A REMEDIAL ARITHMETIC PROGRAM IN COMPUTATIONAL SKILLS FOR CULTURALLY DISADVANTAGED FIFTH GRADE PUPILS

A PLAN B PAPER

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Problems in

Curriculum Construction

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A Requirement for the Degree

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by

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CHAPTER I

THE PROBLEM

The elementary classroom teacher is constantly confronted with the problem of providing instruction for those pupils who because of limited ability or inadequate preparation would not benefit from the standard curriculum in arithmetic. Because their problems are varied and complex they require individualized instruction geared to their rate and level of comprehension. Before these pupils can be helped they must be identified and their problems diagnosed. Traditional curriculums in arithmetic are geared to the average pupil and do not make adequate provision for the instruction of those not up to grade level. Many testing programs are conducted during a prearranged schedule which may or may not have relevance to the needs of the teacher. Even when they are conducted at an appropriate time they merely identify the pupil working below grade level and do not diagnose either the area or the process in which the pupil needs reinforcement. Some very good remedial programs have been developed but these are expensive and may not be readily available to the teacher. The teacher must therefore consistently and effectively plan and create appropriate lessons in order to provide materials for these pupils.

THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to facilitate the identification of culturally disadvantaged fifth grade pupils in need of remedial work in arithmetic computation; (2) to provide a means of diagnosing their problems; and (3) to provide a basis of instruction for these pupils.

Importance of the study. The arithmetic achievement in a typical fifth grade class of culturally disadvantaged pupils is well below grade level. The class contains a large group of pupils with achievement in arithmetic below the 2.0 level. An obvious need exists to provide materials for these pupils which are geared to their individual needs and low level of achievement. In addition to this problem, the teacher of the disadvantaged is constantly plagued by the limits imposed by time. Many of these pupils leave school before they finish the eighth grade and those that enter high school soon quit upon reaching the legal age of sixteen. Since many of these pupils do not posses the basic skills of arithmetic computation by the time they reach the fifth grade, it is necessary for the teacher to institute an arithmetic program of instruction that would provide those skills essential to a productive life in this technological age.

The standardized tests in use in most classrooms do not provide the teacher with the necessary information concerning prospective remedial pupils. This study attempted to provide the teacher with the diagnostic instruments needed to locate and evaluate the underachieving pupils. The remedial materials offer the teacher the necessary framework for curative instruction and the means to evaluate the progress of the pupil. The organization and formalization of a remedial program in arithmetic computation is a necessary step in the attempt to help pupils achieve these basic skills.

CHAPTER II

REVIEW OF THE LITERATURE

Many articles have been written concerning an efficient program of remedial instruction. These articles do not dictate a formula approach, but rather they supply the teacher with guidelines as to identification, diagnosis and curative suggestions.

LITERATURE ON REMEDIATION IN ARITHMETIC

The fact that children are indeed failing in the current curriculum is evidenced by Leroy Callahan's statement that "some children are underachieving by as much as fifty-five months."[1] Harry Wheat concluded that, "this failure is often permitted to become extreme before it is realized that a well-planned attempt to deal with failure should be made."[2] Callahan's study was conducted in a depressed-area school and it revealed that this trend is not irreversible as "children can be beneficially affected by a good diagnostic and remedial program in mathematics."[3]

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[1]Leroy Callahan, "Remedial Work With Underachieving Children," The Arithmetic Teacher, IX (March, 1962), pp. 138-140.

[2]Harry Grove Wheat, Psychology and Teaching of Arithmetic (Boston: D. C. Heath and Company, 1937), p. 522.

[3]Callahan, op. cit., pp. 138-140.

C. Newton Stokes stated that the first step in such a program is the administration of a survey test which "may be of assistance to the teacher in determining that the child has certain specific deficiencies."[4] Once he determined that a pupil is indeed in need of remediation, the teachers next concern is diagnosis.

Leo J. Brueckner made this statement on diagnosis.

> Diagnosis relates to the techniques by which one discovers and evaluates both strength and weaknesses of the individual as a basis for more effective guidance. Diagnosis is a logical process based on a consideration of all the available data concerning a particular individual or group of individuals. The analysis of these data and their interpretation in the light of knowledge gained from past experience enables the diagnostician to suggest necessary developmental or remedial measures. Diagnosis leads to prognosis; that is, to the prediction of the probable outcome of the condition.[5]

Allen Bernstein's research into the numerous studies conducted in remedial arithmetic, prompted his summarizing their conclusions by saying that "every experiment used individual diagnosis, and lesson plans based on the diagnosis as a basic teaching approach."[6]

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[4]C. Newton Stokes, Teaching the Meanings of Arithmetic (New York: Appleton-Century-Crofts, Inc., 1951), p. 276.

[5]Leo J. Brueckner, Educational Diagnosis (Bloomington, Illinois: Public School Publishing Company, 1935), p. 2.

[6]Allen Bernstein, "Library Research-A Study in Remedial Arithmetic," School Science and Mathematics, LIX (March, 1959), pp. 185-195.

G. T. Buswell reports that this individual diagnosis may be accomplished by "a simple technique which can be applied in any classroom. It consists in skillfully questioning and observing the pupil as he performs the four fundamental operations."[7] The author further suggested that "only one process should be diagnosed at a given time."[8] "Teaching can never be done until the teacher understands the processes by which the pupil is doing his work and the difficulties which he encounters."[9]

Stokes stated that "the diagnostic function of a test is its use in helping the teacher recognize inadequacy from its symptoms."[10] Ralph W. Tyler stated that the diagnostic test must also yield a record of behavior. "The significance of a record is due to the fact that single bits of behavior are far less meaningful and far less capable of objective evaluation than are cumulative records of behavior."[11]

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[7]G. T. Buswell, Diagnostic Studies in Arithmetic (Chicago, Illinois: The University of Chicago, 1926), p. 4.

[8]Ibid., p. 155.

[9]Ibid., p. 199.

[10]Stokes, op. cit., p. 275.

[11]Ralph W. Tyler, Educational Diagnosis (Bloomington, Illinois: Public School Publishing Company, 1935), p. 122.

This "record should indicate the significant reactions that actually took place."[12]

The last but not least characteristic of an effective diagnosis is that it must be practicable. "Can the diagnostic procedure be followed under the conditions necessary in the school? Does the procedure require no more time, personnel and equipment than can be provided?"[13]

Once the student has been identified and his difficulties diagnosed we can attempt to prescribe curative measures. Ramon Ross conducted a study in which he outlined the basic considerations in the initiation of corrective instruction.

1. Pinpoint specific skills missed and concentrate on those skills.
2. Provide opportunities for the child to feel successful in his work. Parcel out new learnings in small packages, and let the child have acquaintance with each packages contents before opening the next bundle.
3. Provide immediate feedback of results.
4. Give the child individual attention when possible.
5. Provide the child with encouragement.
6. Use concrete-abstract devices for illustrating mathematical concepts.
7. Provide adequate drill in a variety of situations while keeping the number of drill problems to a minimum.
8. Use a variety of techniques for teaching the various combinations in the basic processes.
9. Test and evaluate often.[14]

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[12] Tyler, loc. cit.

[13] Ibid., p. 108.

[14] Ramon Ross, (Diagnosis and Correction of Arithmetic Underachievement, "The Arithmetic Teacher, X (January, 1963), pp. 22-27.

Lesta Hoel suggested that we should not place too much emphasis on the particular fault of the pupil, but that we let him recognize, along with the teacher, his dilemma. The pupil should start where he will immediately experience success, and all future work must be based on his immediate needs. Wherever possible the pupil should be allowed to discover the process by himself.[15]

Joseph E. Fuller concluded that "the method of instruction should be individualized work within the group, so as to make provision for the wide range of individual achievement and the differences in learning abilities."[16] The materials used should be such that much self-instruction is possible, and they should be highly flexible.

> The pupil should start with concrete situations which he is able to comprehend. In solving the concrete problems he becomes interested in the principles involved. He goes on to other problems involving the same or similiar principles. In this way he begins to understand the operations by which certain types of problems can be solved. He begins to formulate rules of his own. He is, therefore, able to understand the rules formulated by others and to use them intelligently in the solution of problems.[17]

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[15] Lesta Hoel, "What Constitutes Remedial Work in Arithmetic", Mathematics Teacher, XLIII (January, 1950), pp. 19-24.

[16] Joseph E. Fuller, "A Program of Diagnostic Testing and Remedial Treatment in Arithmetic," Mathematics Teacher, XXXIX (December, 1946), pp. 380-384.

[17] Ibid., p. 383.

Kenneth E. Easterday conducted a study with low achievers in arithmetic in which he reported.

> Both traditional and "modern" mathematics, adapted from materials prepared by the SMSG, were used. Concepts were introduced through the techniques suggested by SMSG and additional practice was provided by "traditional" worksheets. The work was organized by topics and as each mastered the topic, as demonstrated by their success on a test, he would proceed to the next topic. Not all students were expected to reach the same level of mastery. The children worked independently and at their own rate. Basic motivation was derived from being able to work successfully on material of their own level.[18]

Paul C. Burns suggests that "the teacher needs first to create a situation (rapport) where pupils are willing to try the analytical test, recognize their deficiencies, and do the necessary follow-up work."[19] Very often these pupils lack concentration and the teacher must overcome this by giving frequent attention to their work, encouraging them as much as possible.[20]

Brueckner and Grossnickle have detailed some of the corrective measures that the teacher can apply. They suggest that: (1) treatment should be based on a diagnosis

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[18]Kenneth E. Easterday, "An Experiment with Low Achievers in Arithmetic," Mathematics Teacher, LVII (November 1964), pp. 462-468.

[19]Paul C. Burns, "Analytical Testing and Follow-Up Excercises in Elementary School Mathematics," School Science and Mathematics, LXV (January, 1965), pp. 34-38.

[20]Ibid., p. 37.

and should be individualized, (2) the interested cooperation of the learner should be secured, (3) specific deficiencies of the learner be attacked directly, (4) steps be taken to correct any physical, emotional, and enviornmental factors that are likely to interfere with progress, (5) correction of weaknesses should proceed on a tentative basis and when progress is slow and uncertain the steps should be modified, (6) instructional procedures and materials be of demonstrated value in making the operations meaningful for the learner, (7) the corrective and developmental program be integrated so that the learner will feel that he is not isolated and that he still is a member of the group, (8) steps be taken to assure the growth of all aspects of the learner's personality, and (9) the correction of deficiencies should not be focused to such an extent that such positive values as interests, attitudes, and appreciations are neglected.[21]

Callahan felt that in order to reverse trends toward increased underachievement remedial programs must answer these questions: (1) Who is having trouble? (2) Where is the difficulty? (3) Why did it occur and (4) What remedies are suggested?[22]

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[21]Foster E. Grossnickle and Leo J. Brueckner, Discovering Meanings in Elementary School Mathematics (New York: Holt, Rinehart and Winston, Inc., 1964), pp. 407-408.

[22]Callahan, op. cit., p. 140.

CHAPTER III

THE PROGRAM AND THE PARTICIPANTS

I. THE CHILDREN

The pupil toward which this study was directed represents about 20% of the pupils in a disadvantaged classroom. He was a member of a minority group and his early life had been characterized by mobility, absenteeism, failure in mathematics, a low level of verbal ability and repeated retention in the early grades.

His mobility was a direct result of the poverty and the social climate in which he found himself. Different schools in widely separated geographic locations, each with a distinctive philosophy and varying degrees of efficiency, deprived the pupil of the continuity of objectives, methods and materials. The pupil had very often attended two or three different schools by the time he reached the fifth grade.

Even while he was in one location this continuity was disrupted by excessive absenteeism. It was not uncommon for these students to be absent for thirty days in a school year. It was not the intent of this paper to delve into the social and economic factors which caused this absenteeism but merely to illuminate this condition as one which existed and with which the teacher had to cope.

The records of these pupils invariably showed that they had consistently faced failure in their academic attempts. Their scores in arithmetic and reading fell below the 2.0 grade level in standardized tests, and they were one to two years older than their classmates due to retention in the early grades.

This study attempted to quickly assimilate the student into the curriculum and offer a continuing cause of study on an individualized basis. The Cuisenaire rods and Domino cards offered the student the concrete applications necessary for him to assimilate the concepts. The absence of graded materials and the decelerated pace offered him a chance of success without the stigma of achieving it in primary books.

II. THE TEACHER

The teacher of culturally disadvantaged children must cope with the problem of providing rewarding experiences with limited resources. Very often the only materials available were the arithmetic text. Since these children would not benefit from instruction at the fifth grade level, it fell upon the teacher to provide the lesson materials. In addition to the amount of time spent in preparing daily lessons and worksheets for these individuals and for the

regular arithmetic groups, the length of time allowed for mathematics instruction precluded an attempt to work with each of these individuals and the groups.

Without adequate time and the necessary materials, the teacher and the pupil would benefit from an organized and sequential series of lessons which would, in part, be self-teaching and at a level the pupil could comprehend and find success.

III. THE PROGRAM

The study included tests in the computational areas of addition, subtraction, multiplication and division of whole numbers. The survey included a variety of examples at the fifth grade level. The tests required the pupil to achieve a minimum score which would indicate that he understood the process and could adequately perform the indicated operation. If the pupil failed to perform at the minimum level in any of the critical areas of the operation, the teacher would then administer the diagnostic test in that area.

The diagnostic test was to be administered on a one-to-one basis. The pupil would write on the test form while stating orally his thought processes. The teacher would listen to his statements and record on the Difficulty Check Sheet any inconsistancies which might have resulted.

The check sheet listed the most dominant mistakes usually made and provision was made for recommendations. Having entered his scores on the record sheet and diagnosed his difficulties as to operation and topic, the teacher had a record of the pupils strengths and weaknesses.

Those pupils who required work in a specific area would then begin to work on those worksheets that are prepared especially for work in the area in which the pupil required additional help. Depending upon the success and the progress the pupil achieved, the teacher may wish to add supplemental materials in each topic area. Included in each area was a topic test which covered the material in the topic. Successful completion of this test would indicate that the pupil had mastered the process covered. Each pupil was not required to start at the beginning of each section and continue through the entire program. Instead, each was assigned in only those areas in which he was deficient or in which he needed reinforcement.

This program was not intended as the complete arithmetic program for the student, but was merely used in addition to his regular group work. If the pupils ability was such that he needed all of the work in the program it was advised that this work be supplemented by other materials that may be available. Gross deficiencies in computation did not preclude his participation in such mathematics units as

geometry, measurement and other topics commonly discussed in the fifth grade from which he might benefit.

In the initial section in addition, much time was spent in the use of Cuisenaire rods. These rods may also be used in the development of later sections even though they had not been utilized in the study. The teacher should become familiar with the rods and their proper use. Not included in the program was the initial period of play, whereby the pupil was allowed to play with the rods in an exploratory manner. This allowed the pupil to become familiar with the rods and their relationships. These excersises may be done in groups as all would benefit from their use.

Some aids such as Cuisenaire rods and Domino cards had been utilized in this program, but the teacher should incorporate as many other manipulative materials as may prove beneficial.

CHAPTER IV

Addition

Test for Addition

Name _____ Date _____

Topic 1. Number Combinations

2. Zeros

3. Higher decades

4. Regrouping

5. Column addition

Purpose - To determine which pupils need remedial work.

To determine in which area a pupil needs remedial work.

1.	$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +8 \\ \hline \end{array}$
2.	$\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +9 \\ \hline \end{array}$
3.	$\begin{array}{r} 16 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 80 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 74 \\ +5 \\ \hline \end{array}$
4.	$\begin{array}{r} 32 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 33 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ +4 \\ \hline \end{array}$
5.	$\begin{array}{r} 34 \\ +52 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ +24 \\ \hline \end{array}$	$\begin{array}{r} 50 \\ +17 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ +53 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ +22 \\ \hline \end{array}$

6.	$\begin{array}{r} 37 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 88 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ +5 \\ \hline \end{array}$
7.	$\begin{array}{r} 47 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 74 \\ +7 \\ \hline \end{array}$
8.	$\begin{array}{r} 87 \\ +95 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ +74 \\ \hline \end{array}$	$\begin{array}{r} 70 \\ +41 \\ \hline \end{array}$	$\begin{array}{r} 88 \\ +53 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ +49 \\ \hline \end{array}$
9.	$\begin{array}{r} 6 \\ 4 \\ 8 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 3 \\ 4 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 0 \\ 5 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 9 \\ 6 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 7 \\ 8 \\ +6 \\ \hline \end{array}$
10.	$\begin{array}{r} 37 \\ 23 \\ +48 \\ \hline \end{array}$	$\begin{array}{r} 247 \\ 834 \\ +682 \\ \hline \end{array}$	$\begin{array}{r} 207 \\ 348 \\ +126 \\ \hline \end{array}$	$\begin{array}{r} 641 \\ 987 \\ 342 \\ +575 \\ \hline \end{array}$	$\begin{array}{r} 788 \\ 541 \\ 398 \\ +483 \\ \hline \end{array}$

Pupil must score: Topic 1.--- 8

Topic 2.--- 7

Topic 3.-- 12

Topic 4.-- 18

Topic 5.--- 7

Topic 1. Number combinations

Rows 1, 2

Topic 2. Zeros

Column C

Topic 3. Higher decade

Rows 3, 4, 5

Topic 4. Regrouping

Rows 6, 7, 8, 9, 10

Topic 5. Column addition

Rows 9, 10

Addition

Diagnostic test for pupil evaluation. To be used with addition difficulty check sheet. All work done by the student is to be written and stated orally.

Topic 1

1.	$\begin{array}{r} 0 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +1 \\ \hline \end{array}$
2.	$\begin{array}{r} 9 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +1 \\ \hline \end{array}$
3.	$\begin{array}{r} 9 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +5 \\ \hline \end{array}$
4.	$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$
5.	$\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$
6.	$\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline \end{array}$

Addition

Diagnostic test for pupil evaluation. To be used with addition difficulty check sheet. All work done by the student is to be written and stated orally.

Topic 2

Add:

1.	$\begin{array}{r} 24 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 22 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ 1 \\ \hline \end{array}$
2.	$\begin{array}{r} 25 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 1 \\ \hline \end{array}$
3.	$\begin{array}{r} 48 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 35 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 3 \\ \hline \end{array}$
4.	$\begin{array}{r} 31 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 33 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 71 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ 5 \\ \hline \end{array}$
5.	$\begin{array}{r} 82 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 82 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 51 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 71 \\ 8 \\ \hline \end{array}$

Addition

Diagnostic test for pupil evaluation. To be used with addition difficulty check sheet. All work done by the student is to be written and stated orally.

