtis in 1909 (6) were the pioneer investigators to follow the example of Rice in applying tests to efficiency in the teaching of arithmetic. Stone's tests consisting of a series of tests in fundamentals and reasoning processes were used in an intensive study of sixth-grade children, "not with a view to testing in any complete way the mastery of the different possible arithmetical combinations" but merely "to make possible a comparison of the achievements of different school systems." (4:37). In other words, the Stone tests were neither intended nor employed for diagnostic purposes or for the gradation of difficulties. The notion of standardization eventuated with the publication in 1909 of a series of articles by the author (6) describing the formulation of the Courtis tests and the standards derived therefrom. From these original tests were developed in subsequent years the now famous Courtis tests which are so organized that the various digits occur with equal frequency in each unit of the test. By averaging the

*References are to the bibliography at the end of the chapter. The first number refers to the item in the bibliography; the second, refers to the page.

scores collected on a large scale from widely scattered school systems Courtis inaugurated the movement for standardization.

The initial attempt to secure a series of graded steps of difficulty in arithmetic was made by Woody (20) who substituted for the logically complete series in which Courtis included all the possible combinations of digits, a series of tests experimentally arranged according to the degrees of difficulty revealed by results secured from pupils. The Woody tests mark the appearance of the first "scale" in arithmetic for they represent, in some measure at least, the inherent difficulty of the arithmetical processes involved. They are, nevertheless, greatly dependent on accidents of training and consequently cannot be called a true scale.

The problem of constructing a scale for measuring the ability of pupils in arithmetic reasoning was attacked by Starch (16) in 1916, by Monroe in 1918 (11). Monroe in particular recognized and pointed out (12:606-7) the double value to the teacher in the use of such scales since they both present a statement of the important type of examples and may also serve as an instrument of diagnostic measurement.

While it is true that arithmetic scales as thus far devised serve to indicate to teachers the large type problems, the value of such knowledge as a guide to teaching procedure is strictly limited. The teacher needs to know precisely the sequence in which problems are to be presented, and not merely certain definite points along the scale of difficulty. Scales as at present constructed show only the "high spots". The teacher is left to grope her way from one goal post to the next. If the teaching of arithmetic is to proceed on a scientific basis, the teacher must know the exact sequence in which each intermediate step must follow another in the presentation of subject matter.

The recognition of the existence of this need for diagnosis of difficulties was but a natural outcome of the survey movement in testing. Investigators early directed their efforts toward meeting it, so that "a large part of the scientific literature on arithmetic has dealt with the nature of the arithmetical processes" (4:58) rather than with the securing of general standards of achievement for the different school graded. While practically all the major phases of the subject, including Counting, Addition, Subtraction,

Multiplication, Division, Fractions, Decimals, and Reasoning, have been at least touched upon by various investigators, a review of the existing literature reveals the fact that many of the studies are not merely fragmentary and inconclusive, but that they show an evident lack of agreement in the results secured. This condition is explained by Judd and Buswell on the ground that the investigations were undertaken "without any large foundation of study or understanding of the whole problem of arithmetic." As will be seen from the summary that follows, many of these studies have dealt with only one phase of a topic, hence, a more inclusive and adequate type of research in this field has become highly desirable. This more fundamental type of attack the present investigation has attempted to supply.

STUDIES OF COUNTING

None of the studies of the nature and process of counting bear directly on the question of gradation. Those, however, relating to the ability of children at the age of entrance to school throw some light on the problem inasmuch as they indicate the correct starting point.

Thorndike (19:201) cites an investigation conducted by a German investigator in 1890 which revealed the fact that two-thirds of the children entering the school of Annaberg were able to count from one to ten.

Binet (1:129) merely summed up the results of his own investigations and those of his colleague, Simon, when he assigned the counting of four pennies as a typical four-year old task, and the counting of thirteen pennies correctly once out of two trials as a typical six-year ability. Since Binet's general procedure was to assign as typical a task which three-fourths of the pupils of a given age could perform, this assignment by him would imply that three-fourths of the children entering the first grade can count to ten or beyond.

STUDIES OF THE FOUR FUNDAMENTALS PROCESSES WITH INTEGERS

THE BASIC NUMBER COMBINATIONS

Of the five investigators who have assisted in the discovery of the relative difficulty of the basic number combinations, Clapp (5) has made the most extensive study, and has presented a list of the basic combinations in each of the four fundamentals processes arranged in the order of difficulty.

Clapp used seven thousand pupils in grades 3 to 8 inclusive in his investigation. He took as an index of difficulty the number of errors made by pupils in the various combinations. His list of the combinations in each process presented singly, showing the combined results from all the grades tested, is considered "the best index of the relative difficulty of combinations available at the present time". (4:63)

Certain phases of the same problem were attacked by Phelps (15) and by Holloway (8) using the same method as Clapp and by Heilman and Shultis (7) using the reaction-time method. Phelps worked with eighth grade pupils only, on the combinations in addition while Holloway gave his at-

tention to both addition and multiplication, but confined his work to pupils in grades 3 and 4.

A study made by Smith (17) basing the difficulty on the comparative amounts of time required to give the answers to the different combinations in the four fundamental processes most nearly approaches in extensiveness that of Clapp. While Smith's graded list of basis combinations in addition, subtraction, multiplication, and division, agrees so well with Clapp's that all except three of the addition combinations that appear in the most difficult third of Smith's list appear likewise in the same section of Clapp's list, the list secured by Smith is inadequate since it is based on the assumption that there are but forty-five basic combinations such as $5 + 8$, and $8 + 5$, must be dealt with singly since they present different degrees of difficulty, and that the zero combinations having a special degree of difficulty of their own, should not be left to incidental learning, but must be taught systematically.

In the table which follows are presented in order of difficulty, as determined by Clapp, the hundred combinations in addition, in subtraction, and in multiplication, and the ninety combinations in division. The lists are arranged in descending order of difficulty:

8+5	4+6	8+0	2+4	4+1
7+9	7+6	1+0	3+0	3+1
5+8	7+4	5+2	4+5	4+0
9+7	9+8	4+2	0+8	1+8
6+8	3+7	1+2	6+0	9+9
6+9	9+0	5+3	8+3	7+7
5+7	2+6	0+3	8+2	2+0
7+8	9+3	0+5	6+4	6+1
8+7	0+6	5+1	1+4	5+4
9+6	6+5	7+0	9+1	3+3
5+9	3+8	8+7	5+0	1+1
8+9	3+4	0+1	6+6	9+2
8+6	3+9	7+2	3+2	8+8
4+7	2+3	1+9	4+3	1+3
7+5	3+5	0+5	1+5	1+6
4+9	6+3	8+1	7+1	1+7
9+5	7+3	6+2	2+9	2+1
9+4	2+7	0+4	2+5	2+2
6+7	8+4	3+6	2+8	5+5
5+6	4+8	0+2	4+4	0+0

14-9	11-4	8-3	7-2	7-1
13-4	11-6	7-0	12-6	4-3
16-9	16-8	12-9	10-7	5-5
14-5	18-9	10-5	8-6	8-4
17-9	11-9	10-6	11-2	6-5
15-9	11-7	8-0	10-1	9-8
17-8	13-6	2-0	6-2	4-4
15-7	15-8	9-7	10-2	9-1
13-9	8-5	9-4	7-6	9-9
13-5	11-5	4-0	9-3	5-3
16-7	11-8	3-0	8-7	5-4
13-7	9-2	5-0	4-1	1-1
13-8	10-3	9-6	2-2	8-1
11-3	10-9	8-2	7-5	4-2
14-6	14-7	10-4	6-4	6-6
12-3	12-4	8-8	6-1	3-3
15-6	10-8	9-3	2-1	3-2
15-8	7-4	7-3	5-2	7-7
12-5	12-8	6-0	6-3	5-1
12-7	1-0	9-0	3-1	0-0

7x0	9x6	4x8	6x4	7x1
0x5	6x9	3x8	1x2	8x2
0x7	7x9	4x6	6x5	3x2
0x1	7x8	5x8	2x6	3x1
4x0	6x8	3x9	3x6	6x1
0x8	8x6	7x7	8x3	1x8
0x2	4x9	3x7	6x2	5x4
0x4	4x7	5x7	3x5	2x9
2x0	1x1	5x9	8x1	2x1
0x6	8x9	9x5	1x9	1x6
9x0	9x4	7x3	4x3	1x5
8x0	7x4	9x9	5x5	2x2
0x3	7x6	7x5	3x3	9x2
6x0	8x8	4x5	9x1	2x8
0x9	8x5	3x4	7x2	1x4
3x0	8x4	2x4	2x7	2x5
9x7	9x8	4x2	2x3	1x3
5x0	9x3	5x3	4x1	5x1
1x0	5x6	6x6	4x4	1x7
8x7	6x7	6x3	5x2	0x0

2÷2	0÷7	72÷8	45÷5	15÷5
9÷9	0÷8	18÷6	42÷6	12÷6
28÷4	0÷3	24÷3	18÷9	36÷6
1÷1	64÷8	72÷9	16÷8	16÷2
36÷4	48÷8	9÷1	4÷1	12÷2
8÷8	0÷4	24÷6	20÷4	14÷7
3÷3	0÷6	0÷1	6÷1	20÷5
6÷6	42÷7	6÷3	32÷8	8÷2
56÷8	36÷9	32÷4	35÷5	12÷2
54÷6	28÷7	18÷2	27÷9	15÷3
7÷7	63÷7	8÷4	5÷1	14÷2
5÷5	27÷3	56÷7	16÷4	10÷5
4÷4	24÷8	45÷9	7÷1	6÷2
63÷9	48÷6	30÷6	12÷4	81÷9
0÷5	24÷4	3÷1	40÷5	9÷3
0÷9	2÷1	35÷7	21÷7	10÷2
54÷9	49÷7	18÷3	30÷5	25÷5
0÷2	40÷8	8÷1	12÷3	4÷2

THE ANALYSIS OF TYPES
IN
THE FUNDAMENTAL PROCESSES
WITH INTEGERS AND FRACTIONS

Many logical analyses of steps of difficulty in each of the four fundamental processes with integers and with common and decimal fractions have been made by writers of books on methods of teaching arithmetic, but all of these lack the proof of experimental validation.

THE ANALYSIS OF TYPES IN THE FUNDAMENTAL PROCESSES
WITH INTEGERS

The single scientific determination of steps of difficulty in addition, subtraction, multiplication, and division of integers, that is inclusive enough to be useful as a guide to teaching procedure, was made by Buswell and John (3:88-99) in their careful preparation of a series of diagnostic tests designed for the study of individual pupil difficulties. The number and magnitude of the changes effected in the relative ranking of the items as a result of submitting the items to the test of use with children, points to the inadequacy of logical analysis as the final deter-

minant of rank of difficulty. As the investigators themselves point out: "It is apparent..... that the logical analysis used in preparing the examples.....did not arrange them in the order of difficulty experienced by the children who worked the examples." Obviously this discrepancy may not have been wholly caused by any inherent difficulty in the processes themselves, but as a result of some accident of training whether in presentation or in drill procedure. Nevertheless, the fact of the discrepancy is worth noting by investigators of the problem of gradation.

All that Buswell and John claim for their series of examples is: that they introduce the elements of the four fundamentals processes in a known manner; that the examples are so graded as to difficulty, that the first example is the easiest and each succeeding example is more difficult. They explain that the steps of difficulty are not equal, and that the material cannot be used as a standardized difficulty scale, but that it is particularly well adapted for individual diagnoses.

The Diagnostic Chart for Fundamentals of Arithmetic contains the steps of difficulty as arranged in revised order by Buswell and John for

use in their study entitled "Diagnostic Studies in Arithmetic" (3). It embodies the 23 types of addition examples, 22 type examples in subtraction, 22 type examples in multiplication, and 21 examples in division, as determined by a combined logical analysis and study of pupil errors. This is the sole experimentally arranged gradation of examples in the four fundamentals processes with integers that isolates in any adequate manner the possible teaching units. While the diagnostic chart has decided value in pointing out the relative difficulty of the items included in each of the fundamental processes with integers, it does not give the teacher any clue as to the relative difficulty of the different items in one process as compared with a given item in any of the other processes. Moreover, it establishes no absolute age or grade standard of attainment so that it gives the teacher no guidance in the matter of determining the proper time for presenting new processes.

Despite the existence of many scales for measuring ability in both fundamentals examples and reasoning problems, the scientific determination of teaching units in the four fundamentals processes with common and with decimal fractions,

and the arrangement of an inclusive list of typical reasoning problems on all levels in order of difficulty are problems that have scarcely been approached. The existing scales in arithmetic by the very nature of their construction (13: 56-103) and by the limitations of time available for their administration, are necessarily limited in their possibilities of guidance in the selection of successive teaching units.

THE ANALYSIS OF TYPES IN THE FUNDAMENTAL PROCESSES WITH COMMON FRACTIONS

Only two experimental studies, those of Kallom (9) and of Morton (14) have been directed toward the discovery of steps of difficulty in the various processes with common fractions. Both studies consisted of an analysis of errors in the fundamentals processes with common fractions. Such detailed analyses as were made by these investigators are of unquestionable value since they discover the processes which need special emphasis in presentation and in drill in order to preclude the possibility of error. They are, moreover, of indirect value in the matter of gradation of difficulties since they point out definite teaching units although at the same time they

leave to scientific experimentation the task of filling in the gaps left in the sequence.

THE ANALYSIS OF TYPES IN THE FUNDAMENTALS PROCESSES WITH DECIMAL FRACTIONS

While the full light of controlled experimentation has never been fully turned upon the problem of gradation of difficulties in the fundamentals processes with decimal fractions, the light has, at least, been pointed in that direction by Monroe (10) who employed a series of four tests to determine the ways in which pupils handle the placing of the decimal point in division of decimals. After concluding from a study of the test that pupils do not place the decimal point in the quotient according to any general rule or general ability but rather as a result of specific abilities, Monroe points out the magnitude of the problem of gradation of difficulties and the necessity to the teacher of the knowledge of the several steps involved in a given process, in these words: "Assuming the possibility of this conclusion, a little consideration will reveal that there are a large number of types of examples in division of decimal fractions. Even within a range of relatively simple examples, it is possible to enum-

erate a considerable number of types. If each type of example requires a specific ability, it is clearly very important that this field of subject matter be carefully analyzed to determine the fundamental types of examples. It is also obvious that it is extremely important that each teacher be aware of the several types of examples which exist, and make certain that each pupil is trained in handling each type of example (10:293)."

THE ANALYSIS OF TYPES
OF
ARITHMETICAL REASONING PROBLEMS

A partial report of the sole extensive study dealing with the gradation of difficulties in reasoning problems in arithmetic was reported by B.R. Buckingham (2) under the title "Selecting and Evaluating Arithmetic Problems." The outcome of the investigation is awaited with much interest. While the ultimate aim of the investigation is the construction of an arithmetic-problem scale, the amount of data concerning the relative difficulty of a large number of type problems at various grade levels that has been secured gives promise of valuable help in the matter of grade-placement of typical reasoning problems in arithmetic.

Dr. Buckingham had been collecting during the decade 1915 to 1925 problems which, to the number of 500, he had been able to evaluate in point of difficulty on the basis of school grade through the assistance of classroom teachers who cooperated by supplying the investigator with data on the achievement of their pupils in the solution of certain problems submitted by him. The 500 problems thus evaluated were assembled in the form of a scale, but the resulting product was far from uniform in richness. According to the investigator, "the problems tended to bunch themselves in the middle of the scale", while there were few very easy and few very difficult problems. To effect the desired enrichment of the scale, the investigator secured the cooperation of eighteen principals and superintendents in whose schools the teachers were asked to formulate five original problems which they considered of about equal difficulty with two type problems selected from the tentative scale. Through a comparative study of the results obtained by pupils on the tests containing the seven problems given them by their own classroom teachers, Buckingham was enabled to formulate thirty-nine short tests involving 288 problems which were then submitted to fifty-nine cooperating schools in which responses

from 56,193 pupils were secured. The following table (2:36) represents the results for a single problem. The total percentage of accuracy obtained in a given section of a grade was used as the basis for determining difficulty.

TABLE I. DISTRIBUTION BY GRADE FOR PROBLEM 1.

(Jack had 15 cents. He spent 5 cents.
How many cents did he have left?)

School Number	LOW SECOND GRADE			HIGH SECOND GRADE		
	Partic- ipants	Cor- rect	Per- cent	Partic- ipants	Cor- rect	Per- cent
1.....	60	44	73.3	51	48	94.1
7.....	19	4	21.1	58	39	67.2
42.....	..	..	..:..	11	10	90.9
94.....	33	31	93.9	55	50	90.9
121.....	..	..	..:..	10	10	100.
125.....	13	4	30.8	12	8	66.7
127.....	42	38	90.5	18	17	94.5
158.....	45	22	48.9	50	27	54.0
Total	212	143	67.5	265	209	78.9

The present study initiated even before the publication of Buckingham's partial report, had for its purpose also the evaluation of problems in arithmetic but the basis of the classification was to be not school grade only or chiefly, but rather mental age principally, and school grade only incidentally. It is particularly on the superiority of its selected basis of standardization of difficulty, and on the greater number and inclusiveness of the type problems evaluated that the present study bases its claim to distinction.

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A SUMMARY OF THE ARGUMENTS FOR THE USE OF MENTAL AGE
RATHER THAN GRADE AS THE BASIS
FOR ALLOCATION OF DIFFICULTIES
IN ARITHMETICAL PROBLEMS AND PROCESSES

All standards of achievement in arithmetic thus far devised by American investigators have, without exception, been based on grade norms rather than on age norms. Exigency may explain the procedure but can never justify the situation.

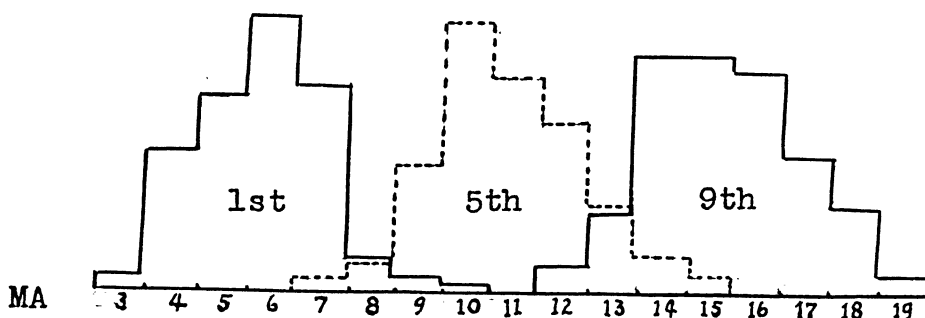
One of the earliest and most significant outcomes of the movement for mental measurement was the startling exposition of the amount of overlapping of mental age among children of the same school grade and of the same chronological age.

The most varied and conclusive data concerning the overlapping of mental age ability in children of the same school grade have been presented by Terman (7:26) in the following table which shows the grade distribution by mental age of 676 unselected pupils below the high school who are mentally eight years old or older.

In commenting on the situation revealed by the data presented in this table, Terman (7:27)

makes the following statement: "Notwithstanding the shifting which takes place at the end of each school year, the resulting classification of children has been so far from successful that, generally speaking, the lowest 25 per cent of pupils in any grade belong mentally in a lower grade. Only the middle half are classified approximately where they should be. Usually more than 15 per cent are at least two grades removed from the one in which they belong by mental age."

No more eloquent evidence of the seriousness of the matter of overlapping is needed than that presented in the following Figure in which Terman shows the actual distribution of mental ages disclosed by the Stanford-Binet scale in the first grade, the fifth grade, and the first year of high school in typical public school systems of California.



Overlapping in the Mental Ages of Children in the
First, Fifth, and Ninth Grades.

Examination of this figure will reveal the fact that "not only do the first grade children greatly overlap those of the fifth grade, and the fifth grade children those of the first year high school, but that the brightest child in the first grade has all but reached a point in mental ability corresponding to that of the lowest pupil in the high school. The brightest of the fifth grade pupils is above the median mental level for the first year of high school, and the brightest pupil of the first grade reaches the median for the fifth grade."

The substitution of chronological age for school grade as the basis for standardization of difficulty has been recommended both by precept and by example by Ballard (1:112-13), an English investigator, who while acknowledging the contributions made by Americans to the movement for scientific measurement in education, at the same time deplores the shortcomings of our use of grade performance as contrasted with chronological age performance as a basis of standardization. Waiving the charge of "insularity" brought against our achievement tests, we may find in the following excerpt from Ballard a just estimate of the usefulness of grade norms: "Turning from France

to America, we find there the home of standardization. A tremendous volume of work has been done by Thorndike, Courtis, Ayres, Terman, Munroe, Judd and others with a view to reaching as much exactitude as the nature of the subject will permit. But its usefulness for us is marred by its insularity - by the fact that it is American and not English. Their arithmetic tests abound in dollars and cents, their problems often refer to customs and transactions peculiar to themselves, and the spelling is Websterian. The next serious defect, however, is that the results are not embodied in an age scale, but in a grade scale. We are told what level the children in Grade IV, say, of a certain American school, did, on an average, attain in arithmetic, spelling and reading. But we are not told the actual age of these children. Nor can we infer it from the grade. We learn from their educational papers that the ages in the grades are not what they are theoretically supposed to be. They vary from school to school, and from city to city. Moreover, it makes a very great difference whether the tests were given at the beginning, the middle, or the end of the school year. Binet's scales are of universal value because they are age scales; and if the American scales are to be used in England they must be translated from

grade scales to age scales. They will then cease to be national and become international."

Few there are who would disagree with Ballard's estimate of the value of grade norms but fewer still could with reason recognize great advantage in the substitution of chronological age as a basis for standardization of scholastic achievement in the face of the data on the variability of mental age in children of the same chronological age which have been accumulated by the researches of such eminent psychologists as Binet, Bobertag, Goddard, Jaederholm, Burt, and Terman.

The findings of all these investigators point to the fact that variability of mental age follows the law of Gauss in the same way as do all psychological and biological phenomena.

In the following table presented by Claparede (5:198) is contained a summary of the findings of three of the most eminent psychologists who have studied the question of the relationship between chronological age and mental age development:

TABLE SHOWING THE DISTRIBUTION OF INTELLIGENCE
AMONG PRIMARY SCHOOL CHILDREN
OF THE SAME CHRONOLOGICAL AGE.

(Quoted from Claparede, p. 198).

	Number of Subjects	- 2 years	- 1 year	0 year	+ 1 year	+ 2 years and more
Binet	203	6%	21.5%	51	% 20.5%	1 %
Bobertag	261	4%	19	% 52	% 22.5%	2.5%
Goddard	1277	11%	20.5%	41.5%	21.5%	5.5%

This table shows the percentages of unselected groups of children of primary school age who were found to be from two years below average to two years and more above average in mental development.

Mr. Cyril Burt (4:151), possibly England's greatest living authority on mental tests, gives in the table that follows the percentiles for each chronological age-group in the London elementary schools:

DISTRIBUTION OF INTELLIGENCE.

ORDINARY ELEMENTARY SCHOOLS.

Percentiles for each Age-Group in Terms
of
Mental Age.

Percentile.											
Age	0	10th	20th	30th	40th	50th	60th	70th	80th	90th	100th
	Worst					Med- ian					Best
3 -	2.0	2.8	3.2	3.4	3.5	3.6	3.8	4.0	4.0	4.2	4.8
4 -	2.2	3.6	3.9	4.1	4.3	4.5	4.6	4.9	5.1	5.4	5.8
5 -	3.2	4.6	5.0	5.2	5.4	5.5	5.6	5.8	6.0	6.3	7.2
6 -	4.0	5.3	5.9	6.2	6.5	6.5	6.7	6.7	7.2	7.7	8.7
7 -	4.7	6.2	6.5	7.1	7.3	7.5	7.8	8.0	8.5	9.0	10.8
8 -	5.2	7.0	7.5	8.0	8.2	8.5	8.7	9.0	9.3	10.4	12.5
9 -	5.7	7.8	8.5	8.8	9.3	9.5	9.7	10.2	10.4	11.7	13.5
10 -	6.8	8.8	9.3	9.7	10.2	10.4	10.8	11.3	11.7	12.5	14.6
11 -	7.7	9.7	10.4	10.8	11.0	11.5	11.7	12.0	12.5	13.5	15.0
12 -	8.7	10.8	11.5	11.7	12.0	12.5	13.0	13.0	13.5	14.3	15.5
13 -	9.0	11.3	12.0	12.5	13.0	13.5	14.0	14.3	14.7	15.0	15.5
14 -	9.7	12.5	13.0	13.5	14.0	14.3	14.7	15.0	15.0	15.5	16.0

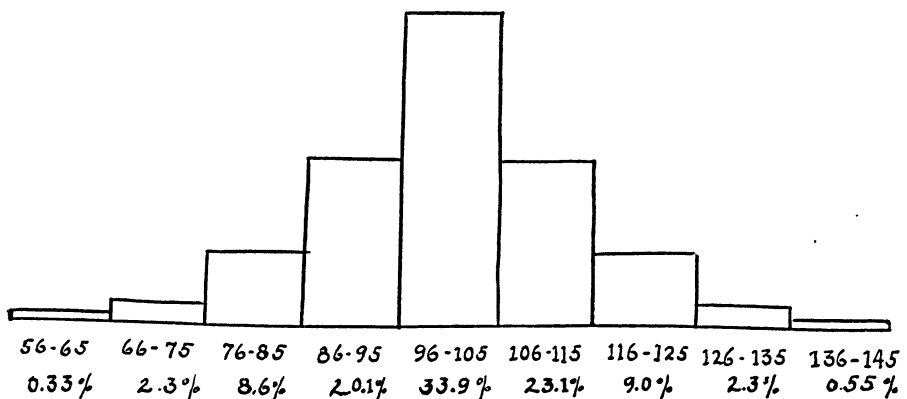
The numbers in the columns marked "Age" represent chronological ages; those in the percentile columns, mental age.

From this table it is evident that the range of mental age in children becomes greater with increase in chronological age. Consequently it also increases with progress through the grades.

Since the intelligence quotient is merely a

ratio representing the amount of correspondence between an individual's mental age and his chronological age it is but reasonable to expect among the subjects in any unselected group a range of intelligence quotient as great as that indicated by the following figure from Terman (198):

Distribution of intelligence quotients
of 900 unselected children
between 5 and 14 years of age.



This figure shows the distribution of intelligence quotients for 905 unselected children ranging in chronological age from 5 to 14 years.

The logical conclusion from such data on those just presented is that drawn by Claparede (5:200) in these words: "The pedagogical interest in the discovery of this variability is easily understood: in a school it is no longer a ques-

tion of classifying pupils according to chronological age but rather according to mental age." The same argument applies with equal force to the classification of pupils in arithmetic classes. For the present, at least, the inertia of tradition and the difficulty of administration offer insuperable obstacles to the inception of such a plan of classification. To enable the teacher of arithmetic to enjoy the advantages of the plan of classification according to mental age, even under existent schemes of organization, the writer has endeavored to grade on the basis of mental age a comprehensive set of typical problems covering the entire field of elementary arithmetic.

Further justification for the use of mental age rather than chronological age or grade as the basis for standardization in arithmetic is had from the findings of Bonser (3:33) and of Harlan (6:102). Bonser, after a series of experiments in arithmetical reasoning with children of the fourth, fifth, and sixth grades, concluded that native ability is a large factor in arithmetical reasoning since "children of three to five years of experience and training more than a corresponding number of other children frequently do not do so well as the group of fewer years and less ex-

perience but with greater ability by nature."

The conclusion that general mental capacity determines achievement in arithmetic rather than the instruction provided by the school was reached similarly by Harlan who showed that grade for grade, the accelerated pupils make better scores in arithmetical reasoning than do the pupils who are retarded. The pedagogical corollary to these verified truths is the statement of the desirability of mental age norms for arithmetic reasoning tests.

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CHAPTER IV.

THE ORGANIZATION OF THE INVESTIGATION.

THE AIM OF THE INVESTIGATION.

The aim of the investigation was to determine on the basis of mental age the absolute and the relative difficulty, under present teaching conditions, of 427 type problems covering all the elements now generally presented in the teaching of elementary arithmetic. In this way it was hoped to be able to provide the teacher of arithmetic not merely with safe guidance in the matter of the relative sequence to be followed in presenting the different items and processes in arithmetic but also with absolute mental age standards by means of which it will be possible to estimate accurately the efficiency of the instruction for each pupil even within a heterogeneous group.

THE METHOD OF THE INVESTIGATION.

In order to secure data on the difficulty of typical problems in arithmetic it was decided to include the selected problems in a series of

twenty-five reasoning tests and to parallel this series with another containing the identical fundamentals examples involved in the solution of the typical reasoning problems. One set of these arithmetic tests consisting of a reasoning test and a parallel test in the fundamentals, together with a group intelligence test, was given to each subject by the regular classroom teacher. The purpose of the intelligence test was to discover the actual mental age of each subject at the time of testing. The fundamentals test was given as a check to show whether failure to solve a given reasoning problem was due to lack of reasoning ability only, or to lack of control of the involved fundamental processes.

THE MATERIAL OF THE INVESTIGATION.

The material of the investigation comprised the McCall Multi-Mental Scale, 427 reasoning problems in arithmetic, and 427 fundamentals examples in arithmetic.

THE SELECTION AND PREPARATION OF THE MATERIAL.

REASONS FOR THE CHOICE OF THE McCALL MULTI-MENTAL SCALE.

In order to determine the mental age of each subject at the time of the investigation it was decided to have the McCall Multi-Mental Scale ad-

ministered to each subject. This test is so named because it fuses into a single test requiring a uniform pupil response at least seventeen different kinds of mental tests, such as opposite, verb-object, modifier-noun, sequence, and identical element. In view of the great number of subjects included in the investigation the use of an individual intelligence test was practically impossible. The choice of the McCall Scale was based on a consideration of eight special features of the test which are thus described by the author (:109, 111 - 12):

The Multi-Mental Scale includes the following novel features:

1. Multi-mental measurement without sub-tests. Mental measurement by means of a test composed of sub-tests lengthens and complicates directions, thus tending to confuse the pupils, to increase the time required for testing, and to demand highly trained examiners.

2. Uniform, simple, rapid responding throughout the test. Most of the satisfactory mental tests require the pupil to learn new test mechanics at the beginning of each sub-test. The type of response demanded of the pupil in the Multi-Mental Scale is uniform throughout the entire test. This

response is the simplest group-test response that psychology has discovered. Uniformity and simplicity of response, plus the nature of the test items, evoke rapid responding from the pupil. This makes for high reliability in the test.

3. Apparent simplicity combined with subtle complexity. Subtlety or complexity is essential in a test of general mental ability. It is usually secured by the use of complicated problems in arithmetic, or long, elaborate completion sentences, or complicated reading passages, or the like. Any one of these is so forbidding as to discourage pupil effort and reduce reliability by preventing rapid responding. The Multi-Mental Scale secures subtle complexity together with apparent simplicity and consequent rapid responding by the divination feature. The pupil is not told the point of view he must take in order to succeed with a test item. He must divine this point of view. Except in a very general way, no two test items employ the same point of view.

4. Refinement of scoring plus variation in correctness of alternatives. There are five possible responses to each test item in the Multi-Mental Scale. The conventional method is to designate one of these alternatives as the correct one and all others as incorrect. The Multi-Mental

Scale is so constructed that there are degrees of correctness in the five alternatives. The pupil receives a score from zero to ten on each test item, depending upon the correctness of the alternative he marks. This refined scoring tends to increase both the reliability and the validity of the test, for each test item thus has a chance to divide a class into five groups of ability instead of two.

5. Optimum scoring key and directional validation. Adults, however competent, cannot escape their sophistication and return once more to the level of minds of children. Hence, adult judgment was completely eliminated in the preparation of the scoring key for the Multi-Mental Scale. To take its place a statistical method was developed which yields the optimum scoring key for measuring any defined criterion or mental ability. A scoring key so developed points the test in any desired direction. The examiner will not always agree with the scoring key. This may be evidence of his own sophistication rather than an imperfect scoring key. A perfectly reliable scoring key cannot be deduced from the behavior of 250 pupils but it is more trustworthy than the judgment of one or even 250 adults.

Score values have been assigned such as will produce the maximum differentiation in the group of pupils being tested in terms of one form of the following weighted criterion: Stanford Revision of the Binet-Simon Scale, Stanford Achievement Tests, National Intelligence Test, Scale A, Thorndike-McCall Reading Scale, Woody-McCall Mixed Fundamentals in Arithmetic, Morrison-McCall Spelling Scale, and ranking of pupils by expert teachers who had known them for a year. Since all of the pupils on whom the scoring key is based had had since infancy ample educational opportunity and unusually strong motivation, it is reasonable to use educational tests in constructing an intelligence criterion.

6. Quantitative determination of the validity or differentiating power of each test item. A method was developed whereby refinement of scoring, optimum scoring key, directional validation, and quantitative determination of validity could be accomplished at the same time with the same statistical process. This quantitative determination of the validity of each test item showed that there is an enormous variation in the validity of test items where no difference whatever is discernible by mere inspection. Many hundreds of test items were prepared, criticized and revised.

From these the most promising four hundred were selected and subjected to the processes partially described above. The one hundred items shown to have the highest validity were selected for use in the final test.

7. Calibration with a series of educational tests. A number of the more important educational tests have been scaled on the same basis as the Multi-Mental Scale or have been calibrated against it directly. This makes the scores on the different tests highly comparable, thus facilitating the practical use of test results.

8. Determination of final validity of total test. The value of a test is always relative. Consequently, the Multi-Mental Scale has been compared with what is generally considered the best individual test and the best group intelligence test that have been produced, namely, the Stanford Revision of the Binet-Simon Scale and the National Intelligence Test, Scale A. These two and the Multi-Mental Scale have been correlated with the highly reliable and comprehensive criterion already listed. The following table shows the relative value of the three tests:

	M.M.	N.I.T.	Binet
Approximate cost per pupil in cents.....	.01	.05	.08
Approximate time in minutes to apply and score test and secure final record for one pupil.....	5	10	70
Correlation with criterion (containing N.I.T. and Binet with one-seventh weight each but not containing M.M.) for 92 pupils in grades 3 through 8.....	.93	.93	.89
Correlation with criterion (containing N.I.T. and Binet and M.M. with one-seventh weight each) for 141 pupils in grades 3 through 7.....	.904	.95	.814
Estimated correlation for thousands of pupils in grades 3 through 8 in a typical school when the three tests receive equal weight in the criterion.....	.93	.95	.88

Thus one form of the Multi-Mental Scale is more valid than the Binet Scale and almost as valid as one form of the National Intelligence Test, for measuring the ability measured by the above criterion. Since two forms of the Multi-Mental Scale can be given and scored in the time required for one form of the National Intelligence Test, it is believed that the Multi-Mental Scale represents a forward step in test construction. An exploitation of the techniques developed during its construction promises a still greater advance.

A further consideration of the very important matter of the reliability and the validity of the test revealed the fact that "the correlation between the scores on the even and odd numbered items of the thirty-minute test on the second group of pupils, was determined and found to be .89. The Spearman-Brown formula was used for the whole test and showed the self-correlation to be .94.

But validity is a more crucial evaluation of a test since validity is the resultant of reliability plus all other factors. "Validity is the correspondence between the ability measured by the test and ability as otherwise objectively defined and measured." To determine the validity of the Multi-Mental Scale it was decided to correlate the total score according to the simplified scoring key with criterion scores, as previously defined, made by this second group of pupils in grades three through eight in the Horace Mann School. The validity correlation was .93.

One remarkable fact about this self-r of .94 and this validity r of .93 on the same group of pupils is that the test utilizes practically all of its reliability for validity. Usually the reliability of a test greatly exceeds its validity." (:409-10).

THE PREPARATION OF THE ARITHMETIC TESTS.

CHOICE OF ELEMENTS:

The first step in the preparation of the arithmetic tests was a logical analysis of each of the fundamental processes with integers, with common fractions, and with decimal fractions, with a view to discovering the various elements that go to make up the different abilities in arithmetic, as, for example, the ability to add, the ability to subtract, the ability to multiply, and the ability to divide. In the preparation of this analysis valuable help was obtained from a comparison of the various analyses presented in such discussions of the principles and practices in arithmetic teaching as those of Brown and Coffman (1), Klapper (2), Lennes (3), Lindquist (4), Osburn (6), Smith (7), Stamper (8), Stone (9), Suzzalo (10), Thorndike (11), and Wilson (12).

The result of the analysis of the various factors which enter into the successive steps in the four fundamental processes led to the construction of 427 examples each of which differed from all the others in some known manner.

