ABSTRACT
        Developed during 1975-76 by 40 primary teachers and
10 elementary principals from 12 small school districts in 2
Washington counties and first used during 1976-77 in more than 20
districts, this K-3 mathematics curriculum is designed to assist
district compliance with Washington's Student Learning Objectives
(SLO) Law, which requires identification of student learning
objectives and evaluation of each student's performance related to
the attainment of the objectives. Specific learning objectives for
mathematics, suggested activities, monitoring procedures and possible
resources used in teaching to the objectives are presented, following
the unique Small Schools Curriculum format. Mathematics goals for the
entire K-12 curriculum and areas of study for K-8 are outlined.
Included in the scope of the K-3 curriculum are counting (serial,
objects, order), equality and inequality, reading and writing
numerals, place value, addition, subtraction, multiplication,
division, story problems, common fractions, geometric shapes (square,
circle, triangle, rectangle), simple graphs and measurements (time,
money, linear, volume, weight, temperature). (NEC)

SMALL SCHOOLS

MATHEMATICS CURRICULUM

K-3

Reading • Language Arts • Mathematics • Science • Social Studies

Dr. Frank B. Brouillet, State Superintendent of Public Instruction, Olympia, Washington

SMALL SCHOOLS

MATHEMATICS CURRICULUM

K-3

Scope

Objectives

Activities

Resources

Monitoring Procedures

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ACKNOWLEDGMENTS

APPRECIATION

Many educators have been involved in the development of the Small Schools Curriculum materials. Of these, Robert Groeschell, now retired from the office of the State Superintendent of Public Instruction, deserves special recognition for his insight, leadership and support in initiating the Small Schools Curriculum Project.

In order to provide assistance to small school districts, a curriculum assessment was conducted by Mr. Groeschell in the spring of 1975. The findings of this assessment pointed out the need for the development of curriculum guidelines to assist small districts in identifying learning objectives and in planning for program implementation. These findings were used to provide the basis for originally funding the Small Schools Curriculum Project.

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Appreciation is extended to Dr. Charles Murray, Superintendent, and the staff of ESD 189 for providing meeting space, equipment and resources which facilitated the development of the Small Schools Curriculum materials.

Additional appreciation is given to the pilot districts and ESDs 171 and 189 for their assistance in field testing and revising the primary Small Schools Curriculum materials.

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TABLE OF CONTENTS

INTRODUCTION

The Small Schools materials were developed through the cooperative efforts of three levels of educational organizations: local, regional, and state. Forty primary teachers and ten elementary principals from small districts in Snohomish and Island Counties (Arlington, Darrington, Granite Falls, Lake Stevens, Lakewood, Monroe, Snohomish, Stanwood, Sultan, South Whidbey and Monroe Christian School), developed and sequenced student learning objectives for grades kindergarten through third in five curriculum areas: reading, language arts, mathematics, science and social studies. Suggested activities, monitoring procedures and possible resources used in teaching the objectives were identified and each student learning objective was correlated to the State Goals for Washington Common Schools and to broad program goals.

On the following pages you will find the Small Schools Mathematics Curriculum Materials for grades kindergarten through third. Included are student learning objectives, suggested activities, suggested monitoring procedures and possible resources. These materials were developed during 1975-76, and were piloted during the 1976-77 school year in more than twenty small districts within the state. Pilot districts included the districts which originally developed the materials, as well as Methow Valley, Chelan, Entiat, Orondo, Leavenworth, Peshastin-Dryden, Washtucna, Wahluke, Royal City, Wilson Creek, Othello and Quincy. Personnel from ESDs 189 and 171 assisted with the implementation of the pilot materials by providing regional organization, coordination, technical assistance and secretarial services. Data collected from the pilot districts were used to modify the materials in preparation for publication and statewide distribution.