Topic 3

26	48	64	28	45	655	748
+17	+17	+28	+67	+18	+82	+71
592	166	256	416	397	645	397
+144	+81	+63	+385	+529	+187	+373

Topic 4

275	594	250	456	332
400	302	526	303	457
323	201	201	721	325
+602	+105	+433	+244	+344
345	477	475	202	336
458	303	230	570	223
220	204	460	328	350
+454	+532	+705	+724	+704

Addition Difficulties

Name _____ Date _____

Topic	Score	Difficulty	Remarks
1		Errors in combinations	
		a. Easy facts	
		b. Hard facts	
2		Zero difficulty	
3		Higher decade	
		a. Number combination	
		b. Bridging the tens	
4		Regrouping	
		a. Added regrouped number last	
		b. Forgot to add regrouped number	
		c. Added regrouped number irregularly	
		d. Wrote number to be regrouped	
		e. Regrouped wrong number	
		f. Regrouped when it wasn't necessary	
		g. Wrote regrouped number in the answer	
		h. Added regrouped number twice	

Topic	Score	Difficulty	Remarks
		i. Subtracted regrouped number	
		j. Other	
5		Column Addition	
		a. Retraced work partly done	
		b. Irregular procedure	
		c. Grouped numbers	
		d. Split numbers	
		e. Lost place in column	
		f. Disregards column	
		g. Omits digits	
		h. Error in writing answer	
		i. Added in pairs	
		j. Added same digit in two columns	
		k. Began with left column	
		l. Counting	
		Miscellaneous faults	
		a. Used wrong operation	
		b. Errors in reading numbers	
		c. Depended upon visualization	
		d. Skipped decades	
		e. Confused columns	

Topic	Score	Difficulty	Remarks
		f. Added imaginary numbers	
		Personal Habits	
		a. Scratch paper	
		b. Attention span	
		c. Easily distracted	
		d. Self-confidence	
		e. Other	

Area of greatest need -

Recommendations -

Record Sheet - Addition

Topic	1	2	3	4	5
Total Problems	10	10	15	25	10

Name

Name _____ Topic 1

Number 1

Cuisenaire Constructions

What rods could you use to make a train that would be the same length as the rod on the left. Draw a picture of your train on the right. Use only two blocks in each train.

Color	Trains
Red	
Green	
Purple	
Yellow	
Dark Green	
Black	
Brown	
Orange	
Blue	

Name _____ Topic 1

Number 2

Cuisenaire

Construct trains for each rod using only sections of the same color. Use as many as you like but they must be the same size as the model.

Color	Trains
Orange	
Blue	
Brown	
Black	
Dark Green	
Yellow	
Purple	
Green	
Red	

Name _____ Topic 1

Number 3

Cuisenaire

If the white rod is called one, what would we call each of these others?

Red =

Green =

Purple =

Yellow =

Dark Green =

Black =

Brown =

Blue =

Orange =

Name _____ Topic 1

Number 4

Cuisenaire

Build as many two car trains as you can which look different, but are as long as the color rod on the left. On the right fill in the color of the car in each position.

Red	1 - 2
Green	1 - 2
Purple	1 - 2
Yellow	1 - 2
Dark Green	1 - 2

Black	1 - 2
Brown	1 - 2
Blue	1 - 2
Orange	1 - 2

Name _____ Topic 1

Number 5

Cuisenaire

Fill in the missing sum. Use your rods to build the train.

Example:

Addends	Sum
3 + 2 =	5
3 + 3 =	
1 + 1 =	
2 + 3 =	
2 + 1 =	
2 + 4 =	
5 + 4 =	
2 + 2 =	
3 + 7 =	
1 + 4 =	
9 + 1 =	
3 + 6 =	
2 + 4 =	
7 + 2 =	

Name _____ Topic 1

Number 6

Cuisenaire

Use the rods to see if the number sentence is correct. Check the column under true if sentence is correct, check false if the answer is wrong.

Example:	True	False
1 + 3 = 4	X	
2 + 4 = 5		X
2 + 3 = 5		
6 + 4 = 8		
7 + 1 = 8		
4 + 2 = 6		
1 + 7 = 7		
4 + 3 = 8		
6 + 2 = 8		
5 + 1 = 6		
2 + 4 = 6		
7 + 3 = 10		
8 + 2 = 9		
2 + 8 = 10		
3 + 3 = 6		
2 + 0 = 0		

Name _____ Topic 1

Number 7

Cuisenaire

Use your rods to fill in the missing term. Over each term write in the color of the rods used.

Example:

Green		Yellow		Brown
3	+	5	=	8

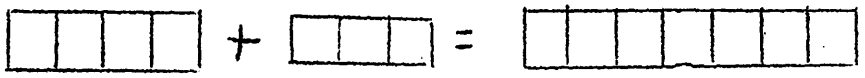
6 + __ = 9	__ + 1 = 4
4 + __ = 4	__ + 2 = 9
__ + 7 = 8	4 + __ = 8
__ + 4 = 7	2 + __ = 6
3 + __ = 8	5 + __ = 7
__ + 1 = 5	1 + __ = 6
3 + __ = 6	6 + __ = 10

Name _____ Topic 1

Number 8

Finding the Sum

When we are asked to find the sum, we must add the numbers and find out how many we have in all.

$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$ 

Seven is the sum of 4 and 3. We can see that if we add 4 blocks and 3 blocks the sum of blocks we get is 7.

Fill in the numeral answers and the picture showing how many in all.

What is the sum of 4 and 2?

$\begin{array}{r} 4 \\ +2 \\ \hline \end{array}$

The sum of 4 and 2 is ____. There are ___ blocks in all.

$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$

The sum of 5 and 3 is ____. There are ___ blocks in all.

$\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$

The sum of 6 and 3 is ____. There are ___ blocks in all.

Fill in the picture.

$$\begin{array}{r} 2 \\ +5 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +3 \\ \hline \end{array}$$

Write a sentence telling about each sum.

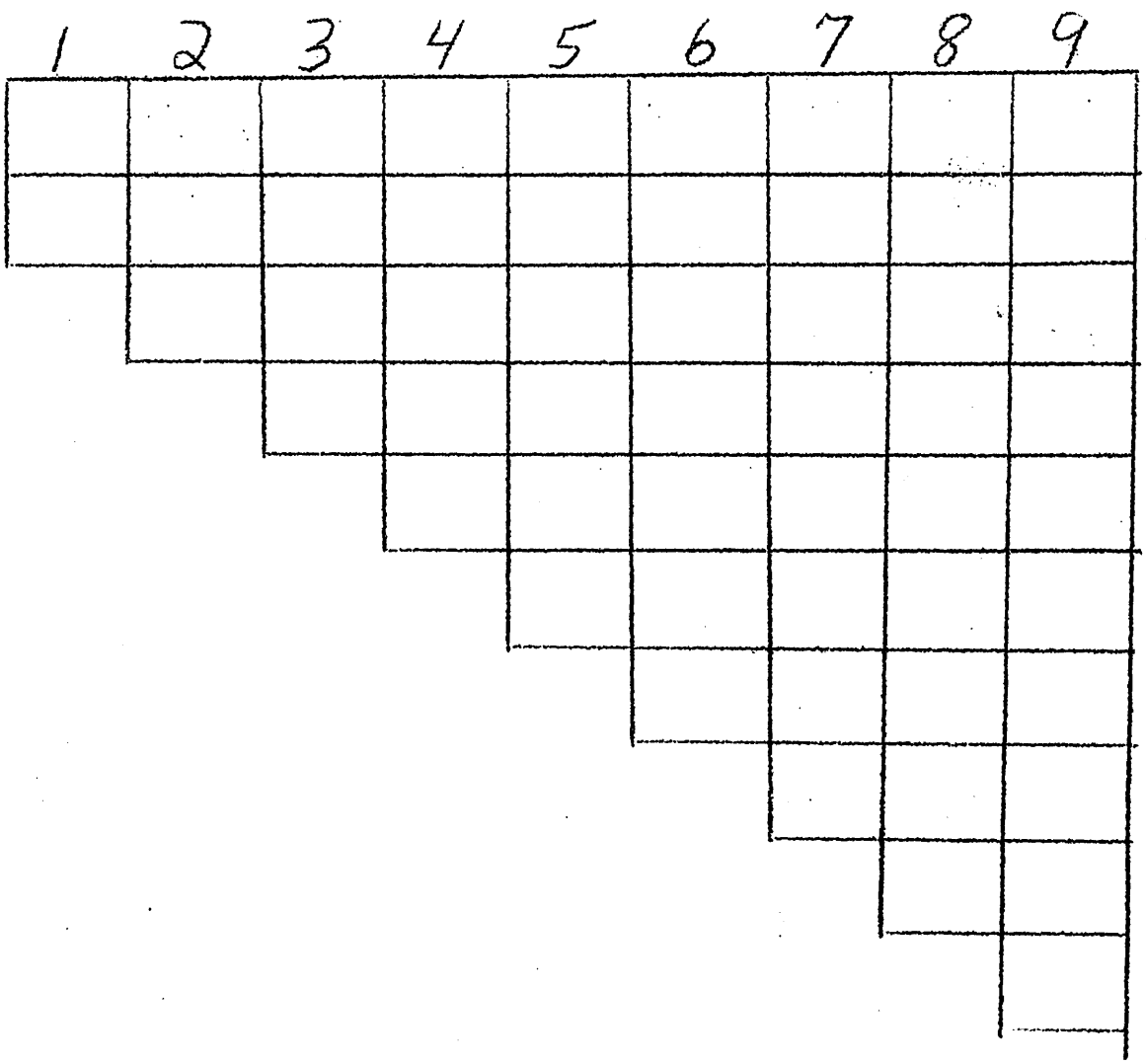
Name _____ Topic 1

Number 9

Addition Combinations

Fill in the number combination which will result in the sum at the top of the column. Use only two addends.

Sum

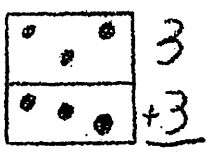


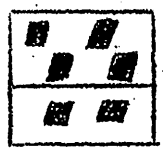
Name _____ Topic 1

Number 10

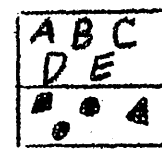
Domino Game

Fill in the numerals.

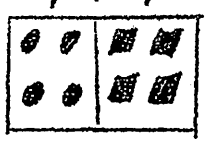

3
+3
6

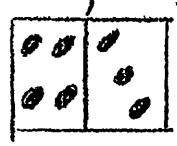

+ ___


+ ___



+ ___

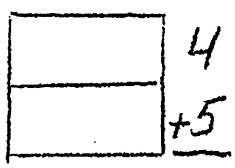

4 + 4 = 8

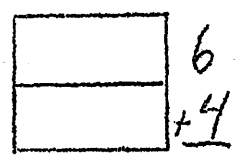

+ =

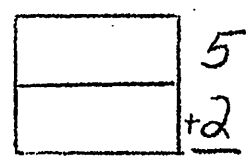

+ =

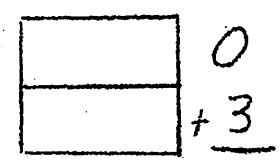

+ =

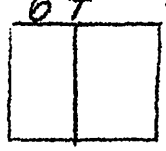
Fill in the dominoes.

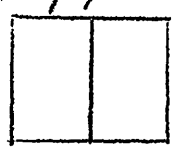

4
+5

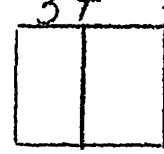

6
+4

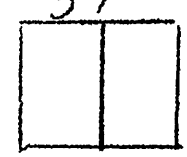

5
+2


0
+3


6+ =8


4+ =7


3+ =9


3+ =6

Name _____ Topic 1

Number 11

Domino Combinations

Fill in the dominoes in as many ways as you can to total each sum.

9 =

8 =

7 =

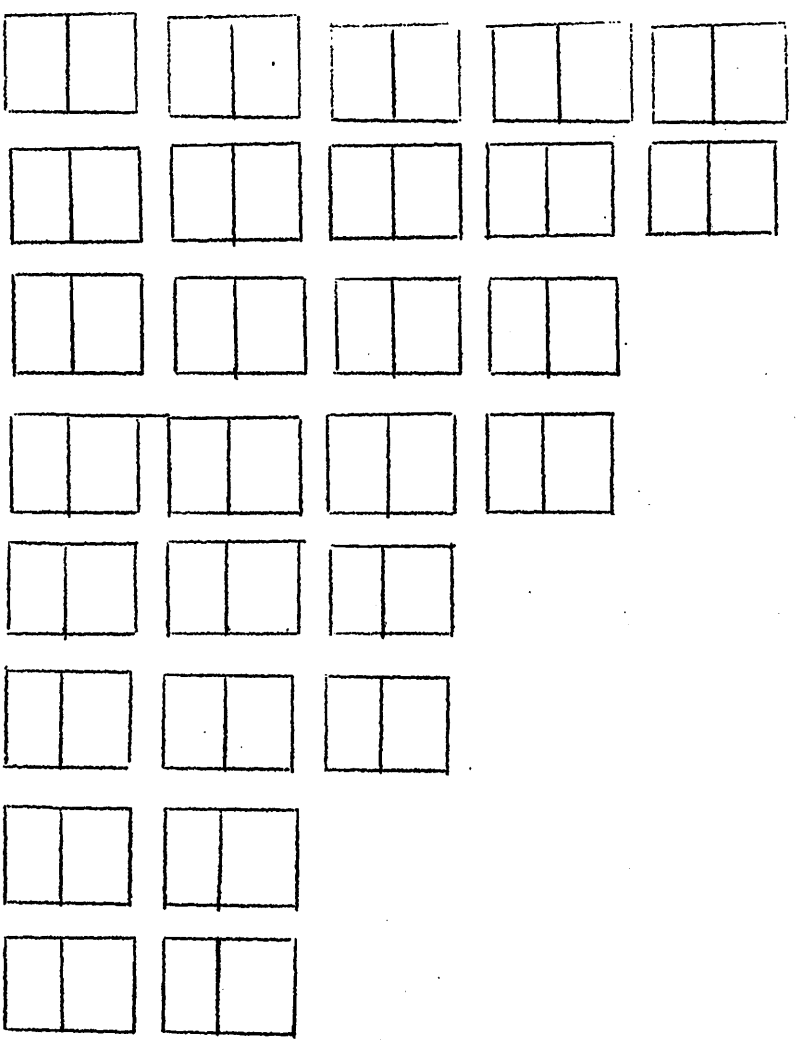
6 =

5 =

4 =

3 =

2 =



Name _____ Topic 1

Number 12

Domino Combinations

Fill in the dominoes in as many different ways as you can to total each sum.

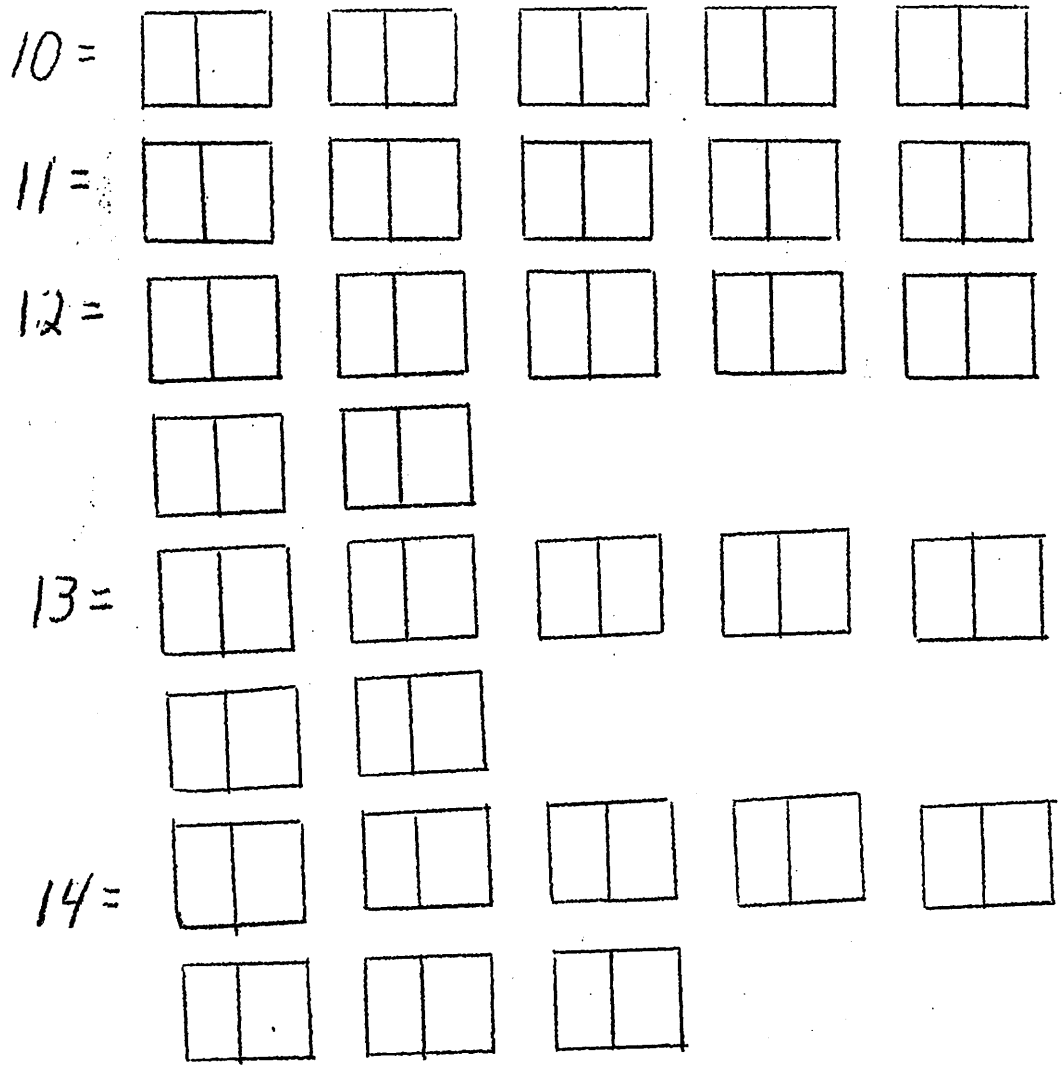
10 =

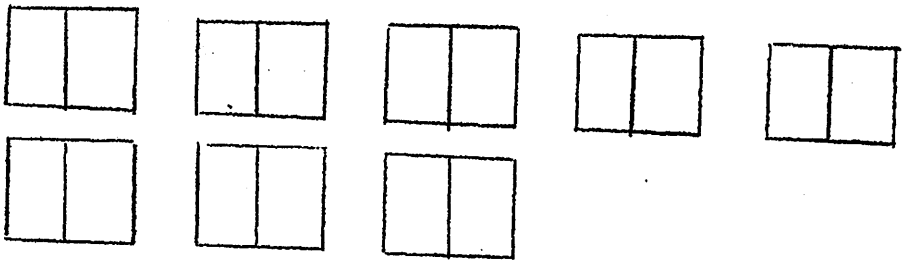
11 =

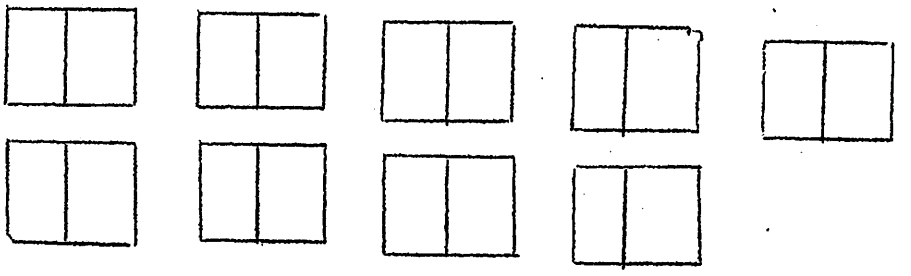
12 =

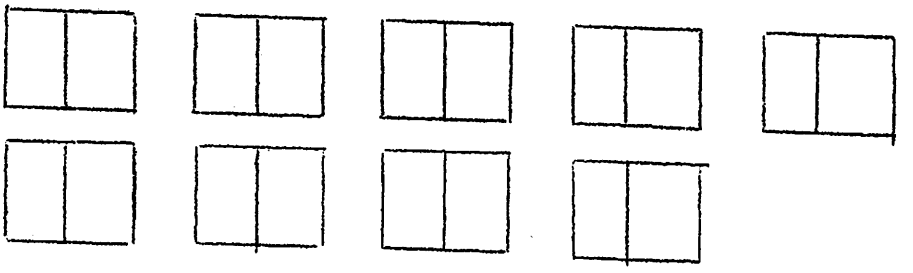
13 =

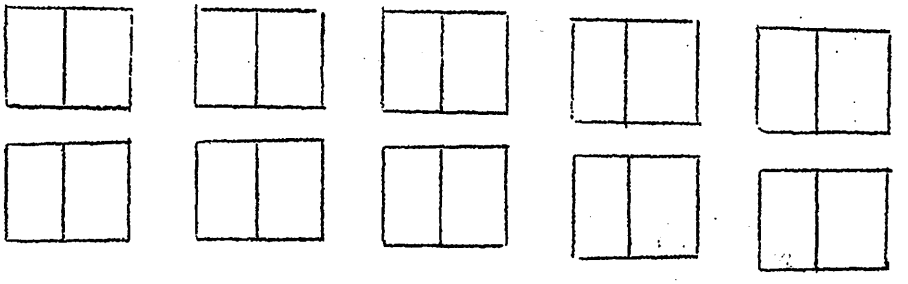
14 =



15 = 

16 = 

17 = 

18 = 

Name _____ Topic 1

Number 13

Addition Table

Find each sum by adding the numerals in each row to those in each column.