The next step was to divide 427 reasoning problems each of which would require for its successful solution the ability to perform one of the

fundamental operations included in the 427 examples selected as types. From the problems and examples thus prepared were formed 20 reasoning tests and 20 parallel tests in the involved fundamental processes. The location of the problems and examples in the different tests was purely arbitrary and mechanical. The 16 types of addition problems and the corresponding addition examples were placed by rotation as the first problem or first example in Tests 1 to 18 respectively. The first subtraction problem was made Problem 1 in Test 19; the second subtraction problem was made Problem 2 in Test 20; the third subtraction problem was made Problem 2 in Test 2, and so on in rotation until all problems and corresponding examples had been included.

Tests 1 to 20 were entitled Forms 1 to 20. As these tests each contained 21 or 22 problems or examples, ranging from very easy to very difficult, and involved abilities that could not possibly be expected of pupils in grades 3 and 4, a special set of "Primary Forms", known as Forms A, B, C, D, and E, respectively, were constructed by selecting from Forms 1 to 20 such examples and problems as consideration of existing courses of study in arithmetic would lead one to expect pu-

pils of those grades to cope with successfully.

A complete set of the 50 arithmetic tests, including 25 reasoning tests and 25 fundamentals tests is appended. Comparison of the similarly lettered or similarly numbered sets of reasoning and fundamentals tests will reveal the fact that a given reasoning problem was always placed within its respective type of test in the same position as was given to its involved fundamental example in the corresponding fundamentals test.

THE ORGANIZATION OF THE TESTING PROGRAM.

The procedure followed in organizing the testing program is fully explained in the Circular of Information and in the Manual of Directions which were sent to collaborators in the survey. Copies of both explanations are given here:

Notre Dame Normal School
Grandin Road
Cincinnati, Ohio

CIRCULAR OF INFORMATION

For Principals and Teachers
Who Are Willing to Collaborate in Our Experiment

1. What is the purpose of the experiment?
To discover the mental age necessary for the solution of certain typical reasoning problems in arithmetic, as well as to discover the relation between ability in the mechanical processes of arithmetic and ability in problem solving.
2. How is the experiment to be carried on?
By testing pupils in all grades from three to eight in various schools throughout the country by means of three tests, copies of which we shall supply to principals and teachers who are willing to collaborate with us.
3. What is the nature of the tests?
They include one group mental test, one arithmetic reasoning test, and one arithmetic mixed fundamental test.
4. When are the tests to be given?
On any three successive days between January 17 and January 27, 1927.
5. How much time will be required for the testing?
The total time required will be two hours, distributed in this manner:
1st day - $1\frac{1}{2}$ hour for the mental test.
2nd day - 1 hour for the arithmetic reasoning test.
3rd day - $1\frac{1}{2}$ hour for the arithmetic fundamental test.
6. Who will give the tests?
The regular classroom teachers.

7. Will teachers be asked to give any time over and above the two hours required for testing?
None whatever, except the time that they will need to take for reading over carefully beforehand the directions for giving the tests.

8. Will the teachers be asked to score the tests?
No. The teacher's work is completed with the giving of the tests. We shall attend to the scoring when the tests are returned to us.

9. What should principals and teachers do who are willing to collaborate?
Fill out the card for collaborators and mail at your earliest convenience to:
Sister Mary Francis, S.N.D.
Notre Dame Normal School,
Grandin Road, Cincinnati, Ohio.

* * * * *

A STUDY OF THE RELATION OF MENTAL AGE
TO PROBLEM-SOLVING ABILITY IN ARITHMETIC

MANUAL OF DIRECTIONS

Just as in the fundamental operations some combinations of digits are known to be intrinsically more difficult than others, so in problems involving reasoning there are varying degrees of difficulty. Certain types of problems, because of the number or nature of the steps involved, are harder for children than others.

There is reason to believe that some types of problem cannot successfully be taught until children have reached a certain mental age. The question has never been thoroughly investigated.

The present study, conducted under the auspices of the Department of Education of the University of Cincinnati, is an attempt to secure conclusive data on this important matter. The plan calls for the testing of about seventy thousand children in all parts of the country. Each child will take a mental test, to determine his mental age; an arithmetic fundamentals test; and an arithmetic reasoning test. The total number of distinct types of reasoning problem contained in the tests is over 425. There are 25 different forms of reasoning test and 25 corresponding forms of fundamentals test. Each child will take only one form of each of the two types of arithmetic tests, and will thus be required to do at most 22 reasoning problems and 22 examples containing the fundamental processes involved in the solution of the reasoning problems. The distribution of the various forms among the participants will be such that the resultant mental age norms will be based upon a minimum of 2000 subjects for each problem in grades 3 and 4, and upon a minimum of 3000 subjects for each problem in grades 5 to 8 inclusive.

The administration of the tests is extremely simple, and cooperating teachers need do no more than follow the short and simple directions

given below. Three remarks, however, may be of value:

First, as always happens when standardized tests are used, the questions are so organized that even the brightest child will be given an opportunity to show the full limit of his power. In consequence, few, if any, children will be able to complete the entire test perfectly. Teachers should not condemn the tests as "too hard," nor should children be discouraged if they do not make a perfect score.

Secondly, since the purpose is to ascertain which types of problem are intrinsically too difficult for certain mental ages, it is necessary for us to know that children fail because the reasoning required is beyond their power, and not because they have not been taught the arithmetic processes involved. Accordingly, there has been sent to each teacher an examiner's card with a request to check thereon any examples in the fundamentals test containing a process which the teacher is certain has never been explained to the pupils at any time in their school career.

Finally, the success of the experiment depends upon the exact observance of the instructions here given, particularly of those concerning the time limits.

THINGS THAT TEACHERS WHO WISH TO ASSIST

IN THE STUDY ARE ASKED TO DO:

1. Give the tests on three consecutive days, if possible, (or on three days of the same week) between January 17 and February 18, 1927.
2. Give the tests in this order:
 - 1st day - McCall Multi-Mental Scale.
 - 2nd day - Arithmetic Reasoning Test.
 - 3rd day - Arithmetic Fundamentals Test.
3. Allow for the tests the time indicated here:
 - a. McCall Multi-Mental Scale - twenty minutes from the time that the reading of the printed directions to pupils is completed.

- b. Arithmetic Reasoning Test - one hour.
- c. Arithmetic Fundamentals Test - one-half hour.

4. Distribute the Primary Arithmetic Tests in grades three and four only.
Distribute the other Arithmetic Tests, Forms 1 to 20 inclusive, both Reasoning and Fundamentals, in grades five, six, seven and eight only.
5. Distribute the Fundamentals Tests to the pupils on the third day with great care so that pupils will receive that form of the Fundamentals Test which corresponds in number to that form of the Reasoning Test which the pupils had on the second day. Much care has been exercised in mailing the tests to collaborators in order that a given teacher may be required to handle only one form of the arithmetic tests in a given class; for instance, only Form A, or B or C, of the Primary tests, or only Form 1, or 9, or 15, of the tests for upper grades. Nevertheless, it may happen that a teacher will receive one form of a test for part of her class, and another form for the rest of the class. In such a case, teachers are earnestly requested to use great care in distributing the tests so that a pupil who takes Reasoning Test, Form B, will also receive Fundamentals Test, Form B, and that one who takes Reasoning Test, Form 16, will receive Fundamentals Test, Form 16.
6. Use every possible means to secure independent work on the part of pupils.
7. Do not hesitate to send in the papers of even the very poorest pupils in the class. The fact is that these papers will be of inestimable value for the purposes of the study.
8. To facilitate the work of scoring, kindly keep the three papers of each pupil together. For this purpose, before returning the tests, kindly arrange each pupil's set of three tests so that the Mental Scale will be inside the Arithmetic Reasoning Test, and the latter inside the Fundamentals Test which will thus be utilized as a cover. Do not fold the tests.
9. Fill out the examiner's card which has been sent to each collaborating teacher and place it carefully in the package with your pupils' tests before returning the latter.

DIRECTIONS FOR GIVING THE TESTS

1. Directions for giving the Multi-Mental Scale:*

How to Apply the Test:

Read the following, word for word, pausing for pupils' responses as indicated:

"Is there anyone who has not a pencil and an eraser? Raise your hand. ... I shall distribute some papers face down. Please leave them face down until I tell you to turn them. Will the pupils in the front row distribute papers for me? ...

"Turn paper, and fill the blanks at the top. Write very plainly. When you have finished, put your pencil down and look at me....

"Look at the first set of five words under A: chair, dog, table, bed, stove. One word does not belong with the others. Which is it? ... 'Dog' is the word, because a dog is not furniture like chair, table, bed, and stove. With your pencil draw a line right through 'dog'....

"Look at the next set of words under B: gate, good, big, bad, little. Which word does not go with the others?.... 'Gate' is the word, because good and bad go together and big and little go together. Draw a line right through 'gate'..

"Look at the next set of words under C: sweet, ripe, red, crow, and apple. Which word does not go with the others?... 'Crow' does not go with the others. We can have a sweet, ripe, red apple, but we cannot have a sweet, ripe, red crow. Draw a line right through 'crow'....

"Look at the next set of words under D: mama, sister, papa, brother, grandma. Which word does not go with the others.... 'Grandma' does not go with the others because mama and papa go together and sister and brother go together. Draw a line right through 'grandma'....

"Look at the next set of words under E:

*Quoted with the permission of the Bureau of Publications, Teachers College, Columbia University.

dog, leaps, stone, runs, barks. Which word does not go with the others?... 'Stone does not go with the others, because a dog leaps, runs, and barks. Draw a line right through 'stone'.

"Pencils down!... Listen carefully. In the same way draw a line through the one and only one word which does not belong with the others in each of the sets on this page. Do set number 1 first, then set number 2, and so on. Be sure not to skip any set. Mark some word in it before passing on to the next set. You will have plenty of time, if you don't waste it. If you finish before time is called, go back and make sure you have made no mistakes. If you decide to change your mark, don't forget to erase your first mark. Now, once more, to make certain you understand every point. Be sure to draw a line right through the one and only one word in each set that does not go with the others. Be sure to do set 1 first, then set 2, and so on without skipping any set. Be sure to use every minute of the time, that we may be proud of the score for our school. Ready with the pencil! Go!"

The instant you say, "GO!" write down the time in minutes and seconds. Exactly twenty minutes after saying "Go!" call "Stop!" "Pencils down!" Have pupils collect papers immediately.

While the pupils are taking the test, keep in constant but quiet motion about the room to see that blanks have been filled out properly and that the above instructions are being followed exactly. If a pupil does not begin because he does not understand what he is to do, quietly re-instruct him on the five practice sets. If he is not obeying instructions, quietly correct him. Give no help on just what should be marked. The use of the dictionary is not permitted. If a pupil asks the meaning or pronunciation of words, say with a smile: "Do the best you can." The skillful examiner knows what every pupil is doing every instant.

2. Directions for giving the Arithmetic REASONING Test.

After distributing papers have the pupils fill in the data called for at the top of the page. Give any assistance necessary, especially

with regard to "age." Then read aloud the following:

"You will find on this paper some problems that are easy and some that are probably too difficult for you to do. Try each problem in order, beginning with the first. You will have all the time you need but do not waste any by staying too long on problems that you are not able to solve. Be sure to write your answers on the dotted line near the problem. Now let us see what the directions on our paper say. You follow silently while I read aloud."

After reading the "Directions to the pupils" from a test paper, say "Now you may begin."

At the end of one hour collect all the papers after making sure that the pupils have written their answers in the place indicated by the dotted line.

3. Directions for giving the Arithmetic FUNDAMENTALS Test.

The directions are the same as for the Arithmetic Reasoning Test, except that the papers are to be collected at the end of thirty minutes.

CONTROLS EMPLOYED IN THE INVESTIGATION.

In order to discover whether failure to solve a given reasoning problem was due wholly to inability to select the correct procedure, or whether it was due in part to inability to perform the fundamental operation involved in the solution, each teacher who collaborated in the experiment was asked to fill out and return a card similar to the following:

EXAMINER'S CARD*

For
Collaborators in the Study
of
The Relation of Mental Age
To
Problem-Solving Ability in Arithmetic

1. I administered the tests to my class on
Jan.
Feb.....,, and,, 1927
2. I am sure that the pupils in my class have
never been taught the processes involved
in those examples of Fundamentals Test,
Form..... of which I have crossed out the
number in the next line.
Example No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
11, 12, 13, 14, 15, 16, 17, 18, 19, 20,
21, 22.
3. I have arranged the three tests taken by
each pupil so that the Mental Scale is in-
side the Reasoning Test and the latter with-
in the Fundamentals Test.
4. I am enclosing the Examiner's Card with my
pupils' tests which are to be returned im-
mediately to the address designated in the
letter accompanying the tests.

Signed.....
(Teacher)

Grade.....School.....

City.....State.....

*Each teacher who cooperates in the study is re-
quested to fill out an Examiner's Card and re-
turn it with the pupils' test papers.

The main purpose of the Examiner's Card was
to discover the fundamentals examples which had
not previously been taught to the pupils in the

various classes tested. No pupils who failed to solve a given problem were considered subjects for that particular problem if the teacher asserted that the involved fundamentals example had never been taught to the pupils in question. On the other hand, all pupils who solved correctly the reasoning problem were considered subjects for that problem despite the fact that in some cases the teacher asserted that the involved example had not previously been taught.

A second control employed in the investigation was the definite sequence specified for the giving of the arithmetic tests. Since some pupils with particularly good visual memory might be assisted on the choice of procedure in solving the reasoning problems if the involved fundamentals examples arranged in similar order were given on the preceding day very explicit directions concerning the time of giving the tests were sent to each collaborator. The result was that in all instances the arithmetic reasoning test was given on the second day of the testing, and the arithmetic fundamentals test on the third day.

THE TIME OF THE EXPERIMENT.

The original time set for the testing was any three successive school days between January

17 and January 27, 1927. Due to mid-year promotions, however, the testing began only about February 1 and was concluded in all cooperating schools by the middle of March.

SCHOOLS AND SUBJECTS INVOLVED IN THE INVESTIGATION.

The number of schools involved in the investigation was 207. The proportion of public schools to Catholic parochial schools was about 5 to 2. The geographical distribution of participating schools is shown by the following table:

STATE	NUMBER OF CITIES	NUMBER OF SCHOOLS
Alabama	1	11
California	5	15
District of Columbia	1	7
Illinois	2	44
Kentucky	2	4
Maryland	1	1
Massachusetts	18	27
Michigan	1	1
New York	1	41
Ohio	9	45
Pennsylvania	1	6
Rhode Island	1	2
South Carolina	1	2
Virginia	1	1
	<u>45</u>	<u>207</u>

The subjects of the investigation were 68, 957 pupils in grades 3 to 8, inclusive. Besides being as widely distributed geographically as possible each form of the arithmetic material was so distributed numerically as to approximate

the ideal allocation represented in the following table:

Table showing the approximate distribution of testing materials among subjects of grades 3 to 8.

Grade	3	4	5	6	7	8
Form A	1000	1000				
B	1000	1000				
C	1000	1000				
D	1000	1000				
E	1000	1000				
1			750	750	750	750
2			750	750	750	750
3			750	750	750	750
4			750	750	750	750
5			750	750	750	750
6			750	750	750	750
7			750	750	750	750
8			750	750	750	750
9			750	750	750	750
10			750	750	750	750
11			750	750	750	750
12			750	750	750	750
13			750	750	750	750
14			750	750	750	750
15			750	750	750	750
16			750	750	750	750
17			750	750	750	750
18			750	750	750	750
19			750	750	750	750
20			750	750	750	750

The numbers in the columns under each grade represent the number of tests of the different forms distributed in the grade marked at the head of the column. The purpose of this distribution was to secure complete data from a minimum of 500 sub-

jects for each form in each grade tested. This desirable frequency was approximated in all but very few instances, in spite of necessary rejections of test results arising from such causes as: the absence of pupils on one or more of the three days when the tests were administered; the failure on the part of those who administered the tests to give the arithmetic tests in the order designated; the lack of correspondence in the form of reasoning and fundamentals tests administered; and, the lack of requested data concerning chronological age and grade.

THE ADMINISTRATION OF THE TESTS.

The tests were administered by the regular classroom teachers who were provided with a Manual of Directions for giving the tests. From the copy here reproduced it will be seen that the directions for administering the Multi-Mental Scale were quoted verbatim from the manual furnished by the Bureau of Publications, Teachers College. The directions for giving the arithmetic tests were so simple as to make no special technical preparation necessary for their proper administration.

THE SCORING OF THE TESTS.

The scoring of the tests was done either by

experienced classroom teachers under the immediate supervision of the writer or of a specially trained representative, and by a group of graduate students of education under special supervision.

The use of the Scoring Key for the scoring of the Multi-Mental Scale, and of a specially prepared set of scoring keys listing every possible acceptable answer to the arithmetic problems and examples, reduced the work of scoring to an approximately objective basis.

A copy of the "Directions for Scoring" is given here in full.

Directions for Scoring the Tests

USED IN THE STUDY OF THE RELATION OF MENTAL AGE
TO PROBLEM-SOLVING ABILITY IN ARITHMETIC

1. Keep each pupil's set of three papers together at all times.
2. Keep the Examiner's Card with the accompanying sets of test papers until direction under 3 is carried out. After that the Examiner's Card is to be placed carefully in a pile with the other Examiner's Cards.
3. Note the numbers which have been crossed out on the Examiner's Card. Then place the pile of test papers sent in by the examiner in such a way that the Cumulative Record on the last page of the Fundamentals Test is spread out before you. Cross out on the Cumulative Record of each pupil in the row marked, "No. of problem or example", the numbers which the teacher (or examiner) has crossed out on the Examiner's Card. Write the teacher's name in the space designated on the Cumulative Record.
4. Score each set of papers completely before beginning a second test. Score in this order: 1st—Multi-Mental Scale; 2nd—Arithmetic Reasoning Test; 3rd—Arithmetic Fundamentals Test.
5. Use the Multi-Mental Scoring Stencil to score the McCall Multi-Mental Scale. Follow exactly the directions given at the top of the stencil. The tables from the Multi-Mental Manual necessary for carrying out direction 6 listed on the Multi-Mental Scoring Stencil are reprinted at the end of these directions. Use these tables in order to convert the Multi-Mental Scale score into G-score, T-score, and Mental Age. As you find each of these, write it in the space designated on the pupil's Cumulative Record.
6. Score the arithmetic tests by consulting the arithmetic scoring stencils for the answers and marking in the right hand margin opposite the printed "Ans." a "c" if the example or problem is correct, and an "x" if the example or problem is either incomplete, or in any way different from the answer given on the stencil. No partial credit is to be given. Even in examples in the fundamentals test in which there are sometimes several answers to one example, no credit must be given unless all the parts of the answer are completed and unless all the parts are correct.
7. Fill in the pupil's record for the Arithmetic Reasoning Test at the top of the Reasoning Test, by checking in the proper spaces the problems attempted, the problems correct, and the totals.
8. Fill in the Cumulative Record completely after scoring the Fundamentals Test.

TABLE FOR CONVERTING THE McCALL MULTI-MENTAL SCALE
INTO G-SCORE, T-SCORE, AND MENTAL AGE*

HOW TO CONVERT SCORE TO G SCORE

Table I shows how to convert each score into a G score. For example, any score between —80 and —67 inclusive converts to a G score of 2.8, which means that the pupil making such a G score has a general mental ability equal to that of a typical pupil eight-tenths of the way through the second grade; that is, a typical pupil who has been in the second grade eight months. Any score between 285 and 295 inclusive converts to a G score of 7.4 which means a general mental ability equal to that of a typical pupil four tenths of the way through the seventh grade.

TABLE I

T, G, AND AGE TABLE FOR MULTI-MENTAL SCALE

SCORE	G	T	MENTAL AGE Yr. Mo.	SCORE	G	T	MENTAL AGE Yr. Mo.
—260 to —258.....	—3.3	0	6—0	—203 to —198.....	.3	15	7—1
—257 to —255.....	—3.1	1	6—1	—197 to —193.....	.1	16	7—2
—254 to —252.....	—2.9	2	6—2	—192 to —189.....	+.1	17	7—3
—251 to —249.....	—2.7	3	6—2	—188 to —183.....	.3	18	7—4
—248 to —245.....	—2.5	4	6—3	—182 to —177.....	.5	19	7—5
—244 to —241.....	—2.3	5	6—3	—176 to —171.....	.7	20	7—7
—240 to —237.....	—2.1	6	6—4	—170 to —165.....	.9	21	7—8
—236 to —234.....	—1.9	7	6—5	—164 to —158.....	1.1	22	7—9
—233 to —231.....	—1.7	8	6—6	—157 to —151.....	1.3	23	7—10
—230 to —227.....	—1.5	9	6—7	—150 to —145.....	1.5	24	8—0
—226 to —223.....	—1.3	10	6—8	—144 to —137.....	1.7	25	8—1
—222 to —218.....	—1.1	11	6—9	—136 to —131.....	1.9	26	8—3
—217 to —213.....	.9	12	6—10	—130 to —119.....	2.1	27	8—4
—212 to —209.....	.7	13	6—11	—118 to —107.....	2.3	28	8—6
—208 to —204.....	.5	14	7—0	—106 to —95.....	2.5	29	8—7

*Quoted, with permission of the Bureau of Publications, Teachers College, Columbia University.

SCORE		MENTAL AGE		
		G	T	Yr. Mo.
— 94 to —	81.....	2.6	30	8— 9
— 80 to —	67.....	2.8	31	8—10
— 66 to —	53.....	3.0	32	9— 0
— 52 to —	35.....	3.2	33	9— 2
— 34 to —	14.....	3.4	34	9— 4
— 13 to +	7.....	3.6	35	9— 5
8 to	26.....	3.8	36	9— 7
27 to	42.....	4.0	37	9— 8
43 to	58.....	4.2	38	10— 0
59 to	75.....	4.4	39	10— 2
76 to	95.....	4.6	40	10— 4
96 to	114.....	4.8	41	10— 6
115 to	133.....	5.0	42	10— 8
134 to	152.....	5.2	43	10—11
153 to	167.....	5.4	44	11— 2
168 to	182.....	5.6	45	11— 4
183 to	195.....	5.8	46	11— 6
196 to	207.....	6.0	47	11— 9
208 to	221.....	6.2	48	12— 0
222 to	235.....	6.4	49	12— 2
236 to	249.....	6.6	50	12— 6
250 to	259.....	6.8	51	12— 9
260 to	271.....	7.0	52	13— 0
272 to	284.....	7.2	53	13— 3
285 to	295.....	7.4	54	13— 7
296 to	306.....	7.6	55	13—10
307 to	317.....	7.8	56	14— 2
318 to	327.....	8.0	57	14— 5
328 to	337.....	8.2	58	14— 8
338 to	347.....	8.4	59	15— 0
348 to	356.....	8.6	60	15— 5
357 to	365.....	8.8	61	15— 9
366 to	372.....	9.0	62	16— 1
373 to	378.....	9.2	63	16— 5
379 to	385.....	9.3	64	16—10

		MENTAL AGE Yr. Mo.		
SCORE		G	T	
386 to	391.....	9.5	65	17— 2
392 to	398.....	9.7	66	17— 6
399 to	403.....	9.9	67	17— 9
404 to	408.....	10.1	68	18— 0
409 to	413.....	10.3	69	18— 3
414 to	418.....	10.5	70	18— 6
419 to	422.....	10.7	71	18— 9
423 to	426.....	10.9	72	19— 0
427 to	430.....	11.1	73	19— 2
431 to	433.....	11.3	74	19— 5
434 to	436.....	11.5	75	19— 7
437 to	439.....	11.7	76	19—10
440 to	442.....	11.9	77	20— 0
443 to	444.....	12.1	78	20— 3
445 to	446.....	12.3	79	20— 5
447 to	448.....	12.5	80	20— 8
449 to	450.....	12.7	81	20—10
451 to	452.....	12.9	82	21— 1
453 to	454.....	13.1	83	21— 3
455 to	456.....	13.3	84	21— 6
457 to	458.....	13.5	85	21— 8
459 to	460.....	13.7	86	21—11
461 to	462.....	13.9	87	22— 1
463 to	464.....	14.1	88	22— 4
465		14.3	89	22— 6
466 to	467.....	14.5	90	22— 8
468		14.7	91	22—10
469 to	470.....	14.9	92	23— 0
471 to	472.....	15.1	93	23— 2
473		15.3	94	23— 4
474 to	475.....	15.5	95	23— 6
476		15.7	96	23— 8
477		15.9	97	23—10
478		16.1	98	24— 0
479		16.3	99	24— 2

BIBLIOGRAPHY FOR CHAPTER IV.

SCORE	G	T	MENTAL AGE Yr. Mo.
480	16.5	100	24—4
481	16.7	101	
482	16.9	102	
483	17.0	103	
484	17.2	104	
485	17.5	105	
486	17.8	107	
487	18.0	108	
488	18.3	109	
489	18.6	111	

SCORE	G	T	MENTAL AGE Yr. Mo.
490	18.8	112	
491	19.1	113	
492	19.5	115	
493	19.9	117	
494	20.2	119	
495	20.5	120	
496	20.9	122	
497	21.3	124	
498	21.7	126	
499	22.1	128	
500	22.4	130	

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CHAPTER V.

THE DATA OF THE INVESTIGATION.

Complete data for each of the problems and corresponding examples included in all the tests used in this investigation were prepared on 427 data sheets similar to the one inserted at the end of this chapter. On each data sheet was prepared a complete report of the results obtained by all subjects in all the grades tested on a given problem and its corresponding fundamentals example. Each subject was allocated by mental age, by intelligence quotient, and by school grade. On each sheet was shown by means of the numbers in columns 1, 2, 3, and 4, under each IQ section, the number of subjects and the number of correct responses for a given reasoning problem and its corresponding fundamentals example.

The number of subjects for the different problems of a given test form varied from problem to problem, whereas it ordinarily happens that a subject for any problem in a test is considered a subject for all other problems in the same test.

In this investigation, however, the procedure adopted in estimating the number of subjects was to include as subjects only those pupils who, according to the teacher's statement on the Examiner's Card, had previously been taught the fundamental process involved in the reasoning problem. The purpose of this strict limitation of the number of recorded subjects was to eliminate lack of opportunity as a cause of failure in problem-solving, and thus to discover more accurately the inherent difficulty of a problem and the relationship existing between mental age and problem-solving ability in arithmetic.

On each data sheet were shown the percentages of correct answers for each mental-age group by year intervals from 6-6 to 18-6 and above. By this means the main purpose of the study was realized. Over and above there were presented the percentages of correct responses for each intelligence quotient section, by intervals of 10, from below 70 to 140 and above, and also, the percentages of correct responses obtained in each grade tested. Data were presented for 427 problems in grades 5 to 8 inclusive, and for 100 of these same problems, data were presented for grades 3 and 4 also. However, data for the problems in Primary

Forms, A, B, C, D, and E, were not presented on separate data sheets but in connection with the data for the problems in Forms 1 to 20 the problems in the Primary Forms are identical.

The sample data sheet for problem 6 of the reasoning test, Form 1, and for example 6 of the fundamentals test, Form 1, is here inserted for the purpose of showing how the three variables MA, IQ, and school grade were recorded for all subjects to whom Form 1 was administered.

Table.....6..... Showing the percentage of accuracy obtained on Form.....1....., Problem.....6....., by 2221..... subjects of grades.....5....., 8 of MA 6-6 to 24-4, and of IQ below 70 to 140+, to.....211..... of whom the involved fundamentals processes had previously been taught.

IQ 110 TO 119				IQ 120 TO 129				IQ 130 TO 139				IQ 140 AND 140 +				TOTALS				% ACCURACY	
Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		% ACCURACY	
No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	Reas.	Fund.
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	2	4

Form	IQ BELOW 70				IQ 70 TO 79				IQ 80 TO 89				IQ 90 TO 99				IQ 100 TO 109				
Problem	Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		Reas.		Fund.		
Grade	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	No. Subj.	No. Cor.	
MA	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
6-6 to 7-5	3																				
	4																				
	5																				
	6	1		1	1																
	7																				
7-6 to 8-5	3																				
	4																				
	5	2	1	2																	
	6	1		1																	
	7																				
8-6 to 9-5	3																				
	4																				
	5	5	1	5	1	6		6		3	1	3	2								
	6	11	4	11	5	6	4	6	4					1		1					
	7	2	2	2	1																
9-6 to 10-5	3																				
	4																				
	5	14	2	14	2	16	1	17	5	29	13	28	14	28	14	23	10	28	10	17	13
	6	10	2	10	5	40	17	30	23	27	12	26	18	10	6	10	6	2		21	3
	7	14	13	14	10	13	8	13	9	15	7	15	4	3	3	3	3				
10-6 to 11-5	3																				
	4																				
	5	4	1	3		18	8	18	7	36	6	36	6	50	23	49	22	70	32	69	43
	6					29	14	29	19	45	25	45	25	50	29	50	38	23	14	23	18
	7	12	10	12	11	25	20	25	19	47	27	47	35	19	11	20	14	2	1	2	2
11-6 to 12-5	3																				
	4																				
	5					2	1	2	1	15	3	15	5	21	9	20	8	38	23	36	19
	6	1		1		4	1	4	2	12	4	12	6	27	13	27	20	44	29	44	36
	7					17	13	17	15	65	55	66	54	47	37	46	37	18	17	19	18
12-6 to 13-5	3																				
	4																				
	5									3		3	2	5	4	5	3	11	6	11	9
	6									4	1	4	2	15	13	16	9				

CHAPTER VI.

THE OUTCOME OF THE INVESTIGATION

Assuming that a problem is at par for a given mental age if 50 per cent of children of that particular mental age are able to solve the problem in question, series of problems and examples graded on the basis of mental age were derived from a consideration of the percentages of accuracy obtained by the various mental age levels participating in the testing program. In all, thirty-two series of problems and thirty-two series of corresponding fundamentals examples were derived as follows:

1. A series of one-step, of two-step, and of three-step, problems and examples in each of the four fundamental processes:

- a. With integers
- b. With common fractions
- c. With decimal fractions
- d. With denominate numbers.

2. A series of one-step and two-step problems in reduction of denominate numbers.

3. A series of problems in the application of percentage in:

- a. Interest
- b. Taxes

- c. Life insurance.
- d. Property insurance.
- e. Commission.
- f. Trade discount.

4. A series of problems in the mensuration of plane and solid surfaces.

The method employed in determining the 50 per cent point was to interpolate between the two percentages bracketing the 50 per cent point, and then to assign the test item to the nearest half-year mental age level. Thus when the percentages for two successive mental ages are as follows:

M.A.	% ACCURACY
8-6 to 9-5	34.0
9-6 to 10-5	65.3
$\text{the M.A. at par} = 9 + \frac{50 - 34.0}{65.3 - 34.0}$	
$= 9 + 0.51, \text{ or } 9.51 \text{ years}$	
$= 9 \text{ years, } 6 \text{ months.}$	

For those problems in which the maximum or minimum percentage of accuracy attained by no mental age group reached the 50 per cent point, the grading was a relative one based on the consideration of the total minimum or maximum percentage of accuracy reached by all mental age groups tested. To indicate approximately the mental age basis of difficulty, provision was made in each series by inserting columns in which the maximum and the

minimum age levels with their corresponding percentages of accuracy were presented in lieu of the 50 per cent level.

The exact M.A. level was regarded in the grading of problems on the basis of relative difficulty, in order to serve as a guide to the teacher in the presentation of steps within a given process. For the sake of simplifying the use of the series for diagnostic purposes it was decided to place a problem in the scale at 9-6, or 10-0, or 11-6, respectively, instead of at 9-4, or 10-2, or 11-7, as the more specific allocation might happen to be.

Primary Reasoning Test—Form A

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Jack went to the circus and saw 5 lions, 9 monkeys, 8 camels, 6 elephants, 4 bears and 7 ponies. How many animals did he see there?

Ans.....

2. There were 436 girls and 302 boys in the parade. How many more girls than boys were there?

Ans.....

3. At 2 cents each, how many pencils can you buy for a dime?

Ans.....

4. A shepherd put his sheep in 6 pastures each containing 45 sheep. How many sheep did he have?

Ans.....

Turn over the page and work the other problems

5. There were 236 grown people and 541 children at the play. How many people saw the play?

Ans.....

6. Mr. Green paid \$5.63 for a small radio last year. When he bought a larger one John offered him \$3.28 for the small one. How large a reduction was John asking?

Ans.....

7. Tom bought a drum for a half dollar and sold it soon after for 45c. How much did he lose on it?

Ans.....

8. The milkman delivered 79 quarts of milk this morning. How many had he still to deliver if he had 92 quarts when he started out?

Ans.....

9. A lady bought 5 qt. and 1 pt. of milk one morning. She used 3 qt. for cooking. How much had she left?

Ans.....

10. The cook had $\frac{5}{6}$ of a pie left from dinner. She gave Billy a piece that was just $\frac{1}{6}$ of the whole pie. How much of the pie was then left?

Ans.....

11. Our huckster sells choice tomatoes in quart boxes. How many boxes can he fill with a peck of tomatoes?

Ans.....

12. On an average the Continental Hotel buys 287 pounds of meat every day. How much meat is bought by the hotel during the year?

Ans.....

13. Tom earned \$18.50 during vacation. His brother Bill earned \$9.75. How much more did Tom earn than his brother?

Ans.....

14. I went into a feed store and asked the man to weigh me. He put on a hundred-weight. I weigh only 93 pounds. How many pounds too much did he have on?

Ans.....

15. Bob sleeps 10 hours every night. How many hours is he awake every day?

Ans.....

16. A large department store had a special sale of percale. They had on hand 2860 yd. of percale and sold 2260 yd. of it. How many bolts of 75 yd. each were left?

Ans.....

17. My brother used 8 gal. 1 qt. of paint in painting our garage. Eight of our neighbors want him to paint their garages also. How much paint will he need if all of the garages are almost the same size as ours?

Ans.....

18. A commission merchant bought wheat for \$1.47 per bushel and sold it for \$1.62 per bushel. How much did he make on a shipment of 40,000 bushels?

Ans.....

19. The expense for caring for our parks last year amounted to \$98,550. What was the average daily expense for the parks last year?

Ans.....

20. Four children at school have jumping ropes. One rope is 5 yd. 1 ft. long; another is 2 yd. long; the third is 3 yd. 2 ft. long; and the fourth is 4 yd. 1 ft. long. We tied all the ropes together to play Double Dutch. How long was the rope we made?

Ans.....

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Primary Reasoning Test—Form B

B

Name _____ Grade _____ School _____ City _____ Boy
or
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Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
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DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Jane went to the fair. She bought a popcorn ball for 3 cents and a glass of lemonade for 5 cents. How much did she pay for both?

Ans.....

2. My brother wants to buy a second-hand automobile which costs \$375. He has \$231. How much must he save before he can buy it?

Ans.....

3. A grocer's boy put up 430 two-pound sacks of sugar. How many pounds of sugar did he put up?

Ans.....

4. Tom Brown's lunch bill at the school cafeteria last week was: \$.26 on Monday, \$.39 on Tuesday, \$.47 on Wednesday, \$.36 on Thursday, and \$.45 on Friday. How much was his bill for the week?

Ans.....

Turn over the page and work the other problems

5. Jack had \$59 in the bank. His big brother had exactly 25 times as much money as that. How much had his brother?

Ans.....

6. In a test consisting of 7 sections we were allowed 2 min. 20 sec. for each section. How much time was allowed for the entire test?

Ans.....

7. The dressmaker used $\frac{2}{9}$ of a yard of trimming for the cuffs and $\frac{2}{9}$ of a yard for the collar on Elsie's new dress. How much trimming did she use?

Ans.....

8. A man in laying a walk from his back porch to the garage, a distance of 16 ft. 8 in., made 7 ft. of it in one evening. How many feet did he have to make the next evening if he wished to finish it?

Ans.....

9. A grocer's clerk was told to put up 824 pounds of coffee in packages containing 4 lb. each. How many packages could he make?

Ans.....

10. Ted raised a bushel of potatoes last year in his garden patch. He took a peck of them to Grandmother. How many pecks did he have left?

Ans.....

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11. Mary, Sue, Ellen, and Betty had a doll party. Mary brought her 5 dolls, Betty brought 4, Sue brought 7 and Ellen brought 2. How many dolls came to the party?

Ans.....

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12. A dealer sold 4 used automobiles at \$820 each. How much did he receive for the 4 automobiles?

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13. A bicycle dealer invested \$3444 in bicycles at \$28 apiece. How many bicycles did he buy?

Ans.....

14. There were 42 boys in each of the 7 divisions in the parade. How many boys were in the parade?

Ans.....

15. In a furniture store there were three remnants of Brussels carpet measuring 3 ft. 2 in., 5 ft. 7 in., and 1 ft. 5 in. What was the total length of the three remnants?

Ans.....

16. Mr. Jones lives 29 miles from his office. He goes $15\frac{3}{4}$ miles by train and the rest of the way in an auto-bus. How far does he go in the bus?

Ans.....

17. Mrs. Brown bought 1 lb. of butter for 45c and 6 eggs at 36c a doz. What was the amount of the bill?

Ans.....