Original funding for the project was made available through a Title IV, Part C grant awarded to the Lake Stevens School District. Technical assistance in the development of the winning proposal was provided by ESD 189 and SPI. Since November, 1975, funds for the project have been been available through the budget of the Superintendent of Public Instruction, Division of Curriculum and Instruction. ESD 189 and the office of the Superintendent of Public Instruction have worked cooperatively to provide participating districts with curriculum assistance, organization leadership, editorial services and the publication of materials. Curriculum Specialists from Washington colleges, universities, and local school districts also assisted with the development of materials.

ORGANIZATION OF THE SMALL SCHOOLS MATERIALS

Book covers and objective pages for all Small Schools materials have been color-coded for each subject: Reading--green, Language Arts--yellow, Mathematics--blue, Social Studies--buff, and Science--pink. Following each colored objective page there are several pages which identify activities, resources and monitoring procedures which may be used when teaching to the

objectives. See page viii of this book for a more detailed explanation of the format. On that objective page all objectives for an area of the scope are identified. Within each curriculum book the objectives have been correlated to the goals for the Washington Common Schools and to the Small Schools Program Goals for that subject area.

Accompanying the Small Schools curriculum books are resource assessment booklets for reading, language arts and mathematics, grades K-3. Within each assessment booklet test items are provided for a selected number of Small Schools objectives. The suggested test items may be used directly by teachers to assess student performance, or they may serve as models for other test items to be developed by the classroom teacher.

Another booklet containing only the Small Schools objectives is available. This booklet contains objectives for reading, language arts and mathematics, grades K-8, and for science and social studies, grades K-3. Also within this booklet are the program goals and the scope for each curriculum area.

RELATIONSHIP TO THE SLO LAW

The purpose of this book and all other Small Schools materials is to assist teachers with the improvement of curriculum and instruction. In addition, it is expected that many smaller districts lacking curriculum personnel will find this book helpful in complying with the SLO law. (This law requires districts to identify student learning objectives and to evaluate each student's performance related to the attainment of the objectives.) Contained within this book are many more objectives than any district would choose to identify as their SLO objectives. In order to provide districts with assistance in identifying objectives which might compose their SLO list, selected objectives are marked with an asterisk (*). These objectives have been selected with the understanding that they serve only as a model when using the Small Schools materials in helping district personnel meet the requirements of the SLO Law.

For more information concerning the SLO Law, see the Handbook for School District Implementation of the Student Learning Objectives Law available from the office of the State Superintendent of Public Instruction.

One unique feature of the Small Schools Curriculum is the format or arrange-
ment of information on the page. The format was developed in order to facili-
tate the transportability of the product by allowing districts to personalize
the curriculum materials to meet their own educational programs. The Small
Schools Format provides a simple arrangement for listing objectives and
identifying activities, monitoring procedures, and resources used in teaching.

Page One

The first format page lists the sequence of student learning objectives re-
lated to a specific area of the curriculum for either reading, language arts,
mathematics, science or social studies. For each objective a grade place-
ment has been recommended indicating where each objective should be taught
and mastered. The grade recommendation is made with the understanding that
it applies to most students and that there will always be some students who
require either a longer or shorter time than recommended to master the know-
ledges, skills and values indicated by the objectives.

Columns at the right of the page have been provided so district personnel can
indicate the grade placement of objectives to coincide with the curriculum
materials available in their schools. District personnel may also choose to
delete an objective by striking it from the list or add another objective by
writing it directly on the sequenced objective page.

<u>Page Two</u>

On the second format page, one or more objectives from the first format page are rewritten and suggested activities, monitoring procedures and possible resources used in teaching to the objective(s) are identified. The objectives are correlated to the State Goals for Washington Common Schools and to broad K-12 program goals. The suggested grade placement of the objectives and the activities is indicated and, wherever applicable, the relatedness of an objective to other curriculum areas have been shown. Particular effort has been given to correlating the materials with the areas of Environmental Education, and the use of the newspaper in the classroom.

Below is an example of a completed second format page. Teachers and principals in local districts may personalize this page by listing their own resources and by correlating their district goals to the student learning objectives.