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

Name _____ Topic 1

Number 14

Addition Table

Find each sum by adding the numerals in the column to those in each row.

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

Name _____ Date _____

Oral Pre-Test

This test should be given orally to determine just which facts the pupil is having difficulty with. The time limit for each set is one minute.

Set 1

Add:

5 1	1 0	3 1	0 5	3 0	1 5	1 3
0 1	4 2	6 0	2 4	4 1	2 2	0 6
4 0	3 2	0 4	1 2	0 3	1 4	2 1
0 0	5 0	3 3	1 1	2 0	2 3	0 2

Set 2

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

Name _____ Topic 1

Number 15

Cuisenaire

Build a staircase from white to orange. Now place an orange rod under each stair. Fill in the chart.

Pattern	Number	Sum	Name
1. O + W	10 + 1	11	Eleven
2. O + R	_____	__	_____
3. O + G	_____	__	_____
4. O + P	_____	__	_____
5. O + Y	_____	__	_____
6. O + D	_____	__	_____
7. O + K	_____	__	_____
8. O + N	_____	__	_____
9. O + U	_____	__	_____
10. O + O	_____	__	_____

Name _____ Topic 1

Number 16

Eleven

Construct as many different patterns for eleven as you can. Write down the colors and the numbers for each.

	Colors	Number Sentence
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Name _____ Topic 1

Number 17

Cuisenaire

Use your rods to fill in the missing sum. Write the color over each addend.

1. 10 + 4 = ____

2. 3 + 8 = ____

3. 6 + 10 = ____

4. 7 + 4 = ____

5. 10 + 8 = ____

6. 5 + 6 = ____

7. 2 + 10 = ____

8. 9 + 2 = ____

9. 10 + 9 = ____

10. 7 + 10 = ____

11. 1 + 10 = ____

12. 4 + 7 = ____

13. 2 + 9 = ____

14. 10 + 5 = ____

15. 3 + 10 = ____

16. 8 + 3 = ____

17. 6 + 5 = ____

18. 10 + 3 = ____

19. 6 + 5 = ____

20. 10 + 1 = ____

Name _____ Topic 1

Number 18

Twelve

Construct as many different patterns equal to twelve as you can.c

Colors	Number Sentence
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	

Name _____

Topic 1

Number 19

Cuisenaire

Use your rods to find the missing term.

1. 10 + 2 = ___
2. __ + 2 = 11
3. 4 + __ = 11
4. 3 + 9 = ___
5. 6 + __ = 12
6. 5 + __ = 11
7. 8 + __ = 11
9. 3 + 9 = ___
10. __ + 4 = 11
11. 6 + 5 = ___
12. 2 + 10 = ___
13. 5 + 7 = ___
14. 3 + ___ = 11
15. ___ + 9 = 11
16. 10 + 1 = ___
17. 8 + 4 = ___
18. 4 + ___ = 12
19. 6 + 4 = ___
20. 7 + ___ = 10

Name _____ Topic 1

Number 20

Thirteen

Construct as many different patterns equal to thirteen as you can.

	Colors	Number Sentence
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Name _____

Topic 1

Number 21

Cuisenaire

Find the sums.

Addends	Sum
10 + 3 =	
8 + 4 =	
7 + 6 =	
9 + 2 =	
7 + 4 =	
5 + 8 =	
9 + 3 =	
8 + 5 =	
4 + 8 =	
6 + 5 =	
7 + 3 =	
9 + 4 =	
7 + 5 =	
4 + 5 =	
6 + 4 =	
8 + 3 =	
6 + 7 =	
3 + 9 =	

Name _____ Topic 1

Number 22

Review

Use your domino cards to help you.

1.	$\begin{array}{r} 2 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline \end{array}$
2.	$\begin{array}{r} 9 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$
3.	$\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$
4.	$\begin{array}{r} 4 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$
5.	$\begin{array}{r} 3 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +7 \\ \hline \end{array}$
6.	$\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$
7.	$\begin{array}{r} 5 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$
8.	$\begin{array}{r} 3 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$

Name _____ Topic 1

Number 23

Cuisenaire

Construct each pattern and fill in the chart.

Pattern	Numbers	Sum	Name
Example:			
O + P	10 + 4	14	fourteen
O + Y	_____	___	_____
K + K	_____	___	_____
Y + U	_____	___	_____
D + U	_____	___	_____
P + O	_____	___	_____
U + Y	_____	___	_____
K + N	_____	___	_____
Y + O	_____	___	_____
D + N	_____	___	_____
U + D	_____	___	_____
N + K	_____	___	_____
N + D	_____	___	_____
K + D	_____	___	_____
U + P	_____	___	_____
N + P	_____	___	_____

Name _____

Topic 1

Number 24

Domino Cards

Use your dominoes to help you find the sum.

1.	$\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +5 \\ \hline \end{array}$
2.	$\begin{array}{r} 6 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$
3.	$\begin{array}{r} 9 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$
4.	$\begin{array}{r} 9 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$
5.	$\begin{array}{r} 5 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$
6.	$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +3 \\ \hline \end{array}$
7.	$\begin{array}{r} 6 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$
8.	$\begin{array}{r} 9 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$

Name _____ Topic 1

Number 25

Sixteen

Construct trains as long as sixteen using only one color. Record each color that will make up one train. What three colors will make up the train?

_____

_____

_____

Use any two rods and construct as many trains each the length of sixteen.

	Colors	Number Sentence
1.		
2.		
3.		
4.		
5.		

Name _____ Topic 1

Number 26

Cuisenaire

Construct trains for each number using the same two rods only once for each number.

Example:

Sum	Addends
4	3 + 1
	2 + 2

not 1 + 3 - these rods were used already

Sum	Addends
11.	
12.	
13.	
14.	
15.	
10.	
16.	

Name _____ Topic 1

Number 27

Cuisenaire

Construct patterns for each of the sums.

Sum	Pattern	Number Sentence
17.		
18.		
19.		

Name _____

Topic 1

Number 28

Cuisenaire

Use your rods to help fill in the missing term.

1. 9 + _ = 18
2. _ + 10 = 16
3. 8 + 6 = _
4. _ + 8 = 17
5. 6 + _ = 12
6. 8 + 3 = _
7. 7 + _ = 13
8. 7 + _ = 12
9. 8 + 8 = _
10. 6 + 9 = _
11. _ + 5 = 15
12. 5 + 9 = _
13. _ + 9 = 16
14. 9 + 6 = _
15. _ + 8 = 13
16. _ + 9 = 19
17. 6 + 5 = _
18. 8 + _ = 12
19. 7 + 7 = _
20. 9 + _ = 18
21. 7 + 8 = _
22. 6 + _ = 14
23. _ + 2 = 11
24. 7 + 5 = _
25. 4 + 9 = _
26. 5 + _ = 15
27. 7 + 4 = _
28. 4 + 10 = _
29. 9 + _ = 16
30. 9 + 5 = _

Name _____ Date _____

Unit Practice

Each set should be one and one-half minutes.

Set 1

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

Set 2

5 +9	8 +8	6 +7	9 +9	7 +8	4 +9	9 +8	8 +7	9 +4	6 +8
7 +6	8 +9	5 +8	7 +9	8 +6	9 +7	8 +5	9 +6	7 +7	9 +5

Name _____ Date _____

Topic Test 1

Add:

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

Name _____ Topic 3

Number 1

Rewrite each number as tens plus ones.

Example:

34 = 30 + 4

17 = 10 + 7

14 =	12 =	80 =	37 =
17 =	34 =	27 =	22 =
48 =	55 =	16 =	46 =
31 =	71 =	53 =	28 =
21 =	49 =	90 =	35 =

Complete each sentence by rewriting the first addend as tens plus ones.

Example:

17 + 2 = (10 + 7) + 2

34 + 3 = (30 + 4) + 3

26 + 3 =	12 + 5 =
17 + 2 =	23 + 3 =
32 + 3 =	34 + 3 =
47 + 0 =	26 + 2 =
55 + 4 =	41 + 4 =

Name _____ Topic 3

Number 2

Rewrite each sentence first by rewriting the addend as tens plus ones and second by grouping the ones. Find the sums.

Example:

12 + 5 = (10 + 2) + 5 = 10 + (2 + 5) = 17

36 + 2 = (30 + 6) + 2 = 30 + (6 + 2) = 38

25 + 4 =

33 + 5 =

17 + 1 =

52 + 4 =

84 + 3 =

46 + 2 =

43 + 0 =

64 + 4 =

87 + 1 =

12 + 6 =

Rewrite these numbers as tens plus ones. Find the sum.

Example:

37 + 2 = 30 + (7 + 2) = 37

21 + 5 =

34 + 3 =

56 + 3 =

23 + 6 =

12 + 7 =

42 + 5 =

54 + 0 =

83 + 5 =

91 + 7 =

11 + 8 =

Name _____ Topic 3

Number 3

Study the example, then find the sums and fill in the blanks.

Example:	31 +4	30 + 1 + 4 30 + 5	31 +4 35
1.	26 +3	20 + 6 + 3	26 +3
2.	12 +5	10 + 2 + 5	12 +5
3.	43 +4	40 + 3 + 4	43 +4
4.	62 +6	60 + 2 + 6	62 +6
5.	83 +5	80 + 3 + 5	83 +5
6.	24 +5	__ + __ +	+
7.	32 +5	__ + __ +	+
8.	23 +3	__ + __ +	+

Name _____ Topic 3

Number 4

Find the sums.

1.	36 +2 = 38	5 +84 = 89	27 +1	80 +6	36 +0	11 +5
2.	72 +5	93 +4	14 +3	12 +3	54 +2	85 +3
3.	65 +4	64 +5	27 +2	43 +5	34 +2	32 +6
4.	53 +5	24 +4	15 +4	14 +5	41 +7	13 +6
5.	35 +2	53 +3	43 +3	31 +8	48 +1	65 +2
6.	61 +7	45 +2	75 +4	95 +4	51 +6	62 +6
7.	84 +4	33 +2	42 +7	63 +4	43 +5	82 +6
8.	25 +4	87 +2	66 +3	46 +2	85 +3	26 +3

Name _____ Topic 3

Number 5

Find the sums.

Example:

2 tens + 1 ten = 3 tens
20 + 10 = 30

$$\begin{array}{r} 20 \\ +10 \\ \hline 30 \end{array}$$

70	20	30	60	50	10	30	20	10
+10	+50	+20	+30	+10	+40	+40	+70	+60

50	30	20	70	50	40	20	10	30
+40	+30	+40	+20	+30	+40	+10	+70	+40

First add the ones and then the tens.

74	43	35	61	52	14	42	18	16
+12	+26	+41	+32	+22	+34	+55	+30	+12

46	70	84	28	33	13	60	31	13
+23	+19	+14	+61	+33	+31	+24	+42	+26

Name _____ Topic 3

Number 6

Add the ones first, then add the tens. Record each sum as is done in the example.

	add ones	add tens	
57 +5	57 +5 12	57 +5 12 50	57 +5 12 +50 62 sum of ones and tens
36 +3	36 +3 9	36 +3 9 30	36 +3 9 30 39
52 +8			85 +6
74 +9			82 +9
65 +7			37 +7
41 +9			58 +3

Name _____ Topic 3

Number 7

Write the greater addend as tens plus ones, then add the ones first and then the tens.

Example:

$$\begin{array}{rcl} 44 & = & 40 + 4 \\ +8 & = & + \quad\quad 8 \\ \hline & & 40 + 12 = 52 \end{array}$$

$$\begin{array}{rcl} 57 & = & 50 + \_\_ \\ +5 & = & + \quad\quad 5 \quad = \\ \hline \end{array}$$

$$\begin{array}{rcl} 78 & = & 70 + \_\_ \\ +6 & = & + \quad\quad \_\_ \quad = \\ \hline \end{array}$$

$$\begin{array}{rcl} 66 & = & \_\_ + \_\_ \\ +4 & & + \quad\quad \_\_ \\ \hline \_\_ & & \_\_\_\_\_ \quad = \end{array}$$

$$\begin{array}{rcl} 62 & = & \\ +9 & = & + \_\_\_\_\_ \quad = \\ \hline \end{array}$$

$$\begin{array}{rcl} 59 & = & \\ +4 & = & + \_\_\_\_\_ \quad = \\ \hline \end{array}$$

$$\begin{array}{rcl} 34 & = & \\ +7 & = & + \_\_\_\_\_ \quad = \\ \hline \end{array}$$

Name _____ Topic 3

Number 8

Record the sum of the ones and then the sum of the tens to find the total.

Example:

$$\begin{array}{r} 52 \\ +8 \\ \hline 10 \\ 50 \\ \hline 60 \end{array}$$

$\begin{array}{r} 74 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 41 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 82 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ +8 \\ \hline \end{array}$
$\begin{array}{r} 66 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 78 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 29 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 44 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ +5 \\ \hline \end{array}$
$\begin{array}{r} 67 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 86 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 32 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 81 \\ +9 \\ \hline \end{array}$
$\begin{array}{r} 23 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 79 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 68 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 27 \\ +4 \\ \hline \end{array}$

Name _____ Topic 3

Number 9

Find the sums.

7 + 8	17 + 8	57 + 8	27 + 8	87 + 8	67 + 8	77 + 8	47 + 8
6 + 5	16 + 5	36 + 5	86 + 5	46 + 5	56 + 5	66 + 5	26 + 5
5 + 8	25 + 8	85 + 8	35 + 8	15 + 8	45 + 8	55 + 8	65 + 8
7 + 6	17 + 6	37 + 6	87 + 6	47 + 6	57 + 6	67 + 6	27 + 6
4 + 7	24 + 7	14 + 7	54 + 7	84 + 7	64 + 7	34 + 7	44 + 7
8 + 8	18 + 8	38 + 8	88 + 8	48 + 8	78 + 8	68 + 8	28 + 8
5 + 9	15 + 9	45 + 9	25 + 9	85 + 9	65 + 9	35 + 9	75 + 9

What can we say about the sum when the sum of the ones is greater than ten?

Name _____ Topic 3

Number 10

Review

Time: 1½ minutes

Pupil Score: 16 minimum

23 + 4 = 17 + 2 = 26 + 3 = 14 + 2 =

36 + 2 = 25 + 2 = 12 + 5 = 27 + 2 =

24 + 5 = 33 + 5 =

42	18	27	35	22	31	26	35
+6	+1	+2	+3	+4	+8	+3	+4

Time: 1½ minutes

Pupil Score: 16 minimum

26 + 7 = 18 + 6 = 46 + 4 = 23 + 8 =

42 + 8 = 17 + 9 = 35 + 8 = 33 + 9 =

29 + 7 = 44 + 9 =

38	47	33	45	47	27	17	12
+9	+4	+8	+8	+6	+8	+5	+9

Topic Test 3

Add:

37 3	48 7	35 3	80 7	19 2	46 7	39 6
74 8	56 7	78 3	29 3	86 2	47 9	29 0
87 5	19 9	36 5	79 3	28 4	85 4	68 5
37 9	27 6	30 9	54 7	39 4	67 8	45 3
76 9	86 8	28 2	57 7	38 9	60 7	39 5
72 9	23 5	49 8	85 7	28 8	46 6	54 4
56 5	70 9	65 8	67 2	73 9	18 6	13 6

Name _____ Topic 4

Number 1

In this section we will be using money to help us re-group. The only pieces of money we will use are the penny, dime, dollar, and the ten dollar.

10 pennies = 1 dime	10 ones = 1 ten
10 dimes = 1 dollar	10 tens = 1 hundred
10 dollars = 1 ten dollar	10 hundreds = 1 thousand
100 pennies = 1 dollar	100 ones = 1 hundred

Example:

17 = 1 dime + 7 pennies

1 ten + 7 ones

24 = 2 tens + 4 ones

2 dimes + 4 pennies

Write these numerals as dimes plus pennies, and tens plus ones.

38 = ____ dimes + ____ pennies

____ tens + ____ ones

27 = ____ dimes + ____ pennies

____ tens + ____ ones

46 = ____ + ____

____ + ____

83 = __ + __

__ + __

59 = __ + __

__ + __

81 = __ + __

__ + __

Name _____ Topic 4

Number 2

6 = 6 ones

7 = 7 ones
13 = 1 ten + 3 ones

Whenever we get enough pennies to make a dime we change them.

13 = 1 dime plus 3 pennies
+8 = 8 pennies
1 dime plus 11 pennies = 2 dimes + 1 penny

Whenever we change pennies into dimes we must add the new dime with the other dimes we have.

Use your coins to find the sum. Put the number of pennies in the ones column and dimes in the tens.

25	89	76	83	82	56	91
+7	+5	+9	+7	+4	+8	+6

34	63	83	54	47	24	82
+9	+9	+8	+7	+8	+7	+8

Name _____ Topic 4

Number 3

Use your coins to find the sum. Remember which column is for dimes and which for pennies.

Example: 34 = 3 dimes + 4 pennies

16	=	1	dime	+	6	pennies	=	16
+21	=	2	dimes	+	1	penny	=	+21
		3	dimes	+	7	pennies	=	37

1. 72 +27 | 56 +32 | 40 +58 | 64 +23 | 85 +12

2. 26 +43 | 66 +12 | 29 +30 | 42 +34 | 31 +58

3. 20 +59 | 36 +51 | 54 +23 | 66 +23 | 15 +81

4. 74 +14 | 43 +55 | 32 +36 | 25 +44 | 82 +12

5. 67 +12 | 18 +40 | 22 +54 | 62 +30 | 28 +71

Name _____ Topic 4

Number 4

Use your coins to find the total amount of dimes and pennies you would have in each of these examples.

Example: 34 + 28 = 5 dimes + 12 pennies = 6 dimes + 2 pennies

1. 36 + 29 =
2. 23 + 59 =
3. 25 + 49 =
4. 42 + 38 =
5. 67 + 14 =
6. 16 + 55 =
7. 47 + 39 =
8. 63 + 28 =
9. 77 + 18 =
10. 29 + 65 =
11. 78 + 15 =
12. 31 + 39 =
13. 66 + 24 =
14. 56 + 26 =
15. 45 + 48 =

Name _____ Topic 4

Number 5

Change the pennies into dimes and pennies. Use as many dimes as you can. Use your coins to make change.

	Pennies		Dimes	+	Pennies
1.	17	=	_____	+	_____
2.	14	=	_____	+	_____
3.	26	=	_____	+	_____
4.	45	=	_____	+	_____
5.	30	=	_____	+	_____
6.	28	=	_____	+	_____
7.	41	=	_____	+	_____
8.	33	=	_____	+	_____
9.	19	=	_____	+	_____
10.	8	=	_____	+	_____
11.	25	=	_____	+	_____
12.	23	=	_____	+	_____
13.	36	=	_____	+	_____
14.	48	=	_____	+	_____
15.	74	=	_____	+	_____

Name _____ Topic 4

Number 6

Change these pennies to dimes plus pennies.