18. Mary and her mother went to the city. They rode 65 miles on the train, and 57 miles in an automobile. What is the distance to the city?

Ans.....

19. The total annual cost of irrigating 137 farms in Oklahoma is \$47,539. What is the average cost per farm?

Ans.....

20. A street car conductor collected 740 fares on Saturday, 850 on Sunday and on Monday $\frac{1}{2}$ of the amount he had collected on the two preceding days. How many fares did he collect on Monday?

Ans.....

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Primary Reasoning Test—Form C

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Name _____ Grade _____ School _____ City _____ Boy
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Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
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DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Harry caught 19 fish and Joe caught 7. How many did they both catch?

Ans.....

2. At 9 cents a quart how much will 7 quarts of milk cost?

Ans.....

3. Mr. Taylor paid \$8000 for a house. He sold it for \$7356. How much did he lose by the sale?

Ans.....

4. Jack stayed at his aunt's home 59 days last summer. How many full weeks was that, and how many days more?

Ans.....

5. How much paint does a painter use in four days if he uses 2 gal. 3 qt.; 3 gal. 1 qt.; 3 qt.; and 2 gal. 2 qt. respectively?

Ans.....

6. An airplane flies 252 miles in 6 hours. How far does it fly in an hour?

Ans.....

7. A dealer sold a lot of 83 automobiles at \$975 each. How much did he receive for the lot?

Ans.....

8. In a large dairy 39 boys are employed to wrap pound-packages of butter. When there are 2730 pounds to be wrapped, how many packages should each boy wrap?

Ans.....

9. In an auto race the winner reached the goal in 9 minutes, 23 seconds. The last car took 15 minutes, 34 seconds for the race. By how many minutes did the winner surpass the slowest car in the race?

Ans.....

10. The monthly payroll for 52 employees of the Excelsior Laundry amounts to \$5616. What is the average monthly wage of these employees?

Ans.....

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11. The milkman delivered 695 quarts of milk yesterday and 487 quarts today. How many quarts did he deliver in the two days?

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12. Jack has a strip of cardboard 36 inches long and just wide enough to make a ruler. How many foot-rulers can he make from the strip?

Ans.....

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13. The distance around the race track is one mile. How many yards is it around the track?

Ans.....

14. We wanted to make a trip of 968 miles in 4 days. The first day we travelled 264 miles and the next day only 171 miles. At the end of the second day how far did we still have to go?

Ans.....

15. We had 180 school days last year. How many days of the entire year did we have holiday?

Ans.....

16. Joe made a record of $12\frac{1}{2}$ ft. in the running broad jump. Bill reached only $11\frac{1}{4}$. How much farther did Joe jump than Bill?

Ans.....

17. I had a quarter to spend for my lunch. I spent only 19 cents. How much did I have left?

Ans.....

18. Mary bought 6 yd. of plaid gingham and 8 yd. of plain gingham. She paid 75c a yd. for the gingham. How much did it cost her?

Ans.....

19. There are 12 gal. 3 qt. of pickles in 3 kegs. What is the average content of each keg?

Ans.....

20. One night in January the ice on our pond increased in thickness from $\frac{1}{4}$ of an inch to $\frac{5}{8}$ of an inch. How much did it increase that night?

Ans.....

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Primary Reasoning Test—Form D

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SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
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1. Helen found 17 violets. Alice found only 9.
How many more did Helen find than Alice?

Ans.....

2. John has 25 marbles and James has 23. How many marbles have they together?

Ans.....

3. A special school assembly yesterday lasted an hour. How many minutes did it last?

Ans.....

4. In the largest department stores of our city there are 335 salesmen employed in one store, 248 in another, 294 in another, 127 in another, 156 in the next, and 189 in the last. How many salesmen are employed in the six stores?

Ans.....

5. The girls in camp made 34 cups of coffee from a pound of coffee. They have a supply of 20 pounds of coffee. oHw many cups of coffee will they be able to make?

Ans.....

6. Mother has four pint-bottles full of milk. How many quarts of milk has she?

Ans.....

7. Fred bought a motorcycle for \$76.54. He paid \$23.76 on it during the first four months. How much did he still owe?

Ans.....

8. How many yards of fencing would Mr. Brown have to buy to fence in a square plot of ground 8 yd. 1 ft. on a side?

Ans.....

9. A newspaper printer used 36963 sheets of paper in 3 days. How much did he use on an average every day?

Ans.....

10. What does it cost to give 370 pupils a high school education when the cost per pupil is \$275?

Ans.....

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11. A man left 398 acres of farm land to be divided equally among his four sons. How much did each son receive?

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12. You buy a dozen lollypops at 3 for a dime and give the man a dollar. How much change should you get?

Ans.....

13. In one week a traveling salesman received orders for 500 radios at \$178 each. What was the total value of his sale for the week?

Ans.....

14. A piano manufacturer sold 21 pianos for \$8862. What did he receive for each piano?

Ans.....

15. Tom gathered 7 pk. 2 qt. of tomatoes from his garden in 2 days. If he gathered the same quantity each day how much did he gather in one day?

Ans.....

16. Mrs. Jones bought 8 gal. 1 qt. of brick ice cream for a party. There were 2 qt. left after the party. How much ice cream was used?

Ans.....

17. A commission merchant shipped 1054 barrels of apples. It took 17 freight cars to haul them. How many barrels did each car hold?

Ans.....

18. Jack lives $\frac{2}{3}$ of a mile from the playground. One day when he was skating home his skate strap broke and he had to ride $\frac{3}{4}$ of the way on one skate. How far did he ride on one skate?

Ans.....

19. The butcher had 4 pieces of beef on the counter. The first, a steak, weighed 2 lb. 7 oz.; the other three were roasts weighing respectively: 5 lb. 3 oz., 4 lb. 1 oz., 9 lb. 12 oz. How much beef was on the counter?

Ans.....

20. Dick wanted to gain $15\frac{3}{8}$ pounds in weight so as to get on the foot ball team. He joined the nutrition class and gained 12 pounds in a month. How much did he still have to gain?

Ans.....

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Primary Reasoning Test—Form E

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Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
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1. In our library there are 524 story books, 213 history reference books, and 162 geography reference books. How many books does that make?

Ans.....

2. Dick read 431 lines during reading time. Joe read twice as many lines. How many lines did Joe read?

Ans.....

3. In a week there are seven days. How many weeks are there in 56 days?

Ans.....

4. Tom had 61 marbles at the beginning of the game. At the end he had only 56. How many did he lose?

Ans.....

Turn over the page and work the other problems

5. At an auction my father bid \$4288 on a house. The highest bidder paid \$5009 for it. How much more was offered by the buyer than by my father?

Ans.....

6. The flag in our class-room is one yard long. How many inches are there in its length?

Ans.....

7. An engineer whose freight train travels on an average 395 miles per day, works 305 days in the year. How many miles does the engineer travel on his train in a year?

Ans.....

8. Robert spent 2 months at the seashore last summer. How many weeks was he there?

Ans.....

9. Mr. Becker delivers 5 qt. 1 pt. of cream daily to a certain restaurant. How many quarts does he deliver in a week?

Ans.....

10. A street car conductor collected 938 fares during a nine-hour work day. On an average, how many fares did he collect every hour?

Ans.....

17. Jane went on an excursion to Mt. Vernon. She paid \$3.24 for her ticket, \$.75 for lunch, \$.06 for post-cards, \$1 for souvenirs, and \$.29 for a box of marshmallows. How much did she spend?

Ans.....

12. Our class contributed all but \$7.50 of our \$35 quota to the Community Chest fund. Then we gave a play and secured \$29.75 which we also contributed. How much did we give altogether?

Ans.....

13. John puts \$1 in the savings bank every month. How much does he save every year?

Ans.....

14. Of the 309 pupils in a school 275 were born in the United States. How many were born in a foreign country?

Ans.....

15. Our new fudge recipe calls for 12 oz. of brown sugar. How many ounces less than a pound should we use if we want to be exact?

Ans.....

16. Daddy brought home 36 marbles to be divided equally among Joe, Dick and Harry. How many marbles did each boy get?

Ans.....

17. In a dry goods store there were 513 bolts of sheeting of which 365 bolts were sold. How many bolts remained unsold?

Ans.....

18. In our State a bushel of onions weigh 55 lb. How many bushels can a farmer get from 3410 lb. of onions?

Ans.....

19. John lives $\frac{4}{5}$ of a mile from school. Dan lives $\frac{3}{5}$ of a mile farther than John. How far from the school does Dan live?

Ans.....

20. A large loaf of bread makes 21 sandwiches. How many sandwiches could you make from 12 large loaves?

Ans.....

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Reasoning Test—Form 1

Boy
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Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							

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1. Jane went to the fair. She bought a popcorn ball for 3 cents and a glass of lemonade for 5 cents. How much did she pay for both?

Ans.....

2. The milkman delivered 79 quarts of milk this morning. How many had he still to deliver if he had 92 quarts when he started out?

Ans.....

3. What does it cost to give 370 pupils a high school education when the cost per pupil is \$275?

Ans.....

4. The total annual cost of irrigating 137 farms in Oklahoma is \$47,539. What is the average cost per farm?

Ans.....

5. The butcher sent $7\frac{1}{2}$ pounds of roast beef and $3\frac{7}{8}$ pounds of pork chops. How many pounds of meat did he send?

Ans.....

6. We bought 12 yards of red baby ribbon to tie up our Christmas presents. How much did it cost us at $5\frac{1}{2}$ cents a yard?

Ans.....

7. The weather bureau in Sheffield, Alabama showed the following rainfall last week: Monday, .26 inches; Tuesday, .39 inches; Wednesday, .47 inches; Thursday, .36 inches; Friday, .45 inches; How much rainfall was there in Sheffield during the five days mentioned?

Ans.....

8. The distance by automobile from Uncle Joe's to Grandma's is 18.68 miles. On the same road from Uncle Joe's to our house it is 25 miles. How far is it from Grandma's to our house?

Ans.....

9. In the Glee Club treasury there are \$34.14. What amount belongs to each of the six members of the club?

Ans.....

10. At the beginning of the year our teacher ordered a gross of notebooks for our class. How many notebooks did she order?

Ans.....

11. The Smiths spent last leap-year in Paris. How many days did they spend there?

Ans.....

12. An agent for a new breakfast food had a hundredweight of the breakfast food put up in ounce-boxes which he distributed to school children throughout the city. How many packages did he distribute?

Ans.....

13. The butcher had on his counter a piece of meat weighing 17 lb. He cut off a roast weighing 11 lb. 13 oz. How large was the piece that remained?

Ans.....

14. It took 8 ft. 2 in. of ribbon to make 7 class badges. How much ribbon did each badge require?

Ans.....

How 15. The distance between Altoona and Columbus is $338\frac{1}{2}$ miles. We started to motor from Altoona towards Columbus yesterday morning and still had 200 miles to go at noon. Before night we made another $183\frac{1}{4}$ miles. How many miles did we cover during the entire day?

Ans.....

16. Dick picked a crate of cherries every day last week except Sunday. For his week's work he received \$3.30. He also sold eggs and daily made 3.25 times as much as he received for picking a crate of cherries. What was his daily income from eggs?

Ans.....

17. Last year we spent \$216 for repairs to our auto. This was \$12 more per month than our bill for tires. What were our total monthly expenses for repairs and tires last year?

Ans.....

18. Four ice-cream truck drivers received equal shares of a supply of $9\frac{1}{3}$ bushels of coarse salt weighing 56 lb. to the bushel. One of the drivers spilt $23\frac{1}{2}$ lb. on the road. How much salt had he left?

Ans.....

19. Mr. Smith had \$4383.52 invested in stock. He kept \$2380.28 thus invested and sold the rest of his shares at cost. He divided the amount received equally among his four sons. The eldest son gave .4 of his to charity. How much was given to charity?

Ans.....

20. What is the amount due on \$500 at the end of 4 years if interest is compounded annually at the rate of 3%?

Ans.....

21. Find the net amount of the bill which our carpenter had to pay when he bought \$325 worth of supplies from a wholesale dealer and received a trade discount of 10% and a cash discount of 5%.

Ans.....

22. One of the circus tents has a ground diameter of 150 feet. How much ground does the tent cover?

Ans.....

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Reasoning Test—Form 2

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Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
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DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. John has 25 marbles and James has 23. How many marbles have they together?

Ans.....

2. My brother wants to buy a second-hand automobile which costs \$375. He has \$231. How much must he save before he can buy it?

Ans.....

3. In one week a traveling salesman received orders for 500 radios at \$178 each. What was the total value of his sale for the week?

Ans.....

4. During 312 working days last year the Jenkins Can Company turned out a total of 23,589,696 cans. What was the average daily output?

Ans.....

5. Helen bought $\frac{4}{9}$ of a yard of lace for her doll cap. The lace was $\frac{2}{9}$ of a yard too long. How much did she need for the cap?

Ans.....

6. Last year Daniel's health chart showed a monthly increase of $\frac{5}{8}$ of a pound. This year his monthly gain is $2\frac{1}{5}$ times as good as it was last year. How much does he now gain every month?

Ans.....

Turn over the page and work the other problems

7. The fifth grade pupils are selling health stamps for the Red Cross fund. Bill sold \$3.72 worth; Lawrence, \$4.34 worth; Tom, \$2.28 worth; and Dick, \$3.75 worth. How much money did these four boys turn in for the fund?

Ans.....

8. Harry's grandfather asked him which he would prefer: \$12.50 or \$12.005. How much would Harry lose by choosing the smaller amount?

Ans.....

9. In the city we ride .6 of a mile a minute. At that rate how long will it take us to travel 34.14 miles?

Ans.....

10. In the supply shop Mr. Waters had a great gross of pencils at the opening of the school year. How many pencils did he have altogether?

Ans.....

11. Our post-office was built a century ago. How old is it?

Ans.....

12. How many pound packages of cornstarch could be filled from a ton of cornstarch?

Ans.....

13. Jack picked 2 pecks and 2 quarts of tomatoes this morning. The cook used 1 peck and 7 quarts to make catsup. How many quarts of tomatoes were left?

Ans.....

14. Nine packages of Tom Thumb crackers weigh 7 lb. 14 oz. What is the weight of each package?

Ans.....

15. A ke an mu so.

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How 15. A farmer raised $79\frac{1}{2}$ bushels of potatoes. He kept $22\frac{3}{4}$ bushels for his own use and for seed, and sold the remainder at $\$1\frac{1}{2}$ a bushel. How much did he receive for the potatoes which he sold?

Ans.....

16. One week a traveling salesman received \$57 commission besides his salary of \$45. His expenses for the week were \$83. At that rate how much could he save in a year?

Ans.....

17. A company estimated that at the rate of \$2 per hour, it would cost \$800 to have a piece of work done by 25 men. The work was finished in 15 hours. How much less was paid to each man than was estimated?

Ans.....

18. A baker bought $18\frac{1}{4}$ bbl. of flour, each containing 196 lb. He had on hand $420\frac{1}{3}$ lb. He wanted to store the flour equally in 6 bins. How much could he put in each bin?

Ans.....

19. Mrs. Jones handed the clerk a fifty-dollar bill in payment for 2 dresses at \$13.75 each. She put the change in her purse along with the \$35.75 which she had just collected as rent. How much money had she then in her purse?

Ans.....

20. Mrs. Smith deposited \$300 in a savings bank that paid 4% interest compounded semi-annually. What amount did she have to her credit at the end of 3 years?

Ans.....

21. A retail dealer bought a watch listed at \$85 at a discount of 20% and 2% for cash. He sold the watch for \$85. What was his rate of gain?

Ans.....

22. My trunk is 28 inches by 21 inches. By putting my parasol in diagonally it just fits. How long is my parasol?

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Reasoning Test—Form 3

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SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
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1. Ruth has 4 white kittens, 2 black kittens, and 3 gray kittens. How many kittens has she?

Ans.....

2. In a dry goods store there were 513 bolts of sheeting of which 365 bolts were sold. How many bolts remained unsold?

Ans.....

3. An engineer whose freight train travels on an average 395 miles per day, works 305 days in the year. How many miles does the engineer travel on his train in a year?

Ans.....

4. The expense for caring for our parks last year amounted to \$98,550. What was the average daily expense for the parks last year?

Ans.....

5. The cook had $\frac{5}{6}$ of a pie left from dinner. She gave Billy a piece that was just $\frac{1}{6}$ of the whole pie. How much of the pie was then left?

Ans.....

6. At a linen sale Mother bought a yard remnant for the amount she would generally have to pay for $\frac{3}{4}$ of a yard. Instead of \$2 $\frac{2}{3}$ which is the regular price of a yard of linen what did she have to pay for the yard remnant?

Ans.....

Turn over the page and work the other problems

7. Mr. Bauer tested the milk of his four dairy cows for butter fat. The cows showed the following amounts of butter fat to every 100 lb. of milk: Diana, 3.72 lb.; Beauty, 4.34 lb.; Flossy, 2.28 lb.; and Princess, 3.75 lb. Find the total amount of butter fat in 100 lb. of milk from each of these cows.

Ans.....

8. Dick makes a running broad jump of 12.5 feet. Joe's record is 12.005 feet. How much better than Joe's record is Dick's?

Ans.....

9. The school garden is .96 acre in extent. We want to mark off as many sections of .12 acre as possible. How many can we mark off?

Ans.....

10. Cement work is generally charged for by the cubic yard. How many cubic feet does that mean?

Ans.....

11. Daniel's flower garden is 2 rods long. How many sections a yard long can he mark off in it?

Ans.....

12. We spend 2 hours after school every day playing games. During how many seconds do we play?

Ans.....

13. From a coal-car containing 9 T. 1050 lb. of coal 1200 lb. were lost. How much coal was left in the car?

Ans.....

14. The Victor Restaurant used 9 bu. 6 pk. of potatoes last week. What was the average amount used per day?

Ans.....

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16. La
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in it?
15. After using a quart out of the gallon of ice cream which she had made, Mrs. Smith gave the rest to John to share equally with 7 playmates. What part of a gallon did each boy receive?

Ans.....

- play-
do we
16. Last year the Boys' Home received \$5000 from the Community Chest and \$10,000 in gifts and legacies. All but \$3000 of this amount was needed for yearly expenses. What was the average cost of running the home for a month?

Ans.....

17. A carpenter had 120 in. of lumber for a piece of work. He found he did not have enough and bought 5 ft. more to complete the work. On inspection he found that he did not need 3 ft. of the wood. How many feet of lumber did he use for the work?

Ans.....

18. At the settling of the last will of a lady it was found that she had $\$15848\frac{1}{2}$, of which $\frac{1}{5}$ was in bank. She left the amount in bank to be divided equally among three charitable institutions. One received in addition real estate valued at $\$5082\frac{2}{5}$. How much did this institution receive altogether?

Ans.....

19. Mr. Albin is a conductor on a motor bus. In one trip he collected \$4.04 in fares, 26 of which were 9c fares. The rest were children's fares at 5c each. How many children rode in the bus on that trip?

Ans.....

20. My father pays \$127.50 a year to insure his house for \$8,500. What is the rate of insurance?

Ans.....

21. What was the selling price of an office desk listed at \$125 and sold at discounts of 10%, 5%, and 2%?

Ans.....

22. Billy's toy blocks are 5 inches on a side. How many square inches of paint are there on the entire surface of the block? How many cubic inches of wood does each block contain?

Ans.....sq. in. of paint

Ans.....cu. in. of wood

Name

Date

No. of Pro

Attempted

Correct

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Reasoning Test—Form 4

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Jack worked 9 problems on Wednesday and 7 problems on Thursday. How many problems did he work those two days?

Ans.....

2. There were 436 girls and 302 boys in the parade. How many more girls than boys were there?

Ans.....

3. At 2 cents each, how many pencils can you buy for a dime?

Ans.....

4. The dressmaker used $\frac{2}{9}$ of a yard of trimming for the cuffs and $\frac{2}{9}$ of a yard for the collar on Elsie's new dress. How much trimming did she use?

Ans.....

5. One night in January the ice on our pond increased in thickness from $\frac{1}{4}$ of an inch to $\frac{5}{8}$ of an inch. How much did it increase that night?

Ans.....

6. Our electrician charges \$2 $\frac{1}{2}$ per hr. How much does he receive for 4 $\frac{1}{3}$ hours of work?

Ans.....

Turn over the page and work the other problems

7. Jane went on an excursion to Mt. Vernon. She paid \$3.24 for her ticket, \$.75 for lunch, \$.06 for post-cards, \$1 for souvenirs, and \$.29 for a box of marshmallows. How much did she spend?

Ans.....

8. At one time during the World War the French centime was worth only \$.0004. The same day the Belgian centime was worth only \$.00019. Of how much more value was the one than the other?

Ans.....

9. Mabel bought a silk remnant containing 2.75 yd. for \$3.30. How much did the silk cost per yard?

Ans.....

10. John saw a cord of wood piled up near the barn on his uncle's farm. He measured it to find out how many cubic feet it contained. What answer should he have had?

Ans.....

11. Peter walks a mile to school every day. How many rods is that?

Ans.....

12. It took the Smiths exactly five weeks last summer to make their tour of Italy. How many hours did they spend in that country?

Ans.....

13. The girls bought 5 gal. 2 qt. of ice-cream to sell at the picnic. On account of the rain only 3 gal. 1 qt. 1 pt. were sold. How much ice-cream remained unsold?

Ans.....

14. A gardener used to buy a certain imported shrub which matured in 5 yr. 4 mo. Afterwards he found a native shrub which matured in $\frac{1}{8}$ that time. How long did it take the native shrub to mature?

Ans.....

How

15. Dick earned $\$1\frac{1}{4}$ a day during 10 days of the berry season. Putting this with the $\$12\frac{1}{2}$ which he had already saved, he was able to buy a bicycle. How much did the bicycle cost?

sum
many

17. A teacher filled a bag of candy for each of her 31 pupils. She put in each bag an equal share of 155 chocolates and 5 times as many pieces of hard candy. How many pieces of candy were there altogether in each bag?

Ans.....

18. A man had a farm of $153\frac{1}{2}$ acres, which he divided into two smaller farms of equal size. From one of these he sold $26\frac{1}{3}$ acres, and later sold the remainder of this farm at $\$28\frac{1}{2}$ per acre. How much did he receive from the second sale?

Ans.....

16. The Gleaner Club rented a hall to give a play. There were 325 seats on the lower floor, and 245 in the balcony. All admissions were 50c. They paid \$100 for the rent of the hall. What was the profit for the night's performance?

Ans.....

Ans.....

19. Frank worked as a bundle-wrapper during 9 weeks of vacation at \$4.75 per week. He spent \$21.50 for new clothes and \$9.75 for books when school began. How much of his earnings did he have left?

Ans.....

20. A school library valued at \$15,000 is insured for \$10,000, at the rate of \$1.05 per \$100. What is the premium on the policy?

Ans.....

21. An agent purchased an automobile listed at \$3,250 at a discount of 15%, and 2% for cash. He sold it to a customer for \$3,500 with a discount of 10% and 2% for cash. How much did the agent gain?

Ans.....

22. The living room in our new bungalow is 18 ft. long, 15 ft. wide and 12 ft. high. After deducting 24 sq. ft. for openings, how much burlap would be needed to cover the walls one-third of the way up?

Ans.....

Name.....

Date.....

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Reasoning Test—Form 5

R5

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Harry caught 19 fish and Joe caught 7. How many did they both catch?

Ans.....

2. Of the 309 pupils in a school 275 were born in the United States. How many were born in a foreign country?

Ans.....

3. Daddy brought home 36 marbles to be divided equally among Joe, Dick and Harry. How many marbles did each boy get?

Ans.....

4. John lives $\frac{4}{5}$ of a mile from school. Dan lives $\frac{3}{5}$ of a mile farther than John. How far from the school does Dan live?

Ans.....

5. Hazel had $\frac{1}{10}$ of an hour free time this morning in school. She spent $\frac{1}{5}$ of an hour in the gymnasium. What part of an hour had she left?

Ans.....

6. A real estate agent had 6 large suburban lots which he sold at $\$965\frac{2}{5}$ each. How much did he receive for the lots?

Ans.....

Turn over the page and work the other problems

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ir lap
third

7. At Christmas time Jane sent parcel-post packages to some of her friends. She weighed them to find out how much she would have to pay. They weighed 3.24 lb., 75 lb., .06 lb., 1 lb., and .29 lb. What was the total weight of all the packages?

Ans.....

8. With a high power microscope Louise was able to see bacteria that were only .0004 inch in length. Her teacher showed her some that were only .00019 inch in length. How much smaller than Louise's were those that the teacher showed her?

Ans.....

9. In an air race the winner made a record of 19.8 miles in .22 of an hour. At the same rate how far could the winner have gone in an hour?

Ans.....

10. Ted raised a bushel of potatoes last year in his garden patch. He took a peck of them to Grandmother. How many pecks did he have left?

Ans.....

11. The rug in our living room contains 4 square yards. How many square feet does it contain?

Ans.....

12. Our school is half a century old. How many months has it been built?

Ans.....

13. A huckster started out in the morning with 3 bu. 2 pk. 2 qt. of string beans. By noon he had sold 1 bu. 3 pk. 6 qt. of them. How much had he still to sell?

Ans.....

14. Ethel finished 6 problems in 8 min. 10 sec. How much time did that allow for each problem?

Ans.....

- square
ntain?
15. Mrs. Jones bought 24 cans of tomatoes at $8\frac{2}{3}$ ¢ a can. How much change should she receive if she gave the storekeeper a $\$2\frac{1}{2}$ gold piece?

Ans.....

- man?
16. A man left \$9875 in real estate and \$7629 in personal property to be divided equally among his four children. The oldest son gave \$500 of his share in charity. How much had he left?

Ans.....

17. A tourist drove an automobile at the rate of 30 miles an hour from New York to Boston, a distance of 270 miles. How long did it take him to make the round trip if he stopped 2 hours at a hotel both going and coming?

Ans.....

18. A man divided his farm of $46\frac{2}{3}$ A. into five equal fields. He wanted a smaller field than any of these so from one of the 5 he fenced off $4\frac{1}{2}$ A. The remaining portion of that field was later enlarged by $2\frac{1}{2}$ A. How many acres did the latter field then contain?

Ans.....

Turn over the page and finish the problems

19. When you buy a bushel (60 lb.) of potatoes in small quantities, you have to pay \$.05 a lb. for them. When you buy a bushel at a time, you pay only \$.0375 a lb. How many more pounds would you get for the money which you pay for a bushel bought in small quantities if you were to spend that same amount for potatoes at one time?

Ans.....

20. My father insured our house valued at \$12,500 for $\frac{1}{4}$ of its value at the rate of 2%. What was the premium on it?

Ans.....

21. An agent charged Dr. Brown 15% for collecting \$900 worth of bills due him. How much did the agent receive?

Ans.....

22. Joe has a cigar box which is 9 in. long, 7 in. wide and $2\frac{1}{2}$ in. deep. He wants to make a screen caterpillar cage of the same size as the cigar box. How many square inches of screening will he need?

Ans.....

Name _____

Date _____

No. of Prc _____

Attempte _____

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Reasoning Test—Form 6

R6

Boy

or

Girl

Name _____ Grade _____ School _____ City _____
 Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Mary, Sue, Ellen, and Betty had a doll party. Mary brought her 5 dolls, Betty brought 2, Sue brought 4 and Ellen brought 7. How many dolls came to the party?

Ans.....

2. At an auction my father bid \$4288 on a house. The highest bidder paid \$5009 for it. How much more was offered by the buyer than by my father?

Ans.....

3. In a week there are seven days. How many weeks are there in 56 days?

Ans.....

4. Tom and Joe helped their father to shovel away the snow from the path before they went to school. Tom did $\frac{3}{10}$ of the path and Joe did $\frac{3}{10}$ of it. How much of the entire path did the boys do?

Ans.....

5. John lives $\frac{3}{5}$ of a mile from school. James lives $\frac{1}{4}$ of a mile from school. How much farther does John live than James?

Ans.....

6. My grandfather once bought some railroad stock for \$258. Some years later he sold it for $4\frac{2}{3}$ times the amount he paid for it. What was the selling price of the stock?

Ans.....

Turn over the page and work the other problems

7. Harry's big brother had to pay personal taxes last year, as follows: \$5.234, \$6.003, \$8.29 and \$5. How much personal tax did he have to pay?

Ans.....

8. The annual rainfall in our state is about 32.41 inches. This year on account of heavy storms it was twice as heavy. How many inches of rainfall did we have?

Ans.....

9. A quart of milk weighs 2.15 pounds. How many quarts of milk does the milkman have if he has 430 pounds of milk?

Ans.....

10. The boys in our class gathered a bushel of walnuts last fall on a nutting party. They shared them equally with all the members of the class, giving a quart to each. How many pupils are there in the class?

Ans.....

11. The grass plot near the school entrance is 1 square rod in extent. Into how many sections each containing a square yard could it be divided?

Ans.....

12. In a furniture store there were three remnants of Brussels carpet measuring 3 ft. 2 in., 5 ft. 7 in., and 1 ft. 5 in. What was the total length of the three remnants?

Ans.....

13. Mr. Becker delivers 5 qt. 1 pt. of cream daily to a certain restaurant. How many quarts does he deliver in a week?

Ans.....

14. We wanted to make a trip of 968 miles in 4 days. The first day we travelled 264 miles and the next day only 171 miles. At the end of the second day how far did we still have to go?

Ans.....

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15. Bob earns $\$3\frac{3}{4}$ a week weeding the flower garden. He saves $\frac{2}{5}$ of this. How long will it take him to save enough to buy a radio worth $\$41\frac{1}{2}$?

Ans.....

nants
5 ft.
ength

16. A touring party went 240 miles the first day, 180 miles the second day, and four times as much during the rest of the week as they had gone the first two days. What was their daily record for the last five days of the trip?

Ans.....

daily
does

17. John sells newspapers after school. He invested $\$6\frac{1}{4}$ in Posts and $\$7\frac{1}{2}$ in Stars last week. He sold this entire stock for $\$16\frac{1}{2}$. How much would he be able to save in a month if this was his average weekly gain?

Ans.....

18. A freight company sent a bill of $\$21\frac{3}{4}$ for storage and shipment to a dealer who shipped $2563\frac{1}{2}$ lb. of freight at $\$.53\frac{1}{2}$ per 100 lb. How much was charged for storage?

Ans.....

19. Five girls agreed to share the expenses of a party. They bought ice cream for \$5.25 and 8 cakes at \$.75 each. How much should each girl pay?

Ans.....

20. I pay \$91.50 to have my house insured for $\frac{5}{6}$ of its value at 2%. What is the value of the house?

Ans.....

21. Mr. Crane received \$75 for selling a piano. His rate of commission was 5%. What was the selling price of the piano?

Ans.....

22. About how many square inches of paper are needed for the label on a tomato can which is 6 inches high and 5 inches in diameter?

Ans.....

Name

Date

No. of Pr

Attempted

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Reasoning Test—Form 7

R7

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							
Percentage																							

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1. Mary and her mother went to the city. They rode 65 miles on the train, and 57 miles in an automobile. What is the distance to the city?

Ans.....

2. Mr. Taylor paid \$8000 for a house. He sold it for \$7365. How much did he lose by the sale?

Ans.....

3. Jack stayed at his aunt's home 59 days last summer. How many full weeks was that, and how many days more?

Ans.....

4. My sister bought $\frac{5}{8}$ of a yard of blue ribbon and $\frac{5}{8}$ of a yard of orange ribbon. How much ribbon did she buy?

Ans.....

5. Roland cut $\frac{1}{6}$ of a yard from a piece of wire that was $\frac{4}{9}$ of a yard in length. How long was the piece that remained?

Ans.....

6. Our grocer had only $28\frac{1}{2}$ lb. of sugar left one day after a special sale. He had had $56\frac{1}{3}$ times as much as that at the opening of the sale in the morning. How much sugar did he have at the opening of the sale?

Ans.....

Turn over the page and work the other problems

7. The boys decided to build a shack in Pierre's back yard with some lumber that they found near the garage. They measured the pieces with a meter stick and found that they were of the following lengths: 5.234 meters, 6.003 meters, 8.29 meters and 5 meters. How many meters were there in the four pieces they measured?

Ans.....

8. Four barrels of sugar each containing 236.8 pounds were shipped to us yesterday. How many pounds of sugar did we receive?

Ans.....

9. In an ammunition factory a workman made 2 shells. One was 1.215 inches in circumference. The other was 3.0375 inches in circumference. How many times was the one larger than the other?

Ans.....

10. Mother ordered a gallon of ice cream for dinner. She wanted half vanilla and half chocolate. How many quarts of chocolate ice cream did she want?

Ans.....

11. The park on Vine Street is exactly one acre in extent. How many square rods does it contain?

Ans.....

12. How much paint does a painter use in four days if he uses 2 gal. 3 qt.; 3 gal. 1 qt.; 3 qt. and 2 gal. 2 qt. respectively?

Ans.....

13. How many yards of fencing would Mr. Brown have to buy to fence in a square plot of ground 8 yd. 1 ft. on a side?

Ans.....

14. Mary bought 6 yd. of plaid gingham and 8 yd. of plain gingham. She paid 75c a yd. for the gingham. How much did it cost her?

Ans.....

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15. Five girls in the Home Economics class made $8\frac{3}{4}$ lb. of fudge which they shared equally. Each one also received $1\frac{1}{2}$ lb. of the taffy which they had made. How many pounds of candy did each girl then have?

Ans.....

16. A man obtained 1265 bu. of corn from one field and 895 bu. from another. He sold $\frac{1}{2}$ of the entire yield at \$2 a bu. How much did he receive for the corn he sold?

Ans.....

17. A sewing class cut the following lengths from a 25-yd. bolt of ribbon: $3\frac{1}{4}$ yd., $6\frac{1}{2}$ yd., $1\frac{3}{4}$ yd. How many pieces $2\frac{1}{4}$ yd. in length could be cut from what remained?

Ans.....

18. Mother gave Jane and Sue each $3\frac{1}{2}$ yd. of blue ribbon and equal shares of a bolt of $8\frac{2}{3}$ yd. of pink ribbon. Sue used $5\frac{3}{4}$ yd. of hers. How much did she have left?

Ans.....

Turn over the page and finish the problem

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3 qt.

3 rows
round

8 yd.
or the

19. A baker made 94.5 dozen rolls, allowing 1.25 lb. of flour to each dozen. He also used 1.5 barrels of flour for bread. How many barrels of flour did he use for rolls and bread? (1 bbl. = 196 lb.)

Ans.....

20. A collection of paintings valued at \$25,000 was insured for 75% of its value at the rate of \$2 per \$100. What was the premium paid for insuring the paintings?

Ans.....

21. The Provident Realty Company sold Mr. Carter's house for \$10,500 at a commission of $3\frac{1}{2}\%$. How much did Mr. Carter receive for the house?

Ans.....

22. How many cubic yards of dirt would have to be removed in order to dig a well 40 feet deep and 9 feet in diameter?

Ans.....

Name.....

Date.....

No. of I.....

Attempt.....

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Reasoning Test—Form 8

R8

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. In our school there are 35 children in the kindergarten, 27 in the first grade, 29 in the second, and 38 in the third grade. How many children are there altogether in these grades?

Ans.....

2. How much do 5 two-cent stamps cost?

Ans.....

3. A newspaper printer used 36963 sheets of paper in 3 days. How much did he use on an average every day?

Ans.....

4. $\frac{1}{5}$ of the boys and $\frac{1}{10}$ of the girls in our class have not been absent from school this year. What part of the class has not been absent?

Ans.....

5. Joe's noon recess lasts $\frac{5}{6}$ of an hour. He takes about $\frac{3}{10}$ of an hour to get home and back to school. How much time does he have for lunch?

Ans.....

6. Mrs. Lane gave $\frac{1}{2}$ bushel of apples to the 5 boys who were weeding the garden. What part of a bushel did each boy get?

Ans.....

Turn over the page and work the other problems

7. At a special sale, Mrs. Scott bought a pound of Golden Blend coffee for \$.315, a can of California peaches at \$.275, a pound of Picot tea at \$.485, and a dozen oranges at \$.365. What was the amount of her bill?

Ans.....

8. Grandmother lives $\frac{3}{4}$ of a mile from our house. Uncle Ned lives 10 times as far away as that. How far away from our house does he live?

Ans.....

9. A jeweler has a diamond of 36.75 carats. How many diamond chips of .875 carats can he cut from the large diamond?

Ans.....

10. You buy 7c worth of candy and give the man a dime. How much change should you receive?

Ans.....

11. The business district in our city occupies a square mile. How many acres does it cover?

Ans.....

12. The butcher had 4 pieces of beef on the counter: the first, a steak, weighed 2 lb. 7 oz.; the other three were roasts weighing respectively: 5 lb. 3 oz., 4 lb. 1 oz., 9 lb. 12 oz. How much beef was on the counter?