SMALL SCHOOLS PROJECT

Suggested Objective Placement ___1-2___

Student Learning Objective(s) __The student knows the addition facts with sums to nine (mastery).__

State Goal | 1,7,10
District Goal |
Program Goal |

Related Area(s) _____

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Title: Nine Holes Group Size: pairs of students Materials: 2 tagboard strips with 9 holes, 2 cubes. one cube marked with numbers 0-5 and another cube marked with numbers 0-4 plus an extra 0. 9 golf tees for each student (18 total) 	Student often uses manipulative aids or other aids. Mastery of addition facts with sums to nine implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+3?" or if shown $\boxed{\begin{matrix}6\\+3\end{matrix}}$ or $\boxed{6+3}$ in written form, the student responds instantly from memory. Check one student at a time.	D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 91-93
Procedure: . Teacher directs as follows: (a) First player rolls the dice. (b) Player adds the addends and says the equation aloud (e.g., "Zero plus five equals five."). (c) Player then puts a golf tee in the hole representing that sum (5). (d) The next player takes a turn, following the same procedure. (e) The first player to fill all 9 holes with golf tees wins the game. (f) When there are only 2 or 3 holes left to		District Resources

<u>Subject</u> indicates a broad course of study. The subject classifies the learning into one of the general areas of the curriculum, i.e., reading, hematics, social studies.

<u>Specific Area</u> indicates a particular learning category contained within the subject. Within the subject of reading there exist several specific areas, i.c., comprehension, study skills, word attack skills.

<u>State Goal</u> indicates a broad term policy statement relating to the education of all students within the State of Washington. In 1972, the State Board of Education adopted 10 State Goals for the Washington Common Schools.

<u>District Goal</u> generally reflects the expectations of the community regarding the kinds of learning that should result from school experience. These goals are employed mainly to inform the citizenry of the broad aims of the school. When district goals are correlated to student learning objectives, community members are able to see how their expectations for schools are translated daily into the teaching/learning process of the classroom.

<u>Program Goals</u> are K-12 goals which do not specify grade placement. These goals provide the basis for generating subgoals or objectives for courses or units of study within a subject area. Program goals are used as a basis for defining the outcomes of an entire area of instruction such as mathematics, language arts or social studies.

<u>Student Learning Objectives</u>

Three major types of learning objectives which have been identified are knowledge, process and value objectives.

> <u>Knowledge Student Learning Objectives</u> identify something that is to be known and begins with the words, "The student knows...". Knowledge objectives specify the knowledge a student is expected to learn. These objectives include categories of learning such as specific facts, principles and laws, simple generalizations, similarities and differences, etc.
>
> An example of a Knowledge Student Learning Objective is: "The student knows guide words in a dictionary indicate the first and last words on the page."
>
> <u>Process Student Learning Objectives</u> identify something the student is able to do, and begins with the words, "The student is able to...". These objectives are associated with the rational thinking processes of communication, inquiry, problem solving, production, service and human relationships.
>
> An example of a Process Student Learning Objective is: "The student is able to associate a consonant sound with the letter name."

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<u>Value Student Learning Objectives</u> identify only the type of
values which foster the context of the discipline. These
objectives are thought to be most uniformly and consistently
approved by society as supporting the major aims of the disci-
pline.

An example of a Value Student Learning Objective is: The
student values the role of plants in his/her daily life."

<u>Suggested Learning Activities</u> describe the behavior of both the teacher
and students. The instructional strategies employed by the teacher. as
well as the activities undertaken by the students, are included in this
section. Each activity includes materials, group size and procedures.

<u>Suggested Monitoring Procedures</u> indicate informal methods for determining
the progress a student is making towards the attainment of the objective.
These methods include techniques such as teacher observation, student
interest and attitude surveys and recording results of classroom instruc-
tion.

<u>Possible Learning Resources</u> indicate materials, teacher-made or commer-
cially produced, which are needed by both the teacher and students in
order to accomplish the learning activities.