Example:

$$\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array} \begin{array}{l} \text{pennies} \\ \text{pennies} \\ \text{pennies} = 1 \text{ dime} + 3 \text{ pennies} \end{array}$$

1. $\begin{array}{r} 9 \\ +8 \\ \hline \end{array}$ = _____ dime + _____ pennies

2. $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$ = _____ dime + _____ pennies

3. $\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$ = _____ dime + _____ pennies

4. $\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$ = _____ dime + _____ pennies

5. $\begin{array}{r} 9 \\ +5 \\ \hline \end{array}$ = _____ dime + _____ pennies

6. $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$ = _____ dime + _____ pennies

7. $\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$ = _____ dime + _____ pennies

Name _____ Topic 4

Number 7

Use your coins to find the sum and record your answer in the proper column.

Example:

$$\begin{array}{rcrcrcl} 14 & = & 1 & \text{dime} & + & 4 & \text{pennies} \\ +38 & & +3 & \text{dimes} & + & 8 & \text{pennies} \\ \hline & & 4 & \text{dimes} & + & 12 & \text{pennies} = 5 \text{ dimes} + 2 \end{array}$$

pennies = 52.

1.	$\begin{array}{r} 65 \\ +29 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ +23 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ +38 \\ \hline \end{array}$	$\begin{array}{r} 29 \\ +64 \\ \hline \end{array}$	$\begin{array}{r} 39 \\ +49 \\ \hline \end{array}$
2.	$\begin{array}{r} 46 \\ +17 \\ \hline \end{array}$	$\begin{array}{r} 68 \\ +15 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ +38 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ +19 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ +68 \\ \hline \end{array}$
3.	$\begin{array}{r} 79 \\ +13 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ +53 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ +36 \\ \hline \end{array}$	$\begin{array}{r} 58 \\ +38 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ +65 \\ \hline \end{array}$
4.	$\begin{array}{r} 57 \\ +27 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ +24 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ +38 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ +27 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ +36 \\ \hline \end{array}$
5.	$\begin{array}{r} 54 \\ +36 \\ \hline \end{array}$	$\begin{array}{r} 19 \\ +46 \\ \hline \end{array}$	$\begin{array}{r} 29 \\ +48 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ +19 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ +25 \\ \hline \end{array}$

Name _____ Topic 4

Number 8

Find the sums using your coins. Add the pennies first and then change them into dimes. Then add the dimes.

Example:

$$\begin{array}{r} 27 \\ +19 \end{array}$$

Step 1 add pennies $\begin{array}{r} 7 \\ +9 \\ \hline 16 \end{array}$ pennies

Step 2 change into dimes

16 pennies = 1 dime + 6 pennies

put pennies in the column

Step 3 remember 1 ten $\begin{array}{r} 1 \\ 2 \\ +1 \\ \hline 4 \end{array}$

add it to the dimes column

Step 4 place numbers in correct column

$$\begin{array}{r} 27 \\ 19 \\ \hline 46 \end{array} = 4 \text{ dimes} + 6 \text{ pennies}$$

$$\begin{array}{r} 39 \\ +25 \end{array}$$

a. Which numbers do we add first? _____

b. How much will you get? _____

c. This is ____ dime + ____ pennies.

d. We put the ____ pennies in the penny column.

e. What numbers do we add next? ____

f. What is their sum? ____

g. What do we have to add to it?

h. What is our total? ____

Find the sums.

$$\begin{array}{rrrrrrr} 37 & 39 & 65 & 46 & 25 & 28 & 38 \\ +29 & +52 & +18 & +49 & +57 & +48 & +54 \end{array}$$

Name _____ Topic 4

Number 9

Find the sums of these addends. Regroup your pennies and put the dime in the dimes column.

Example:

$$\begin{array}{r} 14 \\ +48 \\ \hline \end{array}$$

add $\begin{array}{r} 4 \\ 8 \\ \hline 12 \end{array}$

12 = 1 dime + 2 pennies

put the pennies in their column

$$\begin{array}{r} 14 \\ 48 \\ \hline 2 \end{array}$$

Regroup the one dime and add it to the dimes column

Put the sum of the dimes in the dimes column

$$\begin{array}{r} 14 \\ 48 \\ \hline 62 \end{array}$$

Find the sum.

66 18	28 13	54 39	59 29	67 27	59 21	64 28	77 16
39 46	78 17	46 47	29 48	53 18	39 47	27 38	15 29
14 67	29 23	12 19	32 18	59 37	43 47	18 56	66 25

Name _____ Topic 4

Number 10

We have been using pennies and dimes in our addition. This is the same as saying ones and tens. Since we cannot always add in money we can now call our pennies, ones and our dimes, tens.

The first column we will call ones.

The second column we will call tens.

$$\begin{array}{rcrlcrl} 34 & = & 3 & \text{tens} & + & 4 & \text{ones} \\ +28 & = & +2 & \text{tens} & + & 8 & \text{ones} \\ \hline & & 5 & \text{tens} & + & 12 & \text{ones} \end{array} = 6 \text{ tens} + 2 \text{ ones}$$

Find the sum.

28 67	45 18	38 22	26 8	14 57	39 22	84 9
18 74	46 20	39 53	16 67	44 36	15 25	38 38
43 27	29 67	59 19	9 71	46 48	23 58	37 25
54 19	16 66	29 46	37 46	29 28	17 67	56 25

Name _____ Topic 4

Number 11

How much would you have if you had ten dimes?

Yes, you would have one dollar. How many pennies are there in one dollar? ____

In these problems whenever you have enough dimes, change them into a dollar.

Example:

50 + 50 = 10 dimes = 1 dollar

54 + 50 = 10 dimes + 4 pennies = 1 dollar + 4 pennies

73 + 44 = 11 dimes + 7 pennies = 1 dollar + 1 dime + 7 pennies

If the pennies are in the ones column, and the dimes are in the tens column, where will we put the dollars? Yes, in the hundreds column.

134 = 1 dollar + 3 dimes + 4 pennies

Use your coins to add these numbers and make change whenever you can.

	Dollars		Dimes		Pennies
57 + 71 =		+		+	
83 + 54 =		+		+	
92 + 66 =		+		+	
74 + 73 =		+		+	
65 + 73 =		+		+	
40 + 83 =		+		+	

Name _____ Topic 4

Number 12

Write these amounts as dollars, dimes and pennies.

Example:	Dollars	Dimes	Pennies
28 dimes	2	8	0

1. 37 dimes =
2. 19 dimes =
3. 54 dimes =
4. 25 dimes =
5. 10 dimes =
6. 21 dimes =
7. 33 dimes =
8. 46 dimes =
9. 14 dimes =
10. 18 dimes =
11. 12 dimes + 3 pennies =
12. 21 dimes + 8 pennies =
13. 30 dimes + 5 pennies =
14. 42 dimes + 6 pennies =
15. 10 dimes + 1 penny =

Name _____ Topic 4

Number 13

Find the sums. Add the ones, then tens, then hundreds.

1.	346 +231	835 +144	720 +246	804 +175
2.	524 +253	345 +244	808 +181	126 +473
3.	426 +152	345 +543	628 +150	600 +327
4.	126 +253	426 +351	316 +231	523 +246
5.	143 +726	625 +172	162 +315	523 +244
6.	307 +520	843 +150	421 +345	264 +700
7.	624 + 75	425 +362	243 +620	251 +524

Name _____ Topic 4

Number 14

Draw a picture showing how much money each number represents. Use dollars, dimes and pennies.

1. 347

2. 682

3. 701

4. 940

5. 800

6. 27

7. 948

8. 736

Name _____ Topic 4

Number 15

Write each number hundreds, tens and ones.

Example:

247 = 200 + 40 + 7

1. 576 = ___ + ___ + ___
2. 287 = ___ + ___ + ___
3. 852 = ___ + ___ + ___
4. 129 = ___ + ___ + ___
5. 738 = ___ + ___ + ___
6. 315 = ___ + ___ + ___
7. 664 = ___ + ___ + ___
8. 983 = ___ + ___ + ___
9. 491 = ___ + ___ + ___
10. 530 = ___ + ___ + ___
11. 900 = ___ + ___ + ___
12. 608 = ___ + ___ + ___
13. 400 = ___ + ___ + ___
14. 999 = ___ + ___ + ___
15. 487 = ___ + ___ + ___

Name _____ Topic 4

Number 16

Use your coins to change dimes to dollars.

Example:

572	=	5 dollars	+	7 dimes	+	2 pennies	
+43	=	+		4 dimes	+	3 pennies	
		5 dollars	+	11 dimes	+	5 pennies	=
		6 dollars	+	1 dime	+	5 pennies	= 615

1.	684 +51	256 +72	363 +84	774 +85
2.	448 +91	291 +55	257 +82	585 +32
3.	396 +41	832 +96	443 +85	637 +81
4.	595 +93	286 +73	173 +66	774 +42
5.	462 +63	593 +36	384 +45	271 +67

Name _____

Topic 4

Number 17

Use your coins to add these sums.

655 +82	135 +84	243 +95	774 +54
748 +71	827 +92	661 +58	484 +33
592 +44	263 +74	474 +72	685 +73
166 +81	487 +91	832 +97	594 +71
256 +63	543 +83	273 +82	356 +92
247 +82	585 +63	763 +84	572 +82

Name _____

Topic 4

Number 18

427 +191	662 +185	587 +252	593 +146
355 +483	664 +273	273 +491	492 +253
281 +666	383 +593	465 +464	274 +285
253 +262	175 +451	242 +177	146 +563
552 +263	153 +671	391 +373	764 +152
675 +293	480 +239	462 +397	293 +586

Name _____ Topic 4

Number 19

Use your coins to find these sums.

247 +138	532 +149	648 +225	809 +138
138 +545	642 +86	247 +835	285 +543
534 +37	763 +162	327 +544	865 +26
167 +428	435 +282	645 +294	573 +393
437 +124	682 +153	597 +261	247 +472
482 +282	254 +385	833 +139	167 +428

Name _____ Topic 4

Number 20

We will have to change our coins two times in some of these problems.

Example:

435	=	4 dollars	+	3 dimes	+	5 pennies	
+286	=	+ 2 dollars	+	8 dimes	+	6 pennies	
		6 dollars	+	11 dimes	+	11 pennies	= 721

416 +385	397 +529	183 +657	242 +599
294 +378	672 +238	437 +494	758 +156
255 +489	239 +673	668 +262	126 +795
645 +187	397 +373	289 +271	433 +489

Name _____ Topic 4

Number 21

If we have ten dollars we can change it into one ten dollar bill. Ten hundreds is the same as one thousand.

Example:

600 = 6 hundreds
+400 = 4 hundreds
1000 =10 hundreds = 1 thousand

800 +600	700 +800	600 +500	700 +700
500 +800	900 +700	600 +700	800 +900
600 +500	400 +700	600 +600	900 +600
700 +500	900 +400	400 +800	900 +700
900 +900	300 +800	500 +500	800 +200

Name _____ Topic 4

Number 22

Change your coins whenever you can. Add these coins in the proper column.

516 +294	385 +537	415 +189	349 +264
824 +335	720 +538	635 +704	931 +546
479 +259	179 +488	334 +297	217 +386
537 +829	638 +745	905 +608	748 +637
142 +699	657 +247	244 +568	187 +168

Name _____ Date _____

Topic Test 4

Add:

37 23	38 17	25 46	80 27	29 32	36 47	59 36
74 18	36 27	28 13	19 53	46 34	27 49	49 70
57 25	39 49	16 75	39 33	48 44	35 19	18 15
27 19	77 16	30 28	34 57	69 34	47 58	85 25
56 49	86 38	78 22	97 87	88 79	90 67	69 55
184 728	376 287	279 358	285 547	378 548	686 736	394 729
876 395	490 609	865 648	496 375 924	743 728 389	643 751 987	694 987 875

Name _____ Topic 5

Number 1

When we are adding numbers in a column, we add them two at a time. Do not write the sum but think of it as you add it to the next addend.

Example:

$$\begin{array}{r} 3 \\ 2 \\ +4 \\ \hline 9 \end{array}$$

1. Think: $3 + 2 = 5$
2. Add the five to the four to get the sum. $5 + 4 = 9$

Find the sums.

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

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

Name _____ Topic 5

Number 2

Add the ones column first and then the tens. When you add start at the top.

Example:

$$\begin{array}{r} 32 \\ 43 \\ +14 \\ \hline 89 \end{array}$$

Add 2 + 3 = 5 then add 5 + 4 = 9

Place the nine in the ones column.

Add 3 + 4 = 7 then add 7 + 1 = 8

Place the eight in the tens column.

$$\begin{array}{rrrrrrrr} 24 & 35 & 70 & 33 & 42 & 20 & 33 & 10 \\ 33 & 42 & 18 & 44 & 44 & 14 & 22 & 27 \\ +40 & +21 & +11 & +21 & +13 & +33 & +14 & +41 \end{array}$$

$$\begin{array}{rrrrrrrr} 25 & 41 & 34 & 31 & 10 & 24 & 21 & 31 \\ 43 & 34 & 43 & 22 & 22 & 20 & 34 & 42 \\ +11 & +12 & +22 & +13 & 32 & 42 & 22 & 15 \\ & & & & +24 & +13 & +11 & +11 \end{array}$$

Name _____ Topic 5

Number 3

Whenever a sum is ten or more we must put the numerals in the proper column.

Example:

$$\begin{array}{r} 3 \\ 4 \\ +5 \\ \hline 12 \end{array}$$

Add 3 + 4 = 7
Add 7 + 5 = 12

12 = 1 ten + 2 ones

Place the 1 ten in the tens column.

Place the 2 ones in the ones column.

$$\begin{array}{r} 4 \\ 5 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ 5 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ 4 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ 3 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ 4 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ 4 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ 2 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ 6 \\ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ 5 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ 4 \\ +8 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ 3 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ 4 \\ +9 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ 5 \\ +3 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ 3 \\ +4 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ 2 \\ +9 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ 3 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ 1 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ 3 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ 2 \\ +9 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ 3 \\ +5 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ 3 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ 4 \\ +6 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ 2 \\ +7 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ 3 \\ +5 \\ \hline \end{array}$$

Name _____ Topic 5

Number 4

When the sum of the ones column is ten or more be sure to regroup and add the ten in the tens column.

Example:

$$\begin{array}{r} 34 \\ 15 \\ +35 \\ \hline \end{array}$$

Add 4 + 5 = 9 then add 9 + 5 = 14

14 = 1 ten + 4 ones put the 4 in the ones place

Add the 1 ten in the tens place

Add the 1 ten plus 3 tens = 4 tens

Add 4 + 1 = 5 then add 5 + 3 = 8

Place the 8 in the tens place

51	37	24	34	47	24	18	64
26	24	18	28	33	37	25	18
+18	+15	+35	+17	+18	+15	+43	+15

25	38	19	27	23	14	23	14
34	25	24	34	17	34	17	35
+17	+13	+34	+26	24	25	22	28
				+35	+12	+15	+12

Name _____ Topic 5

Number 5

Regroup the sum in the ones place.

236 122 213 +311	352 134 203 +102	231 104 224 +135	14 325 250 +107
105 244 424 + 13	145 314 103 +412	314 605 62 + 21	724 233 14 + 13
206 153 401 +237	114 215 336 +112	115 243 116 + 22	223 214 215 + 12
306 41 615 + 21	114 234 105 +120	103 526 22 +307	214 135 127 +322

Name _____ Topic 5

Number 6

Regroup the partial sum in each column when it is ten or more.

Example:

$$\begin{array}{r} 471 \\ 249 \\ +154 \\ \hline 874 \end{array}$$

1 + 9 = 14 Put the four in the ones column and regroup the one ten.

1 + 7 + 4 + 5 = 17 Put the seven in the tens column and regroup the one hundred.

1 + 4 + 2 + 1 = 8 Put the eight in the hundreds column.

284 384 +216	594 156 +232	369 347 +133	148 265 +345	285 194 +216
277 265 +123	186 355 +437	369 134 +236	558 249 +162	195 575 +211
158 698 +142	247 179 +331	471 68 +444	23 547 +334	218 56 +492

Name _____ Topic 5

Number 7

Regroup only when the column sum is greater than nine.

121	306	518	257	239
432	613	720	400	201
517	220	123	623	402
+200	+401	+103	+102	+833
457	735	628	526	324
203	604	315	405	635
716	132	442	234	405
+102	+224	+303	+121	+323
906	728	248	425	624
104	207	725	315	515
275	141	412	743	141
+314	+622	+103	+203	+316
428	625	447	428	307
614	417	208	524	425
345	843	513	434	542
+212	+104	+422	+503	+625

Name _____ Topic 5

Number 8

When the sum of the hundreds column is ten or more we must regroup in the thousands place.

Example:

```
 301
 425
+632
1358
```

Add 1 + 5 + 2 = 8 ones

Add 0 + 2 + 3 = 5 tens

Add 3 + 4 + 6 = 13 hundreds

13 hundreds = 1 thousand + 3 hundreds

Put the 1 thousand in the thousands place

134 942 +421	232 403 +612	405 651 +232	942 743 +311	841 502 +543
532 421 +603	724 563 +310	621 552 +714	933 431 +632	855 932 +201
503 575 +211	851 836 +412	742 925 +331	642 803 +222	421 615 +541

Name _____ Topic 5

Number 9

Find the sums.

151	336	518	275	269
452	223	23	400	201
47	50	432	23	702
+800	+704	+130	+602	+ 33
475	356	594	504	403
230	12	302	121	704
60	603	201	344	605
+705	+434	+105	+343	+102
250	561	207	477	384
526	47	702	303	21
201	303	308	204	614
+433	+444	+401	+532	+326
56	346	247	332	202
303	458	424	457	570
721	220	555	325	328
+244	+454	+202	+344	+724

Name _____ Date _____

Topic Test 5

Add:

9 7 5 4	3 8 5 4	9 7 8 4	7 6 8 9	7 4 0 8	24 31 32 12
12 14 21 42	14 53 11 21	23 42 12 21	30 12 14 43	24 53 72	82 74 62
33 14 72	71 43 84	90 37 51	38 47 63 95	47 22 85 13	72 46 81 55
49 93 18 51	87 30 95 76	548 624 872	948 732 596	583 874 795	893 579 686
747 863 705	489 348 518	249 684 627	337 249 684	797 513 482	680 847 922

CHAPTER V

Subtraction

Test for Subtraction

Topic 1. Basic subtraction facts

2. Subtraction not involving regrouping

3. Subtraction involving regrouping

Purpose: To determine which pupils need remedial work.

To determine the area in which the pupil needs remedial work.

Set I

1.	$\begin{array}{r} 5 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -4 \\ \hline \end{array}$
2.	$\begin{array}{r} 5 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -2 \\ \hline \end{array}$
3.	$\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline \end{array}$
4.	$\begin{array}{r} 11 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$
5.	$\begin{array}{r} 16 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$
6.	$\begin{array}{r} 17 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -5 \\ \hline \end{array}$

Set II

7.	22 -11	48 -25	74 -61	87 -40	58 -15	98 -23
8.	649 -218	386 -243	496 -371	774 -232	988 -431	
9.	735 -602	862 -742	228 -109	707 -604	549 -247	

Set III

10.	494 -249	868 -539	784 -456	981 -656	593 -185
11.	909 -727	809 -618	578 -188	629 -437	787 -692
12.	400 -288	920 -337	820 -748	201 -182	742 -158

Pupil must score: Set I -- 26

Set II-- 11

Set III - 11

Easy facts - rows 1, 2, 3

Hard facts - rows 4, 5, 6

Subtraction no regrouping - rows 7, 8, 9

Subtraction with regrouping - rows 10, 11, 12

Subtraction

Diagnostic test for pupil evaluation. To be used with subtraction difficulties check list. All work is to be written and stated orally.