Ans.....

13. In a test consisting of 7 sections we were allowed 2 min. 20 sec. for each section. How much time was allowed for the entire test?

Ans.....

14. A street car conductor collected 740 fares on Saturday, 850 on Sunday and on Monday $\frac{1}{2}$ of the amount he had collected on the two preceding days. How many fares did he collect on Monday?

Ans.....

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15. A dairy farmer delivered $2836\frac{1}{4}$ lb. of milk to a creamery in 1 week (7 days). The average number of pounds delivered per day the preceding week was $412\frac{3}{8}$. By how much did the amount delivered daily the first week exceed that delivered on an average each day the second week?

Ans.....

16. Of the 116 passengers on the train from Washington, 78 got off at Baltimore while 96 passengers boarded the train there. At Philadelphia the train took on 4 times as many passengers as were already on because of the crowds returning to New York from the Exhibit. How many boarded the train at Philadelphia?

Ans.....

17. A lady bought $\frac{3}{4}$ yd. of black velvet ribbon and $\frac{1}{3}$ yd. of blue velvet ribbon at $\$ \frac{2}{5}$ per yd. for each. She gave the clerk $\$ \frac{3}{4}$. How much change should she have received?

Ans.....

18. Mr. Jones raised 300 bu. of potatoes which he sorted into 4 equal lots. He sold one of these lots at $\$1\frac{3}{4}$ per bu., and the rest at a total of $\$368\frac{3}{4}$. What was the selling price of the whole yield?

Ans.....

19. Mr. Burns paid \$3.36 for gasoline at \$.21 per gal. At the end of his trip the motor registered 9.5 gal. What was the cost of the gasoline he had used during the trip?

Ans.....

20. A grain warehouse was insured for \$20,000 in one insurance company, and for \$25,000 in another. It was damaged to the extent of \$20,000. How much more insurance should the second company pay than the first?

Ans.....

21. A commission merchant sold \$3,500 worth of fruit. The cost of the freight and cartage amounted to \$115 and the agent received 4% commission. What were the net proceeds?

Ans.....

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Reasoning Test—Form 9

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Farmer Brown has 18 horses, 7 sheep, 30 pigs, and 49 cows. How many animals does he own?

Ans.....

2. At 9 cents a quart how much will 7 quarts of milk cost?

Ans.....

3. An airplane flies 252 miles in 6 hours. How far does it fly in an hour?

Ans.....

4. The grocer sent Mrs. Smith $\frac{3}{4}$ of a bushel of red tomatoes and $\frac{3}{8}$ of a bushel of green tomatoes. How many bushels of tomatoes did he send her?

Ans.....

5. Dick wanted to gain 15 $\frac{3}{8}$ pounds in weight so as to get on the foot ball team. He joined the nutrition class and gained 12 pounds in a month. How much did he still have to gain?

Ans.....

6. It takes $\frac{4}{9}$ of a yard of ribbon to make a hair-band. How many bands will Mary be able to make out of 20 yards of ribbon?

Ans.....

7. The boys in the General Science class had to measure objects in the laboratory that were less than a meter in length. The most accurate work was done by four of the boys who reported as follows for the objects which they measured: .315 meter, .275 meter, .485 meter and .365 meter. What was the total length in meters of the all objects measured by these four boys?

Ans.....

8. We needed 100 badges for our division of the parade. Each badge required .3 yd. of ribbon. How much ribbon did we have to buy?

Ans.....

9. Jack has a strip of cardboard 36 inches long and just wide enough to make a ruler. How many foot-rulers can he make from the strip?

Ans.....

10. Robert had a dollar in dimes. He spent a dime for a top. How many dimes did he have left?

Ans.....

11. The flag in our class-room is one yard long. How many inches are there in its length?

Ans.....

12. Our grocer sells 4 different grades of potatoes. Saturday night he had left: 7 pk. 2 qt. of the highest grade potatoes; 5 pk. of the next grade; 3 pk. 4 qt. of the next grade and 5 pk. 7 qt. of the lowest grade. How many pecks of potatoes had he left?

Ans.....

13. My brother used 8 gal. 1 qt. of paint in painting our garage. Eight of our neighbors want him to paint their garages also. How much paint will he need if all of the garages are almost the same size as ours?

Ans.....

14. Our class contributed all but \$7.50 of our \$35 quota to the Community Chest fund. Then we gave a play and secured \$29.75 which we also contributed. How much did we give altogether?

Ans.....

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long 15. A farmer raised 363 bushels of potatoes on $2\frac{3}{4}$ acres of land. How many bushels should he get from $5\frac{3}{4}$ acres that yield the same per acre?

Ans.....

16. Mr. Todd bought a house for \$9275 and sold it for \$10500. He also sold a lot at a gain of \$375. He invested his entire gain in stock at \$50 a share. How many shares did he buy?

Ans.....

17. A retail merchant made \$50 $\frac{1}{2}$ profit the first week, \$75 $\frac{3}{10}$ the second, \$30 $\frac{3}{4}$ the third, and \$80 $\frac{7}{10}$ the fourth. He saved $\frac{1}{5}$ of his profit for the month. How much did he spend?

Ans.....

18. The 5 yd. of material for Mary's dress cost \$8 $\frac{3}{4}$. The trimming cost \$ $\frac{3}{4}$ more than a yard of material. The ribbon cost $\frac{2}{5}$ of the price of the trimming. What was the cost of the ribbon?

Ans.....

19. Mr. Brown divided his Christmas Savings check of \$50 among Jack, Betty, Ann and Billy. Jack spent \$10 and added the remainder to the savings account of \$17.50 which he had in the bank. How much had he then in the bank?

Ans.....

20. Mr. Arnold insured his stock of goods for 5 years for \$5,750. The annual rate was \$.55 per \$100. The rate for 5 years was 3 times the annual rate. How much did he save by taking out a five-year policy than by taking 5 annual policies?

Ans.....

21. Louise is making a square pillow top which is 18 inches long. How many square inches of linen are there in the pillow top?

Ans.....

Pupils may not write in this space.

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Reasoning Test—Form 10

R10

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Jack went to the circus and saw 5 lions, 9 monkeys, 8 camels, 6 elephants, 4 bears and 7 ponies. How many animals did he see there?

Ans.....

2. Daddy is 43 years old. Grandpa says that he is twice as old as that. How old is Grandpa?

Ans.....

3. A man left 398 acres of farm land to be divided equally among his four sons. How much did each son receive?

Ans.....

4. A man has an acre of ground. He planted $\frac{2}{3}$ of it in Irish potatoes and $\frac{1}{12}$ of it in sweet potatoes. What part of his field did he plant in potatoes?

Ans.....

5. The Boy Scouts in our class collected $\$8\frac{2}{5}$ toward the Red Cross fund. They spent $\$ \frac{2}{10}$ out of the collection for certain expenses. How much did they then have to contribute to the fund?

Ans.....

6. John sold his pair of rabbits for $\$ \frac{3}{4}$ which was exactly $\frac{5}{6}$ of what he paid for them. What part of a dollar did the rabbits cost him?

Ans.....

Turn over the page and work the other problems

7. Mr. Davis bought a second-hand truck for \$826.50. He also spent \$82.65 for tires, \$.8265 for spark plugs, and \$8.265 for a battery. What did he pay for all?

Ans.....

8. How much ribbon must our school buy in order to make 1000 armbands, when each band requires about .3 yd. of material?

Ans.....

9. Mother has four pint-bottles full of milk. How many quarts of milk has she?

Ans.....

10. I had a quarter to spend for my lunch. I spent only 19 cents. How much did I have left?

Ans.....

11. The walk in front of our house is 3 rods in length. How many feet long is the walk?

Ans.....

12. Four children at school have jumping ropes. One rope is 5 yd. 1 ft. long; another is 2 yd. long; the third is 3 yd. 2 ft. long; and the fourth is 4 yd. 1 ft. long. We tied all the ropes together to play Double Dutch. How long was the rope we made?

Ans.....

13. A grocer bought 9 cans of American Beauty Lard. The net weight of each can was 5 lb. 12 oz. How many lb. of lard did he buy?

Ans.....

14. A commission merchant bought wheat for \$1.47 per bushel and sold it for \$1.62 per bushel. How much did he make on a shipment of 40,000 bushels?

Ans.....

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ds in 15. There were 62.5 inches of water in a cistern. After a heavy rainfall the height of the water was increased 1.97 inches. Then 3.62 inches were drawn out. How many inches of water remained in the cistern?

Ans.....

ropes 2 yd. fourth es to as the 16. Mrs. Dean wanted Clifford's lunch to contain 800 calories. She found that it lacked 110 calories. Then she put in 3 pieces of chocolate which she estimated at 42 calories each. How many calories did the lunch contain then?

Ans.....

eauly 5 lb. ? 17. A boy earns $\$1\frac{1}{4}$ for delivering ice and $\$2\frac{3}{5}$ from his paper route per week. If he saves $\frac{3}{5}$ of his weekly earnings, how many weeks will it take him to save enough to buy a scooter valued at \$7.65?

Ans.....

18. A candy dealer had 32.75 pounds of hard candy in one pail, and 27.75 pounds in another. After selling 5.75 pounds to one customer he sold the rest to Mr. Smith at \$.35 a pound. How much was Mr. Smith's bill?

Ans.....

19. Catherine paid \$5.25 for silk at \$1.50 per yd. Her sister bought the same number of yards of voile at \$.50 per yd. How much more was Catherine's bill than her sister's?

Ans.....

20. Find the yearly premium on a \$3000 life insurance policy if the annual premium on each \$1000 is \$24.

Ans.....

21. My notebook is 7 inches long and 3 inches wide. How many square inches of paper are there in one page?

Ans.....

Pupils may not write in this space.

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Reasoning Test—Form 11

R11

Boy

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Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. There were 236 grown people and 541 children at the play. How many people saw the play?

Ans.....

2. Dick read 431 lines during reading time. Joe read twice as many lines. How many lines did Joe read?

Ans.....

3. A grocer's clerk was told to put up 824 pounds of coffee in packages containing 4 lb. each. How many packages could he make?

Ans.....

4. It took Robert $\frac{2}{3}$ of an hour to walk to church and $\frac{5}{6}$ of an hour to return home. How much time did he spend going and coming?

Ans.....

5. There were $7\frac{3}{4}$ bushels of hickory nuts in the attic. Last night Frank brought down $\frac{7}{8}$ of a bushel to crack. How many bushels were then left in the attic?

Ans.....

6. Our soldiers are given a ration of $4\frac{1}{5}$ oz. of beans every two days while in garrison. What is their daily ration of beans while in garrison?

Ans.....

Turn over the page and work the other problems

7. Jack saw several pieces of marble lying near the new gymnasium. The weight of each piece was marked on the side. Jack wanted to know the entire weight of all the pieces, so he copied the figures which included: 8.265 lb., 82.65 lb., .8265 lb. and 826.50 lb. What answer should he get?

Ans.....

8. A traction company is laying a track 10 miles in length, and .63 of the track is finished. How many miles of track have been laid?

Ans.....

9. Harry wants me to give him nickels for his pennies. How many cents should he give me for each nickel?

Ans.....

10. Tom bought a drum for a half dollar and sold it soon after for 45c. How much did he lose on it?

Ans.....

11. The distance around the race track is one mile. How many yards is it around the track?

Ans.....

12. Our class was being tested. We were allowed 3 hr. 10 min. for one test; 45 min. for another; 1 hr. 20. for another; and 55 min. for the last. How much time was allowed for the four tests?

Ans.....

13. How many square feet of oilcloth must be used in making covers for 23 laboratory tables which require $54\frac{1}{2}$ square inches for each?

Ans.....

14. A large department store had a special sale of percale. They had on hand 2860 yd. of percale and sold 2260 yd. of it. How many bolts of 75 yd. each were left?

Ans.....

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15. My uncle owned property on two main streets of our city. The frontage of one piece was 56.78 ft. That of the other was 37.29 ft. At \$479.75 a front ft. how much were both the pieces of property worth?

Ans.....

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16. In a flower garden there were 117 tulips. The owner left 89 of them stand and cut the rest. He then divided the cut flowers equally among 4 children. One child cut 5 more tulips from her own garden. How many had she then?

Ans.....

17. During Dick's three summers on the farm he made $\$35\frac{9}{10}$ the first year, $\$74\frac{3}{4}$ the second, and $\$150\frac{4}{5}$ the third. He saved $\frac{1}{3}$ of his earnings, and spent $\frac{5}{6}$ the amount of his savings to pay for his extra expenses in high school. What was the amount of his extra expenses?

Ans.....

18. At the Benefit Concert patrons contributed \$1816.50. Ticket returns amounted to \$9863.75. The balance left after \$975.25 was paid for expenses was divided equally among the 3 orphan asylums of the city. What share did each asylum receive?

Ans.....

Turn over the page and finish the problems

19. Mrs. Brown and Betty visited a friend. The railroad fare was \$3.20 for adults and half-fare for children. They paid \$1.15 for having their baggage transferred and \$.15 for street car fare. How much did Mrs. Brown have left out of a \$10 bill?

Ans.....

20. Mr. Hunt took out a 20 year endowment policy for \$2000 on which the annual premium was \$85. How much more will he receive from the company at the end of 20 years than he will have paid in?

Ans.....

21. Our swimming pool is 160 feet long and 120 feet wide. How many square feet of cement are there in the bottom of the pool?

Ans.....

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Reasoning Test—Form 12

R12

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. The milkman delivered 695 quarts of milk yesterday and 487 quarts today. How many quarts did he deliver in the two days?

Ans.....

2. A grocer's boy put up 430 two-pound sacks of sugar. How many pounds of sugar did he put up?

Ans.....

3. A street car conductor collected 938 fares during a nine-hour work day. On an average, how many fares did he collect every hour?

Ans.....

4. At a remnant sale Mrs. Jones bought 2 pieces of blue velvet. One piece was marked $\frac{3}{5}$ of a yard. The other was marked $\frac{1}{3}$ of a yard. How much velvet did Mrs. Jones buy?

Ans.....

5. Joe made a record of $12\frac{1}{2}$ ft. in the running broad jump. Bill reached only $11\frac{1}{4}$ ft. How much farther did Joe jump than Bill?

Ans.....

6. Alice read $4\frac{1}{2}$ pages of her story in 12 minutes. How many minutes did it take her to read a page?

Ans.....

Turn over the page and work the other problem

7. Mr. Green paid \$5.63 for a small radio last year. When he bought a larger one John offered him \$3.28 for the small one. How large a reduction was John asking?

Ans.....

8. It has been proved that .63 of the weight of white potatoes is water. How much water is there in 100 lb. of white potatoes?

Ans.....

9. Our huckster sells choice tomatoes in quart boxes. How many boxes can he fill with a peck of tomatoes?

Ans.....

10. What two pieces of U. S. money are equal in total value to a half dollar?

Ans.....

11. The cement blocks in our school-yard cover exactly 1 square rod. How many square inches of cement are there in each block?

Ans.....

12. In one month a truck driver hauled 3 T. 500 lb. of cement the first week; 2 T. 950 lb. the second; 2 T. 650 lb. the third; and 4 T. the fourth week. How much cement did he haul during the month?

Ans.....

13. In a lumber yard there is a pile of wood containing 108 blocks, each of which contains 6 cu. ft. How many cubic yd. are there in that pile of wood?

Ans.....

14. Jack's father and mother and his Uncle Jack went to Niagara Falls. They paid \$27.50 each for train fare. Their hotel bill and other expenses were \$175 for the party. What were their total expenses for the trip?

Ans.....

15. A man had in one bank \$12557.89 and in another \$7298.51. He wanted to divide it equally among his 5 sons. How much could he give to each?

Ans.....

16. Four boys picked 18 quarts of strawberries. They sold all except 4 qt. at 16c a quart. How much money should each boy receive?

Ans.....

17. Earl earned \$15½ this week helping in the drug store. He gave \$12¾ of it to his mother and saved the rest along with the \$2¾ he received from his paper route, and the \$1¾ for vegetables he sold from his garden. How much would he save in 2 weeks at this rate?

Ans.....

18. In making up his accounts at the end of the day, a storekeeper found that he had taken in \$54 in bills, \$63.25 in checks, and \$13.58 in coins. His charge accounts amounted to twice his currency and his expenses were \$20.50 less than his charge accounts. What were his expenses?

Ans.....

19. A fruit dealer sold 35 doz. lemons for \$15.75 and 40 doz. oranges at the same price per dozen as the lemons. How much money did he receive for all the fruit?

Ans.....

Turn over the page and finish the problems

20. Mr. Smith owns property worth \$14,000, which is assessed at 80% of its value. Find the assessed value of Mr. Smith's property.

Ans.....

21. The new playground is 125 rods long and 130 rods wide. How many acres does it contain?

Ans.....

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Reasoning Test—Form 13

R13

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. In our library there are 524 story books, 213 history reference books, and 162 geography reference books. How many books does that make?

Ans.

2. A dealer sold 4 used automobiles at \$820 each. How much did he receive for the 4 automobiles?

Ans.

3. We are going to drive in an auto to see our grandmother who lives 434 miles from here. How long will it take us to make the trip if we drive 31 miles an hour?

Ans.

4. The front door mat is $\frac{3}{4}$ of a yard long. The back door mat is $\frac{2}{3}$ of a yard long. How long a mat could be made by placing the two together lengthwise?

Ans.

5. Mr. Jones lives 29 miles from his office. He goes $15\frac{1}{4}$ miles by train and the rest of the way in an auto-bus. How far does he go in the bus?

Ans.

6. How many lengths of floss each $\frac{5}{12}$ of a yard long can be cut from a skein of silk $5\frac{5}{6}$ yards long?

Ans.

Turn over the page and work the other problem

7. The April rainfall in this city was 5.63 inches. The rainfall in May amounted to only 3.28 inches. How much greater was the rainfall in April than in May?

Ans.....'

8. A music dealer bought 1000 victrola records at \$.63 each. What did he pay for them all?

Ans.....

9. Our new fudge recipe calls for 12 oz. of brown sugar. How many ounces less than a pound do we need if we want to be exact?

Ans.....

10. Your brother asks you to change a dime. You give him one nickel and some cent pieces. How many cent pieces do you give him?

Ans.....

11. Each Boy Scout in the Eagle Troop took care of a square rod of the vegetable garden near the camp. For how many square feet of land did each scout have to care?

Ans.....

12. Yesterday the fruit dealer sold my mother 5 bu. 2 pk. of apples for cider; 3 bu. 1 pk. for apple butter; 3 pk. for eating and 4 bu. 1 pk. for jelly. How many bushels of apples did my mother buy?

Ans.....

13. While Fred was staying at his uncle's farm he had charge of 240 sq. rd. of land. This was $\frac{1}{16}$ of the entire farm. How many acres did the farm contain?

Ans.....

14. You buy a dozen lollypops at 3 for a dime and give the man a dollar. How much change should you get?

Ans.....

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15. Harry spent on an outfit \$12.25 of the \$15 he had saved when he was made scout leader. He afterwards saved \$7.90. How much money had he then in his bank?

Ans.....

16. Clare's uncle owned 134 shares of stock. He sold 29 shares and then divided the rest equally among the 5 children. At \$115 a share what was the value of each child's stock?

Ans.....

17. At Christmas time Bob used $\$21\frac{3}{4}$ of the $\$25\frac{1}{5}$ he had in bank to buy presents. He received gifts of money amounting to $\$15\frac{1}{2}$. He then invested $\frac{1}{3}$ of his whole fortune in books. How much did he spend for the books?

Ans.....

18. Bob, Dick and Joe made toys for the fish pond. These partners spent \$.36 for cardboards, \$.28 for glue, \$.50 for other materials. When the sale was over each of the boys received \$.75. How much gain did each partner make?

Ans.....

19. Mr. Brown owns 6 houses of equal value, amounting in all to \$21,585. After making improvements amounting to \$110 on one of them he is to sell it at a gain of .08 of its total value. What will be his gain?

Ans.....

20. My father's property, including real estate and personal property, was assessed at \$25,000. At a tax rate of $1\frac{1}{4}\%$ what was the amount of his tax bill this year?

Ans.....

21. Our kitchen is 16 ft. long and 19 ft. wide. We want to cover the floor with linoleum at \$1.25 per sq. yd. How much will the linoleum cost us?

Ans.....

Pupils may not write in this space.

Name

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Reasoning Test—Form 14

R14

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. A dealer bought 647 yards of muslin, 749 yards of percale, and 486 yards of cotton cloth. How many yards of cloth did he buy?

Ans.....

2. There were 42 boys in each of the 7 divisions in the parade. How many boys were in the parade?

Ans.....

3. A piano manufacturer sold 21 pianos for \$8862. What did he receive for each piano?

Ans.....

4. Alice made her doll a dress with $\frac{3}{4}$ of a yard of blue China silk and $\frac{1}{6}$ of a yard of tan silk. How much silk did she use to make the dress?

Ans.....

5. The Hill family took an auto ride on Sunday. They started with $6\frac{2}{3}$ gallons of gasoline. When they reached home they had only $\frac{3}{4}$ of a gallon left. How many gallons did they use that day?

Ans.....

Turn over the page and work the other problem

6. The daily session in the Washington School is $5\frac{1}{3}$ hours. It is divided into periods of $1\frac{1}{3}$ hours each. How many periods are there during the daily session?

Ans.....

7. Tom earned \$18.50 during vacation. His brother Bill earned \$9.75. How much more did Tom earn than his brother?

Ans.....

8. Yesterday our grocer bought 10 bushels of turnips from a farmer at \$.527 per bushel. How much did the lot cost him?

Ans.....

9. My aunt bought us a dozen large bananas. We ate 5 of them. How many have we left?

Ans.....

10. Our vinegar caster holds 1 gill of vinegar. How many times could it be filled from a pint of vinegar?

Ans.....

11. The central playground in our city is an acre in extent. That allows just one square yard for every child in that section of the city. How many children live in the section?

Ans.....

12. On the trip from Boston to Norfolk our train stopped 4 times. The actual time spent in riding was respectively 2 hr. 35 sec.; 3 hr. 15 min. 20 sec.; 1 hr. 45 min. 55 sec.; 4 hr. 45 min. 16 sec.; and 2 hr. 5 min. 48 sec. If our train had not made any stops, how long would it have taken us to make the trip?

Ans.....

How
t of

13. In paving our entire front walk the contractor laid 18 blocks each 2 ft. 7 in. long. How long is the walk?

Ans.....

re in
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How

14. A contractor built a stucco house for \$5250, and a brick house for twice that amount. He put up 3 frame houses for the same amount that he had expended for the one brick house. What was the cost of each of the frame houses?

Ans.....

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15. It is 35.7 miles from Mr. Barden's country home to the city. Mr. Barden drives 3.8 miles to the station every morning in his auto. Then he buys his railroad ticket to the city at the rate of \$.035 per mile. How much does his ticket cost?

Ans.....

16. A man sold on an average, 12 gallons of ice cream a day for the first four days of the week. The latter part of the week he sold 15 gallons less than he did in the early part. How many gallons of ice-cream did he sell during the week?

Ans.....

17. John had $\$25\frac{3}{4}$ in his bank. He bought an erector set for which he paid $\$12\frac{1}{2}$. The following week he sold 7 pairs of pigeons at $\$1\frac{1}{2}$ a pair and added the money he got for them to his bank account. How much had he then in the bank?

Ans.....

18. A company composed of 90 privates, an officer, a chaplain, a cook, and 2 engineers was allotted 2.4 oz. of beans per person daily. How many days would a ration of 1254 ounces of beans have to last the company?

Ans.....

19. Mr. Jones borrowed \$500 from Mr. West for one year at 5%. How much interest did he have to pay for the money?

Ans.....

20. Mr. Green owned real estate assessed at \$12,500 and personal property assessed at \$5,800. How much were his taxes last year if the rate of taxation was $1\frac{3}{4}$ mills?

Ans.....

21. Mother's new dining room table-cloth contains $3\frac{1}{2}$ square yards of linen. The cloth is 14 yards wide. How much fringe would I need? I wanted to put an edge of it around the cloth.

Ans.....

Pupils may not write in this space.

Name _____

Date _____

No. of Pro _____

Attempted _____

Correct _____

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Reasoning Test—Form 15

R15

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

SUMMARY OF PUPILS SCORE																							
No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							
Percentage																							

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. In the largest department stores of our city there are 335 salesmen employed in one store, 248 in another, 294 in another, 127 in another, 156 in the next, and 189 in the last. How many salesmen are employed in the six stores?

Ans.....

2. A shepherd put his sheep in 6 pastures each containing 45 sheep. How many sheep did he have?

Ans.....

3. In our State a bushel of onions weighs 55 lb. How many bushels can a farmer get from 3410 lb. of onions?

Ans.....

4. My father walks $\frac{3}{4}$ of a mile north of our home and $\frac{2}{10}$ of a mile west to reach his office. How far is it from our home to his office?

Ans.....

5. Alice's mother bought $8\frac{3}{8}$ yards of pink lawn. She used $6\frac{3}{4}$ yards to make Alice and Betty a dress. How many yards were left to make the baby sister a dress?

Ans.....

Turn over the page and work the other problems

6. Tony sells $1\frac{2}{3}$ dozen bananas for $\$3\frac{3}{4}$. What part of a dollar does he charge for a dozen?

Ans.....

7. The high water mark of the Green River is 18.5 feet. During a recent dry season the water went down to 9.75 feet. How many feet below the high water mark was the river then?

Ans.....

8. A dealer bought 100 bushels of turnips at \$.527 per bu. What was the total cost of the turnips?

Ans.....

9. A special school assembly yesterday lasted an hour. How many minutes did it last?

Ans.....

10. The second hand on my watch has marked 20 seconds since I began to write. How many seconds more will it take to make a minute?

Ans.....

11. The section of a township is a square mile in extent. How many square rods are there in a section?

Ans.....

12. At a bargain sale Louise bought 5 pieces of lace which matched perfectly. They measured 3 yd. 2 ft. 3 in.; 5 yd. 9 in.; 2 yd. 1 ft. 4 in.; 3 yd. 2 ft. 5 in., and 4 yd. 1 ft. How much lace did she buy in all?

Ans.....

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13. A farmer got on an average 3 bu. 2 pk. of peaches from each of his 15 peach trees. How much did he get from all the peach trees?

Ans.....

14. Mrs. Brown bought 1 lb. of butter for 45c and 6 eggs at 36c a doz. What was the amount of the bill?

Ans.....

15. Lucy had \$6.30 in her purse. She spent \$4.98 for a new gym suit. With the money that was left she bought a dozen skeins of silk. What was the price of the silk per skein?

Ans.....

16. Thirty-six turkeys, the live weight of which was 1224 lb., lost on an average 5 lb. each on being dressed. They were then sold in a lot for \$574.20. What was the selling price per pound?

Ans.....

17. Mr. Ward sold a piece of property for \$18,756 $\frac{3}{4}$. He put \$17,562 $\frac{1}{2}$ in the bank and divided the remainder among three charitable institutions. He later gave each institution \$183 $\frac{1}{2}$ more. How much did each receive?

Ans.....

Turn over the page and finish the problems

18. A dressmaker bought linen remnants of 8.75 yd. and 4.75 yd. respectively. From these she made children's dresses requiring 2.25 yd. of material. How much did she receive for all the dresses at \$5.75 each?

Ans.....

19. My father borrowed \$2000 for a year at $4\frac{1}{2}\%$. How much money did he have to pay back at the end of the year?

Ans.....

20. The assessed value of the property in our town last year was \$6,000,000. It was planned to raise \$150,000 by taxation. What rate of taxation would give the desired amount of money?

Ans.....

21. The garden plot near the school is 28 feet by 19 feet. It is surrounded by a 3-foot walk. What will it cost to cement the walk at \$.75 a square foot?

Ans.....

Pupils may not write in this space.

Name.....

Date.....

No. of Pr.....

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Reasoning Test—Form 16

R16

Name _____ Grade _____ School _____ City _____
 Date _____ Age _____ When is your next birthday? _____ How old will you be? _____
 Boy or Girl _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Jack was employed at the post-office selling stamps. At the end of the day he found that he had sold 3125 two-cent stamps, 380 five-cent stamps, 7 special delivery stamps, 2563 one-cent stamps, and 94 ten-cent stamps. How many stamps did he sell that day?

Ans.....

2. A large loaf of bread makes 21 sandwiches. How many sandwiches could you make from 12 large loaves?

Ans.....

3. A poultry keeper has 1848 chickens. He finds that by keeping 42 in a coop he can provide place for all of the chickens. How many coops has he?

Ans.....

4. Yesterday Frank studied his spelling $\frac{1}{6}$ of an hour before lunch and $\frac{1}{10}$ of an hour in the afternoon. What part of an hour did he spend on his spelling yesterday?

Ans.....

5. A piece of cloth that was $57\frac{2}{8}$ yd. long before it was sponged shrank to $55\frac{3}{4}$ yd. after it was sponged. How many yards did it shrink?

Ans.....

6. On our automobile tour last summer we travelled $1298\frac{3}{4}$ mi. in 5 days. How far did we travel on an average each day?

Ans.....

7. John's savings account last December amounted to \$13.598. In June it showed a total of \$7.788. How much had he withdrawn?

Ans.....

8. A commission merchant bought 1000 bushels of turnips at \$.527 per bu. How much did the turnips cost him?

Ans.....

9. My brother's handkerchief contains 225 square inches of linen. Mine contains one square foot. How much larger than mine is his?

Ans.....

10. Bob sleeps 10 hours every night. How many hours is he awake every day?

Ans.....

11. The largest aquarium in our science laboratory holds a cubic yard of water. How many cubic inches of water does it hold?

Ans.....

12. A lady bought 5 qt. and 1 pt. of milk one morning. She used 3 qt. for cooking. How much had she left?

Ans.....

13. Tom gathered 7 pk. 2 qt. of tomatoes from his garden in 2 days. If he gathered the same quantity each day how much did he gather in one day?

Ans.....

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14. A farmer brought 108 doz. eggs to a dealer who bought 2 crates from him. If there were 36 doz. to a crate, how many crates did the farmer have left?

Ans.....

15. Harold's cyclometer registered 342.7 miles when he started out. After riding 3 hr. at the rate of 12.5 miles an hour, what did the cyclometer register?

Ans.....

16. Mr. Ford had \$4000 which he wished to invest for his children. He deposited \$500 to the account of his younger son and three times that amount to the account of his elder. The balance he invested for them in Government bonds. How much money was invested in bonds?

Ans.....

17. A man had in bank \$5876 $\frac{3}{4}$. He left on deposit \$2000 and invested $\frac{1}{3}$ of what he had withdrawn in stock which he divided equally between his two sons. How much money was invested in stock for each son?

Ans.....

18. A troop of Girl Scouts decided to hike 10.5 mi. on Sunday, but they had to ride 1.8 mi. of the way because they were too tired. On Monday they hiked 9.8 miles and on Tuesday 7.5 miles. The Boy Scouts during their trip hiked twice the number of miles the girls hiked during the three days. How many miles did the Boy Scouts hike?

Ans.....

19. Mr. Brown borrowed \$700 for 8 months at 5%. What interest did he have to pay?

Ans.....

20. At the rate of \$1.25 per \$100 what would my tax bill be on real estate assessed at \$22,000?

Ans.....

21. Mr. Smith sold 40 acres of his farm which is 160 rods square, to my uncle at \$125 an acre. At the same price per acre, what is the value of the part that remains?

Ans.....

Name _____

Date _____

No. of Prob. _____

Attempted _____

Correct _____

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Reasoning Test—Form 17

R17

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Jack had 8 cents. He paid 5 cents for an ice-cream cone. How much had he left?

Ans.....

2. The girls in camp made 34 cups of coffee from a pound of coffee. They have a supply of 20 pounds of coffee. How many cups of coffee will they be able to make?

Ans.....

3. In a large dairy 39 boys are employed to wrap pound-packages of butter. When there are 2730 pounds to be wrapped, how many packages should each boy wrap?

Ans.....

4. Jennie used $\frac{5}{8}$ of a skein of wool to make a skating cap and $\frac{2}{10}$ of a skein to make a scarf for her largest doll. How many skeins of wool did she use?

Ans.....

5. Joe lives 4 miles from school. His father brings him $\frac{7}{8}$ of the way in his auto every morning. How many miles does Joe ride in the auto on his way to school?

Ans.....

Turn over the page and work the other problems

6. A touring party made the trip of 923 miles between Cincinnati and Boston in $3\frac{1}{4}$ days. What was the average daily distance covered?

Ans.....

7. Jack's cyclometer showed 7.788 miles when he started to his grandmother's. When he reached there it showed 13.598 miles. How far is it from his house to his grandmother's?

Ans.....

8. A farmer sold $\frac{3}{4}$ of his farm of 79.25 acres. How many acres did he sell?

Ans.....

9. The contractor charges my father by the cubic foot for excavating the cellar for our new house. How many cubic inches of dirt does he have to remove to count it a foot?

Ans.....

10. Harry spent 3 days of last week at his aunt's house. How many days of last week was he at home?

Ans.....

11. The cook is making a gallon of tomato catsup. How many pint-bottles will I have to bring her for bottling all the catsup?

Ans.....

12. In an auto race the winner reached the goal in 9 minutes, 23 seconds. The last car took 15 minutes, 34 seconds for the race. By how many minutes did the winner surpass the slowest car in the race?

Ans.....

13. During 4 days of last week Helen practised her music 5 hr. 4 min. How long did she practise on an average each day?

Ans.....

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14. A tobacco planter divided his 30-acre plantation into 6 equal sections. In one of these he planted a special quality tobacco plant yielding 1480 pounds to the acre. How many pounds of this quality tobacco did the section yield?

Ans.....

16. Instead of taking a 5-year lease on his office Dr. White paid a monthly rent of \$125. He could have saved $\frac{1}{5}$ of his rent if he had taken the lease. In that case what would his office have cost him a year?

Ans.....

15. The Smiths motored out to their camp on Sunday at the rate of 21.5 miles an hour. At the end of 2.5 hours, how far were they from the camp which is 60 miles from their home?

Ans.....

17. A man owned $438\frac{1}{4}$ A. of land just outside the city limits. He sold $383\frac{3}{4}$ A. and divided the remainder into lots containing $\frac{3}{4}$ of an acre each. He sold the lots for $\$123\frac{4}{5}$ each. How much did he receive for them?

Ans.....

18. At the beginning of the month the gas meter in a students' flat registered 32564.5 cu. ft. and at the end of the month 33564.5 cu. ft. At \$1.15 per 1000 cu. ft., with an additional expense of \$3.75 for a special fixture which they had installed, how much would each of the five students on the flat have to pay?

Ans.....

19. What is the interest on \$900 for 60 days at 5%?

Ans.....

20. My brother paid a property tax of \$112.50 when the rate of taxation was 3%. His property was assessed at 75% of its value. What was the total value of his property?

Ans.....

21. Mr. Alden sold at \$125 an acre a triangular field having the same base and altitude as a rectangular field that is 450 rods long and 120 rods wide. What was the selling price of the triangular field?

Ans.....

Name.....

Date.....

No. of Prob.....

Attempted.....

Correct.....

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1. Hele
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2. Jack
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Reasoning Test—Form 18

R18

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Helen found 17 violets. Alice found only 9.
How many more did Helen find than Alice?

Ans.....

2. Jack had \$59 in the bank. His big brother had exactly 25 times as much money as that. How much had his brother?

Ans.....

3. A commission merchant shipped 1054 barrels of apples. It took 17 freight cars to haul them. How many barrels did each car hold?

Ans.....

4. Aunt Bess bought $1\frac{3}{8}$ pounds of fudge and $1\frac{1}{8}$ pounds of caramels at the candy sale. How many pounds of candy did she buy?

Ans.....

5. Betty Ann is going to make 7 doilies for Mother. She needs $\frac{3}{4}$ of a skein of floss for each doily. How many skeins does she need?

Ans.....

Turn over the page and work the other problems

6. At the art store I bought some drawing paper for \$.15, a box of paints for \$.39, some crayons for \$.14, and a tube of paste for \$.28. What was the amount of my bill?

Ans.....

7. Fred bought a motorcycle for \$76.54. He paid \$23.76 on it during the first four months. How much did he still owe?

Ans.....

8. Mr. Smith promised that every time Joe earned \$.875 for his college fund, he would give him .9 of that amount to add to his savings account. How much did his father have to give Joe each time he himself earned \$.875?

Ans.....

9. I went into a feed store and asked the man to weigh me. He put on a hundred-weight. I weigh only 93 pounds. How many pounds too much did he have on?

Ans.....

10. We had 180 school days last year. How many days of the entire year did we have holidays?

Ans.....

11. My aunts sent us children a quart of maple syrup tapped from some of the trees on their land. There are four children in our family. How many gills should each of us receive?

Ans.....