GOALS FOR THE WASHINGTON COMMON SCHOOLS

1. As a result of the process of education, all students should have the basic skills and knowledge necessary to seek information, to present ideas, to listen to and interact with others, and to use judgment and imagination in perceiving and resolving problems.

2. As a result of the process of education, all students should understand the elements of their physical and emotional well-being.

3. As a result of the process of education, all students should know the basic principles of the American democratic heritage.

4. As a result of the process of education, all students should appreciate the wonders of the natural world, human achievements and failures, dreams and capabilities.

5. As a result of the process of education, all students should clarify their basic values and develop a commitment to act upon these values within the framework of their rights and responsibilities as participants in the democratic process.

6. As a result of the process of education, all students should interact with people of different cultures, races, generations, and life styles with significant rapport.

7. As a result of the process of education, all students should participate in social, political, economic, and family activities with the confidence that their actions make a difference.

8. As a result of the process of education, all students should be prepared for their next career steps.

9. As a result of the process of education, all students should use leisure time in positive and satisfying ways.

10. As a result of the process of education, all students should be committed to life-long learning and personal growth.

MATHEMATICS PROGRAM GOALS
(K-12)

1. The student values the study of mathematics for its usefulness and application to everyday life.

2. The student develops the ability to communicate with precision and confidence using the vocabulary and symbols unique to mathematics.

3. The student develops the concept of number and numeration including counting, place value, reading and writing numbers, various numbering systems, number theory and scientific notation.

4. The student develops general mathematical concepts of time-space relationships; equality-inequality; measurement; function; graphs, charts and tables; probability and statistics; and geometry.

5. The student develops accuracy in using the computational skills of adding, subtracting, multiplying and dividing.

6. The student develops the ability to use problem-solving techniques.

7. The student develops the knowledge and use of the structure of mathematical systems and real numbers.

8. The student knows and is able to use the symbols, elements, operations and structure of the following number systems: whole numbers, integers, rational numbers, real numbers and complex numbers.

MATHEMATICS
SCOPE (K-8)

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the original document was blank

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SMALL SCHOOLS PROJECT

SUBJECT: ___Mathematics___

SPECIFIC AREA: ___Whole Numbers: Counting (Serial, Objects), Order___

		Suggested Grade Placement					District Placement
Page		K	1	2	3	4	

The student knows:

The student is able to:

	Page	Grade
. count to 10.	3-	K
. count to 100.	7	1-2
*. count objects to 10.	9-	K
*. count objects to 50.	11-	1
. count objects by 2's to 100.	15-	1-2
. count objects by 5's to 100.	19-	1-2
*. count objects by 10's to 100.	23-	1-2
. identify the position of objects first through tenth.	25-	K-1
. name the number before, after or between any number to 10.	29	K-1
*. name the number before, after or between any number to 100.	31-	1-2
. name the number before, after or between any number to 1,000.	35-	2-3

The student values:

ERIC

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

SMALL SCHOOLS PROJECT

Suggested Objective Placement ___K___

Student Learning Objective(s) _The student is able to count to 10._

	State Goal	1,7,8
	District Goal	
	Program Goal	
		1,2,5

Related Area(s) _____

Suggested Activities: Grade(s) ___K___	Suggested Monitoring Procedures	Possible Resources
Title: I Spy **Group Size:** small group **Materials:** any small object Procedure: . Teacher selects a student to be "it" (or other students may select a classmate). . Selected student hides an object while the rest of the students close their eyes and count to 10. . Students then open their eyes and search for the hidden object. . The player who finds the object becomes the one who hides the object next.	**Mini-Test:** "Counting to 10" **Group Size:** one student **Procedure:** . Teacher asks student to count from 1 to 10.	Baratta-Lorton, Mary, _Mathematics Their Way_, Addison-Wesley, 1976, pp. 98-99, 112-113
Title: Circle Counting **Group Size:** groups of 10 or less **Materials:** none Procedure: . Ten or less students stand in each circle. . One student is assigned to be the counting starter. . The starter tells the groups to "begin counting". Each student counts in order and the one who says the last number in the circle sits on the floor. The next student begins once more; the last sits down. . Activity continues until one student remains standing.		District Resources