Topic 1

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

Topic 2 & 3

5.	567	487	648	264	474
	-146	-245	-573	-182	-193
6.	734	620	652	823	940
	-226	-405	-421	-816	-836
7.	315	748	579	739	639
	-262	-162	-386	-287	-175

Subtraction Difficulties

Name_____ Date_____

Topic	Score	Difficulty	Remarks
1.		Errors in combinations	
2.		a. hard facts	
		b. easy facts	
3.		Regrouping	
		a. did not regroup	
		b. errors due to zero in minuend	
		c. subtracted minuend from subtrahend	
		d. failed to regroup gave zero for answer	
		e. deducted in minuend when no regrouping was necessary	
		f. changed minuend incorrectly	
		g. errors in facts	
		Counting	
		Faulty procedure	
		a. added instead of subtracting	
		b. omitted a column	
		c. began at left column	
		d. other	

Area of greatest need -

Recommendations -

Record Sheet -- Subtraction

Topic	1	2	3
Total Problems	36	16	15

Name

Name_____ Topic 1

Number 1

Cuisenaire

Find each difference by finding what rod added to the subtrahend equals the minuend.

Red + Green = Yellow Yellow - Red = Green

Yellow - Green = Red

Green - Red: we can solve this by finding what rod added to red will equal green.

Use your rods to help you solve these problems.

Example: G - W = R R + W = G

1. D - W = ____ ___ + W = D
2. P - G = ____ ___ + G = P
3. K - G = ____ ___ + G = K
4. O - U = ____ ___ + U = O
5. Y - G = ____ ___ + G = Y
6. U - D = ____ D + ___ = U
7. K - R = ____ ___ + R = K
8. N - K = ____ K + ___ = N
9. D - P = ____ ___ + P = D
10. Y - P = ____ ___ + P = Y

Name_____ Topic 1

Number 2

Cuisenaire

Find the differences in each of these examples, and write an addition number sentence about each one. Use your rods to help you.

Example:	Difference	Addition Number Sentence
6 - 4 =	2	4 + 2 = 6
2 - 1 =	___	
3 - 1 =	___	
4 - 3 =	___	
4 - 2 =	___	
3 - 2 =	___	
6 - 6 =	___	
5 - 4 =	___	
5 - 3 =	___	
2 - 2 =	___	
6 - 3 =	___	
4 - 4 =	___	
6 - 5 =	___	
1 - 1 =	___	
5 - 2 =	___	
6 - 2 =	___	
5 - 1 =	___	

Name _____ Topic 1

Number 3

Coins

Find out how many are left in each of these examples. Use your pennies to find the answer.

	Start	Take Away	Left
Example:	8	1	7
	9	4	___
	8	8	___
	7	2	___
	7	4	___
	9	9	___
	8	4	___
	8	2	___
	7	3	___
	9	8	___
	9	0	___
	7	6	___
	7	0	___
	8	5	___
	8	7	___
	9	3	___
	9	6	___
	7	1	___

Name _____ Topic 1

Number 4

Cuisenaire

Use your rods to find out how much more is needed.

	Want	Have	Need
Example:	8	7	1
	8	5	___
	8	7	___
	8	3	___
	10	4	___
	10	7	___
	9	7	___
	7	7	___
	10	8	___
	7	5	___
	10	2	___
	9	2	___
	8	0	___
	8	6	___
	5	1	___
	6	3	___
	4	2	___
	3	1	___

Name _____ Topic 1

Number 5

Subtract:

6 2	5 3	6 5	6 3	4 2	5 1	3 2	4 4
2 1	6 0	9 6	9 4	8 2	10 4	8 8	9 2
7 5	9 7	7 0	6 4	3 2	5 2	4 2	6 3
6 2	6 5	4 3	6 0	4 4	2 1	8 5	9 4
7 0	7 5	9 2	9 5	9 6	8 6	3 1	5 4

Name _____ Topic 1

Number 6

Cuisenaire

Use your eleven train to solve these number sentences.

Example:	11 = 1 + 10	11 - __ = 10	11 - __ = 1
	11 = 9 + 2	11 - __ = 2	11 - __ = 9
	11 = 8 + 3	11 - __ = 3	11 - __ = 8
	11 = 7 + 4	11 - __ = 7	11 - __ = 4
	11 = 6 + 5	11 - __ = 6	11 - __ = 5

Find the differences.

11 -7	11 -6	11 -8	11 -9
11 -5	11 -4	11 -2	11 -3

Name

Topic 1

Number 7

Cuisenaire

Use your twelve train to solve these equations.

Example:	12 = 1 + 11	12 - 1 = 11	12 - 11 = 1
	12 = __ + 10	12 - __ = 2	12 - __ = 10
	__ = 3 + 9	12 - __ = 9	12 - __ = 3
	__ = 8 + 4	12 - __ = 8	12 - __ = 4
	12 = 7 + __	12 - __ = 5	12 - __ = 7
	__ = 6 + 6	12 - __ = 6	12 - __ = 6

Find the differences.

12 -9	12 -7	12 -5	12 -3	12 -1
12 -6	12 -8	12 -4	12 -2	12 -12

Name _____ Topic 1

Number 8

Coins

Use your coins to find out how many are left.

	Coins	Take Away	Left
Example:	13	7	6
	13	8	___
	13	9	___
	13	4	___
	13	6	___
	13	2	___
	13	5	___
	13	3	___

Find the differences.

13	13	13	13	13	13	13
-6	-4	-7	-9	-8	-5	-7
___	___	___	___	___	___	___

Name _____

Topic 1

Number 9

Coins

Use your coins to find out how much is needed.

	Want	Have	Need
Example:	14	3	11
	14	2	___
	14	7	___
	14	14	___
	14	8	___
	14	13	___
	14	1	___
	14	6	___
	14	12	___
	14	9	___
	14	4	___
	14	5	___
	14	10	___
	14	11	___

Use your coins to subtract.

14	14	14	14	14
-5	-8	-7	-6	-9

Name _____ Topic 1

Number 10

Coins

Find the solution to each of these equations. Use your coins to find the differences.

		Difference
Example:	15 - 6 =	9
	15 - 7 =	___
	15 - 8 =	___
	17 - 8 =	___
	16 - 7 =	___
	16 - 9 =	___
	16 - 8 =	___
	17 - 9 =	___
	18 - 9 =	____

Find the differences

15 -7	16 -8	15 -9	17 -9	15 -6
16 -9	17 -8	15 -8	16 -7	18 -9

Name _____

Topic 1

Number 11

Review

Subtract:

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

Topic Test I

Name _____

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

Name _____

Topic 2

Number 1

Coins

Study the example; then find the differences.

Example: 36 = 3 dimes + 6 pennies
-20 = 2 dimes + 0 pennies
1 dime + 6 pennies = 16

78 = ____ dimes + ____ pennies
-40 = ____ dimes + ____ pennies
____ dimes + ____ pennies = _____

52 =
-20 = - _____ = _____

67 =
-30 = - _____ = _____

64 =
-60 = - _____ = _____

25 =
-10 = - _____ = _____

Name _____ Topic 2

Number 2

Coins

Use your coins to find the differences.

Example:

30	=	3 dimes	+ 0 pennies
-20	=	-2 dimes	+ 0 pennies
		1 dime	+ 0 pennies = 10

When there are no pennies we must show this by putting a zero in the pennies column.

Subtract

60	80	50	70	90	40	90	80
40	30	10	20	60	30	40	60
20	20	70	60	90	60	40	80
10	20	40	20	30	10	10	40
90	70	50	90	80	50	40	70
50	50	30	70	10	20	20	70

Name _____ Topic 2

Number 3

Coins

Use your coins to do these subtraction problems. Subtract pennies first and then dimes.

Example:

37	=	3 dimes	+	7 pennies		
-21	=	-2 dimes	+	1 penny		
		1 dime	+	6 pennies	=	16

If we have 3 dimes plus 7 pennies and we want to take away 2 dimes plus 1 penny, we will have 1 dime plus 6 pennies left.

49	=	___ dimes	+	_____ pennies		
-24	=	___ dimes	+	_____ pennies		
—		___ dimes	+	_____ pennies	=	_____

84	=			
-52	=	- _____	=	_____

75	=			
-43	=	- _____	=	_____

97	=			
-44	=	- _____	=	_____

Name _____ Topic 2

Number 4

Coins

Subtract the pennies first and then the dimes. Use your coins to help you.

Subtract

84 32	76 25	99 64	47 36	83 20	49 17	35 12
86 14	40 30	74 31	86 22	67 41	58 36	72 20
28 11	97 75	64 13	56 24	79 58	84 24	56 50
66 33	43 31	77 34	68 24	39 16	94 73	77 42
57 21	97 12	86 34	69 42	96 25	78 14	59 20

Name _____ Topic 2

Number 5

Coins

Subtract pennies first, dimes second, and dollars last.

Subtract

793 751	575 275	865 432	648 327	826 524	856 424
685 300	937 214	739 516	678 671	789 623	846 813
975 631	726 314	756 234	657 321	794 332	483 142
864 321	548 216	359 145	648 226	748 325	542 422
224 21	642 220	604 501	847 516	577 243	220 110

Name _____

Topic 2

Number 6

Review

38 -3	47 -4	29 -2	63 -1	88 -5
78 -35	85 -41	76 -13	43 -31	86 -74
597 -362	409 -307	586 -475	980 -740	639 -217
548 -146	797 -387	868 -145	793 -620	674 -323
384 -271	745 -143	989 -317	634 -531	787 -646

Topic Test 2

Name _____ Date _____

47 -12	28 -6	44 -14	20 -10	37 -20	84 -21
800 -600	702 -501	680 -120	840 -240	690 -280	786 -124
728 -216	642 -312	927 -723	583 -251	489 -287	787 -354
638 -414	843 -511	986 -255	457 -143	787 -526	898 -632
987 -821	728 -718	693 -641	849 -742	874 -521	668 -323

Name _____ Topic 3

Number 1

Coins

Rewrite these numbers in two different ways. First as dimes and pennies, and secondly as one less dime and pennies.

Example: 1st 2nd

23 = 2 dimes + 3 pennies = 1 dime + 13 pennies

In the first column we have changed one dime into ten pennies and added them to the pennies we already had.

65 = ____ dimes + _____ pennies = ____ dimes + ___ pennies

92 =

74 =

31 =

18 =

20 =

37 =

48 =

55=

68 =

93 =

Name _____ Topic 3

Number 2

Coins

Study the example and complete the exercises.

Example: 21 = 2 dimes + 1 penny = 1 dime + 11 pennies
−4 = − 4 pennies = − 4 pennies
1 dime + 7 pennies = 17

We cannot subtract 4 pennies from 1 penny, so we changed one of the dimes into ten pennies and added them to the penny we already had. Now we can subtract 4 pennies from our eleven pennies. Since we are not subtracting any dimes, we will have 1 dime left.

34 = ____ dimes + ____ pennies = 2 dimes + ____ pennies
−6 = 6 pennies = 6 pennies
____ dimes + ____ pennies =

51 = ____ dimes + ____ pennies = ____ dimes + ____ pennies
−3 = ____ pennies = ____ pennies
____ dimes + ____ pennies =

33 = =
−5 = = =

54 = =
−7 = = =

Name _____ Topic 3

Number 3

Regroup each of these numbers from the tens to the ones.

Follow the examples.

Examples: $37 = 30 + 7 = 20 + 17$

$24 = 20 + 4 = 10 + 14$

46 =

51 =

73 =

48 =

64 =

92 =

75 =

23 =

40 =

33 =

56 =

84 =

72 =

35 =

97 =

86 =

78 =

Name _____ Topic 3

Number 4

You will need to regroup the minuend from the tens to the ones in these problems. Study the example and complete the problems.

Example: $38 - 9 = 30 + 8 - 9 = 20 + 18 - 9$

$20 + 9 = 29$

$64 - 8 = 60 + 4 - 8 = \_\_\_ + \_\_\_$

$\_\_\_ + \_\_\_ = \_\_\_$

$72 - 6 = 70 + \_\_\_ - 6 = \_\_\_ + \_\_\_$

$\_\_\_ + \_\_\_ = \_\_\_$

$65 - 9 =$

$24 - 7 =$

$31 - 8 =$

Name _____ Topic 3

Number 5

In order to subtract, the numbers in the minuend must be greater than those in the subtrahend. When it is not, regroup in the minuend in order to subtract.

Example: $\begin{array}{r} 84 \\ -8 \\ \hline \end{array} = \begin{array}{r} 80 + 4 \\ -\quad 8 \\ \hline \end{array} = \begin{array}{r} 70 + 14 \\ -\quad 8 \\ \hline 70 + 6 \end{array} = 76$

$\begin{array}{r} 32 \\ -8 \\ \hline \end{array}$

$\begin{array}{r} 73 \\ -5 \\ \hline \end{array}$

$\begin{array}{r} 43 \\ -6 \\ \hline \end{array}$

$\begin{array}{r} 58 \\ -9 \\ \hline \end{array}$

$\begin{array}{r} 23 \\ -8 \\ \hline \end{array}$

$\begin{array}{r} 33 \\ -4 \\ \hline \end{array}$

Name _____ Topic 3

Number 6

Regroup these numbers from the tens to the ones.

Example: 30 = 20 + 10

50 = 40 =

60 = 90 =

80 = 20 =

Regroup the tens and solve these problems.

Example: 30 = 20 + 10
$\underline{-4}$ $\underline{-\ \ 4}$
20 + 6 = 26

20 -7	30 -6	50 -1	70 -8	10 -2	80 -5
40 -9	60 -4	70 -3	90 -6	40 -5	50 -7
30 -8	80 -2	70 -4	60 -5	40 -7	90 -6

Name _____ Topic 3

Number 7

Find the differences.

41 -2	73 -4	34 -7	55 -7	63 -9	76 -9	84 -6	60 -2
42 -5	95 -9	38 -9	21 -7	93 -8	65 -8	32 -4	53 -7
80 -5	46 -9	74 -5	26 -8	64 -7	37 -8	23 -6	75 -9
90 -6	52 -8	88 -9	43 -8	24 -9	71 -4	35 -8	41 -4
77 -9	34 -6	62 -7	95 -6	61 -3	47 -8	68 -9	85 -7

Name _____

Topic 3

Number 8

$$\begin{array}{r} 42 \\ -17 \\ \hline \end{array}$$

$$\begin{array}{rl} 42 = & 30 + 12 \\ -17 = & -10 + \ 7 \\ \hline & 20 + \ 5 = 25 \end{array}$$

1. The 2 ones is less than the 7 ones so we must regroup the 4 tens to 3 tens and 10 ones.
2. Subtract the ones first. 12 - 7 = 5
3. Subtract the tens next. 3 - 1 = 2
4. 2 tens plus 5 ones = 25

$$\begin{array}{r} 42 \\ -17 \\ \hline 25 \end{array}$$

Example: $84 = 8$ tens $+ 4$ ones $= 7$ tens $+ 14$ ones

$-26 = 2$ tens $+ 6$ ones $= 2$ tens $+ 6$ ones

5 tens $+ 8$ ones $= 58$

$$\begin{array}{r} 62 = \\ -39 = \\ \hline \end{array}$$

$$\begin{array}{r} 93 = \\ -49 = \\ \hline \end{array}$$

$$\begin{array}{r} 71 = \\ -2[illegible] = \\ \hline \end{array}$$

Name _____ Topic 3

Number 9

When the ones in the minuend is less than the ones in the subtrahend we must regroup the tens in the minuend. Subtract the ones first and then the tens.

Example:

$$\begin{array}{r} 82 \\ -78 \\ \hline \end{array} = \begin{array}{r} 7 \text{ tens} + 12 \text{ ones} \\ -7 \text{ tens} + 8 \text{ ones} \\ \hline 0 \text{ tens} + 4 \text{ ones} \end{array} = 4$$

Subtract

$\begin{array}{r} 62 \\ -45 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ -27 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ -49 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ -16 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ -36 \\ \hline \end{array}$
$\begin{array}{r} 60 \\ -57 \\ \hline \end{array}$	$\begin{array}{r} 83 \\ -28 \\ \hline \end{array}$	$\begin{array}{r} 95 \\ -66 \\ \hline \end{array}$	$\begin{array}{r} 72 \\ -56 \\ \hline \end{array}$	$\begin{array}{r} 64 \\ -19 \\ \hline \end{array}$
$\begin{array}{r} 46 \\ -28 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ -38 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ -14 \\ \hline \end{array}$	$\begin{array}{r} 72 \\ -39 \\ \hline \end{array}$	$\begin{array}{r} 80 \\ -23 \\ \hline \end{array}$

Name _____

Topic 3

Number 10

Review

34 -28	60 -33	38 -19	67 -58	81 -66	33 -24
31 -12	42 -26	36 -27	40 -38	93 -67	67 -29
74 -16	93 -75	85 -27	90 -15	42 -19	74 -35
62 -25	83 -36	44 -37	75 -28	42 -27	74 -49
91 -17	56 -29	80 -46	73 -29	56 -48	20 -15

Name _____ Topic 3

Number 11

Regroup the numbers from the tens place to the ones place.

Example: 348 = 300 + 40 + 8 = 300 + 30 + 18.

231 = 200 + 30 + 1 = 200 + ___ + 11.

586 = 500 + ___ + ___ = ___ + 70 + ____.

421 =

735 =

926 =

820 =

684 =

762 =

524 =

681 =

843 =

538 =

728 =

432 =

Name _____ Topic 3

Number 12

Regroup each of the minuends from the tens to the ones.

Study the example and solve these problems.

Example:

$$\begin{array}{rcl} 652 & = & 600 + 50 + 2 \\ -\ 9 & = & -\qquad\quad 9 \\ \hline & & 600 + 40 + 12 \\ & & -\qquad\quad 9 \\ \hline & & 600 + 40 + 3 \end{array} = 643$$

$$\begin{array}{rcl} 463 & = & 400 + 60 + 3 \\ -27 & = & \quad 20 + 7 \\ \hline & & 400 + 50 + 13 \\ & & \quad 20 + 7 \\ \hline & & 400 + 30 + 6 \end{array} = 436$$

483 -59	365 -47	657 -28	293 -76	554 -47
862 - 7	172 -64	476 - 9	673 - 5	473 -38
854 - 9	466 -28	745 -36	241 -18	382 -43
712 - 9	643 -27	571 -56	982 -77	944 -37

Name _____ Topic 3

Number 13

Regroup from the tens place whenever there are not enough ones. Regroup only if you need to. Subtract ones first, then tens, and then hundreds.

776 -138	547 -228	648 -209	853 -714	491 -186
956 -239	895 -229	784 -238	377 -149	651 -518
646 -438	982 -158	593 -247	868 -319	943 -628
789 -283	536 -125	566 -237	482 -256	762 -149
856 -248	841 -624	394 -167	425 -218	557 -239

Name _____ Topic 3

Number 14

Regroup these numbers from the hundreds to the tens.

Example: 341 = 300 + 40 + 1 = 200 + 140 + 1 =

We regrouped one hundred as ten tens. Add these ten tens to the four tens we have, to give us fourteen tens.