12. A man in laying a walk from his back porch to the garage, a distance of 16 ft. 8 in., made 7 ft of it in one evening. How many feet did he have to make the next evening if he wished to finish it?

Ans.....

13. There are 12 gal. 3 qt. of pickles in 3 kegs. What is the average content of each keg?

Ans.....

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14. Marie's big sister practises her music 3 hours daily. Monday morning she practised $1\frac{1}{4}$ hours. In the afternoon she practised $1\frac{1}{2}$ hours. How much longer did she have to practise to complete the 3 hours?

Ans.....

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- egs
15. Lead is 11.35 times as heavy as water which weighs 62.5 pounds per cubic foot. How many cubic feet of lead are there in 248,281.25 pounds of lead?

Ans.....

16. A teacher had twenty pieces of red crayon, three times as much white crayon, and 40 pieces of blue crayon. She divided them equally among 30 pupils. How many pieces did each pupil receive?

Ans.....

17. One day a coal dealer received payment for $50\frac{1}{4}$ T. of coal at $\$8\frac{1}{4}$ per ton. He paid out $\$128\frac{1}{4}$, and later in the day received $\$42\frac{1}{5}$ in cash payment from a customer. How much money had he to his credit for that day?

Ans.....

Turn over the page and finish the problems

18. A commission merchant bought 1236.75 bu. of potatoes. He stored away 600 bu. and sold the remainder at \$.40 per bu. Find the value of all his potatoes if those he kept were worth \$300?

Ans.....

19. Mr. Walters mortgaged his home for \$4,200 at 6% per annum. He cancelled the mortgage at the end of 4 years. What amount had he paid as interest on the sum borrowed?

Ans.....

20. My uncle's personal property is worth \$75,000 and his real estate is valued at \$10,800. All his property was assessed at 85% of its value, and the rate of taxation was $1\frac{1}{2}\%$. How much was his tax bill?

Ans.....

21. Our class pennant is triangular in shape. It is 27 inches long and 14 inches wide at the widest part. How many square inches of felt does the pennant contain?

Ans.....

Name

Date

No. of Prob.....

Attempted.....

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Reasoning Test—Form 19

R19

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Tom had 61 marbles at the beginning of the game. At the end he had only 56. How many did he lose?

Ans.....

2. A dealer sold a lot of 83 automobiles at \$975 each. How much did he receive for the lot?

Ans.....

3. A bicycle dealer invested \$3444 in bicycles at \$28 apiece. How many bicycles did he buy?

Ans.....

4. Fred rode $2\frac{7}{8}$ miles on his scooter yesterday and $2\frac{3}{8}$ miles today. How far did he ride in both days?

Ans.....

5. Jack lives $\frac{2}{3}$ of a mile from the playground. One day when he was skating home his skate strap broke and he had to ride $\frac{3}{4}$ of the way on one skate. How far did he ride on one skate?

Ans.....

Turn over the page and work the other problems

6. The boys measured the race track they had built at camp. From the starting point to the pine tree is .15 miles. From the pine tree to the turn is .39 miles. From the turn to the circular grass plot is .14 miles, and from there to the finishing line is .28 miles. How far does Jack go on his bicycle when he rides around the track once?

Ans.....

7. A real estate agent sold 76.45 acres of ground to Mr. Smith and 23.76 acres to Mr. Brown. How much more did he sell to Mr. Smith than to Mr. Brown?

Ans.....

8. Our grocer had 65.25 pounds of coffee valued at \$.44 per pound. How much was the coffee worth?

Ans.....

9. Your father ordered the winter coal and thought he would have enough for the winter. The dealer used the short ton measure instead of the long one. How many pounds less than he expected did your father get on every ton?

Ans.....

10. Robert spent 2 months at the seashore last summer. How many weeks was he there?

Ans.....

11. At the school picnic we sold a peck of peanuts in pint sacks. How many sacks of nuts did we sell?

Ans.....

12. Mrs. Smith bought a remnant of material containing 5 yd. 1 ft. She used only 3 yd. 2 ft. How much had she left?

Ans.....

13. A hardware dealer used 16 yd. 2 ft. of screening in making 5 screen doors of equal size. How much screening was used for each door?

Ans.....

14. The girls themselves made one new apron. How many more did they need?

15. The total cost of the share class was \$95.75. How much more did they need to spend as the class grew?

14. The girls in the Busy Bee Club are going to make themselves a working cap and apron. If each one needs $\frac{1}{2}$ yd. for her cap and $1\frac{3}{4}$ yd. for her apron, how many yards of muslin will be needed by all 12 members of the club?

Ans.....

16. A man bought 16 shares of stock at \$58 per share. He divided it equally among his 4 daughters. The eldest already had \$118 invested in the same kind of stock. What was the value of all the stock owned by the eldest daughter?

Ans.....

15. The ticket sale for our school play amounted to \$95.75. Each of the 8 rooms is to receive an equal share of the proceeds. How much could our class afford to pay for an aquarium if we were to spend for it our share of the proceeds as well as the \$8.06 we have in the class treasury?

Ans.....

17. Rose's mother gave her $\$21\frac{1}{4}$ with which to go to the grocer's. She bought $2\frac{3}{4}$ lb. of cheese at \$.40 per lb. With $\frac{1}{2}$ the money that was left she bought vegetables. What did she pay for the vegetables?

Ans.....

Turn over the page and finish the problems

18. From \$.75 Bob spent \$.07 for candy and the remainder for apples at \$.08 per pound. On the following day he bought 14.5 lb. of apples at the same price per pound. How many pounds of apples did he buy within those two days?

Ans.....

19. Mr. Adams borrowed \$700 from Mr. Rowe on March 16, 1925. He returned it with interest at 6% on Feb. 2, 1926. How much did he return to Mr. Rowe?

Ans.....

20. Mr. Andrews paid a property tax of \$202.50 when the tax rate was \$2.25 per \$100. What was the value of his property if it was assessed at 60% of its value?

Ans.....

21. Our garden plot is 12 feet on one side and 18 feet on the opposite parallel side. The perpendicular distance between these two sides is 10 feet. What is the area of the plot?

Ans.....

Name.....

Date.....

No. of Pro.....

Attempted.....

Correct.....

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Reasoning Test—Form 20

R20

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

SUMMARY OF PUPIL'S SCORE

No. of Problem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Attempted																							
Correct																							

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1. Mrs. Carter had \$49. She spent \$36 for a dress and a hat. How much money had she left?

Ans.....

2. On an average the Continental Hotel buys 287 pounds of meat every day. How much meat is bought by the hotel during the year?

Ans.....

3. The monthly payroll for 52 employees of the Excelsior Laundry amounts to \$5616. What is the average monthly wage of these employees?

Ans.....

4. Nan studied $6\frac{1}{5}$ hr. last week in school, and $5\frac{1}{4}$ hr. at home. How many hours of study was that for the week?

Ans.....

5. Mother bought $4\frac{3}{4}$ yd. of silk to make party dresses for Bertha and Jane. She paid \$2 a yd. for it. How much did the silk cost?

Ans.....

Turn over the page and work the other problems

6. Tom Brown's lunch bill at the school cafeteria last week was: \$.26 on Monday, \$.39 on Tuesday, \$.47 on Wednesday, \$.36 on Thursday, and \$.45 on Friday. How much was his bill for the week?

Ans.....

7. Martha received a \$25 Christmas Savings check. She spent \$18.68 for gifts and put the rest in the bank for the next year. How much did she put in the bank?

Ans.....

8. Stock bought at \$.875 per share was sold at a gain of .125 of the cost. What was the gain on each share?

Ans.....

9. Jack has a score of agates. You have a dozen. How many more has Jack than you?

Ans.....

10. John puts \$1 in the savings bank every month. How much does he save every year?

Ans.....

11. Our grocer promised to pay me a nickel for every bushel of lima beans that I measured out in quart boxes. How many boxes did I have to measure out for a nickel?

Ans.....

12. Mrs. Jones bought 8 gal. 1 qt. of brick ice cream for a party. There were 2 qt. left after the party. How much ice-cream was used?

Ans.....

13. A farmer had in 5 equal stacks a total of 7 T. 1000 lb. of hay. What was the average weight of each stack?

Ans.....

14. Betty's which contain can sl

15. Tomo Grang the lu my we

14. Betty's mother gave her 2 pieces of linen with which to make a half dozen doilies. One piece contains $2\frac{1}{3}$ yd. and the other $1\frac{1}{6}$ yd. How much can she allow for each doily?

Ans.....

15. Tomorrow 14 of us are going to hike to Manor Grange. After contributing my fair share for the lunch which is to cost \$6.72, how much of my weekly allowance of \$1.25 will I have left?

Ans.....

16. Four partners had equal rights to an income of \$50,000. The first partner invested \$4250 in one stock company, and the remainder in another. He lost the first investment but gained 8 times the amount of his second investment. How much did he gain?

Ans.....

17. Aunt Joe bought new cretonne draperies for the nursery windows. For each one of the six windows she needed a piece $2\frac{1}{2}$ yd. long. She also needed one extra piece $8\frac{1}{4}$ yd. long. How much was left on the bolt of cretonne containing $31\frac{1}{2}$ yd. after the saleslady had cut off Aunt Joe's material?

Ans.....

18. A grain elevator had in storage 1582.5 bu. of grain. Of these 436 bu. were lost in a fire. Of the part that remained only .88 was fit to be sold. This amount was sold in four equal shipments. How many bu. did each shipment contain?

Ans.....

19. What is the amount of \$1000 borrowed at 5% on June 6, 1925, and returned October 29, 1925?

Ans.....

20. A piano marked \$625 was sold at a discount of 20%. What was the selling price of the piano?

Ans.....

21. It took Louise 24 hours to embroider the outer edge of a centerpiece which is 32 inches in diameter. How many inches did she finish in an hour?

Ans.....

Name
Date
DIRECTION:
time
as we
you

1. Add

2. Subtr

3.

Primary Fundamentals Test—Form A

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 5 \\ 9 \\ 8 \\ 6 \\ 4 \\ 7 \\ \hline \end{array}$$

Ans.....

4. Multiply

$$\begin{array}{r} 45 \\ 6 \\ \hline \end{array}$$

Ans.....

2. Subtract

$$\begin{array}{r} 436 \\ 302 \\ \hline \end{array}$$

Ans.....

5. Add

$$\begin{array}{r} 236 \\ 541 \\ \hline \end{array}$$

Ans.....

3.

$$\begin{array}{r} 2 \overline{) 10} \\ \hline \end{array}$$

Ans.....

6. Subtract

$$\begin{array}{r} \$5.63 \\ 3.28 \\ \hline \end{array}$$

Ans.....

7.

A half dollar — 45 cents =cents

8.

Subtract $\begin{array}{r} 92 \\ 79 \\ \hline \end{array}$

Ans.....

9.

Subtract $\begin{array}{r} 5 \text{ qt. } 1 \text{ pt.} \\ 3 \text{ qt.} \\ \hline \end{array}$

Ans.....

10.

$\frac{5}{6} - \frac{1}{6}$

Ans.....

11.

1 peck =quarts

12.

Multiply $\begin{array}{r} 287 \\ 365 \\ \hline \end{array}$

Ans.....

13.

Subtract $\begin{array}{r} \$18.50 \\ 9.75 \\ \hline \end{array}$

Ans.....

14.

1 hundredweight — 93 pounds =pounds

15.

A day

16.

Subt
by 75

15.

A day = 10 hours +hours

16.

Subtract 2260 from 2860 and divide the answer by 75.

Ans.....

17.

Multiply 8 gal. 1 qt.
8

Ans.....

18.

Find the difference between \$1.62 and \$1.47.
And multiply the answer by 40,000.

Ans.....

Pupils may not use this space.

365) \$ 9 8 5 5 0

Ans.....

20.

Add 5 yd. 1 ft.
 2 yd.
 3 yd. 2 ft.
 4 yd. 1 ft.

Ans.....

Pupils may not use this space.

Name_____

Date _____

DIRECTION
time
as we
you

$$1. \quad 5 +$$

2
Subtr

3. Multi

ulti—	Total	M A	Grade	School	Sex
ental	Minus	C A	Grade Score	City	Dates of Testing
ale	Score	I Q	T Score	State	Teacher's Name
		No. of Problem or Example	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Totals	
rithmetic Reasoning		Attempted			
Form		Correct			
rithmetic Fundamentals		Attempted			
Form A		Correct			

Primary Fundamentals Test—Form B

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1.

$$5 + 3$$

Ans.....

2.

$$\begin{array}{r} \text{Subtract } \$375 \\ 231 \\ \hline \end{array}$$

Ans.....

3.

$$\begin{array}{r} \text{Multiply } 430 \\ 2 \\ \hline \end{array}$$

Ans.....

4.

$$\begin{array}{r} \text{Add } \$26 \\ .39 \\ .47 \\ .36 \\ .45 \\ \hline \end{array}$$

Ans.....

5.

$$\begin{array}{r} \text{Multiply } \$59 \\ 25 \\ \hline \end{array}$$

Ans.....

6.

$$\begin{array}{r} \text{Multiply } 2 \text{ min. } 20 \text{ sec.} \\ 7 \\ \hline \end{array}$$

Ans.....

7.

$$\frac{2}{9} + \frac{2}{9}$$

Ans.....

8.

Subtract 16 ft. 8 in.
7 ft.

Ans.....

9.

$$4 \overline{) 824}$$

Ans.....

Pupils may not use this space.

10.

$$1 \text{ bu.} - 1 \text{ pk.} = \dots\dots\dots \text{pk.}$$

Ans.....

11.

$$\begin{array}{r} \text{Add } 5 \\ 4 \\ 7 \\ 2 \\ \hline \end{array}$$

Ans.....

12.

$$\begin{array}{r} \text{Multiply } \$820 \\ 4 \\ \hline \end{array}$$

Pupils may not use this space.

13.

14.

Mul

13.

$$\begin{array}{r} \$28 \overline{) \$3444} \end{array}$$

Ans.....

14.

$$\begin{array}{r} \text{Multiply } 42 \\ \underline{7} \end{array}$$

Ans.....

15.

$$\begin{array}{r} \text{Add } 3 \text{ ft. } 2 \text{ in.} \\ 5 \text{ ft. } 7 \text{ in.} \\ \underline{1 \text{ ft. } 5 \text{ in.}} \end{array}$$

Ans.....

16.

$$29 - 15\frac{3}{4}$$

Ans.....

Pupils may not use this space.

17. Find $\frac{1}{2}$ of 36 cents. Then add 45 cents to the answer.

Ans.....

18. Add $\begin{array}{r} 65 \\ 57 \\ \hline \end{array}$

Ans.....

19.

137) $\overline{\$ 47539}$

Ans.....

20. Add 740 and 850 and divide the answer by 2

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School										Sex						
Mental	Minus	C A	Grade Score				City										Dates of Testing						
Scale	Score	I Q	T Score				State										Teacher's Name						
		No. of Problem or example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Totals
Arithmetic Reasoning		Attempted																					
Form		Correct																					
Arithmetic Fundamentals		Attempted																					
Form B		Correct																					

Narr
Date
DIRE

1. A

2.

3. Sub

Primary Fundamentals Test—Form C

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1.
Add $\begin{array}{r} 19 \\ 7 \\ \hline \end{array}$

Ans.....

2.
 9×7

Ans.....

3.
Subtract $\begin{array}{r} \$8000 \\ 7356 \\ \hline \end{array}$

Ans.....

4.
 $\begin{array}{r} 7 \overline{) 59} \end{array}$

Ans.....

5.
Add $\begin{array}{r} 2 \text{ gal. } 3 \text{ qt.} \\ 3 \text{ gal. } 1 \text{ qt.} \\ \quad 3 \text{ qt.} \\ 2 \text{ gal. } 2 \text{ qt.} \\ \hline \end{array}$

Ans.....

6.
 $\begin{array}{r} 6 \overline{) 252} \end{array}$

Ans.....

7. Multiply $\begin{array}{r} \$975 \\ 83 \cdot \\ \hline \end{array}$

Ans.....

8.

$$39 \overline{) 2730}$$

Ans.....

9.

Subtract $\begin{array}{r} 15 \text{ min. } 34 \text{ sec.} \\ 9 \text{ min. } 23 \text{ sec.} \\ \hline \end{array}$

Ans.....

10.

$$52 \overline{) \$5616}$$

Ans.....

11.

Add $\begin{array}{r} 695 \\ 487 \\ \hline \end{array}$

Ans.....

12.

36 inches =feet

13.

A mi

14.

Add

13.

A mile =yards

14.

Add 264 and 171 and subtract the sum from 968.

Ans.....

15.

A year — 180 days =days

16.

$12\frac{1}{2}$ — $11\frac{1}{4}$

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

17.

1 quarter — 19 cents =cents

18.

Multiply \$.75 by the sum of 8 and 6.

Ans.....

19.

3) 12 gal. 3 qt.

Ans.....

20.

$\frac{5}{8}$ — $\frac{1}{4}$

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School														Sex		
Mental	Minus	C A	Grade Score				City														Dates of Testing		
Scale	Score	I Q	T Score				State														Teacher's Name		
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Totals
Arithmetic Reasoning		Attempted																					
Form		Correct																					
Arithmetic Fundamentals		Attempted																					
Form C		Correct																					

Name _____
Date _____
DIRECTIONS
time as w
you

1.

1

2.

Add

3.

1 hour

Primary Fundamentals Test—Form D

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. $17 - 9$

Ans.....

2. Add $\begin{array}{r} 25 \\ 23 \end{array}$

Ans.....

3. 1 hour = minutes

4. Add $\begin{array}{r} 335 \\ 248 \\ 294 \\ 127 \\ 156 \\ 189 \end{array}$

Ans.....

5. Multiply $\begin{array}{r} 34 \\ 20 \end{array}$

Ans.....

6. 4 pints = quarts

7.

Subtract $\begin{array}{r} \$76.45 \\ 23.76 \\ \hline \end{array}$

Ans.....

8.

Multiply $\begin{array}{r} 8 \text{ yd. } 1 \text{ ft.} \\ 4 \\ \hline \end{array}$

Ans.....

9.

$3 \overline{) 36963}$

Ans.....

10.

Multiply \$275 by 370.

Ans.....

11.

$\begin{array}{r} 4 \overline{) 398} \end{array}$ and remaining

Ans.....

12.

Multiply \$.10 by 4 and subtract that answer from \$1.

Ans.....

13.

Multiply \$178
500

Ans.....

14.

21) \$ 8 8 6 2

Ans.....

15.

2) 7 pk. 2 qt.

Ans.....

16.

Subtract 8 gal. 1 qt.
2 qt.

Ans.....

Pupils may not use this space.

17.

$$17) \overline{1054}$$

Ans.....

18.

$$\frac{3}{4} \times \frac{2}{3}$$

Ans.....

19.

$$\begin{array}{r} \text{Add } 2 \text{ lb. } 7 \text{ oz.} \\ 5 \text{ lb. } 3 \text{ oz.} \\ 4 \text{ lb. } 1 \text{ oz.} \\ \hline 9 \text{ lb. } 12 \text{ oz.} \end{array}$$

Ans.....

20.

$$15\frac{3}{8} - 12$$

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade					School										Sex						
Mental	Minus	C A	Grade Score					Clty										Dates of Testing						
Scale	Score	I Q	T Score					State										Teacher's Name						
		No. of Problem or example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Totals	
Arithmetic Reasoning		Attempted																						
Form		Correct																						
Arithmetic Fundamentals		Attempted																						
Form D		Correct																						

Name

Date

DIRECT
time
as
you

1. Add

2. Mul

3.

Primary Fundamentals Test—Form E

Name _____ Grade _____ School _____ City _____ Boy or Girl _____
 Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1.

Add 524
 213
 162

Ans.....

2.

Multiply 431
 2

Ans.....

3.

7) 56

Ans.....

4.

61 — 56

Ans.....

5.

Subtract \$5009
 4288

Ans.....

6.

A yard =inches

7.

Multiply $\begin{array}{r} 395 \\ 305 \end{array}$

Ans.....

8.

Two months =weeks

9.

Multiply 5 qt. $\frac{1}{7}$ pt.

Ans.....

10.

$\begin{array}{r} 9 \overline{) 938} \end{array}$

Ans.....

11.

Add $\begin{array}{r} \$3.24 \\ .75 \\ .06 \\ 1. \\ .29 \end{array}$

Ans.....

12.

$\$35 - \$7.50 + \$29.75$

Ans.....

13.

A

14.

Su

13.

A year =months

15.

1 lb. — 12 oz. =oz.

14.

Subtract $\begin{array}{r} 309 \\ 275 \\ \hline \end{array}$

16.

$\begin{array}{r} 3 \overline{) 36} \end{array}$

Ans.....

Ans.....

Pupils may not use this space.

17. Subtract $\begin{array}{r} 513 \\ 365 \\ \hline \end{array}$

Ans.....

18. $\begin{array}{r} 55 \overline{) 3410} \end{array}$

Ans.....

19. $\frac{4}{5} + \frac{3}{5}$

Ans.....

20. Multiply $\begin{array}{r} 21 \\ 12 \\ \hline \end{array}$

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade					School												Sex			
Mental	Minus	C A	Grade Score					City												Dates of Testing			
Scale	Score	I Q	T Score					State												Teacher's Name			
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Totals
Arithmetic Reasoning		Attempted																					
Form		Correct																					
Arithmetic Fundamentals		Attempted																					
Form E		Correct																					

Name _____
Date _____
DIRECT time as you

1. 5 -

2. Su

3. Mu

4. 137

Fundamentals Test—Form 1

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. $5 + 3 =$

Ans.....

2. Subtract $\begin{array}{r} 92 \\ 79 \\ \hline \end{array}$

Ans.....

3. Multiply \$275 by 370.

Ans.....

4. $137 \overline{) \$47539}$

Ans.....

5. $7\frac{5}{8} + 3\frac{7}{8} =$

Ans.....

6. $12 \times 5\frac{1}{2} =$

Ans.....

7. Add $\begin{array}{r} .26 \\ .39 \\ .47 \\ .36 \\ .45 \\ \hline \end{array}$

Ans.....

8. Subtract $\begin{array}{r} 25 \\ 18.68 \\ \hline \end{array}$

Ans.....

9. $6 \overline{) \$34.14}$

Ans.....

10. 1 gross =things

11. 1 leap year =days

12. A hundredweight =ounces

13. Subtract $\begin{array}{r} 17 \text{ lb.} \\ 11 \text{ lb. } 13 \text{ oz.} \end{array}$

Ans.....

14. $7 \overline{) 8 \text{ ft. } 2 \text{ in.}}$

Ans.....

15. Subtract 200 from $338\frac{1}{2}$. Then add $184\frac{1}{4}$ to the answer.

Ans.....

16. Divide \$3.30 by 6. Then multiply the answer by 3.25.

Ans.....

17. Divide \$216 by 12. Subtract \$12 from this answer. Then add \$18 to the last answer.

Ans.....

18. Multiply $9\frac{1}{3}$ by 56. Divide the answer by 4. From the last answer subtract $23\frac{1}{2}$.

Ans.....

19. From
answe

19. From \$4382.52 subtract \$2380.28. Divide the answer by 4. Then multiply the last answer by 4

Ans.....

20.

$$\$546.36 + \$16.39$$

Ans.....

$$\$500 + \$15$$

Ans.....

$$\$530.45 + \$15.91$$

Ans.....

$$\$515 + \$15.45$$

Ans.....

$$\$500 \times .03$$

Ans.....

$$\$546.36 \times .03$$

Ans.....

$$\$530.45 \times .03$$

Ans.....

$$\$515 \times .03$$

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

21.

$$\$292.50 \times .05$$

Ans.....

$$\$325 - \$32.50$$

Ans.....

$$\$325 \times .10$$

Ans.....

$$\$292.50 - \$14.63$$

Ans.....

22. Find the area of a circle which is 150 ft. in diameter.

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 1		Correct																							

Name

Date

DIRECTIO
time
as w
you

1. Add

2. Subtr

3. Mult

Fundamentals Test—Form 2

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add $\begin{array}{r} 25 \\ 23 \\ \hline \end{array}$

Ans.....

2. Subtract $\begin{array}{r} \$375 \\ 231 \\ \hline \end{array}$

Ans.....

3. Multiply $\begin{array}{r} \$178 \\ 500 \\ \hline \end{array}$

Ans.....

4. $312 \overline{) 23589696}$

Ans.....

5. $\frac{4}{9} - \frac{2}{9}$

Ans.....

6. $2\frac{1}{5} \times \frac{5}{8}$

Ans.....

7. Add $\begin{array}{r} \$3.72 \\ 4.34 \\ 2.28 \\ 3.75 \\ \hline \end{array}$

Ans.....

8. Subtract $\begin{array}{r} \$12.50 \\ 12.005 \\ \hline \end{array}$

Ans.....

Turn over the page and work the other examples

9. $.6 \overline{) 34.14}$

Ans.....

10. 1 great gross =things

11. A century =years

12. A ton =pounds

13. Subtract $\begin{array}{r} 2 \text{ pk. } 2 \text{ qt.} \\ 1 \text{ pk. } 7 \text{ qt.} \end{array}$

Ans.....

14. $9 \overline{) 7 \text{ lb. } 14 \text{ oz.}}$

Ans.....

15. Subtract $22\frac{3}{4}$ from $79\frac{1}{2}$. Multiply $\$1\frac{1}{2}$ by the answer.

Ans.....

16. Find $\$57 + \$45 - \$83$. Then multiply the answer by 12.

Ans.....

17. Divide $\$800$ by 25. Multiply $\$2$ by 15. Subtract the last answer from the first one.

Ans.....

18. Multiply $18\frac{1}{4}$ by 196. Add to the answer $420\frac{1}{2}$. Divide the last answer by 6.

Ans.....

19. Mult
\$50.

20. \$331.2

\$312

\$306

19.

20.

\$324.73 + \$6.49

Ans......

\$318.36 + \$6.36

Ans.....

\$300 + \$6

Ans.....

$$\$324.73 \times .02$$

Ans.....

$$\$312.12 \times .02$$

Ans.....

$$\$331.22 \times .02$$

Ans.....

$$\$306 \times .02$$

Ans.....

$$\$318.36 \times .02$$

Ans.....

$$\$300 \times .02$$

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

Ans.....

Pupils may not use this space.

3. Mult

4. 365)

[illegible]

Fundamentals Test—Form 3

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 4 \\ 2 \\ 3 \\ \hline \end{array}$$

Ans.....

2. Subtract

$$\begin{array}{r} 513 \\ 365 \\ \hline \end{array}$$

Ans.....

3. Multiply

$$\begin{array}{r} 395 \\ 305 \\ \hline \end{array}$$

Ans.....

4. 365) \$98550

Ans.....

5. $\frac{5}{6} - \frac{1}{6}$

Ans.....

6. $\frac{3}{4} \times \$2\frac{2}{3}$

Ans.....

7. Add

$$\begin{array}{r} 3.72 \\ 4.34 \\ 2.28 \\ 3.75 \\ \hline \end{array}$$

Ans.....

8. Subtract

$$\begin{array}{r} 12.5 \\ 12.005 \\ \hline \end{array}$$

Ans.....

Turn over the page and work the other examples

9. $.12 \overline{) .96}$

Ans.....

10. 1 cubic yard =cubic feet

11. Two rods =yards

12. Two hours =seconds

13. Subtract 9 T. 1050 lb.
1200 lb.

Ans.....

14. $7 \overline{) 9 \text{ bu. } 6 \text{ pk.}}$

Ans.....

15. Subtract 1 quart from 1 gallon. Divide the number in the answer by 7.

Ans.....

16. Find $\$5000 + \$10,000 - \$3000$. Divide the answer by 12.

Ans.....

17. Divide 120 by 12. Add 5 to this answer. Subtract 3 from the last answer.

Ans.....

18. Multiply $\$15848\frac{1}{2}$ by $\frac{1}{5}$. Divide the answer by 3. Add $\$5082\frac{2}{5}$ to the last answer.

Ans.....

19. Multiply 9 cents by 26. Subtract that answer from \$4.04. Then divide the last answer by \$.05.

20.

$$\$127.50 \div \$8500$$

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

\$112.50 — \$5.63

Ans......

\$125 — \$12.50

Ans......

\$106.77 — \$2.14

Ans......

$$\$112.50 \times .05$$

Ans.....

$$\text{\$125} \times .10$$

Ans......

$$\text{\$106.77} \times .02$$

Ans......

22. Find the entire area of the faces of a block 5 inches on a side.

Ans......

Find the volume of a block 5 inches on a side.

Ans.....

[illegible]

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1. Add

2. Sub

3. 2) —

4. $\frac{2}{3}$

Fundamentals Test—Form 4

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$$

Ans.....

2. Subtract
$$\begin{array}{r} 436 \\ 302 \\ \hline \end{array}$$

Ans.....

3. $2 \overline{) 10}$

Ans.....

4. $\frac{2}{9} + \frac{2}{9}$

Ans.....

5. $\frac{5}{8} - \frac{1}{4}$

Ans.....

6. $4\frac{1}{3} \times \$2\frac{1}{2}$

Ans.....

7. Add
$$\begin{array}{r} \$3.24 \\ .75 \\ .06 \\ 1. \\ .29 \\ \hline \end{array}$$

Ans.....

8. Subtract
$$\begin{array}{r} \$0.0004 \\ .00019 \\ \hline \end{array}$$

Ans.....

9. $2.75 \overline{) \$3.30}$

Ans.....

10. 1 cord =cu. ft.

11. A mile = rods

12. Five weeks =hours

13. Subtract $\begin{array}{r} 5 \text{ gal. } 2 \text{ qt.} \\ 3 \text{ gal. } 1 \text{ qt. } 1 \text{ pt.} \\ \hline \end{array}$

Ans.....

14. $8 \overline{) 5 \text{ yr. } 4 \text{ mo.}}$

Ans.....

15. Multiply $\$1\frac{1}{4}$ by 10. Add $\$12\frac{1}{2}$ to the answer.

Ans.....

16. Multiply 50c by 325 + 245. Then subtract \$100 from the answer.

Ans.....

17. Divide 155 by 31. Multiply this answer by 5. Add the first and second answers.

Ans.....

18. Divide $153\frac{1}{2}$ by 2. From the answer subtract $26\frac{1}{3}$. Multiply $\$28\frac{1}{2}$ by the last answer.

Ans.....

19. Mult the

20. $\begin{array}{r} \$10.00 \\ \$100 \end{array}$

Answer.

19. Multiply \$4.75 by 9. From that answer subtract the sum of \$21.50 and \$9.75.

Ans.....

.....
\$100

.....
by 5

20. $\frac{\$10,000}{\$100} \times \$1.05$

Ans.....

.....
act

21.

$\$2762.50 - \55.25

Ans.....

$\$3150 - \63

Ans.....

$\$3087 - \2707.25

Ans.....

$\$3500 - \350

Ans.....

$\$3250 - \487.50

Ans.....

Pupils may not use this space.

21. (Continued)

$$\$3250 \times .15$$

Ans.....

$$\$2762.50 \times .02$$

Ans.....

$$\$3500 \times .10$$

Ans.....

$$\$3150 \times .02$$

Ans.....

22. Find $\frac{1}{3}$ of the area of the 4 walls of a room which is 18 ft. long, 15 ft. wide, and 12 ft. high. Deduct 24 sq. ft. for openings.

Ans.....

Pupils may not write in this space.

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School										Sex								
Mental	Minus	C A	Grade Score				City										Dates of Testing								
Scale	Score	I Q	T Score				State										Teacher's Name								
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 4		Correct																							

Name

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Fundamentals Test—Form 5

room
t. high

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 19 \\ 7 \\ \hline \end{array}$$

Ans.....

2. Subtract
$$\begin{array}{r} 309 \\ 275 \\ \hline \end{array}$$

Ans.....

3. $3 \overline{) 36}$

Ans.....

4.
$$\frac{4}{5} + \frac{3}{5}$$

Ans.....

5.
$$\frac{7}{10} - \frac{1}{5}$$

Ans.....

6. $6 \times \$965\frac{2}{5}$

Ans.....

7. Add
$$\begin{array}{r} 3.24 \\ .75 \\ .06 \\ 1. \\ \hline .29 \end{array}$$

Ans.....

8. Subtract
$$\begin{array}{r} .0004 \\ .00019 \\ \hline \end{array}$$

Ans.....

9.

$$\begin{array}{r} .22 \overline{) 19.8} \\ \hline \end{array}$$

Ans.....

10.

$$1 \text{ bu.} - 1 \text{ pk.} = \dots\dots\dots \text{pk.}$$

11.

$$\text{Four sq. yd.} = \dots\dots\dots \text{sq. ft.}$$

$$12. \text{ A half century} = \dots\dots\dots \text{months}$$

$$13. \text{ Subtract } 3 \text{ bu. } 2 \text{ pk. } 2 \text{ qt.}$$

$$\underline{1 \text{ bu. } 3 \text{ pk. } 6 \text{ qt.}}$$

Ans.....

14.

$$6 \overline{) 8 \text{ min. } 10 \text{ sec.}}$$

Ans.....

$$15. \text{ Multiply } 8\frac{2}{3} \text{ c by } 24. \text{ Subtract the answer from } \$2\frac{1}{2}.$$

Ans.....

$$16. \text{ Find } \frac{1}{4} \text{ of the sum of } \$9875 \text{ and } \$7629. \text{ Then subtract } \$500 \text{ from the answer.}$$

Ans.....

$$17. \text{ Divide } 270 \text{ by } 30. \text{ Add } 2 \text{ to this answer. Multiply this last answer by } 2.$$

Ans.....

$$18. \text{ Divide } 46\frac{2}{3} \text{ by } 5. \text{ From the answer subtract } 4\frac{1}{2}. \text{ To the last answer add } 2\frac{1}{2}.$$

Ans.....

19. Mul.
\$.037

19. Multiply \$.05 by 60. Divide the answer by \$.0375. From that answer subtract 60.

20.

$$\$12,500 \times \frac{1}{4} \times .02$$

Ans.....

Ans.....

Pupils may not use this space.

21.

$$\$900 \times .15$$

22.

What is the entire surface of a rectangular solid that is 9 inches long, 7 inches wide, and 2 inches high?

Ans.....

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 5		Correct																							

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1. Add

2. Subt

3.

7) 5

4.

3
10

Fundamentals Test—Form 6

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nd 2:

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 5 \\ 4 \\ 7 \\ 2 \\ \hline \end{array}$$

Ans.....

2. Subtract

$$\begin{array}{r} \$5009 \\ 4288 \\ \hline \end{array}$$

Ans.....

3.

$$\begin{array}{r} 7 \overline{) 56} \\ \hline \end{array}$$

Ans.....

4.

$$\frac{3}{10} + \frac{3}{10}$$

Ans.....

5.

$$\frac{3}{5} - \frac{1}{4}$$

Ans.....

6. $4\frac{2}{3} \times \$258$

Ans.....

7. Add

$$\begin{array}{r} \$5.234 \\ 6.003 \\ 8.29 \\ 5. \\ \hline \end{array}$$

Ans.....

8.

$$2 \times 32.41$$

Ans.....

Turn over the page and work the other examples

9.

$$\begin{array}{r} 2.15 \overline{) 430} \end{array}$$

Ans.....

10.

$$1 \text{ bu.} = \dots\dots\dots \text{qt.}$$

$$11. \text{ A sq. rd.} = \dots\dots\dots \text{sq. yd.}$$

$$\begin{array}{r} 12. \text{ Add } 3 \text{ ft. } 2 \text{ in.} \\ \quad \quad 5 \text{ ft. } 7 \text{ in.} \\ \quad \quad 1 \text{ ft. } 5 \text{ in.} \\ \hline \end{array}$$

Ans.....

$$13. \text{ Multiply } 5 \text{ qt. } 1 \text{ pt.} \\ \quad \quad \quad 7$$

Ans.....

14. Add 264 and 171 and subtract the sum from 968.

Ans.....

15. Find $\frac{3}{5}$ of $\$3\frac{3}{4}$. Then divide $\$4\frac{1}{2}$ by the answer you get.

Ans.....

16. Add 240 and 180. Multiply that answer by 4. Divide the last answer by 5.

Ans.....

17. Add $\$6\frac{1}{4}$ and $\$7\frac{1}{2}$. Subtract that answer from $\$16\frac{1}{2}$. Multiply the last answer by 4.

Ans.....

19. Mult.
Divi

from 18. Divide $2563\frac{1}{2}$ by 100. Multiply $\$.53\frac{1}{2}$ by the answer. Subtract the last answer from $\$21\frac{3}{4}$.

20.

$$\$4575 \times \frac{6}{5}$$

Ans.....

$$\$91.50 \div .02$$

Ans.....

19. Multiply \$.75 by 8. To that answer add \$5.25. Divide the last answer by 5.

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

$$\$75 \div .05$$

22. Find the lateral surface of a cylinder 6 inches high with a base 5 inches in diameter.

Ans.....

Pupils may not write in this space.