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Bounce Counting Group Size: whole class or small group Materials: ball Procedure: . One student bounces a ball while the students count: "one, two. . . ten."		Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 96-97
Title: The Striking Clock Group Size: entire class Materials: a rhythm instrument, triangle and striker or a bell . Procedure: . Students stand in a circle with feet spread and rock from side to side as they say the poem below. Poem: "We are swinging pendulums Hanging from a clock. As we count the hours struck, We rock and tick and tock." . One student stands in the center of the circle with a triangle to strike the hour when the poem has been said. . The students count as each hour is struck.		Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 197 6, pp. 96-97
		District Resources

Suggested Objective Placement ___K___

Student Learning Objective(s) __The student is able to count to 10.__

	State Goal	1,7,8
	District Goal	
	Program Goal	1,2,5

Related Area(s)_____

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Poems and Fingerplays Group Size: entire class Materials: poems Procedure: . Teacher reads poem and demonstrates action. Students then recite and follow the action as indicated. TEN FINGERS I have ten little fingers And they all belong to me. I can make them do things. Would you like to see? I can shut them up tight Or open them wide. I can put them together Or make them all hide. I can make them jump high, I can make them jump low, I can fold them quietly And hold them just so.		Sharp, F. A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 13-14 Grayson, Marion F., Let's Do Finger Plays, Luce, 1962 Ginsberg, Herbert, Children's Arithmetic: The Learning Process, D. Van Nostrand Co., 1977, chapter 1 D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 64
		District Resources

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources

FIVE LITTLE FROGGIES
 	
Five little froggies sat on the shore,
  (open hand; extend fingers. Push down one
  finger as each frog leaves.)
One went for a swim and then there were four.
 	
Four little froggies looked out to sea,
One went swimming, and then there were three.
Three little froggies said, "What can we do?"
One jumped in the water and then there were two.
Two little froggies sat in the sun,
One swam off and then there was one.
One lonely froggie said, "This is no fun."
He dived into the water and then there was none.
 	
GRASSHOPPERS
 	
Ten little grasshoppers sitting on a vine;
  (hold up ten fingers; fold one down at each count.)
One ate too much corn, and then there were nine.
Nine little grasshoppers swinging on a gate;
One fell off, then there were eight.
Eight little grasshoppers started off to Devon;
One lost his way, then there were seven.
Seven little grasshoppers lived between two bricks;
Along came a windstorm, then there were six.
Six little grasshoppers found a beehive;
One found a bumblebee, then there were five.
Five little grasshoppers playing on the floor;
Pussycat passed that way, then there were four.
Four little grasshoppers playing near a tree;
One chased a buzzy fly, then there were three.
Three little grasshoppers looked for pastures new;
A turkey gobbler saw them, then there were two.
Two little grasshoppers sitting in the sun;
A little boy went fishing, then there was one.
One little grasshopper left all alone;
H to find his brothers, then there was none.
		District Resources

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Student Learning Objective(s) _The student is able to count to 100._____ State Goal

_____ District Goal

_____ Program Goal

State Goal	1,7,8
District Goal	
Program Goal	1,2,5

Related Area(s)_____/_____

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: Counting Game **Group Size:** entire class **Materials:** none needed Procedure: . Teacher calls on someone to begin counting to 100. After a short time, the teacher says "stop" and calls on another student to continue where the first student left off. . Teacher continues this process with students until 100 is reached. **Title:** Student Counting **Group Size:** whole class **Materials:** none Procedure: . Designate one student as the counting starter. . Agree on the order in which the students are to "count off", . Starter begins with "one". . Other students count in turn and in sequence. . As soon as the last student "counts off", the counting starter picks up the counting sequence and the students continue to count. . The student who counts off "100" stands and becomes the new counting starter. **Variation:** . Student could count backwards from 100 to 1.	**Mini-Test:** "Counting to 100" **Group Size:** one student **Procedure:** . Ask student to count from 1 to 100.	Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, pp. 126-127 D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 70-72 _Computation and Structure_, The Nuffield Corporation, 1967, pp. 42-43 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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Suggested Objective Placement ___K___