527 = 500 + 20 + 7 = 400 + ____ + 7

842 = 800 + ___ + ____ = ____ + 140 + 2

634 = ___ + 30 + ____ = 500 + ____ + ____

928 =

643 =

722 =

904 =

837 =

414 =

553 =

324 =

817 =

629 =

Name _____ Topic 3

Number 15

In these problems you will have to regroup from the hundreds to the tens.

Example:

$$\begin{array}{rl} 746 & = 6 \text{ hundreds} + 14 \text{ tens} + 6 \text{ ones} \\ -83 & = \quad\quad\quad\quad\;\; 8 \text{ tens} + 3 \text{ ones} \\ \hline & 6 \text{ hundreds} + 6 \text{ tens} + 3 \text{ ones} = 663 \end{array}$$

Subtract

537 -85	414 -33	629 -56	846 -72	123 -72
345 -63	234 -72	916 -55	427 -81	745 -91
536 -44	376 -81	629 -62	239 -68	927 -46

Name _____ Topic 3

Number 16

Regroup from the hundreds to the tens in each problem.

749 -283	536 -195	566 -273	428 -265	726 -194
865 -284	814 -642	349 -176	452 -281	575 -293
683 -192	758 -467	939 -257	827 -485	814 -193
474 -183	662 -391	549 -265	853 -371	418 -254
738 -383	839 -364	926 -152	618 -272	759 -365

Name _____

Topic 3

Number 17

Review

Subtract

437 124	835 294	746 362	671 346	763 647
554 386	725 349	476 178	932 458	416 397
872 354	417 262	863 624	633 192	885 457
956 278	934 758	823 694	835 447	823 464

Name _____ Topic 3

Number 18

Regroup each of these numbers from the hundreds to the tens.

Example; 400 = 3 hundreds + 10 tens

500 =

300 =

800 =

100 =

700 =

200 =

900 =

600 =

Regroup and solve these problems.

200	500	800	900	600
-140	-230	-260	-720	-480
700	400	300	500	800
-640	-270	-190	-350	-630

Name _____ Topic 3

Number 19

Study each example and rewrite each of these numbers as tens plus ones.

Example: 400 = 39 tens + 10 ones

300 =

800 =

500 =

600 =

700 =

900 =

200 =

Regroup each of the minuends and subtract.

400	600	500	300	800
-278	-347	-186	-197	-421
200	900	700	300	400
-135	-453	-389	-271	-342

Name _____

Topic 3

Number 20

Review

Subtract

84 17	50 23	71 38	90 37	63 49
624 17	406 37	583 97	340 87	968 74
747 358	652 475	832 655	487 398	870 684
500 274	600 503	800 620	900 473	700 259

Topic Test 3

Name _____

684 -415	516 -294	885 -537	613 -349	700 -479
667 -179	334 -297	287 -389	271 -649	866 -548
673 -286	466 -376	200 -198	908 -657	355 -187
432 -189	581 -359	701 -298	800 -476	300 -137
920 -337	820 -740	494 -249	868 -539	724 -456

CHAPTER VI

Multiplication

Test for Multiplication

Topic 1. Multiplication facts

2. Zero multiplication

3. Single digit multiplier

4. Two digit multiplier

1. $\begin{array}{r} 1 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$ $\begin{array}{r} 1 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$ $\begin{array}{r} 3 \\ \times 0 \\ \hline \end{array}$ $\begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 1 \\ \times 1 \\ \hline \end{array}$

2. $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$

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

4. $\begin{array}{r} 44 \\ \times 2 \\ \hline \end{array}$ $\begin{array}{r} 13 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 51 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 91 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 83 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array}$

5. $\begin{array}{r} 38 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 27 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 58 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 76 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 84 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 49 \\ \times 8 \\ \hline \end{array}$

6. 343 x 2 | 631 x 5 | 615 x 6 | 851 x 8 | 657 x 9 | 812 x 4

7. 340 x 2 | 601 x 5 | 400 x 3 | 504 x 7 | 205 x 6 | 607 x 3

8. 92 x12 | 61 x98 | 32 x21 | 52 x30 | 24 x85 | 53 x94

9. 412 x21 | 230 x22 | 612 x30 | 369 x78 | 144 x25 | 769 x80

Pupil must score: Topic 1.-- 20

Topic 2.--- 8

Topic 3.-- 20

Topic 4.--- 9

Topic 1. Multiplication facts

Row 1, 2, 3

Topic 2. Zero multiplication

Row 1, 7, 8, 9

Topic 3. Single digit multiplier

Row 4, 5, 6, 7

Topic 4. Two digit multiplier

Row 8, 9

Multiplication

Diagnostic test for pupil evaluation. To be used with multiplication difficulty check sheet. All work done by the student is to be written and stated orally.

Topic 1

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

Multiplication

Diagnostic test for pupil evaluation. To be used with multiplication difficulty check sheet. All work done by the student is to be wirtten and stated orally.

Topic 2

1. $\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 0 \\ \hline \end{array}$ $\begin{array}{r} 1 \\ \times 0 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$ $\begin{array}{r} 0 \\ \times 9 \\ \hline \end{array}$

2. $\begin{array}{r} 20 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 40 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 30 \\ \times 9 \\ \hline \end{array}$ $\begin{array}{r} 500 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 600 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 900 \\ \times 3 \\ \hline \end{array}$

3. $\begin{array}{r} 37 \\ \times 10 \\ \hline \end{array}$ $\begin{array}{r} 82 \\ \times 40 \\ \hline \end{array}$ $\begin{array}{r} 63 \\ \times 90 \\ \hline \end{array}$ $\begin{array}{r} 300 \\ \times 20 \\ \hline \end{array}$ $\begin{array}{r} 700 \\ \times 80 \\ \hline \end{array}$ $\begin{array}{r} 400 \\ \times 60 \\ \hline \end{array}$

4. $\begin{array}{r} 803 \\ \times 40 \\ \hline \end{array}$ $\begin{array}{r} 705 \\ \times 20 \\ \hline \end{array}$ $\begin{array}{r} 601 \\ \times 30 \\ \hline \end{array}$ $\begin{array}{r} 908 \\ \times 26 \\ \hline \end{array}$ $\begin{array}{r} 604 \\ \times 79 \\ \hline \end{array}$ $\begin{array}{r} 506 \\ \times 58 \\ \hline \end{array}$

Multiplication

Diagnostic test for pupil evaluation. To be used with multiplication difficulty check sheet. All work done by the student is to be done aloud.

Topic 3

1.	22 x3	41 x2	57 x1	31 x3	42 x3
2.	53 x3	72 x4	83 x2	61 x5	94 x2
3.	28 x3	19 x4	47 x2	26 x4	16 x5
4.	231 x 2	424 x 3	567 x 6	429 x 2	687 x9

Multiplication

Diagnostic test for pupil evaluation. To be used with multiplication difficulty check sheet. All work done by the student is to be written and stated orally.

Topic 4

1. $\begin{array}{r} 31 \\ \times 24 \\ \hline \end{array}$ $\begin{array}{r} 44 \\ \times 22 \\ \hline \end{array}$ $\begin{array}{r} 23 \\ \times 32 \\ \hline \end{array}$ $\begin{array}{r} 61 \\ \times 32 \\ \hline \end{array}$ $\begin{array}{r} 82 \\ \times 41 \\ \hline \end{array}$ $\begin{array}{r} 73 \\ \times 33 \\ \hline \end{array}$

2. $\begin{array}{r} 68 \\ \times 74 \\ \hline \end{array}$ $\begin{array}{r} 59 \\ \times 26 \\ \hline \end{array}$ $\begin{array}{r} 71 \\ \times 87 \\ \hline \end{array}$ $\begin{array}{r} 54 \\ \times 63 \\ \hline \end{array}$ $\begin{array}{r} 98 \\ \times 35 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ \times 47 \\ \hline \end{array}$

3. $\begin{array}{r} 426 \\ \times 82 \\ \hline \end{array}$ $\begin{array}{r} 597 \\ \times 35 \\ \hline \end{array}$ $\begin{array}{r} 643 \\ \times 78 \\ \hline \end{array}$ $\begin{array}{r} 922 \\ \times 69 \\ \hline \end{array}$ $\begin{array}{r} 834 \\ \times 56 \\ \hline \end{array}$

Multiplication Difficulties

Name _____ Date _____

Topic	Score	Difficulty	Remarks
1		Errors in combinations	
		Wrote tables	
		Based unknown combinations	
		on known	
2		Error due to zero in multiplier	
		Error due to zero in multiplicand	
		Error in regrouping into zero	
3		Procedure with one digit	
		Regrouped wrong number	
		Forgot to regroup	
		Counted to regroup	
		Added regrouped number twice	
		Wrote number to be regrouped	
		Omitted digits	
		Wrote in zero placeholders	
4		Procedure with two digits	
		Regrouped wrong number	
		Forgot to regroup	
		Counted to regroup	
		Added regrouped number twice	

Topic	Score	Difficulty	Remarks
		Wrote number to be regrouped	
		Omitted digits	
		Wrote in zero placeholders	
		Illegible figures	
		Error in writing product	
		Error in position of partial product	

Area of greatest need -

Recommendations -

Name _____ Topic 1

Number 1

We will read 2 x 3 as two groups of three. This means that we have two groups and each group has three members.

2 x 3 Two groups of three = 6

Each box is one group. Each box contains 3 dots. If we have two groups of three, we have six in all. In each of these problems draw a picture of the groups and tell how many dots there are in all.

Example: 2 x 2 = = 4

3 x 1 =

1 x 2 =

1 x 1 =

3 x 2 =

4 x 1 =

2 x 1 =

1 x 3 =

1 x 4 =

4 x 2 =

2 x 4 =

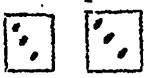
Name _____ Topic 1

Number 2

In each of these write a number sentence for each picture .

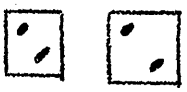
Follow the example.

Example:

 = 2 x 3 = 6

 =

 =

 =

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 =

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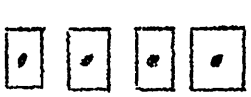
 =

 =

 =

Name _____ Topic 1

Number 3

Draw a picture showing each of these problems and the product.

Examples:

1 x 2 = = = 2

2 x 3 = = = 6

2 x 2 =

4 x 1 =

1 x 3 =

3 x 3 =

When we multiply, our answer is called the product. The product of 3 x 2 is 6. We can also write our problem as

$$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$$ (product)

Find the products.

$$\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ \times 1 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 2 \\ \times 5 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ \times 2 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$$

Name _____ Topic 1

Number 4

Multiplication is a fast way of adding like numbers. 2 x 4, which is two groups of four, means the same as 4 + 4.

Find the products.

3 x2	1 x4	5 x2	3 x3	6 x2	5 x1	1 x2
7 x2	2 x4	8 x2	1 x1	2 x2	9 x2	3 x1

Write the numbers from 2 to 18 by 2's.

2 __ __ 8 __ __ __ __ 18

Write the numbers from 5 to 45 by 5's.

5 __ __ __ 25 __ __ __ 45

Write the numbers from 4 to 36 by 4's.

4 __ __ 16 __ __ __ __ 36

Practice counting by 2's, 4's and 5's until you can do it quickly.

Name _____ Topic 1

Number 5

When we have learned one multiplication fact we have really learned two.

$3 \times 2 =$ $= 6$

$2 \times 3 =$ $= 6$

Find the products.

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

Practice counting by 2's, 4's and 5's.

Name _____ Topic 1

Number 6

Count by 3's to 27.

3 ___ ___ ___ ___ ___ ___ ___ 27

4 x 3 = four groups of three = 3 + 3 + 3 + 3 = 12

Fill in these just as is done above.

6 x 3 =

5 x 3 =

8 x 3 =

2 x 3 =

7 x 3 =

1 x 3 =

9 x 3 =

4 x 3 =

Find the products.

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

Name _____ Topic 1

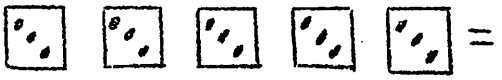
Number 7

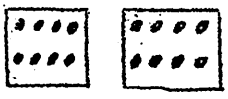
Write a number sentence for each of these pictures.

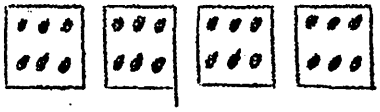
Example:

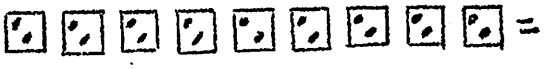
 = 4 x 5 = 20

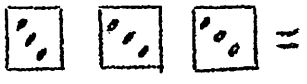
 =

 =

 =

 =

 =

 =

 =

Name _____ Topic 1

Number 8

Count by 6's to 54.

6 ___ ___ ___ ___ ___ ___ ___ 54

Find the products.

6	6	6	6	6	6	6	6	6
x1	x2	x3	x4	x5	x6	x7	x8	x9

6 x 6 =

5 x 6 =

8 x 6 =

4 x 6 =

1 x 6 =

9 x 6 =

7 x 6 =

2 x 6 =

3 x 6 =

4	1	2	8	5	6	3	9	7
x6	x6	x6	x6	x6	x6	x6	x6	x3

Count by

2 ___ ___ ___ ___ ___ ___ ___ 18

3 ___ ___ ___ ___ ___ ___ ___ 27

4 ___ ___ ___ ___ ___ ___ ___ 36

5 ___ ___ ___ ___ ___ ___ ___ 45

Name _____ Topic 1

Number 9

7 x 7 = 49	8 x 8 = 64
7 x 8 = 56	8 x 9 = 72
7 x 9 = 63	9 x 9 = 81

Learn these six facts.

Find the products.

7 x8	9 x7	8 x8	9 x8	9 x9	8 x9	8 x7	7 x9	7 x7

Review

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

Name _____ Topic 1

Number 10

Fill in this chart.

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

Topic Test 1

Name _____ Date _____

Multiply:

81	21	06	47	19	22	25	86	09	12
37	83	16	90	10	85	15	20	45	49
31	82	35	65	91	23	99	64	00	08
55	78	62	01	43	93	14	72	56	69
04	03	36	58	30	26	46	79	80	29
73	88	05	32	54	95	41	33	39	57
18	42	75	74	17	70	34	76	52	11

Topic Test 1

Name _____ Date _____

Multiply:

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

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

9	6	0	5	5	8	5	2	6	9
8	7	2	3	9	7	0	7	6	6

Name _____ Topic 2

Number 1

If you have two marble bags, and each bag has zero marbles, how many marbles would you have? ____ Yes, you would have zero marbles. We can write this as 2 x 0 = 0. But if all the marble bags have four marbles in each of them and you didn't have any of the bags, how many marbles would you have? ___ This can be written as 0 x 4 = 0.

What can you say about multiplication by 0?

Solve these equations.

0 x 4 =	6 x 0 =
5 x 0 =	0 x 5 =
0 x 0 =	0 x 2 =
1 x 0 =	7 x 0 =
0 x 9 =	8 x 0 =

Name _____ Topic 2

Number 2

When multiplying by tens our product is tens.

Example: 20
x4
80

1. 4 x 0 ones = 0 ones
2. 4 x 2 tens = 8 tens

When multiplying by hundreds our product is hundreds.

Example: 400
x 3
1200

1. 3 x 0 ones = 0 ones
2. 3 x 0 tens = 0 tens
3. 3 x 4 hundreds = 12 hundreds

Find the products.

30	70	20	40	60	90
x2	x8	x6	x9	x7	x1

300	700	400	800	500	600
x 3	x 5	x 6	x 2	x 4	x 7

Name _____ Topic 2

Number 3

We can write 20 x 34 as 20 x (30 + 4). Study the example to see how we can make use of this.

Example:

$$\begin{array}{rcl} 23 & = & 20 + 3 \\ \times 20 & = & \times \quad\quad 20 \\ \hline & & 400 + 60 \end{array}$$

$$\begin{array}{rll} 23 & & \\ \times 20 & & \\ \hline 60 & (20 \times 3) & \\ 400 & (20 \times 20) & \\ \hline 460 & (20 \times 23) & \end{array}$$

Using the example as a guide, find the products.

$$\begin{array}{r} 61 \\ \times 70 \\ \hline \end{array}$$

$$\begin{array}{r} 83 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 92 \\ \times 40 \\ \hline \end{array}$$

Name _____ Topic 2

Number 4

When multiplying by tens our product is tens.

30 x 32 can be thought of as 3 tens x 32.

Example:

$$\begin{array}{r} 32 \\ \times 30 \end{array} \qquad \begin{array}{r} 32 \\ \times 3\text{tens} \\ \hline 960 \end{array}$$

1. 3 tens x 2 = 6 tens
2. 3 tens x 3 tens = 9 hundreds

If you were to write a number for 6 tens, what would you have to put in the ones place?

Study the example, then solve these problems.

$$\begin{array}{r} 22 \\ \times 20 \end{array} \qquad \begin{array}{r} 42 \\ \times 30 \end{array} \qquad \begin{array}{r} 25 \\ \times 10 \end{array} \qquad \begin{array}{r} 17 \\ \times 40 \end{array}$$

$$\begin{array}{r} 34 \\ \times 50 \end{array} \qquad \begin{array}{r} 56 \\ \times 70 \end{array} \qquad \begin{array}{r} 73 \\ \times 60 \end{array} \qquad \begin{array}{r} 87 \\ \times 80 \end{array}$$

Name _____ Topic 2

Number 5

Study these examples:

A.
$$\begin{array}{r} 30 \\ \times 24 \\ \hline 120 \\ 60 \\ \hline 720 \end{array}$$

1. 4 ones x 0 ones = 0 ones, put 0 in the ones place.
2. 4 ones x 3 tens = 12 tens, put 12 in the proper places.
3. 2 tens x 0 ones = 0 tens, put 0 in the tens place.
4. 2 tens x 3 tens = 6 hundreds, put 6 in the hundreds place.
5. Add partial products, 120 + 600 = 720.

B.
$$\begin{array}{r} 400 \\ \times 32 \\ \hline 800 \\ 1200 \\ \hline 12800 \end{array}$$

1. 2 ones x 0 ones = 0 ones, put 0 in the ones place.
2. 2 ones x 0 tens = 0 tens, put 0 in the tens place.
3. 2 ones x 4 hundreds = 8 hundreds, put 8 in the hundreds place.
4. 3 tens x 0 ones = 0 tens, put 0 in the tens place.
5. 3 tens x 0 tens = 0 hundreds, put 0 in the hundreds place.
6. 3 tens x 4 hundreds = 12 thousands, put 2 in the thousands place and 1 in the ten thousands place.
7. Add the partial products, 800 + 12000 = 12800.

Find the products.

$$\begin{array}{r} 40 \\ \times 38 \\ \hline \end{array} \qquad \begin{array}{r} 60 \\ \times 47 \\ \hline \end{array} \qquad \begin{array}{r} 70 \\ \times 85 \\ \hline \end{array} \qquad \begin{array}{r} 90 \\ \times 63 \\ \hline \end{array} \qquad \begin{array}{r} 20 \\ \times 54 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ \times 92 \\ \hline \end{array}$$

$$\begin{array}{r} 500 \\ \times 27 \\ \hline \end{array} \qquad \begin{array}{r} 200 \\ \times 52 \\ \hline \end{array} \qquad \begin{array}{r} 700 \\ \times 17 \\ \hline \end{array} \qquad \begin{array}{r} 900 \\ \times 73 \\ \hline \end{array} \qquad \begin{array}{r} 600 \\ \times 81 \\ \hline \end{array}$$

Name _____ Topic 2

Number 6

Study this example.

$$\begin{array}{r} 206 \\ \times\ 7 \\ \hline 1442 \end{array}$$

1. 7 ones x 6 ones = 42 ones, put 2 in the ones place.
2. Regroup the 4 tens in the tens place.
3. 7 ones x 0 tens = 0 tens, 0 tens plus 4 tens that were regrouped = 4 tens.
4. Put 4 in the tens place.
5. 7 ones x 2 hundreds = 14 hundreds.
6. Put 4 in the hundreds place.
7. Put 1 in the thousands place.