Ans.....

[illegible]

Fundamentals Test—Form 7

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 65 \\ 57 \\ \hline \end{array}$$

Ans.....

2. Subtract
$$\begin{array}{r} \$8000 \\ 7356 \\ \hline \end{array}$$

Ans.....

3.

$$7 \overline{) 59}$$

Ans.....

4.

$$\frac{5}{8} + \frac{5}{8}$$

Ans.....

5.

$$\frac{4}{9} - \frac{1}{6}$$

Ans.....

6.

$$56\frac{2}{3} \times 28\frac{1}{2}$$

Ans.....

7. Add
$$\begin{array}{r} 5.234 \\ 6.003 \\ 8.29 \\ 5. \\ \hline \end{array}$$

Ans.....

8.

$$4 \times 236.8$$

Ans.....

Turn over the page and work the other problems

9.

$$\begin{array}{r} 1.215 \overline{) 3.0375} \end{array}$$

Ans.....

10. $\frac{1}{2}$ gal. =qt.

11. An acre =sq. rd.

$$\begin{array}{r} \text{Add } 2 \text{ gal. } 3 \text{ qt.} \\ 3 \text{ gal. } 1 \text{ qt.} \\ 3 \text{ qt.} \\ 2 \text{ gal. } 2 \text{ qt.} \\ \hline \end{array}$$

Ans.....

13. Multiply 8 yd. $\frac{1}{4}$ ft.
4

Ans.....

14. Multiply \$.75 by the sum of 8 and 6.

Ans.....

15. Divide $8\frac{3}{4}$ by 5. Add $1\frac{1}{2}$ to the answer.

Ans.....

16. Add 1265 and 895. Take $\frac{1}{2}$ of this sum. Then multiply \$2 by this answer.

Ans.....

17. Add $3\frac{1}{4}$, $6\frac{1}{2}$ and $1\frac{3}{4}$. Subtract the answer from 25. Then divide the last answer by $2\frac{1}{4}$.

Ans.....

18. Di
sub

19. M
196

18. Divide $8\frac{2}{3}$ by 2. Add $3\frac{1}{2}$ to that answer. Then subtract $5\frac{3}{4}$ from the last answer.

Ans.....

19. Multiply 94.5 by 1.25. Divide the answer by 196. Then add 1.5 to the answer.

Ans.....

20. .

$$\frac{\$18750}{\$100} \times \$2$$

Ans.....

$$\$25000 \times .75$$

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

21. \$10,500 — \$367.50

Ans.....

\$10,500 $\times$.035

Ans.....

22. A cylinder 40 ft. high has a base 9 ft. in diameter. Find the volume.

Ans.....

Pupils may not write in this space.

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School				Sex														
Mental	Minus	C A	Grade Score				City				Dates of Testing														
Scale	Score	I Q	T Score				State				Teacher's Name														
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 7		Correct																							

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Fundamentals Test—Form 8

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Name _____ Grade _____ School _____ City _____ Boy or Girl _____
 Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 35 \\ 27 \\ 29 \\ 38 \\ \hline \end{array}$$

Ans.....

2.
$$5 \times 2$$

Ans.....

3.
$$\begin{array}{r} 3 \overline{) 36963} \end{array}$$

Ans.....

4.
$$\frac{1}{5} + \frac{1}{10}$$

Ans.....

5.
$$\frac{5}{6} - \frac{3}{10}$$

Ans.....

6.
$$\frac{1}{2} \div 5$$

Ans.....

7. Add
$$\begin{array}{r} \$315 \\ .275 \\ .485 \\ .365 \\ \hline \end{array}$$

Ans.....

8.
$$10 \times .3$$

Ans.....

Turn over the page and work the other examples

9.

$$\begin{array}{r} .875 \overline{) 36.75} \\ \hline \end{array}$$

Ans.....

10.

1 dime — 7 cents =cents

11. A square mile =acres

12. Add $\begin{array}{r} 2 \text{ lb. } 7 \text{ oz.} \\ 5 \text{ lb. } 3 \text{ oz.} \\ 4 \text{ lb. } 1 \text{ oz.} \\ 9 \text{ lb. } 12 \text{ oz.} \\ \hline \end{array}$

Ans.....

13. Multiply 2 min. 20 sec.
7

Ans.....

14. Add 740 and 850 and divide the answer by 2

Ans.....

15. Divide $2836\frac{1}{4}$ by 7. From the answer subtract $412\frac{3}{8}$.

Ans.....

16. Subtract 78 from 116. Add 96 to the answer. Then multiply the last answer by 4.

Ans.....

17. Add $\frac{3}{4}$ and $\frac{1}{3}$. Multiply $\$ \frac{3}{5}$ by the answer. Subtract the last answer from $\$ \frac{3}{4}$.

Ans.....

by 2 18. Divide 300 by 4. Multiply $1\frac{3}{4}$ by that answer.
Then add to the last answer $368\frac{3}{4}$.

19. Divide \$3.36 by \$.21. From this answer subtract 9.5. Multiply \$.21 by the last answer.

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the example

20.

$$\$25,000 + \$20,000$$

Ans.....

$$\$11,111.11 - \$8,888.89$$

Ans.....

$$\frac{4}{9} \times \$20,000$$

Ans.....

$$\frac{5}{9} \times \$20,000$$

Ans.....

21.

$$\$140 + \$115$$

Ans.....

$$\$3500 \times .04$$

Ans.....

$$\$3500 - \$255$$

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School										Sex									
Mental	Minus	C A	Grade Score				City										Dates of Testing									
Scale	Score	I Q	T Score				State										Teacher's Name									
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals	
Arithmetic Reasoning		Attempted																								
Form		Correct																								
Arithmetic Fundamentals		Attempted																								
Form 8		Correct																								

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Fundamentals Test—Form 9

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 18 \\ 7 \\ 30 \\ 49 \\ \hline \end{array}$$

Ans.....

2.

9×7

Ans.....

3.

$6 \overline{) 252}$

Ans.....

4.

$\frac{3}{4} + \frac{3}{8}$

Ans.....

5.

$15\frac{3}{8} - 12$

Ans.....

6.

$20 \div \frac{4}{9}$

Ans.....

7. Add
$$\begin{array}{r} .315 \\ .275 \\ .485 \\ .365 \\ \hline \end{array}$$

Ans.....

8.

$100 \times .3$

Ans.....

9. 36 inches =feet

10. 1 dollar — 1 dime =dimes

11. A yard =inches

12. Add 7 pk. 2 qt.
5 pk.
3 pk. 4 qt.
5 pk. 7 qt.

Ans.....

13. Multiply 8 gal. 1 qt.
8

Ans.....

14. \$35 — \$7.50 + \$29.75

Ans.....

15. Divide 363 by $2\frac{3}{4}$. Multiply the answer by $5\frac{3}{4}$. 18.

Ans.....

16. Subtract \$9275 from \$10500. Add \$375 to the answer. Then divide the last answer by \$375.

Ans.....

17. Add $\$50\frac{1}{2}$, $\$75\frac{3}{10}$, $\$30\frac{3}{4}$ and $\$80\frac{7}{10}$. Divide the sum of these numbers by 5. Then subtract the last answer from the sum.

Ans.....

wer by 18.

Divide $8\frac{3}{4}$ by 5. Add $3\frac{1}{4}$ to the answer. Multiply the last answer by $\frac{2}{5}$.

19.

Divide \$50 by 4. From this answer subtract \$10. Then add \$17.50 to the last answer.

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by \$34

ide the
ract the

Ans.....

Ans.....

Pupils may not use this space.

\$158.125 — \$94.875

Ans.....

$$\frac{\$5750 \times 3 \times \$0.55}{\$100}$$

Ans.....

$$\frac{\$5750 \times 5 \times \$0.55}{\$100}$$

Ans.....

Find the area of an 18-inch square.

Ans.....

[illegible]

Fundamentals Test—Form 10

Name _____ Grade _____ School _____ City _____ Boy or Girl _____
 Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 5 \\ 9 \\ 8 \\ 6 \\ 4 \\ 7 \\ \hline \end{array}$$

Ans.....

2. Multiply

$$\begin{array}{r} 43 \\ 2 \\ \hline \end{array}$$

Ans.....

3. 4) 398 and remaining

Ans.....

4. $\frac{2}{3} + \frac{1}{12}$

Ans.....

5.

$$\$8\frac{2}{5} - \$\frac{3}{10}$$

Ans.....

6.

$$\$ \frac{3}{4} \div \frac{5}{6}$$

Ans.....

7.

$$\$8.265 + \$82.65 + \$.8265 + \$826.50$$

Ans.....

8.

$$1000 \times .3$$

Ans.....

Turn over the page and work the other problems

9. 4 pints = quarts

10. I quarter — 19 cents =cents

11. Three rods =feet

12. Add 5 yd. 1 ft.
2 yd.
3 yd. 2 ft.
4 yd. 1 ft.

Ans.....

13. Multiply 5 lb. 12 oz.
9

Ans.....

14. Find the difference between \$1.62 and \$1.67 and multiply the answer by 40,000.

Ans.....

15. Add 62.5 and 1.97. Then subtract 3.62 from the answer.

Ans.....

16. Subtract 110 from 800. Add to that answer 3×42 .

Ans.....

17. Add $\$1\frac{1}{4}$ and $\$2\frac{3}{5}$. Multiply the answer by $\frac{2}{5}$. Divide \$7.65 by the last answer.

Ans.....

nd \$1.1 18. Add 32.75 to 27.75. From the answer subtract 5.75. Multiply \$.35 by the last answer.

19. Divide \$5.25 by \$1.50. Multiply \$.50 by this answer. Then subtract the last answer from \$5.25.

32 from

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y $\frac{3}{5}$ D

Ans.....

Ans.....

Pupils may not use this space.

$$\frac{\$3000}{\$1000} \times \$24$$

Find the area of a rectangle 7 inches long
3 inches wide.

Ans.....

[illegible]

Fundamentals Test—Form 11

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 236 \\ 541 \\ \hline \end{array}$$

Ans.....

2. Multiply
$$\begin{array}{r} 431 \\ 2 \\ \hline \end{array}$$

Ans.....

3.
$$\begin{array}{r} 4 \overline{) 824} \end{array}$$

Ans.....

4.
$$\frac{2}{3} + \frac{5}{6}$$

Ans.....

5.

$$7\frac{3}{4} - \frac{7}{8}$$

Ans.....

6.

$$4\frac{4}{5} \div 2$$

Ans.....

7.

$$8.265 + 82.65 + .8265 + 826.50$$

Ans.....

8.

$$10 \times .63$$

Ans.....

Turn over the page and work the other examples

9.

1 nickel =cents

10.

A half dollar — 45 cents =cents

11. A mile =yards

12. Add 3 hr. 10 min.
45 min.
1 hr. 20 min.
55 min.

Ans.....

13. Multiply $54\frac{1}{2}$ sq. in. by 23. Express the answer
~~in cu. ft.~~
in sq. ft.

Ans.....

14. Subtract 2260 from 2860 and divide the answer
by 75.

Ans.....

15. Add 56.78 and 37.29. Multiply \$479.75 by the
answer.

Ans.....

16. Subtract 89 from 117. Divide the answer by 4.
Then add 5 to the last answer.

Ans.....

17. Add $\$35\frac{9}{10}$, $\$74\frac{3}{4}$, and $\$150\frac{4}{5}$. Divide the sum
by 3. Then multiply the answer by $\frac{5}{6}$.

Ans.....

18. Ac
su

answer

18. Add \$1816.50 and \$9863.75. From that answer subtract \$975.25. Divide the last answer by 3.

19. Divide \$3.20 by 2. Add to that answer \$3.20, \$1.15 and \$.15. Then subtract the last answer from \$10.

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by the

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by 4

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2 sum

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

20.

\$2000 — \$1700

Ans.....

\$85 × 20

Ans.....

21. Find the area of a rectangle 160 feet long and 120 feet wide.

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 11		Correct																							

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4.

Fundamentals Test—Form 12

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 695 \\ 487 \\ \hline \end{array}$$

Ans.....

2. Multiply
$$\begin{array}{r} 430 \\ 2 \\ \hline \end{array}$$

Ans.....

3.
$$\begin{array}{r} 9 \overline{) 938} \end{array}$$

Ans.....

4.
$$\frac{3}{5} + \frac{1}{8}$$

Ans.....

5.

$$12\frac{1}{2} - 11\frac{1}{4}$$

Ans.....

6.

$$12 \div 4\frac{1}{2}$$

Ans.....

7. Subtract
$$\begin{array}{r} \$5.63 \\ 3.28 \\ \hline \end{array}$$

Ans.....

8.

$$100 \times .63$$

Ans.....

Turn over the page and work the other problems

10.

1 peck =quarts

9.

A half dollar = 2

11.

A sq. rd. = sq. in.

12. Add 3 T. 500 lb.
 2 T. 950 lb.
 2 T. 650 lb.
 4 T.

Ans.....

13. Multiply 6 cu. ft. by 108. Express the answer in cu. yd.

Ans.....

14. Add \$175 and three times \$27.50.

Ans.....

15. Add \$12557.89 and \$7298.51. Divide the answer by 5.

Ans.....

16. Subtract 4 from 18, and multiply \$.16 by this answer. Then divide the last answer by 4.

Ans.....

17. From \$15½ subtract \$12¾. To that answer add \$2¾ and \$1¾. Multiply the last answer by 2.

Ans.....

18. Add
ans
\$20

18. Add \$54, \$63.25 and \$13.58. Multiply that answer by 2. From the last answer subtract \$20.50.

19. Divide \$15.75 by 35. Multiply the answer by 40. Then add \$15.75 to the last answer.

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

20.

$$\$14,000 \times .80$$

21. Find the area in acres of a field 130 rods by 125 rods.

Ans.....

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 12		Correct																							

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3.

4.

Fundamentals Test—Form 13

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add
$$\begin{array}{r} 524 \\ 213 \\ 162 \\ \hline \end{array}$$

Ans.....

2. Multiply
$$\begin{array}{r} \$820 \\ 4 \\ \hline \end{array}$$

Ans.....

3.

$$31 \overline{) 434}$$

Ans.....

4.

$$\frac{3}{4} + \frac{2}{8}$$

Ans.....

5.

$$29 - 15\frac{3}{4}$$

Ans.....

6.

$$5\frac{5}{6} \div \frac{5}{12}$$

Ans.....

7. Subtract
$$\begin{array}{r} 5.63 \\ 3.28 \\ \hline \end{array}$$

Ans.....

8.

$$1000 \times \$.63$$

Ans.....

Turn over the page and work the other examples

9.

1 lb. — 12 oz. =oz.

10.

A dime = 1 nickel +cents

11.

A sq. rd. =sq. ft.

12. Add 5 bu. 2 pk.
 3 bu. 1 pk.
 3 pk.
 4 bu. 1 pk.

Ans.....

13. Multiply 240 sq. rd. by 15. Express the answer in acres.

Ans.....

14. Multiply \$.10 by 4 and subtract that answer from \$1.

Ans.....

15. Subtract \$12.25 from \$15. Add to that answer \$7.90.

Ans.....

16. Subtract 29 from 134. Divide the answer by 5. Then multiply \$115 by the last answer.

Ans.....

17. From $25\frac{3}{5}$ subtract $21\frac{3}{4}$. To that answer add $15\frac{1}{2}$. Then divide the last answer by 3.

Ans.....

answer

18. Add \$.36, \$.28 and \$.50 Divide the answer by 3. Then subtract the last answer from \$.75.

19. Divide \$21,585 by 6. To that answer add \$110. Multiply the last answer by .08.

.....
answer

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er by
r.

.....
add

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

20.

$$\$25,000 \times .0125$$

21. Find the cost of linoleum at \$1.15 per sq. ft. for a floor 19 ft. long and 16 ft. wide.

Ans.....

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade					School														Sex			
Mental	Minus	O A	Grade Score					City														Dates of Testing			
Scale	Score	I Q	T Score					State														Teacher's Name			
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 13		Correct																							

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2.

4.

Fundamentals Test—Form 14

Boy

or

Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 647 \\ 749 \\ 486 \\ \hline \end{array}$$

Ans.....

2. Multiply

$$\begin{array}{r} 42 \\ 7 \\ \hline \end{array}$$

Ans.....

3.

$$21 \overline{) \$8862}$$

Ans.....

4.

$$\frac{3}{4} + \frac{1}{6}$$

Ans.....

5.

$$6\frac{2}{3} - \frac{3}{4}$$

Ans.....

6.

$$5\frac{1}{3} \div 1\frac{1}{3}$$

Ans.....

7. Subtract

$$\begin{array}{r} \$18.50 \\ 9.75 \\ \hline \end{array}$$

Ans.....

8.

$$10 \times \$5.27$$

Ans.....

Turn over the page and work the other examples

9.

1 dozen things — 5 things =things

10.

A pint =gills

11.

An acre =sq. yd.

12. Add 2 hr. 35 sec.
 3 hr. 15 min. 20 sec.
 1 hr. 45 min. 55 sec.
 4 hr. 45 min. 16 sec.
 2 hr. 5 min. 48 sec.

Ans.....

13. Multiply 2 ft. 7 in.
 18

Ans.....

14. Multiply \$5250 by 2. Then divide the answer by 3.

Ans.....

15. Subtract 3.8 from 35.7. Multiply \$.035 by the answer.

Ans.....

16. Multiply 12 by 4. From that answer subtract 15. Add the second answer to the first one.

Ans.....

17. Subtract $\$12\frac{1}{2}$ from $\$25\frac{3}{4}$. To that answer add $7 \times \$1\frac{1}{2}$.

Ans.....

answer

18. Add 90 and 5. Multiply the answer by 2.4.
Then divide 1254 by the last answer.

19.

$$\$500 \times .05$$

by the

act 15

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

20.

$$\$12,500 + \$5,800$$

Ans.....

$$\$18,300 \times .00175$$

Ans.....

21. Find the perimeter of a rectangle having an area of $3\frac{1}{2}$ sq. yd. and a width of $1\frac{3}{4}$ yd.

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade				School										Sex								
Mental	Minus	C A	Grade Score				City										Dates of Testing								
Scale	Score	I Q	T Score				State										Teacher's Name								
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 14		Correct																							

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Fundamentals Test—Form 15

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1.

$$\begin{array}{r} \text{Add } 335 \\ 248 \\ 294 \\ 127 \\ 156 \\ 189 \\ \hline \end{array}$$

Ans.....

2. Multiply $\begin{array}{r} 45 \\ 6 \\ \hline \end{array}$

Ans.....

3.

$$55 \overline{) 3410}$$

Ans.....

4.

$$\frac{3}{4} + \frac{3}{10}$$

Ans.....

5.

$$8\frac{3}{8} - 6\frac{3}{4}$$

Ans.....

6.

$$\$ \frac{3}{4} \div 1\frac{2}{3}$$

Ans.....

7. Subtract $\begin{array}{r} 18.5 \\ 9.75 \\ \hline \end{array}$

Ans.....

8.

$$100 \times \$527$$

Ans.....

Turn over the page and work the other problems

9.

1 hour =minutes

10.

A minute = 20 sec. +seconds

11.

A sq. mile =sq. rd.

12. Add $\begin{array}{r} 3 \text{ yd. } 2 \text{ ft. } 3 \text{ in.} \\ 5 \text{ yd. } 9 \text{ in.} \\ 2 \text{ yd. } 1 \text{ ft. } 4 \text{ in.} \\ 3 \text{ yd. } 2 \text{ ft. } 5 \text{ in.} \\ 4 \text{ yd. } 1 \text{ ft.} \end{array}$

Ans.....

13. Multiply $\begin{array}{r} 3 \text{ bu. } 2 \text{ pk.} \\ 15 \end{array}$

Ans.....

14. Find $\frac{1}{2}$ of 36c. Then add 45c to the answer.

Ans.....

15. Subtract \$4.98 from \$6.30. Divide the answer by 12.

Ans.....

16. Multiply 36 by 5. Subtract that answer from 1224. Divide \$574.20 by the last answer.

Ans.....

17. From \$18,756 $\frac{3}{4}$ subtract \$17,562 $\frac{1}{2}$. Divide the answer by 3. Then add to the last answer \$183 $\frac{1}{2}$.

Ans.....

Answer

18. Add 8.75 and 4.75. Divide the answer by 2.25.
Then multiply \$5.75 by the last answer.

19.

$$\$2000 + \$90$$

Ans.....

$$\$2000 \times .045$$

Ans.....

Ans.....

Pupils may not use this space.

20.

$$\$150,000 \div \$6,000,000$$

Ans.....

21.

$$2 \times 34 \times 3$$

$$2 \times 19 \times 3$$

Ans.....

$$114 + 204$$

Ans.....

$$318 \times \$0.75$$

Ans.....

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 15		Correct																							

Name

Date

1.

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4.

Fundamentals Test—Form 16

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Add

$$\begin{array}{r} 3125 \\ 380 \\ 7 \\ 2563 \\ 94 \\ \hline \end{array}$$

Ans.....

2. Multiply

$$\begin{array}{r} 21 \\ 12 \\ \hline \end{array}$$

Ans.....

3.

$$42) \overline{1848}$$

Ans.....

4.

$$\frac{1}{6} + \frac{1}{10}$$

Ans.....

5.

$$57\frac{2}{3} - 55\frac{3}{4}$$

Ans.....

6.

$$1298\frac{3}{4} \div 5$$

Ans.....

7. Subtract

$$\begin{array}{r} \$13.598 \\ 7.788 \\ \hline \end{array}$$

Ans.....

8.

$$1000 \times \$527$$

Ans.....

Turn over the page and work the other examples

9.

225 sq. in. — 1 sq. ft. =sq. in.

10.

A day = 10 hours +hours

11. A cu. yd. =cu. in.

12. Subtract $\begin{array}{r} 5 \text{ qt. } 1 \text{ pt.} \\ 3 \text{ qt.} \\ \hline \end{array}$

Ans.....

13.

$\begin{array}{r} \hline 2) \text{ 7 pk. 2 qt.} \end{array}$

Ans.....

14. Divide 108 by 36. Then subtract 2 from the answer.

Ans.....

15. Multiply 12.5 by 3. To that answer add 3427

Ans.....

16. Multiply \$500 by 3. Add this answer to \$500. Then subtract the last answer from \$4000.

Ans.....

17. From \$5876 $\frac{3}{4}$ subtract \$2000. Multiply the answer by $\frac{1}{3}$. Divide the last answer by 2.

Ans.....

18. S
s
b

on the

18. Subtract 1.8 from 10.5 To that answer add the sum of 9.8 and 7.5. Multiply the last answer by 2.

19.

$$\$700 \times .05 \times \frac{8}{12}$$

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

20.

$$\frac{\$22,000}{\$100} \times \$1.25$$

Ans.....

21. At \$125 an acre find the selling price of all except 40 acres of a field 160 rd. square.

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 16		Correct																							

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Fundamentals Test—Form 17

Boy
or
Girl

Name _____ Grade _____ School _____ City _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. $8 - 5$

Ans.....

2.

$$\begin{array}{r} \text{Multiply } 34 \\ 20 \\ \hline \end{array}$$

Ans.....

3.

$$\begin{array}{r} 39 \overline{) 2730} \\ \hline \end{array}$$

Ans.....

4.

$$\frac{5}{8} + \frac{9}{10}$$

Ans.....

5.

$$\frac{7}{8} \times 4$$

Ans.....

6.

$$923 \div 3\frac{1}{4}$$

Ans.....

$$\begin{array}{r} \text{7. Subtract } 13.598 \\ 7.788 \\ \hline \end{array}$$

Ans.....

8.

$$.3 \times 79.25$$

Ans.....

Turn over the page and work the other problems

9.

1 cu. ft. =cu. in.

10.

A week — 3 days =days

11.

A gallon =pints

12. Subtract 15 min. 34 sec.
9 min. 23 sec.

Ans.....

13.

4) 5 hr. 4 min.

Ans.....

14. Divide 30 by 6. Multiply the answer by 1480.

Ans.....

15. Multiply 21.5 by 2.5. Subtract that answer from 60.

Ans.....

16. Multiply \$125 by 12. Then divide that answer by 5. Subtract the second answer from the first answer.

Ans.....

17. From $438\frac{1}{4}$ subtract $383\frac{3}{4}$. Divide the answer by $\frac{3}{4}$. Multiply $\$123\frac{4}{5}$ by the answer.

Ans.....

18.

by 1480.

18. Subtract 32564.5 from 33564.5. Add \$1.15 and \$3.75. Then divide the last answer by 5.

19.

$$\$900 \times .05 \times \frac{.00}{360}$$

Ans.....

Ans.....

Pupils may not use this space.

20.

$$\$3750 \div .75$$

Ans.....

$$\$112.5 \div .03$$

Ans.....

21. Find the selling price at \$125 per acre of a triangular field having the same base and altitude as a rectangle 450 rods long and 120 rods wide.

Ans.....

CUMULATIVE RECORD OF

Multi—	Total	M A	Grade	School	Sex																				
Mental	Minus	C A	Grade Score	City	Dates of Testing																				
Scale	Score	I Q	T Score	State	Teacher's Name																				
		No. of Problem or Example	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Arithmetic Reasoning		Attempted																							
Form		Correct																							
Arithmetic Fundamentals		Attempted																							
Form 17		Correct																							

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Fundamentals Test—Form 18

ere of a
and al-
120 rods

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____
Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1.

$$17 - 9$$

Ans.....

2.

Multiply $\begin{array}{r} \$59 \\ 25 \\ \hline \end{array}$

Ans.....

3.

$$17 \overline{) 1054}$$

Ans.....

4.

$$1\frac{3}{8} + \frac{1}{8}$$

Ans.....

5.

$$7 \times \frac{3}{4}$$

Ans.....

6. Add $\begin{array}{r} \$.15 \\ .39 \\ .14 \\ .28 \\ \hline \end{array}$

Ans.....

7. Subtract $\begin{array}{r} \$76.45 \\ 23.76 \\ \hline \end{array}$

Ans.....

6.

$$.9 \times \$8.75$$

Ans.....

9. 1 hundredweight — 93 pounds =pounds

10. A year — 180 days =days

11. A quart =gills

12. Subtract $\begin{array}{r} 16 \text{ ft. } 8 \text{ in.} \\ 7 \text{ ft.} \end{array}$

Ans.....

13.

3) 12 gal. 3 qt.

Ans.....

14. Add $1\frac{1}{2}$ and $1\frac{1}{4}$. Then subtract that number from 3.

Ans.....

15. Multiply 11.35 by 62.5. Divide 248,281.25 by the answer.

Ans.....

16. Multiply 20 by 3. Add this number to 20 plus 40. Divide the last answer by 30.

Ans.....

17. Multiply $\$8\frac{1}{4}$ by $50\frac{1}{4}$. From this answer subtract $\$128\frac{1}{4}$. Then add $42\frac{1}{6}$ to the last answer.

Ans.....

25 by 18. From 1236.75 subtract 600. Multiply \$.40 by the answer. Then add \$300 to the last answer.

19.

$$\$4200 \times .06 \times 4$$

Ans.....

Ans.....

Pupils may not use this space.

Fundamentals Test—Form 19

ase of 27

Name _____ Grade _____ School _____ City _____

Boy
or
Girl

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. $61 - 56$

Ans.....

2. Multiply $\begin{array}{r} \$975 \\ 83 \\ \hline \end{array}$

Ans.....

3.

$\$28) \3444

Ans.....

4.

$2\frac{7}{8} + 2\frac{3}{8}$

Ans.....

5.

$\frac{3}{4} \times \frac{2}{3}$

Ans.....

6. Add $\begin{array}{r} .15 \\ .39 \\ .14 \\ .28 \\ \hline \end{array}$

Ans.....

7. Subtract $\begin{array}{r} 76.45 \\ 23.76 \\ \hline \end{array}$

Ans.....

8.

$62.25 \times \$44$

Ans.....

Turn over the page and work the other examples

9.

1 long ton — 1 short ton =pounds

10. Two months =weeks

11. A peck =pints

12. Subtract $\begin{array}{r} 5 \text{ yd. } 1 \text{ ft.} \\ 3 \text{ yd. } 2 \text{ ft.} \\ \hline \end{array}$

Ans.....

13.

$5 \overline{) 16 \text{ yd. } 2 \text{ ft.}}$

Ans.....

14. Add $\frac{1}{2}$ and $1\frac{3}{4}$. Then multiply the answer by 12. 18.

Ans.....

15. Divide \$95.75 by 8. Add \$8.06 to the answer.

Ans.....

16. Multiply \$58 by 16. Divide this answer by 4. Add \$118 to the last answer.

Ans.....

17. Multiply \$.40 by $2\frac{3}{4}$. Subtract the answer from \$2 $\frac{1}{4}$. Divide the last answer by 2.

Ans.....

answer by

18. From \$.75 subtract \$.07. Then divide the remainder by \$.08. Add to the last answer 14.5.

19.

$$\$700 \times .06 \times \frac{324}{360}$$

answer

Ans.....

$$\$700 + \$37.80$$

er by 4

Ans.....

Ans.....

Pupils may not use this space.

$$\$9000 \div .60$$

Ans.....

$$90 \times \$100$$

Ans......

$$\$202.50 \div \$2.25$$

Ans......

Ans.....

[illegible]

Fundamentals Test—Form 20

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de 18 R

Name _____ Grade _____ School _____ City _____ Boy
or
Girl _____

Date _____ Age _____ When is your next birthday? _____ How old will you be? _____

DIRECTIONS TO PUPILS: You will find some of these problems very easy and some difficult. Try each one but do not waste time on any which you do not know how to do. There are problems on the 4 pages. Do as many as you can and do them as well as you can. Do all work in the space below the problems. Be sure to write your answers on the dotted lines where you see Ans. printed.

1. Subtract $\begin{array}{r} \$49 \\ 36 \\ \hline \end{array}$

Ans.:.....

2. Multiply $\begin{array}{r} 287 \\ 365 \\ \hline \end{array}$

Ans.....

3.
$$\begin{array}{r} 52 \overline{) \$ 5616} \end{array}$$

Ans.....

4. $6\frac{1}{8} + 5\frac{1}{4}$

Ans.....

5. $4\frac{3}{4} \times \$2$

Ans.....

6. Add $\begin{array}{r} \$26 \\ .39 \\ .47 \\ .36 \\ .45 \\ \hline \end{array}$

Ans.....

7. Subtract $\begin{array}{r} \$25 \\ 18.68 \\ \hline \end{array}$

Ans.....

14. $.125 \times \$8.75$

Ans.....

Turn over the page and work the other problems.

9.

1 score — 1 dozen =

10. A year =months

11. A bushel =quarts

12. Subtract 8 gal. 1 qt.
 2 qt.

Ans.....

13.

5) 7 T. 1000 lb.

Ans.....

14. Add $2\frac{1}{8}$ and $1\frac{1}{6}$ Then divide the answer by 6. 18. F b

Ans.....

15. Divide \$6.72 by 14. Subtract the answer from \$1.25.

Ans.....

16. Divide \$50,000 by 4. Subtract \$4250 from this answer. Multiply the last answer by 8.

Ans.....

17. Multiply $2\frac{1}{2}$ by 6. Add $8\frac{1}{4}$ to the answer. Then subtract the answer from $31\frac{1}{2}$.

Ans.....

18. From 1582.5 subtract 436. Multiply the answer by .88. Then divide that answer by 4.

19.

$$\$1000 + \$44.69$$

Ans.....

$$\$1000 \times .05 \times \frac{143}{390}$$

Ans.....

Ans.....

Pupils may not use this space.

Turn over the page and finish the examples

\$625 — \$125

Ans......

$$\$625 \times .20$$

Ans.....

21. Find $\frac{1}{24}$ of the circumference of a circle with a diameter 32 inches.

Ans.....

[illegible]

SERIES 1 (16 problems)

ONE-STEP PROBLEMS IN ADDITION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Jane went to the fair. She bought a popcorn ball for 3 cents and a glass of lemonade for 5 cents. How much did she pay for both?	7-0		
2.	John has 25 marbles and James has 23. How many marbles have they together?	7-0		
3.	Ruth has 4 white kittens, 2 black kittens, and 3 gray kittens. How many kittens has she?	7-0		
4.	Jack worked 9 problems on Wednesday and 7 problems on Thursday. How many problems did he work those two days?	7-0		
5.	Harry caught 19 fish and Joe caught 7. How many did they both catch?	7-6		
6.	Mary, Sue, Ellen, and Betty had a doll party. Mary brought her 5 dolls, Betty brought 2, Sue brought 4 and Ellen brought 7. How many dolls came to the party?	7-6		

SERIES 1 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	In our school there are 35 children in the kindergarten, 27 in the first grade, 29 in the second, and 38 in the third grade. How many children are there altogether in these grades?	7-6		
8.	Farmer Brown has 18 horses, 7 sheep, 30 pigs, and 49 cows. How many animals does he own?	7-6		
9.	Jack went to the circus and saw 5 lions, 9 monkeys, 8 camels, 6 elephants, 4 bears and 7 ponies. How many animals did he see there?	7-6		
10.	In our library there are 524 story books, 213 history reference books, and 162 geography reference books. How many books does that make?	7-6		
11.	Mary and her mother went to the city. They rode 65 miles on the train, and 57 miles in an automobile. What is the distance to the city?	8-0		
12.	There were 236 grown people and 541 children at the play. How many people saw the play?	8-0		

SERIES 1 (continued)

ONE-STEP PROBLEMS IN SUBTRACTION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	The milkman delivered 695 quarts of milk yesterday and 487 quarts today. How many quarts did he deliver in the two days?	8-0	8-0 (90.2%)	
14.	A dealer bought 647 yards of muslin, 749 yards of percale, and 486 yards of cotton cloth. How many yards of cloth did he buy?	8-6	8-6 (75.7%)	
15.	In the largest department stores of our city there are 335 salesmen employed in one store, 248 in another, 294 in another, 127 in another, 156 in the next, and 189 in the last. How many salesmen are employed in the six stores?	9-0	9-0 (88.7%)	
16.	Jack was employed at the post-office selling stamps. At the end of the day he found that he had sold 3125 two-cent stamps, 380 five-cent stamps, 7 special delivery stamps, 2563 one-cent stamps, and 94 ten-cent stamps. How many stamps did he sell that day?	9-6		

SERIES 2 (11 problems)

ONE-STEP PROBLEMS IN SUBTRACTION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Jack had 8 cents. He paid 5 cents for an ice-cream cone. How much had he left?	8-6	9-0 (93.2%)	
2.	Helen found 17 violets. Alice found only 9. How many more did Helen find than Alice?	8-6	9-0 (79.7%)	
3.	Mrs. Carter had \$49. She spent \$36 for a dress and a hat. How much money had she left?	8-6	9-0 (85.7%)	
4.	Tom had 61 marbles at the beginning of the game. At the end he had only 56. How many did he lose?	7-6		
5.	My brother wants to buy a second-hand automobile which costs \$375. He has \$231. How much must he save before he can buy it?	8-6		
6.	There were 436 girls and 302 boys in the parade. How many more girls than boys were there?	8-6		

SERIES 2 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	The milkman delivered 79 quarts of milk this morning. How many had he still to deliver if he had 92 quarts when he started out?	9-6	9-0 (97.6%)	
8.	In a dry goods store there were 513 bolts of sheeting of which 365 bolts were sold. How many bolts remained unsold?	9-6	9-0 (97.6%)	
9.	Of the 309 pupils in a school 275 were born in the United States. How many were born in a foreign country?	9-6		
10.	Mr. Taylor paid \$8000 for a house. He sold it for \$7365. How much did he lose by the sale?	9-6		
11.	At an auction my father bid \$4288 on a house. The highest bidder paid \$5009 for it. How much more was offered by the buyer than by my father?	10-6		

SERIES 3 (16 problems)

ONE-STEP PROBLEMS IN MULTIPLICATION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	How much do 5 two-cent stamps cost?		9-0 (97.6%)	
2.	At 9 cents a quart how much will 7 quarts of milk cost?		9-0 (88.2%)	
3.	Daddy is 43 years old. Grandpa says that he is twice as old as that. How old is Grandpa?	9-0		
4.	Dick read 431 lines during reading time. Joe read twice as many lines. How many lines did Joe read?	9-0		
5.	A dealer sold 4 used automobiles at \$820 each. How much did he receive for the 4 automobiles?	9-0		
6.	Jack had \$59 in the bank. His big brother had exactly 25 times as much money as that. How much had his brother?	9-0		

SERIES 3 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A grocer's boy put up 430 two-pound sacks of sugar. How many pounds of sugar did he put up?	9-6		
8.	There were 42 boys in each of the 7 divisions in the parade. How many boys were in the parade?	9-6		
9.	A shepherd put his sheep in 6 pastures each containing 45 sheep. How many sheep did he have?	9-6		
10.	The girls in camp made 34 cups of coffee from a pound of coffee. They have a supply of 20 pounds of coffee. How many cups of coffee will they be able to make?	9-6		
11.	A large loaf of bread makes 21 sandwiches. How many sandwiches could you make from 12 large loaves?	9-6		
12.	A dealer sold a lot of 83 automobiles at \$975 each. How much did he receive for the lot?	10-6		

SERIES 3 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	In one week a traveling salesman received orders for 500 radios at \$178 each. What was the total value of his sale for the week?	10-6	8-0 (52.5%)	
14.	An engineer whose freight train travels on an average 395 miles per day, works 305 days in the year. How many miles does the engineer travel on his train in a year?	10-6		
15.	What does it cost to give 370 pupils a high school education when the cost per pupil is \$275?	11-0		
16.	On an average the Continental Hotel buys 287 pounds of meat every day. How much meat is bought by the hotel during the year?	12-0		
	An airplane flies 252 miles in 6 hours. How far does it fly in an hour?	13-0		
	Jack stayed at Mr. Smith's house 30 days for summer. How many full weeks was that?	10-5		

SERIES 4 (9 problems)

ONE-STEP PROBLEMS IN SHORT DIVISION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	At 2 cents each, how many pencils can you buy for a dime?	10-6	8-0 (62.5%)	
2.	Daddy brought home 36 marbles to be divided equally among Joe, Dick and Harry. How many marbles did each boy get?	9-6		
3.	In a week there are seven days. How many weeks are there in 56 days?	9-6		
4.	A newspaper printer used 36963 sheets of paper in 3 days. How much did he use on an average every day?	10-0		
5.	An airplane flies 252 miles in 6 hours. How far does it fly in an hour?	10-0		
6.	Jack stayed at his aunt's home 59 days last summer. How many full weeks was that, and how many days more?	10-6		

SERIES 4 (continued)

ONE-STEP PROBLEMS IN LONG DIVISION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A man left 398 acres of farm land to be divided equally among his four sons. How much did each son receive?	10-6		
8.	A grocer's clerk was told to put up 824 pounds of coffee in packages containing 4 lb. each. How many packages could he make?	10-6		
9.	A street car conductor collected 938 fares during a nine-hour work day. On an average, how many fares did he collect every hour?	11-6		
4.	A piano manufacturer sold 12 pianos for \$1200. What did he receive for each piano?	10-0		
5.	In our State a bushel of onions weighs 35 lb. How many bushels can a farmer get from 350 lb. of onions?	10-0		
6.	A bicycle dealer sold \$345 in bicycles. If each bicycle cost \$17, how many bicycles did he sell?	10-0		

SERIES 5 (11 problems)

ONE-STEP PROBLEMS IN LONG DIVISION OF INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	We are going to drive in an auto to see our grandmother who lives 434 miles from here. How long will it take us to make the trip if we drive 31 miles an hour?	9-0		
2.	A poultry keeper has 1848 chickens. He finds that by keeping 42 in a coop he can provide place for all of the chickens. How many coops has he?	9-0		
3.	In a large dairy 39 boys are employed to wrap pound-packages of butter. When there are 2730 pounds to be wrapped, how many packages should each boy wrap?	9-6		
4.	A piano manufacturer sold 21 pianos for \$8862. What did he receive for each piano?	10-0		
5.	In our State a bushel of onions weighs 55 lb. How many bushels can a farmer get from 3410 lb. of onions?	10-0		
6.	A bicycle dealer invested \$3444 in bicycles at \$28 apiece. How many bicycles did he buy?	10-0		

SERIES 5 (continued)

ONE-STEP PROBLEMS IN ADDITION OF FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A commission merchant shipped 1054 barrels of apples. It took 17 freight cars to haul them. How many barrels did each car hold?	10-6		
8.	The monthly payroll for 52 employees of the Excelsior Laundry amounts to \$5616. What is the average monthly wage of these employees?	10-6		
9.	The total annual cost of irrigating 137 farms in Oklahoma is \$47,539. What is the average cost per farm?	11-6		
10.	During 312 working days last year the Jenkins Can Company turned out a total of 23,589,696 cans. What was the average daily output?	11-6		
11.	The expense for caring for our parks last year amounted to \$98,550. What was the average daily expense for the parks last year?	14-6		
12.	Tom and Joe helped their father to shovel away the snow from the path before they went to school. Tom did $\frac{1}{3}$ of the path and Joe did $\frac{1}{4}$ of it. How much of the entire path did the boys do?	11-0		

SERIES 6 (18 problems)

ONE-STEP PROBLEMS IN ADDITION OF FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	The dressmaker used $\frac{2}{9}$ of a yard of trimming for the cuffs and $\frac{2}{9}$ of a yard for the collar on Elsie's new dress. How much trimming did she use?	9-6		
2.	Fred rode $2\frac{7}{8}$ miles on his scooter yesterday and $2\frac{3}{8}$ miles today. How far did he ride in both days?	9-6		
3.	Aunt Bess bought $1\frac{3}{8}$ pounds of fudge and $1\frac{1}{8}$ pounds of caramels at the candy sale. How many pounds of candy did she buy?	10-0		
4.	The grocer sent Mrs. Smith $\frac{3}{4}$ of a bushel of red tomatoes and $\frac{3}{8}$ of a bushel of green tomatoes. How many bushels of tomatoes did he send her?	10-6		
5.	Alice made her doll a dress with $\frac{3}{4}$ of a yard of blue China silk and $\frac{1}{6}$ of a yard of tan silk. How much silk did she use to make the dress?	10-6		
6.	Tom and Joe helped their father to shovel away the snow from the path before they went to school. Tom did $\frac{3}{10}$ of the path and Joe did $\frac{2}{10}$ of it. How much of the entire path did the boys do?	11-0		

SERIES 6 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	My sister bought $\frac{5}{8}$ of a yard of blue ribbon and $\frac{5}{8}$ of a yard of orange ribbon. How much ribbon did she buy?	11-0		
8.	$\frac{1}{5}$ of the boys and $\frac{1}{10}$ of the girls in our class have not been absent from school this year. What part of the class has not been absent?	11-0		
9.	The front door mat is $\frac{3}{4}$ of a yard long. The back door mat is $\frac{2}{3}$ of a yard long. How long a mat could be made by placing the two together lengthwise?	11-0		
10.	Nan studied $6\frac{1}{5}$ hr. last week in school, and $5\frac{1}{4}$ hr. at home. How many hours of study was that for the week?	11-0		
11.	It took Robert $\frac{2}{3}$ of an hour to walk to church and $\frac{5}{6}$ of an hour to return home. How much time did he spend going and coming?	11-6		
12.	At a remnant sale Mrs. Jones bought 2 pieces of blue velvet. One piece was marked $\frac{3}{5}$ of a yard. The other was marked $\frac{1}{3}$ of a yard. How much velvet did Mrs. Jones buy?	11-6		

SERIES 6 (continued)

ONE-STEP PROBLEMS IN SUBTRACTION OF COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	My father walks $\frac{3}{4}$ of a mile north of our home and $\frac{3}{10}$ of a mile west to reach his office. How far is it from our home to his office?	12-0	9-0 (66.6%)	
14.	The butcher sent $7\frac{5}{8}$ pounds of roast beef and $3\frac{7}{8}$ pounds of pork chops. How many pounds of meat did he send?	12-6		
15.	John lives $\frac{4}{5}$ of a mile from school. Dan lives $\frac{3}{5}$ of a mile farther than John. How far from the school does Dan live?	13-0		
16.	A man has an acre of ground. He planted $\frac{2}{3}$ of it in Irish potatoes and $\frac{1}{12}$ of it in sweet potatoes. What part of his field did he plant in potatoes?	13-0		
17.	Jennie used $\frac{5}{8}$ of a skein of wool to make a skating cap and $\frac{3}{10}$ of a skein to make a scarf for her largest doll. How many skeins of wool did she use?	13-0		
18.	Yesterday Frank studied his spelling $\frac{1}{6}$ of an hour before lunch and $\frac{1}{10}$ of an hour in the afternoon. What part of an hour did he spend on his spelling yesterday?	14-0		

SERIES 7 (15 problems)

ONE-STEP PROBLEMS IN SUBTRACTION OF COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	There were $7\frac{3}{4}$ bushels of hickory nuts in the attic. Last night Frank brought down $\frac{7}{8}$ of a bushel to crack. How many bushels were then left in the attic?		9-0 (66.6%)	
2.	Helen bought $\frac{4}{9}$ of a yard of lace for her doll cap. The lace was $\frac{2}{9}$ of a yard too long. How much did she need for the cap?	9-6		
3.	Dick wanted to gain $15\frac{3}{8}$ pounds in weight so as to get on the foot ball team. He joined the nutrition class and gained 12 pounds in a month. How much did he still have to gain?	9-6		
4.	Joe made a record of $12\frac{1}{2}$ ft. in the running broad jump. Bill reached only $11\frac{1}{4}$ ft. How much farther did Joe jump than Bill?	9-6		
5.	The cook had $\frac{5}{6}$ of a pie left from dinner. She gave Billy a piece that was just $\frac{1}{6}$ of the whole pie. How much of the pie was then left?	11-6		
6.	The Boy Scouts in our class collected $\$8\frac{2}{5}$ toward the Red Cross fund. They spent $\$1\frac{3}{10}$ out of the collection for certain expenses. How much did they then have to contribute to the fund?	11-6		

SERIES 7 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Mr. Jones lives 29 miles from his office. He goes $15\frac{3}{4}$ miles by train and the rest of the way in an auto-bus. How far does he go in the bus?	11-6		
8.	Alice's mother bought $8\frac{3}{8}$ yards of pink lawn. She used $6\frac{3}{4}$ yards to make Alice and Betty a dress. How many yards were left to make the baby sister a dress?	11-6		
9.	John lives $\frac{3}{5}$ of a mile from school. James lives $\frac{1}{4}$ of a mile from school. How much farther does John live than James?	12-0		
10.	One night in January the ice on our pond increased in thickness from $\frac{1}{4}$ of an inch to $\frac{5}{8}$ of an inch. How much did it increase that night?	12-6		
11.	A piece of cloth that was $57\frac{2}{3}$ yd. long before it was sponged shrank to $55\frac{3}{4}$ yd. after it was sponged. How many yards did it shrink?	12-6		
12.	Hazel had $\frac{7}{10}$ of an hour free time this morning in school. She spent $\frac{1}{5}$ of an hour in the gymnasium. What part of an hour had she left?	13-0		

SERIES 8 (11 problems)

ONE-STEP PROBLEMS
IN
MULTIPLICATION OF COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	We bought 12 yards of red baby ribbon to tie up our Christmas presents. How much did it cost us at $5\frac{1}{2}$ cents a yard?	10-6		
2.	Joe lives 4 miles from school. His father brings him $\frac{7}{8}$ of the way in his auto every morning. How many miles does Joe ride in the auto on his way to school?	11-6		
3.	Betty Ann is going to make 7 doilies for Mother. She needs $\frac{3}{4}$ of a skein of floss for each doily. How many skeins does she need?	11-6		
4.	Mother bought $4\frac{3}{4}$ yd. of silk to make party dresses for Bertha and Jane. She paid \$2 a yd. for it. How much did the silk cost?	11-6		
5.	A real estate agent had 6 large suburban lots which he sold at $\$965\frac{2}{5}$ each. How much did he receive for the lots?	11-6		
6.	My grandfather once bought some railroad stock for \$258. Some years later he sold it for $4\frac{2}{3}$ times the amount he paid for it. What was the selling price of the stock?	12-0		

SERIES 8 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Our electrician charges $\$2\frac{1}{2}$ per hr. How much does he receive for $4\frac{1}{3}$ hours of work?	12-6		
8.	Last year Daniel's health chart showed a monthly increase of $\frac{5}{8}$ of a pound. This year his monthly gain is $2\frac{1}{5}$ times as good as it was last year. How much does he now gain every month?	13-0		
9.	Our grocer had only $28\frac{1}{2}$ lb. of sugar left one day after a special sale. He had had $56\frac{2}{3}$ times as much as that at the opening of the sale in the morning. How much sugar did he have at the opening of the sale?	14-0		
10.	At a linen sale Mother bought a yard remnant for the amount she would generally have to pay for $\frac{3}{4}$ of a yard. Instead of $\$2\frac{2}{3}$ which is the regular price of a yard of linen what did she have to pay for the yard remnant?	14-6		
11.	Jack lives $\frac{2}{3}$ of a mile from the playground. One day when he was skating home his skate strap broke and he had to ride $\frac{3}{4}$ of the way on one skate. How far did he ride on one skate?	15-0		

SERIES 9 (10 problems)

ONE-STEP PROBLEMS
IN
DIVISION OF COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	The daily session in the Washington School is $5\frac{1}{3}$ hours. It is divided into periods of $1\frac{1}{3}$ hours each. How many periods are there during the daily session?		10-0 (64%)	
2.	It takes $\frac{4}{9}$ of a yard of ribbon to make a hair-band. How many bands will Mary be able to make out of 20 yards of ribbon?	12-6		
3.	Our soldiers are given a ration of $4\frac{1}{5}$ oz. of beans every two days while in garrison. What is their daily ration of beans while in garrison?	13-0		
4.	On our automobile tour last summer we travelled $1298\frac{3}{4}$ mi. in 5 days. How far did we travel on an average each day?	13-6		
5.	A touring party made the trip of 923 miles between Cincinnati and Boston in $3\frac{1}{4}$ days. What was the average daily distance covered?	13-6		
6.	How many lengths of floss each $\frac{5}{12}$ of a yard long can be cut from a skein of silk $5\frac{5}{6}$ yards long?	14-0		

SERIES 9 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Mrs. Lane gave $\frac{1}{2}$ bushel of apples to the 5 boys who were weeding the garden. What part of a bushel did each boy get?	14-6		
8.	Alice read $4\frac{1}{2}$ pages of her story in 12 minutes. How many minutes did it take her to read a page?	14-6		
9.	John sold his pair of rabbits for $\$ \frac{3}{4}$ which was exactly $\frac{5}{6}$ of what he paid for them. What part of a dollar did the rabbits cost him?			16-0 (31.4%)
10.	Tony sells $1\frac{2}{3}$ dozen bananas for $\$ \frac{3}{4}$. What part of a dollar does he charge for a dozen?			16-0 (29.5%)

SERIES 10 (14 problems)

ONE-STEP PROBLEMS IN ADDITION OF DECIMALS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	At the art store I bought some drawing paper for \$.15, a box of paints for \$.39, some crayons for \$.14, and a tube of paste for \$.28. What was the amount of my bill?		9-0 (93.6%)	
2.	The fifth grade pupils are selling health stamps for the Red Cross fund. Bill sold \$3.72 worth; Lawrence, \$4.34 worth; Tom, \$2.28 worth; and Dick, \$3.75 worth. How much money did these four boys turn in for the fund?	8-0		
3.	Tom Brown's lunch bill at the school cafeteria last week was: \$.26 on Monday, \$.39 on Tuesday, \$.47 on Wednesday, \$.36 on Thursday, and \$.45 on Friday. How much was his bill for the week?	8-6		
4.	The weather bureau in Sheffield, Alabama showed the following rainfall last week: Monday, .26 inches; Tuesday, .39 inches; Wednesday, .47 inches; Thursday, .36 inches; Friday, .45 inches; How much rainfall was there in Sheffield during the five days mentioned?	9-0		
5.	The boys measured the race track they had built at camp. From the starting point to the pine tree is .15 miles. From the pine tree to the turn is .39 miles. From the turn to the circular grass plot is .14 miles, and from there to the finishing line is .28 miles. How far does Jack go on his bicycle when he rides around the track once?	9-6		
6.	Jack saw several pieces of marble lying near the new gymnasium. The weight of each piece was marked on the side. Jack wanted to know the entire weight of all the pieces, so he copied the figures which included: 8.265 lb., 82.65 lb., .8265 lb. and 826.50 lb. What answer should he get?	9-6		

SERIES 10 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Mr. Bauer tested the milk of his four dairy cows for butter fat. The cows showed the following amounts of butter fat to every 100 lb. of milk: Diana, 3.72 lb.; Beauty, 4.34 lb.; Flossy, 2.28 lb.; and Princess, 3.75 lb. Find the total amount of butter fat in 100 lb. of milk from each of these cows.	10-0		
8.	The boys in the General Science class had to measure objects in the laboratory that were less than a meter in length. The most accurate work was done by four of the boys who reported as follows for the objects which they measured: .315 meter, .275 meter, .485 meter and .365 meter. What was the total length in meters of the all objects measured by these four boys?	10-0		
9.	Jane went on an excursion to Mt. Vernon. She paid \$3.24 for her ticket, \$.75 for lunch, \$.06 for post-cards, \$1 for souvenirs, and \$.29 for a box of marshmallows. How much did she spend?	10-6		
10.	Harry's big brother had to pay personal taxes last year, as follows: \$5.234, \$6.003, \$8.29 and \$5. How much personal tax did he have to pay?	10-6		
11.	Mr. Davis bought a second-hand truck for \$826.50. He also spent \$82.65 for tires, \$.8265 for spark plugs, and \$8.265 for a battery. What did he pay for all?	10-6		
12.	The boys decided to build a shack in Pierre's back yard with some lumber that they found near the garage. They measured the pieces with a meter stick and found that they were of the following lengths: 5.234 meters, 6.003 meters, 8.29 meters and 5 meters. How many meters were there in the four pieces they measured?	11-0		

SERIES 10 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	At a special sale, Mrs. Scott bought a pound of Golden Blend coffee for \$.315, a can of California peaches at \$.275, a pound of Picot tea at \$.485, and a dozen oranges at \$.365. What was the amount of her bill?	11-0		
14.	At Christmas time Jane sent parcel-post packages to some of her friends. She weighed them to find out how much she would have to pay. They weighed 3.24 lb., 75 lb., .06 lb., 1 lb., and .29 lb. What was the total weight of all the packages?	12-0		

SERIES 11 (14 problems)

ONE-STEP PROBLEMS IN SUBTRACTION OF DECIMALS

		Mental Age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	A real estate agent sold 76.45 acres of ground to Mr. Smith and 23.76 acres to Mr. Brown. How much more did he sell to Mr. Smith than to Mr. Brown?		9-0 (66%)	
2.	Jack's cyclometer showed 7.788 miles when he started to his grandmother's. When he reached there it showed 13.598 miles. How far is it from his house to his grandmother's?		9-0 (61.3%)	
3.	Mr. Green paid \$5.63 for a small radio last year. When he bought a larger one John offered him \$3.28 for the small one. How large a reduction was John asking?		9-0 (60.7%)	
4.	The April rainfall in this city was 5.63 inches. The rainfall in May amounted to only 3.28 inches. How much greater was the rainfall in April than in May?		9-0 (54.4%)	
5.	The high water mark of the Green River is 18.5 feet. During a recent dry season the water went down to 9.75 feet. How many feet below the high water mark was the river then?	9-6		
6.	John's savings account last December amounted to \$13.598. In June it showed a total of \$7.788. How much had he withdrawn?	9-6		

SERIES 11 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Martha received a \$25 Christmas Savings check. She spent \$18.68 for gifts and put the rest in the bank for the next year. How much did she put in the bank?	9-6		
8.	Fred bought a motorcycle for \$76.54. He paid \$23.76 on it during the first four months. How much did he still owe?	9-6		
9.	Harry's grandfather asked him which he would prefer: \$12.50 or \$12.005. How much would Harry lose by choosing the smaller amount?	9-6		
10.	Tom earned \$18.50 during vacation. His brother Bill earned \$9.75. How much more did Tom earn than his brother?	10-0		
11.	Dick makes a running broad jump of 12.5 feet. Joe's record is 12.005 feet. How much better than Joe's record is Dick's?	13-0		
12.	With a high power microscope Louise was able to see bacteria that were only .0004 inch in length. Her teacher showed her some that were only .00019 inch in length. How much smaller than Louise's were those that the teacher showed her?	14-0		

SERIES 11 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	At one time during the World War the French centime was worth only \$.0004. The same day the Belgian centime was worth only \$.00019. Of how much more value was the one than the other?	14-6		
14.	The distance by automobile from Uncle Joe's to Grandma's is 18.68 miles. On the same road from Uncle Joe's to our house it is 25 miles. How far is it from Grandma's to our house?			16-0 (37.1%)

SERIES 12 (15 problems)

ONE-STEP PROBLEMS
IN
MULTIPLICATION OF DECIMALS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	A commission merchant bought 1000 bushels of turnips at \$.527 per bu. How much did the turnips cost him?		10-0 (67%)	
2.	Yesterday our grocer bought 10 bushels of turnips from a farmer at \$.527 per bushel. How much did the lot cost him?		9-0 (65%)	
3.	A music dealer bought 1000 victrola records at \$.63 each. What did he pay for them all?		9-0 (56%)	
4.	The annual rainfall in our state is about 32.41 inches. This year on account of heavy storms it was twice as heavy. How many inches of rainfall did we have?	9-0		
5.	It has been proved that .63 of the weight of white potatoes is water. How much water is there in 100 lb. of white potatoes?	9-0		
6.	Four barrels of sugar each containing 236.8 pounds were shipped to us yesterday. How many pounds of sugar did we receive?	9-6		

SERIES 12 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A dealer bought 100 bushels of turnips at \$.527 per bu. What was the total cost of the turnips?	10-0		
8.	Our grocer had 65.25 pounds of coffee valued at \$.44 per pound. How much was the coffee worth?	10-6		
9.	Grandmother lives .3 of a mile from our house. Uncle Ned lives 10 times as far away as that. How far away from our house does he live?	12-0		
10.	We needed 100 badges for our division of the parade. Each badge required .3 yd. of ribbon. How much ribbon did we have to buy?	12-0		
11.	How much ribbon must our school buy in order to make 1000 armbands, when each band requires about .3 yd. of material?	12-0		
12.	A traction company is laying a track 10 miles in length, and .63 of the track is finished. How many miles of track have been laid?	13-0		

SERIES 12 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	A farmer sold .3 of his farm of 79.25 acres. How many acres did he sell?	14-0		
14.	Stock bought at \$.875 per share was sold at a gain of .125 of the cost. What was the gain on each share?			16-0 (45.2%)
15.	Mr. Smith promised that every time Joe earned \$.875 for his college fund, he would give him .9 of that amount to add to his savings account. How much did his father have to give Joe each time he himself earned \$.875?			16-0 (33%)

SERIES 13 (8 problems)

ONE-STEP PROBLEMS IN DIVISION OF DECIMALS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	In the Glee Club treasury there are \$34.14. What amount belongs to each of the six members of the club?	9-6		
2.	The school garden is .96 acre in extent. We want to mark off as many sections of .12 acre as possible. How many can we mark off?	12-0		
3.	A jeweler has a diamond of 36.75 carats. How many diamond chips of .875 carats can he cut from the large diamond?	12-0		
4.	A quart of milk weighs 2.15 pounds. How many quarts of milk does the milkman have if he has 430 pounds of milk?	13-0		
5.	In the city we ride .6 of a mile a minute. At that rate how long will it take us to travel 34.14 miles?	13-6		
6.	Mabel bought a silk remnant containing 2.75 yd. for \$3.30. How much did the silk cost per yard?	15-0		

SERIES 13 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	In an ammunition factory a workman made 2 shells. One was 1.215 inches in circumference. The other was 3.0375 inches in circumference. How many times was the one larger than the other?		9-0 (73%)	16-0 (35%)
8.	In an air race the winner made a record of 19.8 miles in .22 of an hour. At the same rate how far could the winner have gone in an hour?		9-0 (73%)	16-0 (32.6%)
9.	Harry spent 3 days of last week at his uncle's house. How many days of last week was he at home?		9-0 (73%)	
10.	Your brother who was 12 years old 3 years ago gave him one nickel every week. How many cents did you give him?		9-0 (73%)	

SERIES 14 (40 problems)

ONE-STEP PROBLEMS
IN
REDUCTION OF DENOMINATE NUMBERS

		Mental age obtaining:		
		50%	Minimum %	Maximum %
		accuracy	accuracy	accuracy
1.	Tom bought a drum for a half dollar and sold it soon after for 45c. How much did he lose on it?		8-0 (75%)	
2.	My aunt bought us a dozen large bananas. We ate 5 of them. How many have we left?		9-0 (86.2%)	
3.	Harry wants me to give him nickels for his pennies. How many cents should he give me for each nickel?		9-0 (86%)	
4.	You buy 7c worth of candy and give the man a dime. How much change should you receive?		9-0 (85.3%)	
5.	Harry spent 3 days of last week at his aunt's house. How many days of last week was he at home?		9-0 (72.1%)	
6.	Your brother asks you to change a dime. You give him one nickel and some cent pieces. How many cent pieces do you give him?		9-0 (71%)	

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A special school assembly yesterday lasted an hour. How many minutes did it last?		9-0 (61%)	
8.	Mother has four pint-bottles full of milk. How many quarts of milk has she?	8-6		
9.	I went into a feed store and asked the man to weigh me. He put on a hundred-weight. I weigh only 93 pounds. How many pounds too much did he have on?	9-0		
10.	I had a quarter to spend for my lunch. I spent only 19 cents. How much did I have left?	9-0		
11.	The second hand on my watch has marked 20 seconds since I began to write. How many seconds more will it take to make a minute?	9-0		
12.	Our post-office was built a century ago. How old is it?	9-0		

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	Ted raised a bushel of potatoes last year in his garden patch. He took a peck of them to Grandmother. How many pecks did he have left?	9-6		
14.	Mother ordered a gallon of ice cream for dinner. She wanted half vanilla and half chocolate. How many quarts of chocolate ice cream did she want?	9-6		
15.	Robert had a dollar in dimes. He spent a dime for a top. How many dimes did he have left?	9-6		
16.	Robert spent 2 months at the seashore last summer. How many weeks was he there?	9-6		
17.	John puts \$1 in the savings bank every month. How much does he save every year?	9-6		
18.	Jack has a strip of cardboard 36 inches long and just wide enough to make a ruler. How many foot-rulers can he make from the strip?	10-0		

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
19.	Our new fudge recipe calls for 12 oz. of brown sugar. How many ounces less than a pound do we need if we want to be exact?	10-6		
20.	At the beginning of the year our teacher ordered a gross of notebooks for our class. How many notebooks did she order?	10-6		
21.	What two pieces of U. S. money are equal in total value to a half dollar?	10-6		
22.	Bob sleeps 10 hours every night. How many hours is he awake every day?	10-6		
23.	The Smiths spent last leap-year in Paris. How many days did they spend there?	11-0		
24.	My brother's handkerchief contains 225 square inches of linen. Mine contains one square foot. How much larger than mine is his?	11-6		

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
25.	The boys in our class gathered a bushel of walnuts last fall on a nutting party. They shared them equally with all the members of the class, giving a quart to each. How many pupils are there in the class?	11-6		
26.	Our huckster sells choice tomatoes in quart boxes. How many boxes can he fill with a peck of tomatoes?	12-0		
27.	Our vinegar caster holds 1 gill of vinegar. How many times could it be filled from a pint of vinegar?	12-6		
28.	The rug in our living room contains 4 square yards. How many square feet does it contain?	12.6		
29.	Jack has a score of agates. You have a dozen. How many more has Jack than you?	13-0		
30.	Peter walks a mile to school every day. How many rods is that?	13-0		

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
31.	We had 180 school days last year. How many days of the entire year did we have holidays?	13-6		
32.	The contractor charges my father by the cubic foot for excavating the cellar for our new house. How many cubic inches of dirt does he have to remove to count it a foot?	14-0		
33.	John saw a cord of wood piled up near the barn on his uncle's farm. He measured it to find out how many cubic feet it contained. What answer should he have had?	15-0		
34.	The park on Vine Street is exactly one acre in extent. How many square rods does it contain?	15-6		
35.	The business district in our city occupies a square mile. How many acres does it cover?	16-0		
36.	Cement work is generally charged for by the cubic yard. How many cubic feet does that mean?			16-0 (44%)

SERIES 14 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
37.	Daniel's flower garden is 2 rods long. How many sections a yard long can he mark off in it?			16-0 (42%)
38.	In the supply shop Mr. Waters had a great gross of pencils at the opening of the school year. How many pencils did he have altogether?			16-0 (30.7%)
39.	The grass plot near the school entrance is 1 square rod in extent. Into how many sections, each containing a square yard could it be divided?			16-0 (28%)
40.	Your father ordered the winter coal and thought he would have enough for the winter. The dealer used the short ton measure instead of the long one. How many pounds less than he expected did your father get on every ton?			16-0 (22%)

SERIES 15 (17 problems)

TWO-STEP PROBLEMS
IN
REDUCTION OF DENOMINATE NUMBERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	The cook is making a gallon of tomato catsup. How many pint-bottles will I have to bring her for bottling all the catsup?		10-0 (60.2%)	
2.	The flag in our class-room is one yard long. How many inches are there in its length?	9-6		
3.	It took the Smiths exactly five weeks last summer to make their tour of Italy. How many hours did they spend in that country?	10-6		
4.	Our school is half a century old. How many months has it been built?	11-0		
5.	At the school picnic we sold a peck of peanuts in pint sacks. How many sacks of nuts did we sell?	12-6		
6.	How many pound packages of cornstarch could be filled from a ton of cornstarch?	12-6		

SERIES 15 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	The distance around the race track is one mile. How many yards is it around the track?	14-6		
8.	Our grocer promised to pay me a nickel for every bushel of lima beans that I measured out in quart boxes. How many boxes did I have to measure out for a nickel?	15-0		
9.	An agent for a new breakfast food had a hundredweight of the breakfast food put up in ounce-boxes which he distributed to school children throughout the city. How many packages did he distribute?	15-0		
10.	We spend 2 hours after school every day playing games. During how many seconds do we play?	15-0		
11.	The walk in front of our house is 3 rods in length. How many feet long is the walk?	16-0		
12.	The largest aquarium in our science laboratory holds a cubic yard of water. How many cubic inches of water does it hold?	17-6		

SERIES 15 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	My aunts sent us children a quart of maple syrup tapped from some of the trees on their land. There are four children in our family. How many gills should each of us receive?			16-0 (37.%)
14.	Each Boy Scout in the Eagle Troop took care of a square rod of the vegetable garden near the the camp. For how many square feet of land did each scout have to care?			16-0 (26.3%)
15.	The cement blocks in our school-yard cover exactly 1 square rod. How many square inches of cement are there in each block?			18-0 (24%)
16.	The central playground in our city is an acre in extent. That allows just one square yard for every child in that section of the city. How many children live in the section?			16-0 (22.5%)
17.	The section of a township is a square mile in extent. How many square rods are there in a section?			16-0 (15.5%)

SERIES 16 (10 problems)

PROBLEMS IN ADDITION
OF
COMPOUND DENOMINATE NUMBERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	In a furniture store there were three remnants of Brussels carpet measuring 3 ft. 2 in., 5 ft. 7 in., and 1 ft. 5 in. What was the total length of the three remnants?	13-6		
2.	The butcher had 4 pieces of beef on the counter: the first, a steak, weighed 2 lb. 7 oz.; the other three were roasts weighing respectively: 5 lb. 3 oz., 4 lb. 1 oz., 9 lb. 12 oz. How much beef was on the counter?	14-0		
3.	Yesterday the fruit dealer sold my mother 5 bu. 2 pk. of apples for cider; 3 bu. 1 pk. for apple butter; 3 pk. for eating and 4 bu. 1 pk. for jelly. How many bushels of apples did my mother buy?	14-0		
4.	On the trip from Boston to Norfolk our train stopped 4 times. The actual time spent in riding was respectively 2 hr. 35 sec.; 3 hr. 15 min. 20 sec.; 1 hr. 45 min. 55 sec.; 4 hr. 45 min. 16 sec.; and 2 hr. 5 min. 48 sec. If our train had not made any stops, how long would it have taken us to make the trip?	15-0		
5.	How much paint does a painter use in four days if he uses 2 gal. 3 qt.; 3 gal. 1 qt.; 3 qt.; and 2 gal. 2 qt. respectively?	15-6		
6.	Our grocer sells 4 different grades of potatoes. Saturday night he had left: 7 pk. 2 qt. of the highest grade potatoes; 5 pk. of the next grade; 3 pk. 4 qt. of the next grade and 5 pk. 7 qt. of the lowest grade. How many pecks of potatoes had he left?	16-6		

SERIES 16 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Four children at school have jumping ropes. One rope is 5 yd. 1 ft. long; another is 2 yd. long; the third is 3 yd. 2 ft. long; and the fourth is 4 yd. 1 ft. long. We tied all the ropes together to play Double Dutch. How long was the rope we made?	15-6		
8.	Our class was being tested. We were allowed 3 hr. 10 min. for one test; 45 min. for another; 1 hr. 20. for another; and 55 min. for the last. How much time was allowed for the four tests?	15-6		
9.	In one month a truck driver hauled 3 T. 500 lb. of cement the first week; 2 T. 950 lb. the second; 2 T. 650 lb. the third; and 4 T. the fourth week. How much cement did he haul during the month?	16-0		
10.	At a bargain sale Louise bought 5 pieces of lace which matched perfectly. They measured 3 yd., 2 ft. 3 in.; 5 yd. 9 in.; 2 yd. 1 ft. 4 in.; 3 yd. 2 ft. 5 in., and 4 yd. 1 ft. How much lace did she buy in all?	16-0		

SERIES 17 (10 problems)
 PROBLEMS IN SUBTRACTION
 OF
 COMPOUND DENOMINATE NUMBERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	A lady bought 5 qt. and 1 pt. of milk one morning. She used 3 qt. for cooking. How much had she left?	10-6		
2.	In an auto race the winner reached the goal in 9 minutes, 23 seconds. The last car took 15 minutes, 34 seconds for the race. By how many minutes did the winner surpass the slowest car in the race?	11-0		
3.	A man in laying a walk from his back porch to the garage, a distance of 16 ft. 8 in., made 7 ft. of it in one evening. How many feet did he have to make the next evening if he wished to finish it?	11-6		
4.	Jack picked 2 pecks and 2 quarts of tomatoes this morning. The cook used 1 peck and 7 quarts to make catsup. How many quarts of tomatoes were left?	11-6		
5.	The girls bought 5 gal. 2 qt. of ice-cream to sell at the picnic. On account of the rain only 3 gal. 1 qt. 1 pt. were sold. How much ice-cream remained unsold?	12-0		
6.	Mrs. Smith bought a remnant of material containing 5 yd. 1 ft. She used only 3 yd. 2 ft. How much had she left?	12-6		

SERIES 17 (continued)

		Mental age obtaining:		
		50%	Minimum	Maximum
		accuracy	% accuracy	% accuracy
7.	The butcher had on his counter a piece of meat weighing 17 lb. He cut off a roast weighing 11 lb. 13 oz. How large was the piece that remained?	13-6		
8.	Mrs. Jones bought 8 gal. 1 qt. of brick ice cream for a party. There were 2 qt. left after the party. How much ice-cream was used?	14-6		
9.	A huckster started out in the morning with 3 bu. 2 pk. 2 qt. of string beans. By noon he had sold 1 bu. 3 pk. 6 qt. of them. How much had he still to sell?			16-0 (42.8%)
10.	From a coal-car containing 9 T. 1050 lb. of coal, 1200 lb. were lost. How much coal was left in the car?			16-0 (26.0%)

SERIES 18 (10 problems)

PROBLEMS IN MULTIPLICATION
OF
COMPOUND DENOMINATE NUMBERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	My brother used 8 gal. 1 qt. of paint in painting our garage. Eight of our neighbors want him to paint their garages also. How much paint will he need if all of the garages are almost the same size as ours?	12-6		
2.	Mr. Becker delivers 5 qt. 1 pt. of cream daily to a certain restaurant. How many quarts does he deliver in a week?	13-0		
3.	A grocer bought 9 cans of American Beauty Lard. The net weight of each can was 5 lb. 12 oz. How many lb. of lard did he buy?	13-6		
4.	In a test consisting of 7 sections we were allowed 2 min. 20 sec. for each section. How much time was allowed for the entire test?	14-6		
5.	A farmer got on an average 3 bu. 2 pk. of peaches from each of his 15 peach trees. How much did he get from all the peach trees?	15-0		
6.	In paving our entire front walk the contractor laid 18 blocks each 2 ft. 7 in. long. How long is the walk?	15-6		

SERIES 18 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	In a lumber yard there is a pile of wood containing 108 blocks, each of which contains 6 cu. ft. How many cubic yd. are there in that pile of wood?	17-0		
8.	How many yards of fencing would Mr. Brown have to buy to fence in a square plot of ground 8 yd. 1 ft. on a side?			16-0 (42.7%)
9.	While Fred was staying at his uncle's farm he had charge of 240 sq. rd. of land. This was $\frac{1}{15}$ of the entire farm. How many acres did the farm contain?			16-0 (16.2%)
10.	How many square feet of oilcloth must be used in making covers for 23 laboratory tables which require $54\frac{1}{2}$ square inches for each?			16-0 (7.2%)

SERIES 19 (10 problems)

PROBLEMS IN DIVISION
OF
COMPOUND DENOMINATE NUMBERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Nine packages of Tom Thumb crackers weigh 7 lb. 14 oz. What is the weight of each package?	13-6		
2.	There are 12 gal. 3 qt. of pickles in 3 kegs. What is the average content of each keg?	14-0		
3.	A hardware dealer used 16 yd. 2 ft. of screening in making 5 screen doors of equal size. How much screening was used for each door?	15-0		
4.	It took 8 ft. 2 in. of ribbon to make 7 class badges. How much ribbon did each badge require?	15-0		
5.	A gardener used to buy a certain imported shrub which matured in 5 yr. 4 mo. Afterwards he found a native shrub which matured in $\frac{1}{8}$ that time. How long did it take the native shrub to mature?	15-6		
6.	During 4 days of last week Helen practised her music 5 hr. 4 min. How long did she practise on an average each day?	16-0		

SERIES 19 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A farmer had in 5 equal stacks a total of 7 T. 1000 lb. of hay. What was the average weight of each stack?			16-0 (40.5%)
8.	Tom gathered 7 pk. 2 qt. of tomatoes from his garden in 2 days. If he gathered the same quantity each day how much did he gather in one day?			16-0 (33%)
9.	The Victor Restaurant used 9 bu. 6 pk. of potatoes last week. What was the average amount used per day?			16-0 (34%)
10.	Ethel finished 6 problems in 8 min. 10 sec. How much time did that allow for each problem?	18-0		

SERIES 20 (12 problems)

TWO-STEP PROBLEMS WITH INTEGERS.