Find the products.

$$\begin{array}{r} 209 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 607 \\ \times\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 201 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 803 \\ \times\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 509 \\ \times\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 708 \\ \times 23 \\ \hline \end{array} \qquad \begin{array}{r} 805 \\ \times 38 \\ \hline \end{array} \qquad \begin{array}{r} 902 \\ \times 12 \\ \hline \end{array} \qquad \begin{array}{r} 405 \\ \times 39 \\ \hline \end{array} \qquad \begin{array}{r} 109 \\ \times 16 \\ \hline \end{array}$$

$$\begin{array}{r} 4003 \\ \times\ 27 \\ \hline \end{array} \qquad \begin{array}{r} 5007 \\ \times\ 48 \\ \hline \end{array} \qquad \begin{array}{r} 1003 \\ \times\ 94 \\ \hline \end{array} \qquad \begin{array}{r} 7007 \\ \times\ 26 \\ \hline \end{array}$$

Name _____

Topic 2

Number 7

Review

Find the products.

9 x0	0 x1	0 x0	6 x0	0 x5	7 x0	8 x0
20 x7	30 x4	70 x8	80 x9	10 x6	40 x3	
800 x 4	400 x 7	600 x 5	300 x 3	900 x 8	700 x 6	
37 x10	48 x30	64 x50	83 x40	77 x80	94 x20	

Name _____ Date _____

Topic Test 2

Multiply:

0	0	1	2	0	0	0	8	7	0
6	9	0	0	0	1	3	0	0	6

30	40	70	200	800	900
6	9	8	7	5	4

64	82	97	490	720	950
30	50	40	30	60	80

500	400	300	640	750	480
40	90	70	37	54	65

200	800	100	309	506	709
73	39	78	63	38	69

Name _____

Topic 3

Number 1

Numbers can be renamed in this way.

Example:

27 = 20 + 7

124 = 100 + 20 + 4

3426 = 3000 + 400 + 20 + 6

Rename each of these numbers.

63 =

28 =

47 =

10 =

52 =

61 =

126 =

428 =

710 =

602 =

746 =

287 =

6428 =

7537 =

6405 =

8740 =

Name _____ Topic 3

Number 2

In multiplying 4 x 32, we can rename 32 as 30 + 2 and multiply each of these by 4.

Example:

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array} \quad = \quad \begin{array}{r} 30 + 2 \\ \times \quad 4 \\ \hline \end{array} \quad = \quad \begin{array}{r} 32 \\ \times 4 \\ \hline 8 \quad (4 \times 2) \\ 120 \quad (4 \times 30) \\ \hline 128 \end{array}$$

1. Multiply ones first.
2. Multiply tens second.
3. Add their products.

Find the products.

$$\begin{array}{r} 32 \\ \times 3 \\ \hline 6 \quad (3 \times 2) \\ 90 \quad (3 \times 30) \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times 4 \\ \hline 12 \quad (4 \times 3) \\ 80 \quad (4 \times 20) \\ \hline \end{array} \qquad \begin{array}{r} 34 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 65 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 82 \\ \times 4 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$$

Name _____ Topic 3

Number 3

In the problem 3 x 23 = 69, 3 and 23 are called the factors of 69. The factors are the numbers we multiply to find the product.

$$\begin{array}{r} 23 \\ \times 3 \\ \hline \end{array} = \begin{array}{r} 20 + 3 \\ \times \quad 3 \\ \hline 60 + 9 \end{array} = 69$$

1. Rename 23 as 20 + 3
2. Multiply 3 x 3 and 3 x 20
3. Add these two products

Rename each of these factors and then multiply.

$$\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array} = \begin{array}{r} 20 + 4 \\ \times \quad - \\ \hline - + - \end{array} = -$$

$$\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array} = \begin{array}{r} - + - \\ \times \quad - \\ \hline - + - \end{array} = -$$

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 52 \\ \times 5 \\ \hline \end{array}$$

Name _____ Topic 3

Number 4

Study the example.

$$\begin{array}{r} 312 \\ \times\ 3 \\ \hline 6 = (3 \times 2) \\ 30 = (3 \times 10) \\ 900 = (3 \times 300) \\ \hline 936 \end{array}$$

1. Multiply ones first, 3 x 2
2. Multiply tens next, 3 x 10
3. Multiply hundreds next, 3 x 300
4. Add the partial products

Find the products.

311	434	322	412	212
x 2	x 2	x 4	x 3	x 3

711	243	134	821	612
x 8	x 2	x 2	x 4	x 4

Name _____ Topic 3

Number 5

In this exercise we will learn how to make use of a shorter form for doing multiplication.

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 92 \end{array}$$

1. 4 x 3 = 12. 12 = 1 ten and 2 ones.
2. Write the 2 in the one's place and remember the 1 ten.
3. 4 x 2 tens = 8 tens. 8 tens and 1 ten are 9 tens.
4. Write the 9 tens in the tens place.

Find the products using this shorter form.

$\begin{array}{r} 17 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 62 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 81 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 87 \\ \times 7 \\ \hline \end{array}$
$\begin{array}{r} 56 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 89 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 78 \\ \times 8 \\ \hline \end{array}$
$\begin{array}{r} 45 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 82 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 37 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 74 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ \times 3 \\ \hline \end{array}$

Name _____ Topic 3

Number 6

Use the shorter form to solve this kind of a problem.

Study the example.

Example:

$$\begin{array}{r} 342 \\ \times\ 6 \\ \hline 2052 \end{array}$$

1. 6 x 2 = 12. 12 = 1 ten + 2 ones.
2. Write the 2 ones in the ones place and remember the 1 ten.
3. 6 x 4 tens = 24 tens. 24 tens + 1 ten = 25 tens.
4. 25 tens = 2 hundreds + 5 tens.
5. Write the 5 in the tens place and remember the 2 hundreds.
6. 6 x 3 hundreds = 18 hundreds. 18 hundreds + 2 hundreds = 20 hundreds.
7. Write the 20 hundreds.

Find the products.

$\begin{array}{r} 234 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 628 \\ \times\ 7 \\ \hline \end{array}$	$\begin{array}{r} 357 \\ \times\ 3 \\ \hline \end{array}$	$\begin{array}{r} 549 \\ \times\ 5 \\ \hline \end{array}$
$\begin{array}{r} 454 \\ \times\ 6 \\ \hline \end{array}$	$\begin{array}{r} 732 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 514 \\ \times\ 9 \\ \hline \end{array}$	$\begin{array}{r} 643 \\ \times\ 2 \\ \hline \end{array}$
$\begin{array}{r} 875 \\ \times\ 6 \\ \hline \end{array}$	$\begin{array}{r} 935 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 634 \\ \times\ 7 \\ \hline \end{array}$	$\begin{array}{r} 589 \\ \times\ 3 \\ \hline \end{array}$

Name _____ Topic 3

Number 7

We can use the shorter form when we have three digits in the multiplicand.

$$\begin{array}{r} 324 \\ \times\ 2 \\ \hline 648 \end{array}$$

1. 2 x 4 ones = 8 ones. Write the 8 in the ones place.
2. 2 x 2 tens = 4 tens. Write the 4 in the tens place.
3. 2 x 3 hundreds = 6 hundreds. Write the 6 in the hundreds place.

Use the short form for solving these problems.

$$\begin{array}{r} 321 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 434 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 113 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 431 \\ \times\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 632 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 724 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 642 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 532 \\ \times\ 3 \\ \hline \end{array}$$

Name _____

Topic 3

Number 8

Review

Find the products.

26 x3	48 x4	73 x5	37 x2	59 x7
56 x8	93 x2	31 x6	54 x8	65 x9
426 x 7	538 x 6	349 x 5	667 x 8	747 x 9
523 x 4	295 x 7	482 x 3	391 x 8	987 x 6

Topic Test 3

Name _____ Date _____

Multiply:

$\begin{array}{r} 32 \\ \times\ 3 \\ \hline \end{array}$	$\begin{array}{r} 41 \\ \times\ 2 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 35 \\ \times\ 2 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times\ 3 \\ \hline \end{array}$
$\begin{array}{r} 52 \\ \times\ 6 \\ \hline \end{array}$	$\begin{array}{r} 78 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 98 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ \times\ 7 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ \times\ 5 \\ \hline \end{array}$
$\begin{array}{r} 567 \\ \times\ 5 \\ \hline \end{array}$	$\begin{array}{r} 645 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 367 \\ \times\ 6 \\ \hline \end{array}$	$\begin{array}{r} 849 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 938 \\ \times\ 9 \\ \hline \end{array}$
$\begin{array}{r} 826 \\ \times\ 7 \\ \hline \end{array}$	$\begin{array}{r} 583 \\ \times\ 5 \\ \hline \end{array}$	$\begin{array}{r} 647 \\ \times\ 9 \\ \hline \end{array}$	$\begin{array}{r} 628 \\ \times\ 2 \\ \hline \end{array}$	$\begin{array}{r} 947 \\ \times\ 7 \\ \hline \end{array}$
$\begin{array}{r} 586 \\ \times\ 3 \\ \hline \end{array}$	$\begin{array}{r} 327 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 653 \\ \times\ 4 \\ \hline \end{array}$	$\begin{array}{r} 957 \\ \times\ 3 \\ \hline \end{array}$	$\begin{array}{r} 834 \\ \times\ 6 \\ \hline \end{array}$

Name _____ Topic 4

Number 1

When multiplying by a two digit number, we can rename it into tens and ones.

Example:

23 x32	23 x2 = 46	23 x30 = 690	23 x32 = 46 + 690 = 736	
			46	(2 x 23)
			690	(30 x 23)
			736	

Using the example as a guide, fill in the blanks.

1. 43 x21

43 x1 = 43	43 x20 = 860	43 x21 = __ + ___ = ___	
		__	(1 x 43)
		___	(20 x 43)
		___	

2. 54 x32

54 x_ = ___	54 x30 = ____	54 x32 = ___ + ____ = _____	
		___	(2 x 54)
		____	(30 x 54)
		_____	

3. 35 x43

__ x3 = ___	35 x_ = ____	35 x43 = ___ + ____ = _____	
		___	(3 x 35)
		____	(40 x 35)
		_____	

Name _____ Topic 4

Number 2

When we have two digits in the multiplier, we always multiply by the ones first.

Example:

45	45	45	45	
x24	x4	x20	x24	
	180	900	180	(4 x 45)
			900	(20 x 45)
			1080	

Study the example and do each of these in the same way.

54
x43

64
x35

72
x53

Name _____ Topic 4

Number 3

We will now write our partial products in a shorter form, in order to save time. Study the example and solve the problems.

Example:

$$\begin{array}{r} 84 \\ \times 26 \\ \hline 504 \\ 1680 \\ \hline 2184 \end{array} \quad \begin{array}{l} \\ \\ (6 \times 84) \\ (20 \times 84) \\ \\ \end{array}$$

1. Multiply by 6 ones first.
2. Multiply by 2 tens next.
3. Place your partial product under the partial product from the ones.
4. Add the partial products.

$$\begin{array}{r} 57 \\ \times 24 \\ \hline \end{array} \qquad \begin{array}{r} 64 \\ \times 55 \\ \hline \end{array} \qquad \begin{array}{r} 78 \\ \times 32 \\ \hline \end{array}$$

$$\begin{array}{r} 83 \\ \times 46 \\ \hline \end{array} \qquad \begin{array}{r} 72 \\ \times 28 \\ \hline \end{array} \qquad \begin{array}{r} 49 \\ \times 63 \\ \hline \end{array}$$

Name _____ Topic 4

Number 4

Use the shorter form to find the products. Remember to multiply by the ones first and then the tens.

Example:

$$\begin{array}{r} 64 \\ \times 38 \\ \hline 512 \\ 1920 \\ \hline 2432 \end{array} \quad \begin{array}{l} \\ \\ (8 \times 64) \\ (30 \times 64) \\ \\ \end{array}$$

Multiply:

$$\begin{array}{r} 83 \\ 49 \\ \hline \end{array} \qquad \begin{array}{r} 48 \\ 76 \\ \hline \end{array} \qquad \begin{array}{r} 59 \\ 68 \\ \hline \end{array}$$

$$\begin{array}{r} 76 \\ 35 \\ \hline \end{array} \qquad \begin{array}{r} 64 \\ 58 \\ \hline \end{array} \qquad \begin{array}{r} 96 \\ 47 \\ \hline \end{array}$$

Name _____ Topic 4

Number 5

When multiplying 63 x 248, we multiply 3 x 248 first and then 60 x 248. Study the example and then do the examples.

Example:

$$\begin{array}{r} 248 \\ \times 63 \\ \hline 744 \\ 14880 \\ \hline 15624 \end{array} \quad \begin{array}{l} \\ \\ (3 \times 248) \\ (60 \times 248) \\ \\ \end{array}$$

$$\begin{array}{r} 532 \\ \times 43 \\ \hline \end{array} \qquad \begin{array}{r} 648 \\ \times 57 \\ \hline \end{array} \qquad \begin{array}{r} 759 \\ \times 64 \\ \hline \end{array}$$

$$\begin{array}{r} 817 \\ \times 84 \\ \hline \end{array} \qquad \begin{array}{r} 986 \\ \times 72 \\ \hline \end{array} \qquad \begin{array}{r} 326 \\ \times 48 \\ \hline \end{array}$$

Name _____ Topic 4

Number 6

When multiplying by two or more digits, we can save time by using a shorter form. The partial product, when multiplying by tens, is tens plus zero ones. We can write our partial product as tens without putting in the zero placeholder.

Example:

$$\begin{array}{r} 348 \\ \times 26 \\ \hline 1888 \\ 696 \\ \hline 8848 \end{array}$$

1. 6 x 348 = 1888.
2. 2 tens x 348 = 696 tens.
3. Write 696 tens without the zero placeholder.

Find the products.

$$\begin{array}{r} 647 \\ \times 43 \\ \hline \end{array} \qquad \begin{array}{r} 834 \\ \times 57 \\ \hline \end{array} \qquad \begin{array}{r} 759 \\ \times 68 \\ \hline \end{array}$$

$$\begin{array}{r} 586 \\ \times 36 \\ \hline \end{array} \qquad \begin{array}{r} 943 \\ \times 75 \\ \hline \end{array} \qquad \begin{array}{r} 678 \\ \times 94 \\ \hline \end{array}$$

Name _____

Topic 4

Number 7

Review

Multiply:

27 x36	58 x76	97 x38	74 x59
462 x48	575 x37	846 x84	791 x67
954 x58	621 x59	382 x72	519 x63
632 x59	465 x34	794 x67	198 x84

Topic Test 4

Name _____ Date _____

Multiply:

32 × 43	24 × 52	63 × 27	59 × 38	74 × 27
77 × 11	96 × 38	43 × 32	82 × 75	53 × 64
584 × 29	635 × 74	981 × 27	683 × 96	744 × 58
297 × 56	348 × 92	486 × 54	797 × 48	633 × 49

CHAPTER VII

Division

Test for Division

Topic 1. Division facts

2. Single digit divisor

   a. No remainder

   b. Remainder

3. Two digit divisor

Purpose: To determine which pupils need remedial work.

To determine in which areas a pupil needs remedial work.

1.	$3\overline{)6}$	$4\overline{)20}$	$7\overline{)28}$	$8\overline{)40}$
2.	$9\overline{)45}$	$6\overline{)42}$	$9\overline{)27}$	$8\overline{)56}$
3.	$6\overline{)54}$	$8\overline{)32}$	$7\overline{)35}$	$7\overline{)42}$
4.	$2\overline{)42}$	$3\overline{)36}$	$4\overline{)60}$	$5\overline{)55}$

5. $6\overline{)636}$ $7\overline{)504}$ $9\overline{)828}$ $8\overline{)824}$

6. $6\overline{)374}$ $4\overline{)183}$ $3\overline{)251}$

7. $8\overline{)703}$ $9\overline{)800}$ $7\overline{)678}$

8. $32\overline{)69}$ $21\overline{)89}$ $12\overline{)38}$

9. $29\overline{)275}$ $58\overline{)187}$ $78\overline{)356}$

10. $21\overline{)1155}$ $32\overline{)2592}$ $42\overline{)1008}$

Pupil must score: Topic 1 - 9

Topic 2 - 10

Topic 3 - 6

Topic 1. Division facts - rows 1, 2, 3

2. Single digit divisor

a. No remainder - rows 4, 5

b. Remainder - rows 6, 7

3. Two digit divisor - rows 8, 9, 10

Division

Diagnostic test for pupil evaluation. To be used with division difficulties check list. All work is to be written and stated orally.

Topic 1

1. $3\overline{)3}$ $4\overline{)8}$ $3\overline{)6}$ $4\overline{)20}$ $4\overline{)12}$

2. $6\overline{)18}$ $5\overline{)25}$ $6\overline{)12}$ $5\overline{)45}$ $8\overline{)24}$

3. $8\overline{)40}$ $7\overline{)35}$ $9\overline{)18}$ $9\overline{)54}$ $7\overline{)56}$

4. $3\overline{)48}$ $4\overline{)76}$ $7\overline{)84}$ $8\overline{)96}$

5. $6\overline{)23}$ $8\overline{)62}$ $7\overline{)61}$ $9\overline{)44}$

6. $6\overline{)132}$ $9\overline{)207}$ $2\overline{)819}$ $4\overline{)347}$

Division

Diagnostic test for pupil evaluation. To be used with division difficulties check list. All work is to be written and stated orally.

Topic 2

7. $20\overline{)40}$ $30\overline{)60}$ $40\overline{)40}$

8. $21\overline{)89}$ $31\overline{)96}$ $23\overline{)59}$

9. $35\overline{)105}$ $34\overline{)108}$ $28\overline{)138}$

10. $23\overline{)483}$ $32\overline{)407}$ $35\overline{)428}$

11. $33\overline{)1786}$ $28\overline{)1896}$ $63\overline{)4285}$

Division Difficulties

Name _____ Date _____

Topic	Score	Difficulty	Remarks
1.		Errors in division combinations	
2.		Errors in multiplication	
		Errors in subtraction	
		Remainders	
		a. Used remainder larger than divisor	
		b. Omitted final remainder	
		Counting	
		a. Counted to get quotient	
		b. Repeated part of multiplication table	
		c. Counted in subtractions	
		Faulty procedure	
		Lapses	
		a. Used wrong operation	
		b. Error in reading	
		c. Illegible figures	
3.		Errors in multiplication	
		Errors in subtraction	
		Remainders	

Topic	Score	Difficulty	Remarks
		a. Used remainder larger than divisor	
		b. Omitted final remainder	
		Counting	
		a. Counted to get quotient	
		b. Repeated part of multiplication table	
		c. Counted in subtractions	
		Faulty procedure	
		Lapses	
		a. Used wrong operation	
		b. Error in reading	
		c. Illegible figures	

Area of greatest need -

Recommendations -

Record Sheet - Division

Topic	1	2	3
Total problems	12	14	9

Name

Name _____ Topic 1

Number 1

Division tells us how many groups there are. Two groups of four equals eight. In order to find out how many groups of four there are in eight we must divide.

$8 \div 4$ (what number multiplied by four will equal eight)

Example:

$2 \times 4 = 8$ $8 \div 4 = 2$

Solve these equations.