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	We wanted to make a trip of 968 miles in 4 days. The first day we travelled 264 miles and the next day only 171 miles. At the end of the second day how far did we still have to go?	11-6		
2.	Mary bought 6 yd. of plaid gingham and 8 yd. of plain gingham. She paid 75c a yd. for the gingham. How much did it cost her?	11-6		
3.	A street car conductor collected 740 fares on Saturday, 850 on Sunday and on Monday $\frac{1}{2}$ of the amount he had collected on the two preceding days. How many fares did he collect on Monday?	11-6		
4.	You buy a dozen lollypops at 3 for a dime and give the man a dollar. How much change should you get?	11-6		
5.	Jack's father and mother and his Uncle Jack went to Niagara Falls. They paid \$27.50 each for train fare. Their hotel bill and other expenses were \$175 for the party. What were their total expenses for the trip?	12-0		
6.	Mrs. Brown bought 1 lb. of butter for 45c and 6 eggs at 36c a doz. What was the amount of the bill?	12-0		

SERIES 20 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum accuracy	Maximum accuracy
7.	A large department store had a special sale of percale. They had on hand 2860 yd. of percale and sold 2260 yd. of it. How many bolts of 75 yd. each were left?	12-6		
8.	A farmer brought 108 doz. eggs to a dealer who bought 2 crates from him. If there were 36 doz. to a crate, how many crates did the farmer have left?	12-6		
9.	A tobacco planter divided his 30-acre plantation into 6 equal sections. In one of these he planted a special quality tobacco plant yielding 1480 pounds to the acre. How many pounds of this quality tobacco did the section yield?	12-6		
10.	A commission merchant bought wheat for \$1.47 per bushel and sold it for \$1.62 per bushel. How much did he make on a shipment of 40,000 bushels?	13-0		
11.	A contractor built a stucco house for \$5250, and a brick house for twice that amount. He put up 3 frame houses for the same amount that he had expended for the one brick house. What was the cost of each of the frame houses?	13-0		
12.	Our class contributed all but \$7.50 of our \$35 quota to the Community Chest fund. Then we gave a play and secured \$29.75 which we also contributed. How much did we give altogether?	13-6		

SERIES 21 (12 problems)

TWO-STEP PROBLEMS WITH COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	The girls in the Busy Bee Club are going to make themselves a working cap and apron. If each one needs $\frac{1}{2}$ yd. for her cap and $1\frac{3}{4}$ yd. for her apron, how many yards of muslin will be needed by all 12 members of the club?	12-0		
2.	Dick earned $\$1\frac{1}{4}$ a day during 10 days of the berry season. Putting this with the $\$12\frac{1}{2}$ which he had already saved, he was able to buy a bicycle. How much did the bicycle cost?	12-0		
3.	Mrs. Jones bought 24 cans of tomatoes at $8\frac{2}{3}$ ¢ a can. How much change should she receive if she gave the stor. keeper a $\$2\frac{1}{2}$ gold piece?	12-0		
4.	Marie's big sister practises her music 3 hours daily. Monday morning she practised $1\frac{1}{4}$ hours. In the afternoon she practised $1\frac{1}{2}$ hours. How much longer did she have to practise to complete the 3 hours?	12-6		
5.	Bob earns $\$3\frac{3}{4}$ a week weeding the flower garden. He saves $\frac{3}{5}$ of this. How long will it take him to save enough to buy a radio worth $\$4\frac{1}{2}$?	13-0		
6.	The distance between Altoona and Columbus is $338\frac{1}{2}$ miles. We started to motor from Altoona towards Columbus yesterday morning and still had 200 miles to go at noon. Before night we made another $183\frac{1}{4}$ miles. How many miles did we cover during the entire day?	15-0		

SERIES 21 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A farmer raised 363 bushels of potatoes on $2\frac{3}{4}$ acres of land. How many bushels should he get from $5\frac{3}{4}$ acres that yield the same per acre?	15-0		
8.	Betty's mother gave her 2 pieces of linen with which to make a half dozen doilies. One piece contains $2\frac{1}{3}$ yd. and the other $1\frac{1}{6}$ yd. How much can she allow for each doily?			16-0 (44.4%)
9.	Five girls in the Home Economics class made $8\frac{3}{4}$ lb. of fudge which they shared equally. Each one also received $1\frac{1}{2}$ lb. of the taffy which they had made. How many pounds of candy did each girl then have?			16-0 (44.2%)
10.	A farmer raised $79\frac{1}{2}$ bushels of potatoes. He kept $22\frac{3}{4}$ bushels for his own use and for seed, and sold the remainder at $\$1\frac{1}{2}$ a bushel. How much did he receive for the potatoes which he sold?			16-0 (43.8%)
11.	After using a quart out of the gallon of ice cream which she had made, Mrs. Smith gave the rest to John to share equally with 7 playmates. What part of a gallon did each boy receive?			16-0 (11.4%)
12.	A dairy farmer delivered $2836\frac{1}{4}$ lb. of milk to a creamery in 1 week (7 days). The average number of pounds delivered per day the preceding week was 412%. By how much did the the amount delivered daily the first week exceed that delivered on an average each day the second week?			16-0 (11.3%)

SERIES 22 (12 problems)

TWO-STEP PROBLEMS WITH DECIMALS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	A man had in one bank \$12557.89 and in another \$7298.51. He wanted to divide it equally among his 5 sons. How much could he give to each?	10-6		
2.	Harry spent on an outfit \$12.25 of the \$15 he had saved when he was made scout leader. He afterwards saved \$7.90. How much money had he then in his bank?	10-6		
3.	There were 62.5 inches of water in a cistern. After a heavy rainfall the height of the water was increased 1.97 inches. Then 3.62 inches were drawn out. How many inches of water remained in the cistern?	12-0		
4.	Lucy had \$6.30 in her purse. She spent \$4.98 for a new gym suit. With the money that was left she bought a dozen skeins of silk. What was the price of the silk per skein?	12-6		
5.	Harold's cyclometer registered 342.7 miles when he started out. After riding 3 hr. at the rate of 12.5 miles an hour, what did the cyclometer register?	13-0		
6.	Tomorrow 14 of us are going to hike to Manor Grange. After contributing my fair share for the lunch which is to cost \$6.72, how much of my weekly allowance of \$1.25 will I have left?	13-6		

SERIES 22 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	The ticket sale for our school play amounted to \$95.75. Each of the 8 rooms is to receive an equal share of the proceeds. How much could our class afford to pay for an aquarium if we were to spend for it our share of the proceeds as well as the \$8.06 we have in the class treasury?	15-0		
8.	The Smiths motored out to their camp on Sunday at the rate of 21.5 miles an hour. At the end of 2.5 hours, how far were they from the camp which is 60 miles from their home?	15-6		
9.	It is 35.7 miles from Mr. Barden's country home to the city. Mr. Barden drives 3.8 miles to the station every morning in his auto. Then he buys his railroad ticket to the city at the rate of \$.035 per mile. How much does his ticket cost?	16-0		
10.	Dick picked a crate of cherries every day last week except Sunday. For his week's work he received \$3.30. He also sold eggs and daily made 3.25 times as much as he received for picking a crate of cherries. What was his daily income from eggs?			16-0 (30%)
11.	Lead is 11.35 times as heavy as water which weighs 62.5 pounds per cubic foot. How many cubic feet of lead are there in 248,281.25 pounds of lead?			16-0 (25%)
12.	My uncle owned property on two main streets of our city. The frontage of one piece was 56.78 ft. That of the other was 37.29 ft. At \$479.75 a front ft. how much were both the pieces of property worth?			16-0 (22.4%)

SERIES 23 (24 problems)

THREE-STEP PROBLEMS WITH INTEGERS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	In a flower garden there were 117 tulips. The owner left 89 of them stand and cut the rest. He then divided the cut flowers equally among 4 children. One child cut 5 more tulips from her own garden. How many had she then?	11-6		
2.	Mr. Ford had \$4000 which he wished to invest for his children. He deposited \$500 to the account of his younger son and three times that amount to the account of his elder. The balance he invested for them in Government bonds. How much money was invested in bonds?	12-0		
3.	Four boys picked 18 quarts of strawberries. They sold all except 4 qt. at 16c a quart. How much money should each boy receive?	12-0		
4.	Of the 116 passengers on the train from Washington, 78 got off at Baltimore while 96 passengers boarded the train there. At Philadelphia the train took on 4 times as many passengers as were already on because of the crowds returning to New York from the Exhibit. How many boarded the train at Philadelphia?	12-6		
5.	A teacher had twenty pieces of red crayon, three times as much white crayon, and 40 pieces of blue crayon. She divided them equally among 30 pupils. How many pieces did each pupil receive?	12-6		
6.	A man bought 16 shares of stock at \$58 per share. He divided it equally among his 4 daughters. The eldest already had \$118 invested in the same kind of stock. What was the value of all the stock owned by the eldest daughter?	12-6		

SERIES 23 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A man left \$9875 in real estate and \$7629 in personal property to be divided equally among his four children. The oldest son gave \$500 of his share in charity. How much had he left?	13-0		
8.	The Gleaner Club rented a hall to give a play. There were 325 seats on the lower floor, and 245 in the balcony. All admissions were 50c. They paid \$100 for the rent of the hall. What was the profit for the night's performance?	13-0		
9.	A man obtained 1265 bu. of corn from one field and 895 bu. from another. He sold $\frac{1}{2}$ of the entire yield at \$2 a bu. How much did he receive for the corn he sold?	13-0		
10.	Clare's uncle owned 134 shares of stock. He sold 29 shares and then divided the rest equally among the 5 children. At \$115 a share what was the value of each child's stock?	13-0		
11.	Mr. Todd bought a house for \$9275 and sold it for \$10500. He also sold a lot at a gain of \$375. He invested his entire gain in stock at \$50 a share. How many shares did he buy?	13-6		
12.	A carpenter had 120 in. of lumber for a piece of work. He found he did not have enough and bought 5 ft. more to complete the work. On inspection he found that he did not need 3 ft. of the wood. How many feet of lumber did he use for the work?	14-0		

SERIES 23 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	Mrs. Dean wanted Clifford's lunch to contain 800 calories. She found that it lacked 110 calories. Then she put in 3 pieces of chocolate which she estimated at 42 calories each. How many calories did the lunch contain then?	14-6		
14.	A man sold on an average, 12 gallons of ice cream a day for the first four days of the week. The latter part of the week he sold 15 gallons less than he did in the early part. How many gallons of ice-cream did he sell during the week?	14-6		
15.	Thirty-six turkeys, the live weight of which was 1224 lb., lost on an average 5 lb. each on being dressed. They were then sold in a lot for \$574.20. What was the selling price per pound?	15-0		
16.	Last year the Boys' Home received \$5000 from the Community Chest and \$10,000 in gifts and legacies. All but \$3000 of this amount was needed for yearly expenses. What was the average cost of running the home for a month?	16-0		
17.	Instead of taking a 5-year lease on his office Dr. White paid a monthly rent of \$125. He could have saved $\frac{1}{5}$ of his rent if he had taken the lease. In that case what would his office have cost him a year?	16-0		
18.	A touring party went 240 miles the first day, 180 miles the second day, and four times as much during the rest of the week as they had gone the first two days. What was their daily record for the last five days of the trip?	16-6		

SERIES 23 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
19.	One week a traveling salesman received \$57 commission besides his salary of \$45. His expenses for the week were \$83. At that rate how much could he save in a year?	17-0		
20.	A teacher filled a bag of candy for each of her 31 pupils. She put in each bag an equal share of 155 chocolates and 5 times as many pieces of hard candy. How many pieces of candy were there altogether in each bag?	17-0		
21.	A company estimated that at the rate of \$2 per hour, it would cost \$800 to have a piece of work done by 25 men. The work was finished in 15 hours. How much less was paid to each man than was estimated?			16-0 (37.7%)
22.	A tourist drove an automobile at the rate of 30 miles an hour from New York to Boston, a distance of 270 miles. How long did it take him to make the round trip if he stopped 2 hours at a hotel both going and coming?			16-0 (34.4%)
23.	Four partners had equal rights to an income of \$50,000. The first partner invested \$4250 in one stock company, and the remainder in another. He lost the first investment but gained 8 times the amount of his second investment. How much did he gain?			16-0 (31.9%)
24.	Last year we spent \$216 for repairs to our auto. This was \$12 more per month than our bill for tires. What were our total monthly expenses for repairs and tires last year?			16-0 (24.7%)

SERIES 24 (24 problems)

THREE-STEP PROBLEMS WITH COMMON FRACTIONS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	John had $\$25\frac{3}{4}$ in his bank. He bought an erector set for which he paid $\$12\frac{1}{2}$. The following week he sold 7 pairs of pigeons at $\$1\frac{1}{2}$ a pair and added the money he got for them to his bank account. How much had he then in the bank?	13-0		
2.	Earl earned $\$15\frac{1}{2}$ this week helping in the drug store. He gave $\$12\frac{3}{4}$ of it to his mother and saved the rest along with the $\$2\frac{3}{4}$ he received from his paper route, and the $\$1\frac{3}{4}$ for vegetables he sold from his garden. How much would he save in 2 weeks at this rate?	14-6		
3.	Rose's mother gave her $\$2\frac{1}{4}$ with which to go to the grocer's. She bought $2\frac{3}{4}$ lb. of cheese at \$.40 per lb. With $\frac{1}{2}$ the money that was left she bought vegetables. What did she pay for the vegetables?	14-6		
4.	John sells newspapers after school. He invested $\$6\frac{1}{4}$ in Posts and $\$7\frac{1}{2}$ in Stars last week. He sold this entire stock for $\$16\frac{1}{2}$. How much would he be able to save in a month if this was his average weekly gain?	15-0		
5.	At Christmas time Bob used $\$21\frac{3}{4}$ of the $\$25\frac{2}{5}$ he had in bank to buy presents. He received gifts of money amounting to $\$15\frac{1}{2}$. He then invested $\frac{1}{3}$ of his whole fortune in books. How much did he spend for the books?	15-0		
6.	Aunt Joe bought new cretonne draperies for the nursery windows. For each one of the six windows she needed a piece $2\frac{1}{2}$ yd. long. She also needed one extra piece $8\frac{1}{4}$ yd. long. How much was left on the bolt of cretonne containing $31\frac{1}{2}$ yd. after the saleslady had cut off Aunt Joe's material?	15-0		

SERIES 24 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	The 5 yd. of material for Mary's dress cost $\$8\frac{3}{4}$. The trimming cost $\$3\frac{3}{4}$ more than a yard of material. The ribbon cost $\frac{2}{5}$ of the price of the trimming. What was the cost of the ribbon?	16-0		
8.	A sewing class cut the following lengths from a 25-yd. bolt of ribbon: $3\frac{1}{4}$ yd., $6\frac{1}{2}$ yd., $1\frac{3}{4}$ yd. How many pieces $2\frac{1}{4}$ yd. in length could be cut from what remained?	17-0		
9.	A lady bought $\frac{3}{4}$ yd. of black velvet ribbon and $\frac{1}{3}$ yd. of blue velvet ribbon at $\$3\frac{3}{5}$ per yd. for each. She gave the clerk $\$3\frac{3}{4}$. How much change should she have received?	17-0		
10.	Mr. Ward sold a piece of property for $\$18,756\frac{3}{4}$. He put $\$17,562\frac{1}{2}$ in the bank and divided the remainder among three charitable institutions. He later gave each institution $\$183\frac{1}{2}$ more. How much did each receive?	17-0		
11.	A retail merchant made $\$50\frac{1}{2}$ profit the first week, $\$75\frac{2}{10}$ the second, $\$30\frac{3}{4}$ the third, and $\$80\frac{1}{10}$ the fourth. He saved $\frac{1}{5}$ of his profit for the month. How much did he spend?			16-0 (46%)
12.	Mother gave Jane and Sue each $3\frac{1}{2}$ yd. of blue ribbon and equal shares of a bolt of $8\frac{2}{3}$ yd. of pink ribbon. Sue used $5\frac{3}{4}$ yd. of hers. How much did she have left?			16-0 (42.1%)

SERIES 24 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	A boy earns $\$1\frac{1}{4}$ for delivering ice and $\$2\frac{3}{5}$ from his paper route per week. If he saves $\frac{3}{5}$ of his weekly earnings, how many weeks will it take him to save enough to buy a scooter valued at \$7.65?			16-0 (41.8%)
14.	A man had in bank \$5876 $\frac{3}{4}$. He left on deposit \$2000 and invested $\frac{1}{3}$ of what he had withdrawn in stock which he divided equally between his two sons. How much money was invested in stock for each son?			16-0 (39.3%)
15.	Mr. Jones raised 300 bu. of potatoes which he sorted into 4 equal lots. He sold one of these lots at $\$1\frac{3}{4}$ per bu., and the rest at a total of \$368 $\frac{3}{4}$. What was the selling price of the whole yield?			16-0 (38.7%)
16.	During Dick's three summers on the farm he made $\$35\frac{9}{10}$ the first year, $\$74\frac{3}{4}$ the second, and $\$150\frac{4}{5}$ the third. He saved $\frac{1}{3}$ of his earnings, and spent $\frac{5}{6}$ the amount of his savings to pay for his extra expenses in high school. What was the amount of his extra expenses?			16-0 (30.8%)
17.	A man divided his farm of $46\frac{2}{3}$ A. into five equal fields. He wanted a smaller field than any of these so from one of the 5 he fenced off $4\frac{1}{2}$ A. The remaining portion of that field was later enlarged by $2\frac{1}{2}$ A. How many acres did the latter field then contain?			16-0 (29.7%)
18.	Four ice-cream truck drivers received equal shares of a supply of $9\frac{1}{3}$ bushels of coarse salt weighing 56 lb. to the bushel. One of the drivers spilt $23\frac{1}{2}$ lb. on the road. How much salt had he left?			16-0 (25%)

SERIES 24 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
19.	At the settling of the last will of a lady it was found that she had \$15848½, of which $\frac{1}{5}$ was in bank. She left the amount in bank to be divided equally among three charitable institutions. One received in addition real estate valued at \$5082 $\frac{2}{5}$. How much did this institution receive altogether?			16-0 (23%)
20.	A man had a farm of 153½ acres, which he divided into two smaller farms of equal size. From one of these he sold 26½ acres, and later sold the remainder of this farm at \$28½ per acre. How much did he receive from the second sale?			16-0 (18%)
21.	One day a coal dealer received payment for 50¼ T. of coal at \$8¼ per ton. He paid out \$128¼, and later in the day received \$42½ in cash payment from a customer. How much money had he to his credit for that day?			16-0 (17.4%)
22.	A man owned 438¼ A. of land just outside the city limits. He sold 383¾ A. and divided the remainder into lots containing $\frac{3}{4}$ of an acre each. He sold the lots for \$123¼ each. How much did he receive for them?			16-0 (12.8%)
23.	A freight company sent a bill of \$21¾ for storage and shipment to a dealer who shipped 2563½ lb. of freight at \$.53½ per 100 lb. How much was charged for storage?			16-0 (10.5%)
24.	A baker bought 18¼ bbl. of flour, each containing 196 lb. He had on hand 420½ lb. He wanted to store the flour equally in 6 bins. How much could he put in each bin?			16-0 (8.6%)

SERIES 25 (24 problems)

THREE-STEP PROBLEMS WITH DECIMALS

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Frank worked as a bundle-wrapper during 9 weeks of vacation at \$4.75 per week. He spent \$21.50 for new clothes and \$9.75 for books when school began. How much of his earnings did he have left?	11-6		
2.	Mrs. Brown and Betty visited a friend. The railroad fare was \$3.20 for adults and half-fare for children. They paid \$1.15 for having their baggage transferred and \$.15 for street car fare. How much did Mrs. Brown have left out of a \$10 bill?	12-0		
3.	Five girls agreed to share the expenses of a party. They bought ice cream for \$5.25 and 8 cakes at \$.75 each. How much should each girl pay?	12-6		
4.	Mr. Brown divided his Christmas Savings check of \$50 among Jack, Betty, Ann and Billy. Jack spent \$10 and added the remainder to the savings account of \$17.50 which he had in the bank. How much had he then in the bank?	12-6		
5.	A dressmaker bought linen remnants of 8.75 yd. and 4.75 yd. respectively. From these she made children's dresses requiring 2.25 yd. of material. How much did she receive for all the dresses at \$5.75 each?	13-6		
6.	Catherine paid \$5.25 for silk at \$1.50 per yd. Her sister bought the same number of yards of voile at \$.50 per yd. How much more was Catherine's bill than her sister's?	13-6		

SERIES 25 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Bob, Dick and Joe made toys for the fish pond. These partners spent \$.36 for cardboards, \$.28 for glue, \$.50 for other materials. When the sale was over each of the boys received \$.75. How much gain did each partner make?	14-0		
8.	From \$.75 Bob spent \$.07 for candy and the remainder for apples at \$.08 per pound. On the following day he bought 14.5 lb. of apples at the same price per pound. How many pounds of apples did he buy within those two days?	14-0		
9.	Mrs. Jones handed the clerk a fifty-dollar bill in payment for 2 dresses at \$13.75 each. She put the change in her purse along with the \$35.75 which she had just collected as rent. How much money had she then in her purse?	14-0		
10.	Mr. Albin is a conductor on a motor bus. In one trip he collected \$4.04 in fares, 26 of which were 9c fares. The rest were children's fares at 5c each. How many children rode in the bus on that trip?	14-0		
11.	A candy dealer had 32.75 pounds of hard candy in one pail, and 27.75 pounds in another. After selling 5.75 pounds to one customer he sold the rest to Mr. Smith at \$.35 a pound. How much was Mr. Smith's bill?	15-0		
12.	A grain elevator had in storage 1582.5 bu. of grain. Of these 436 bu. were lost in a fire. Of the part that remained only .88 was fit to be sold. This amount was sold in four equal shipments. How many bu. did each shipment contain?	15-0		

SERIES 25 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	A troop of Girl Scouts decided to hike 10.5 mi. on Sunday, but they had to ride 1.8 mi. of the way because they were too tired. On Monday they hiked 9.8 miles and on Tuesday 7.5 miles. The Boy Scouts during their trip hiked twice the number of miles the girls hiked during the three days. How many miles did the Boy Scouts hike?	15-6		
14.	A fruit dealer sold 35 doz. lemons for \$15.75 and 40 doz. oranges at the same price per dozen as the lemons. How much money did he receive for all the fruit?	15-6		
15.	At the Benefit Concert patrons contributed \$1816.50. Ticket returns amounted to \$9863.75. The balance left after \$975.25 was paid for expenses was divided equally among the 3 orphan asylums of the city. What share did each asylum receive?	16-6		
16.	At the beginning of the month the gas meter in a students' flat registered 32564.5 cu. ft. and at the end of the month 33564.5 cu. ft. At \$1.15 per 1000 cu. ft., with an additional expense of \$3.75 for a special fixture which they had installed, how much would each of the five students on the flat have to pay?	16-6		
17.	In making up his accounts at the end of the day, a storekeeper found that he had taken in \$54 in bills, \$63.25 in checks, and \$13.58 in coins. His charge accounts amounted to twice his currency and his expenses were \$20.50 less than his charge accounts. What were his expenses?	17-0		
18.	A commission merchant bought 1236.75 bu. of potatoes. He stored away 600 bu. and sold the remainder at \$.40 per bu. Find the value of all his potatoes if those he kept were worth \$300?	18-0		

SERIES 25 (continued)

		Mental age obtaining:		
		50%	Minimum %	Maximum %
		accuracy	accuracy	accuracy
19.	A company composed of 90 privates, an officer, a chaplain, a cook, and 2 engineers was allotted 2.4 oz. of beans per person daily. How many days would a ration of 1254 ounces of beans have to last the company?			16-0 (42.6%)
20.	Mr. Brown owns 6 houses of equal value, amounting in all to \$21,585. After making improvements amounting to \$110 on one of them he is to sell it at a gain of .08 of its total value. What will be his gain?			16-0 (38.5%)
21.	Mr. Smith had \$4383.52 invested in stock. He kept \$2380.28 thus invested and sold the rest of his shares at cost. He divided the amount received equally among his four sons. The eldest son gave .4 of his to charity. How much was given to charity?			16-0 (36%)
22.	When you buy a bushel (60 lb.) of potatoes in small quantities, you have to pay \$.05 a lb. for them. When you buy a bushel at a time, you pay only \$.0375 a lb. How many more pounds would you get for the money which you pay for a bushel bought in small quantities if you were to spend that same amount for potatoes at one time?			16-0 (31%)
23.	Mr. Burns paid \$3.36 for gasoline at \$.21 per gal. At the end of his trip the motor registered 9.5 gal. What was the cost of the gasoline he had used during the trip?			16-0 (25.5%)
24.	A baker made 94.5 dozen rolls, allowing 1.25 lb. of flour to each dozen. He also used 1.5 barrels of flour for bread. How many barrels of flour did he use for rolls and bread? (1 bbl. = 196 lb.)			16-0 (17.7%)

SERIES 26 (9 problems)

PROBLEMS IN THE APPLICATION
OF
PERCENTAGE IN INTEREST

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Mr. Jones borrowed \$500 from Mr. West for one year at 5%. How much interest did he have to pay for the money?	12-0		14-0 (10.7%)
2.	What is the interest on \$900 for 60 days at 5%?	15-0		16-0 (7.7%)
3.	My father borrowed \$2000 for a year at $4\frac{1}{2}\%$. How much money did he have to pay back at the end of the year?	17-0		18-0 (7.5%)
4.	Mr. Brown borrowed \$700 for 8 months at 5%. What interest did he have to pay?			16-0 (47.4%)
5.	Mr. Walters mortgaged his home for \$4,200 at 6% per annum. He cancelled the mortgage at the end of 4 years. What amount had he paid as interest on the sum borrowed?			16-0 (37%)
6.	What is the amount due on \$500 at the end of 4 years if interest is compounded annually at the rate of 3%?			16-0 (11.7%)

SERIES 26 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	Mr. Adams borrowed \$700 from Mr. Rowe on March 16, 1925. He returned it with interest at 6% on Feb. 2, 1926. How much did he return to Mr. Rowe?	14-0		14-0 (10.9%)
8.	What is the amount of \$1000 borrowed at 5% on June 6, 1925, and returned October 29, 1925?			16-0 (7.7%)
9.	Mrs. Smith deposited \$300 in a savings bank that paid 4% interest compounded semi-annually. What amount did she have to her credit at the end of 3 years?			16-0 (7.5%)
	Mr. father pays \$127.50 a year to insure his house for \$5,000. What is the rate of insurance?			16-0 (31.3%)
	Mr. Arnold insured his stock of goods for 7 years for \$5,750. The annual rate was 3% per year. The rate for 8 years was 3% (lower the annual rate). How much did he save by taking out a five-year policy then by taking 3-year policies?			16-0 (21.3%)
	I pay \$51.50 to have my house insured for 1 year of its value of \$500. What is the value of the house?			16-0 (13%)

SERIES 27 (7 problems)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
PROPERTY INSURANCE

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	My father insured our house valued at \$12,500 for $\frac{1}{4}$ of its value at the rate of 2%. What was the premium on it?	14-0		
2.	A school library valued at \$15,000 is insured for \$10,000, at the rate of \$1.05 per \$100. What is the premium on the policy?			16-0 (38.6%)
3.	A collection of paintings valued at \$25,000 was insured for 75% of its value at the rate of \$2 per \$100. What was the premium paid for insuring the paintings?			16-0 (32%)
4.	My father pays \$127.50 a year to insure his house for \$8,500. What is the rate of insurance?			16-0 (31.3%)
5.	Mr. Arnold insured his stock of goods for 5 years for \$5,750. The annual rate was \$.55 per \$100. The rate for 5 years was 3 times the annual rate. How much did he save by taking out a five-year policy than by taking 5 annual policies?			16-0 (21.1%)
6.	I pay \$91.50 to have my house insured for $\frac{5}{6}$ of its value at 2%. What is the value of the house?			16-0 (19%)

SERIES 27 (continued)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
LIFE INSURANCE

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	A grain warehouse was insured for \$20,000 in one insurance company, and for \$25,000 in another. It was damaged to the extent of \$20,000. How much more insurance should the second company pay than the first?	12-0		16-0 (6.7%)
2.	Find the yearly premium on a \$3000 life insurance policy if the annual premium on each \$1000 is \$24.	13-0		

SERIES 28 (2 problems)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
LIFE INSURANCE

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Mr. Hunt took out a 20 year endowment policy for \$2000 on which the annual premium was \$85. How much more will he receive from the company at the end of 20 years than he will have paid in?	12-0		
2.	Find the yearly premium on a \$3000 life insurance policy if the annual premium on each \$1000 is \$24.	13-0		

SERIES 29 (8 problems)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
TAXES

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	Mr. Smith owns property worth \$14,000, which is assessed at 80% of its value. Find the assessed value of Mr. Smith's property.		11-0 (60%)	
2.	At the rate of \$1.25 per \$100 what would my tax bill be on real estate assessed at \$22,000?	14-6		
3.	My father's property, including real estate and personal property, was assessed at \$25,000. At a tax rate of $1\frac{1}{4}\%$ what was the amount of his tax bill this year?	15-0		
4.	My uncle's personal property is worth \$75,000 and his real estate is valued at \$10,800. All his property was assessed at 85% of its value, and the rate of taxation was $1\frac{1}{2}\%$. How much was his tax bill?			16-0 (47.4%)
5.	The assessed value of the property in our town last year was \$6,000,000. It was planned to raise \$150,000 by taxation. What rate of taxation would give the desired amount of money?			16-0 (39.1%)
6.	Mr. Green owned real estate assessed at \$12,500 and personal property assessed at \$5,800. How much were his taxes last year if the rate of taxation was $1\frac{3}{4}$ mills?			16-0 (24%)

SERIES 29 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	My brother paid a property tax of \$112.50 when the rate of taxation was 3%. His property was assessed at 75% of its value. What was the total value of his property?			16-0 (16.3%)
8.	Mr. Andrews paid a property tax of \$202.50 when the tax rate was \$2.25 per \$100. What was the value of his property if it was assessed at 60% of its value?			16-0 (15.8%)

SERIES 30 (5 problems)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
TRADE DISCOUNT

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	A piano marked \$625 was sold at a discount of 20%. What was the selling price of the piano?	13-6		
2.	What was the selling price of an office desk listed at \$125 and sold at discounts of 10%, 5%, and 2%?			16-0 (32%)
3.	Find the net amount of the bill which our carpenter had to pay when he bought \$325 worth of supplies from a wholesale dealer and received a trade discount of 10% and a cash discount of 5%.			16-0 (30.3%)
4.	An agent purchased an automobile listed at \$3,250 at a discount of 15%, and 2% for cash. He sold it to a customer for \$3,500 with a discount of 10% and 2% for cash. How much did the agent gain?			16-0 (13.1%)
5.	A retail dealer bought a watch listed at \$85 at a discount of 20% and 2% for cash. He sold the watch for \$85. What was his rate of gain?			16-0 (9.3%)

SERIES 31 (4 problems)

PROBLEMS IN THE APPLICATION OF PERCENTAGE
IN
COMMISSION

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	An agent charged Dr. Brown 15% for collecting \$900 worth of bills due him. How much did the agent receive?	12-0		
2.	Mr. Crane received \$75 for selling a piano. His rate of commission was 5%. What was the selling price of the piano?	16-0		
3.	The Provident Realty Company sold Mr. Carter's house for \$10,500 at a commission of 3½%. How much did Mr. Carter receive for the house?	17-0		
4.	A commission merchant sold \$3,500 worth of fruit. The cost of the freight and cartage amounted to \$115 and the agent received 4% commission. What were the net proceeds?			17-0 (37.5%)

SERIES 32 (19 problems)

PROBLEMS IN THE MENSURATION OF
PLANE AND SOLID SURFACES

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
1.	My notebook is 7 inches long and 3 inches wide. How many square inches of paper are there in one page?	12-0		
2.	Our swimming pool is 160 feet long and 120 feet wide. How many square feet of cement are there in the bottom of the pool?	13-0		
3.	Louise is making a square pillow top which is 18 inches long. How many square inches of linen are there in the pillow top?	16-0		
4.	My trunk is 28 inches by 21 inches. By putting my parasol in diagonally it just fits. How long is my parasol?	16-0		
5.	Our class pennant is triangular in shape. It is 27 inches long and 14 inches wide at the widest part. How many square inches of felt does the pennant contain?			16-0 (45%)
6.	About how many square inches of paper are needed for the label on a tomato can which is 6 inches high and 5 inches in diameter?			16-0 (44.4%)

SERIES 32 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
7.	The new playground is 125 rods long and 130 rods wide. How many acres does it contain?			16-0 (35.2%)
8.	It took Louise 24 hours to embroider the outer edge of a centerpiece which is 32 inches in diameter. How many inches did she finish in an hour?			16-0 (33%)
9.	Mr. Smith sold 40 acres of his farm which is 160 rods square, to my uncle at \$125 an acre. At the same price per acre, what is the value of the part that remains?			16-0 (32%)
10.	Our kitchen is 16 ft. long and 19 ft. wide. We want to cover the floor with linoleum at \$1.15 per sq. yd. How much will the linoleum cost us?			16-0 (27.2%)
11.	One of the circus tents has a ground diameter of 150 feet. How much ground does the tent cover?			16-0 (26.6%)
12.	Our garden plot is 12 feet on one side and 15 feet on the opposite parallel side. The perpendicular distance between these two sides is 18 feet. What is the area of the plot?			16-0 (25%)

SERIES 32 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
13.	Joe has a cigar box which is 9 in. long, 7 in. wide and $2\frac{1}{2}$ in. deep. He wants to make a screen caterpillar cage of the same size as the cigar box. How many square inches of screening will he need?			16-0 (25%)
14.	How many cubic yards of dirt would have to be removed in order to dig a well 40 feet deep and 9 feet in diameter?			16-0 (22%)
15.	The living room in our new bungalow is 18 ft. long, 15 ft. wide and 12 ft. high. After deducting 24 sq. ft. for openings, how much burlap would be needed to cover the walls one-third of the way up?			16-0 (21.2%)
16.	Mr. Alden sold at \$125 an acre a triangular field having the same base and altitude as a rectangular field that is 450 rods long and 120 rods wide. What was the selling price of the triangular field?			16-0 (17.5%)
17.	Billy's toy blocks are 5 inches on a side. How many square inches of paint are there on the entire surface of the block? How many cubic inches of wood does each block contain?			16-0 (14.3%)
18.	The garden plot near the school is 28 feet by 19 feet. It is surrounded by a 3-foot walk. What will it cost to cement the walk at \$.75 a square foot?			18-0 (12.5%)

SERIES 32 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
19.	Mother's new dining room table-cloth contains $3\frac{1}{2}$ square yards of linen. The cloth is $1\frac{3}{4}$ yards wide. How much fringe would I need if I wanted to put an edge of it around the cloth?			16-0 (12%)

SERIES 32 (continued)

		Mental age obtaining:		
		50% accuracy	Minimum % accuracy	Maximum % accuracy
19.	Mother's new dining room table-cloth contains $3\frac{1}{2}$ square yards of linen. The cloth is $1\frac{3}{4}$ yards wide. How much fringe would I need if I wanted to put an edge of it around the cloth?			16-0 (12%)