$\_ \times 1 = 5$	$5 \div 1 = \_$
$5 \times \_ = 5$	$5 \div 5 = \_$
$\_ \times 2 = 10$	$10 \div 2 = \_$
$5 \times \_ = 10$	$10 \div 5 = \_$
$\_ \times 4 = 12$	$12 \div 4 = \_$
$3 \times \_ = 12$	$12 \div 3 = \_$
$\_ \times 3 = 15$	$15 \div 3 = \_$
$5 \times \_ = 15$	$15 \div 5 = \_$

Name _____

Topic 1

Number 2

Find the missing factor.

3 x _ = 15	9 x _ = 63
_ x 7 = 49	8 x _ = 64
_ x 5 = 45	5 x _ = 40
6 x _ = 42	3 x _ = 9
9 x _ = 36	4 x _ = 32
4 x _ = 24	_ x 8 = 24
_ x 3 = 27	8 x _ = 56
6 x _ = 54	_ x 5 = 35
6 x _ = 18	6 x _ = 30
_ x 9 = 81	4 x _ = 16
8 x _ = 48	6 x _ = 36
_ x 7 = 21	_ x 8 = 72
3 x _ = 12	3 x _ = 6
5 x _ = 25	9 x _ = 0

Name _____

Topic 1

Number 3

Complete each equation.

Example:

$24 \div 3 = 8$

Check

$3 \times 8 = 24$

$8 \div 4 =$ _	$12 \div 4 =$ _
$2 \div 2 =$ _	$5 \div 1 =$ _
$9 \div 3 =$ _	$6 \div 3 =$ _
$20 \div 5 =$ _	$5 \div 5 =$ _
$2 \div 1 =$ _	$15 \div 3 =$ _
$10 \div 2 =$ _	$4 \div 1 =$ _
$12 \div 3 =$ _	$8 \div 2 =$ _
$4 \div 2 =$ _	$15 \div 5 =$ _
$16 \div 4 =$ _	$20 \div 4 =$ _
$3 \div 3 =$ _	$25 \div 5 =$ _
$6 \div 2 =$ _	$4 \div 4 =$ _

Name _____ Topic 1

Number 4

When we multiply (3 x 4), we could find the product by adding 4 + 4 + 4 = 12. In division, we can find the quotient of 16 ÷ 4 by subtracting groups of four from sixteen, to find out how many groups there were.

Example:

16
-4
12
-4
8
-4
4
-4
0

1. We subtracted four, four times.
2. There are four groups of four in sixteen.

Using the subtractive method, find out how many groups of six there are in each of these.

24 54 48 60

Name _____ Topic 1

Number 5

We can show division by using another form. $6 \div 2$ can be written $2\overline{)6}$. The two is called the divisor and the six is called the dividend. Our problem is to find out how many groups of two there are in six, or what number multiplied by two will equal six. This can also show us how many would be in each of the two groups.

Example: $2\overline{)\overset{3}{6}}$ 3 is called the quotient.

Solve each problem.

$4\overline{)24}$	$3\overline{)9}$	$2\overline{)14}$
$3\overline{)12}$	$2\overline{)8}$	$8\overline{)16}$
$4\overline{)16}$	$3\overline{)6}$	$5\overline{)20}$
$5\overline{)15}$	$2\overline{)10}$	$3\overline{)18}$

Name _____ Topic 1

Number 6

Find the quotient.

$7\overline{)49}$	$5\overline{)25}$	$6\overline{)30}$	$9\overline{)45}$
$9\overline{)63}$	$4\overline{)16}$	$7\overline{)42}$	$8\overline{)64}$
$6\overline{)36}$	$6\overline{)24}$	$5\overline{)40}$	$3\overline{)6}$
$9\overline{)81}$	$3\overline{)9}$	$3\overline{)15}$	$8\overline{)48}$
$8\overline{)24}$	$9\overline{)36}$	$7\overline{)21}$	$8\overline{)56}$
$3\overline{)27}$	$3\overline{)12}$	$5\overline{)35}$	$6\overline{)54}$

Topic Test 1

Name _____ Date _____

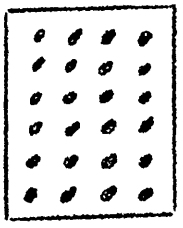
Divide:

$4\overline{)12}$	$3\overline{)15}$	$2\overline{)8}$	$5\overline{)20}$
$8\overline{)24}$	$9\overline{)36}$	$6\overline{)42}$	$7\overline{)56}$
$2\overline{)16}$	$5\overline{)40}$	$7\overline{)49}$	$9\overline{)63}$
$3\overline{)21}$	$4\overline{)24}$	$6\overline{)36}$	$8\overline{)32}$
$5\overline{)25}$	$2\overline{)14}$	$9\overline{)27}$	$7\overline{)28}$
$4\overline{)16}$	$8\overline{)48}$	$6\overline{)54}$	$3\overline{)24}$

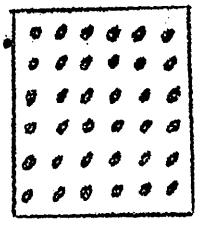
Name _____ Topic 2

Number 1

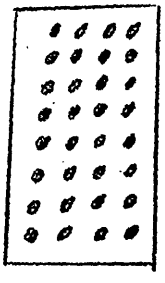
We are going to find out how many groups of two there are in this group.

A. 

1. How many dots in all? 24
2. Circle 9 groups of 2. 18 = 9 groups (9x2)
3. How many are left? 6
4. Circle 3 more groups. 6 = 3 groups (3x2)
5. How many are left? 0
6. How many groups of two were there? 12 groups (12x2)

B. 

1. How many dots in all? ___
2. Circle 8 groups of 3. = ___ x ___
3. How many are left?
4. Circle 4 groups of 3. = ___ x ___
5. How many are left?
6. How many groups of 3 are there in 36? ___

C. 

Find out how many groups of two there are in this box.

Name _____ Topic 2

Number 2

Very often there are more groups in a number than we know facts for.

Example:

$$7\overline{)77}$$

63 | 9

14

14 | 2

0 | 11

1. We know that 9 x 7 = 63
2. 77 is more than 63, so there must be more than 9 groups.
3. If we take out the 9 nine groups, how much is left? (14)
4. How many groups of 7 are there in 14?
5. Yes, there is 2 groups.
6. Are there any left after we take out the 2 groups?
7. How many groups did we get in all?
8. We can check to see if there are 11 groups by multiplying 11 x 7.

Study the example, then find how many groups in each of these problems.

$5\overline{)60}$ $4\overline{)40}$ $3\overline{)36}$

Name _____ Topic 2

Number 3

Copy the table and complete it.

X	100	200	300	400	500	600	700	800	900	1000
1						600				
2		400								
3								2400		
4										
5				2000						
6									5400	
7			2100							
8							5600			
9										9000
10					5000					

Name _____ Topic 2

Number 4

In order to estimate how many groups in all, we must be able to multiply by larger numbers.

8 x 10 = 80 8 x 30 = 240

7 x 100 = 700 7 x 400 = 2800

Do these without looking on your chart.

6 x 40 = __ 20 x 9 = __

7 x 80 = __ 70 x 4 = __

4 x 300 = __ 300 x 8 = __

7 x 600 = __ 10 x 9 = __

5 x 30 = __ 60 x 7 = __

50 x 6 = __ 8 x 40 = __

3 x 70 = __ 3 x 20 = __

8 x 50 = __ 6 x 600 = __

2 x 90 = __ 5 x 500 = __

Name _____ Topic 2

Number 5

When working with larger numbers, use those facts with which you are familiar and which are easiest to use, such as 10 or 100.

Example:

$$\begin{array}{r|l} 3\overline{)45} & \\ 30 & 10 \\ \hline 15 & \\ 15 & 5 \\ \hline 15 & \end{array}$$

1. There are at least 10 groups of 3 in 45 because 10 x 3 = 30 and 30 is less than 45.
2. Take out ten groups because it is easiest to work with.
3. After we take out 10 groups how much is left? ___
4. How many more groups can we take out? ___
5. How many groups of three did we get in all? ___
6. Yes, our quotient is 15.

Find the quotients.

$4\overline{)76}$ $8\overline{)80}$ $7\overline{)84}$

$4\overline{)48}$ $2\overline{)26}$ $3\overline{)33}$

Name _____ Topic 2

Number 6

Study the example.

$$9\overline{)225}$$

180	20
45	
45	5
25	

1. 9 x 10 = 90, 9 x 20 = 180, 9 x 30 = 270.
2. We can get at least 20 groups of 9 from 225.
3. 30 groups would be too much. Why?
4. After we take out 20 groups, how much is left? __
5. How many groups of 9 can we get from 45? __
6. How many groups of 9 are there in all? __

In this example, we have left out 20 x 9 and we only record the 20, because all of our groups will have nine in each and we want only to find out how many in all.

Find the quotients.

$9\overline{)207}$ $6\overline{)132}$

$3\overline{)69}$ $3\overline{)96}$

Name _____ Topic 2

Number 7

Study these three methods of doing the same problem.

A.
$$\begin{array}{r|l} 6\overline{)444} & \\ 300 & 50 \\ \hline 144 & \\ 120 & 20 \\ \hline 24 & \\ 24 & 4 \\ \hline & 74 \end{array}$$

B.
$$\begin{array}{r|l} 6\overline{)444} & \\ 360 & 60 \\ \hline 84 & \\ 60 & 10 \\ \hline 24 & \\ 24 & 4 \\ \hline & 74 \end{array}$$

C.
$$\begin{array}{r|l} 6\overline{)444} & \\ 420 & 70 \\ \hline 24 & \\ 24 & 4 \\ \hline & 74 \end{array}$$

Find the quotients.

$3\overline{)249}$ $4\overline{)284}$ $5\overline{)365}$

$6\overline{)378}$ $4\overline{)184}$ $8\overline{)704}$

Name _____

Topic 2

Number 8

Find the quotients.

$9\overline{)342}$ $3\overline{)291}$ $8\overline{)664}$

$5\overline{)450}$ $7\overline{)343}$ $9\overline{)711}$

$6\overline{)594}$ $7\overline{)679}$ $8\overline{)736}$

$9\overline{)801}$ $3\overline{)252}$ $7\overline{)392}$

Name _____ Topic 2

Number 9

Complete the table.

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

Name _____ Topic 2

Number 10

In division with larger dividends, use larger groups for your partial quotient. Which is the shortest of the three ways? Why?

Example:

A.

8) 1720	
400	50
1320	
800	100
520	
480	60
40	
40	5
	215

B.

8) 1720	
800	100
920	
800	100
120	
80	10
40	
40	5
	215

C.

8) 1720	
1600	200
120	
80	10
40	
40	5
	215

Find the quotients.

4) 340

9) 567

8) 3616

Name _____ Topic 2

Number 11

Find the quotients. Think in multiples of ten when deciding on partial quotients. Use your chart to help you.

$7\overline{)5250}$ $9\overline{)8280}$ $8\overline{)8960}$

$4\overline{)2240}$ $7\overline{)5761}$ $8\overline{)1056}$

Name _____ Topic 2

Number 12

Many times there is not an even number of groups in the dividend.

Example:

$$\begin{array}{r|l} 6\overline{)127} & \\ 120 & 20 \\ \hline 7 & \\ 6 & 1 \\ \hline 1 & 21 \end{array}$$

There are 21 groups of 6, plus 1 in 127.

$$127 = (21 \times 6) + 1$$

The 1 is called our remainder. This is the number left over after we have taken out all the groups we can.

Find the quotient and the remainder in each of these problems.

$7\overline{)600}$ $9\overline{)138}$ $8\overline{)450}$

Name _____ Topic 2

Number 13

The remainder must be less than the divisor. If it is not less than the divisor, we will be able to get more groups.

Find the quotients and the remainders.

$8\overline{)512}$ $7\overline{)382}$ $4\overline{)251}$

$6\overline{)456}$ $9\overline{)812}$ $7\overline{)756}$

$3\overline{)527}$ $4\overline{)805}$ $9\overline{)927}$

Name _____

Topic 2

Number 14

Divide:

$5\overline{)87}$	$6\overline{)81}$	$7\overline{)83}$
$4\overline{)78}$	$4\overline{)520}$	$6\overline{)720}$
$3\overline{)630}$	$4\overline{)640}$	$7\overline{)854}$
$6\overline{)685}$	$8\overline{)976}$	$4\overline{)694}$
$5\overline{)4637}$	$7\overline{)8341}$	$9\overline{)3407}$

Topic Test 2

Name _____ Date _____

Divide:

$3\overline{)69}$	$7\overline{)84}$	$3\overline{)72}$	$8\overline{)96}$
$6\overline{)132}$	$9\overline{)207}$	$5\overline{)325}$	$8\overline{)376}$
$7\overline{)343}$	$5\overline{)451}$	$8\overline{)665}$	$9\overline{)341}$
$7\overline{)576}$	$4\overline{)376}$	$6\overline{)938}$	$5\overline{)151}$
$2\overline{)963}$	$3\overline{)100}$	$4\overline{)671}$	$6\overline{)743}$

Name _____

Topic 3

Number 1

Complete the table.

X	10	20	30	40	50	60	70	80	90	100
1										
2		40					140			
3				120						
4										
5									450	
6			180							
7										700
8		160			400					
9								720		
10						600				

Name _____ Topic 3

Number 2

Practice multiplying using multiples of 10. You will need these to help you find your partial quotients, if there are two digit divisors.

Example:

20 x 40 = 800

20 x 20 =	40 x 30 =
40 x 20 =	60 x 20 =
60 x 30 =	10 x 50 =
50 x 20 =	80 x 10 =
30 x 80 =	40 x 70 =
90 x 50 =	90 x 20 =
30 x 60 =	50 x 40 =
80 x 40 =	40 x 60 =
60 x 80 =	30 x 40 =
50 x 50 =	70 x 20 =
90 x 70 =	70 x 80 =

Name _____ Topic 3

Number 3

In your partial quotient use numbers which are multiples of ten.

Example:

20) 480		
200	10	
280		
200	10	
80		
80	4	
0	24	

1. 10 x 20 = 200. There are at least 10 groups of 20.
2. After taking out ten groups, how much is left?
3. Can we take out 10 more groups?
4. How much is left after we have taken out these 20 groups?
5. How many more groups can we get out?
6. How many groups in 480?
7. Instead of taking out 10 groups twice, how many could we have taken at first, to make our work easier?

Find the quotients.

30) 720 20) 840 40) 680

Name _____ Topic 3

Number 4

Find the quotients. Use your table if you need help to estimate the partial quotients.

$20\overline{)800}$ $40\overline{)2800}$ $70\overline{)2800}$

$20\overline{)1800}$ $70\overline{)5600}$ $50\overline{)4500}$

$30\overline{)1800}$ $50\overline{)1500}$ $60\overline{)6000}$

$40\overline{)3600}$ $70\overline{)4900}$ $80\overline{)7200}$

Name _____ Topic 3

Number 5

If multiples of ten are too small, use multiples of 100.

Example:

```
40) 9285
    4000 | 100
    5285
    4000 | 100
    1285
    1200 |  30
      85
      80 |   2
       5 | 232
```

1. 100 x 40 = 4000.
   You can get 100 groups of 40 from 9285.
2. With 5285 left, we can get 100 more groups of 40.
3. 30 x 40 = 1200. We can get 30 groups of 40 from 1285.
4. You can get 2 groups of 40 from 85 with 5 left.
5. 9285 = (232 x 40) + 5.

Find the quotients and remainders.

30)7833 10)5820 40)9240

Name _____

Topic 3

Number 6

Divide:

$30\overline{)1628}$ $70\overline{)6586}$ $40\overline{)9274}$

$80\overline{)9000}$ $60\overline{)8563}$ $20\overline{)7459}$

$50\overline{)7496}$ $80\overline{)7163}$ $70\overline{)5872}$

Name _____ Topic 3

Number 7

If we round off our divisors, we can use them as "helpers" in finding our partial quotients. We will round the divisor to the next ten. Round these numbers to the next ten.

Examples:

23 -- 30	51 -- 60
37 -- 40	65 -- 70
21 --	54 --
44 --	71 --
68 --	18 --
74 --	11 --
85 --	26 --
92 --	35 --
87 --	83 --
28 --	77 --
43 --	88 --
37 --	49 --
55 --	61 --
78 --	82 --

Name _____ Topic 3

Number 8

When our divisor is not a multiple of ten, we must remember to round it to the next ten.

Example:

```
23 ) 859
     230  10
     629
     230  10
     399
     230  10
     169
     161   7
       8  37
```

1. Think of 23 as 30.
2. How many groups of 30 are there in 859?
3. 10 x 30 = 300. We will be able to get at least 10 groups of 23. 10 x 23 = 230.
4. Can we get 10 more groups?
5. How much do we have left now?
6. Will we be able to get 10 more groups?
7. With 169 left, we can get 7 more groups of 23.
8. What is our remainder?
9. (37 x 23) + 8 = 859.

Divide:

82) 604

41) 340

Name _____ Topic 3

Number 9

Study the example.

$$67\overline{)1724}\quad 20,\ 5,\ 25$$

1340

384

335

49

1. Is the quotient between 10 and 100? ___
2. What will we round off 67 to in order to help us find our partial quotient? ___
3. 10 x 70 = 700

   20 x 70 = 1400

   30 x 70 = 2100
4. Multiply 20 x 67.
5. How much is left? ___
6. How many groups of 70 in 384?
7. 4 x 70 = 280

   5 x 70 = 350

   6 x 70 = 420
8. Multiply 5 x 67.
9. What is our quotient? ___
10. What is our remainder? ___

Find the quotients and the remainders.

$39\overline{)2681}$ $57\overline{)2464}$

Name _____

Topic 3

Number 10

Find the quotients and remainders.

$94\overline{)695}$

$73\overline{)4090}$

$66\overline{)5136}$

$27\overline{)184}$

$75\overline{)6434}$

$88\overline{)5103}$

Name _____

Topic 3

Number 11

Review

$60\overline{)420}$ $24\overline{)120}$ $80\overline{)560}$

$26\overline{)234}$ $56\overline{)504}$ $37\overline{)333}$

$63\overline{)2042}$ $36\overline{)2014}$ $29\overline{)1962}$

$88\overline{)5748}$ $67\overline{)5729}$ $73\overline{)3198}$

Topic Test 3

Name _____ Date _____

Divide:

$40\overline{)80}$ $20\overline{)60}$ $20\overline{)44}$

$63\overline{)428}$ $25\overline{)128}$ $17\overline{)95}$

$23\overline{)483}$ $25\overline{)575}$ $32\overline{)407}$

$15\overline{)1065}$ $28\overline{)1896}$ $63\overline{)4285}$

CHAPTER IV

SUMMARY AND CONCLUSIONS

The materials used in this study attempted to supply the teacher with the tools necessary for the identification, diagnosis and instruction of pupils in need of remedial help in arithmetic computation. In order to accomplish these goals, the study included survey, diagnostic and topic tests. In addition, it contained a sequential series of lessons which utilized manipulative materials and which was geared to the needs of the pupils.

The need for remedial work exists and studies have been conducted which offer the classroom teacher a guide for instituting such a program. All that now remains is for the teacher to implement the program. The professional educator must make use of the data and techniques developed by the researcher to further improve his approach in dealing with the problems that beset him. The benefits of diagnosis and individual treatment in teaching have already been amply demonstrated.

This paper has attempted to translate the findings, procedures and techniques of the researcher to the practical limits of the teacher. These materials are not intended

as a complete or definitive solution to the problem of identifying, diagnosing and providing instruction for those children in need of remedial work in arithmetic, but rather it should serve as a guide to the types of materials and procedures which are in agreement with the research done in this field. The teacher is encouraged to apply his efforts and creativeness to expand and develop this guide so as to fulfill the needs of the individual pupil.

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