Student Learning Objective(s) __The student is able to count objects to 10.__

State Goal	1,7,8
District Goal	
Program Goal	1,2,5

Related Area(s) _____

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Hangers and Clothespins **Group Size:** individual **Materials:** 10 hangers and 55 clothespins, 3"x5" tagboard strips with numerals written 1-10 Procedure: . Teacher fastens tagboard cards on hangers. Teacher directs student to put the appropriate number of clothespins on the hangers. **Title:** Pincushions **Group Size:** individual **Materials:** 3" squares of cardboard, pincushions cut from foam rubber, glue, 55 large-headed pins, container for pins Procedure: . Teacher marks tagboard strips with numerals and corresponding dots from 1-10. Teacher glues pincushions on tagboard strips. . Student then puts the appropriate number of pins into cushions. Example: 	**Mini-Test:** "Counting Objects to 10" **Group Size:** one student **Materials:** small box 10 counters Procedure: . Ask the student to count the counters and to place each counter in the box as it is counted.	Baratta-Lorton, Mary, Workjobs, Addison-Wesley Pub. Co., 1972, pp. 156-157 and pp. 130-131 Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 117-119 D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, 1973, pp. 61-65 Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 521-522
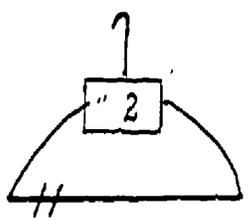
Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Counter Toss Group Size: small group Materials: bags containing sets of counters from 1-10 Procedure: • Each student selects a bag and records estimate of number of counters in the bag. • When all have recorded their estimates, the bags are spilled on a rug or table. • In turn, the students touch each counter as they count aloud. • When all have counted in turn, the student(s) who estimated the counters correctly stand.		Baratta-Lorton, Mary, <u>Mathematics Their Way</u>, Addison-Wesley, 1976, p. 102 <u>Mathematics for Elementary School Teachers</u>, National Council of Mathematics, 1966, pp. 11-14
		District Resources

3 1   35

Student Learning Objective(s) __The student is able to count objects to 50.__

State Goal	1,7
District Goal	
Program Goal	1,2,5

Related Area(s)_____

Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Collage **Group Size:** small group **Materials:** colored scraps of paper, sheet of paper 12"x18", glue **Procedure:** . Teacher directs students to make a collage of the fifty scraps of colored paper (by gluing the scraps to the large sheet). **Title:** Collecting Stuff **Group Size:** entire class **Materials:** large container, rocks, leaves, twigs, pine cones, etc. **Procedure:** . Teacher takes class to a park or the school yard. Students collect various objects and place them in the container. . When sufficient objects have been collected, students, one at a time, remove an object from the container and count it. Continue the process until the students reach 50. **Variation:** . Discuss groupings of objects. How many rocks, leaves, etc.? Group 5 types of objects to make 50.	**Mini-Test** "Counting Objects to 50" **Group Size:** one student **Materials:** small box 50 counters **Procedure:** . Ask the student to count the counters and to place each counter in the box as it is counted.	Step Math Board (with counting strips) District Resources

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources

Title: Count to 50
Group Size: small group
Materials: blocks, cubes, tongue depressors
 	
Procedure:
  . Each student is given cubes, blocks, etc. to count to see how many are in a group of a hundred.
  . If the students come up with 50 each, they exchange with a classmate to check the figure.
 	
Title: Count The Squares
Group Size: individual or small group
Materials: 1/2" graph paper
 	
Procedure:
  . Students are directed to county 50 squares and to draw a line around the area enclosing the 50 squares.
Variation:
  . Students may color or mark each square as they count.
 	
Title: My Count
Group Size: pairs
Materials: small box, 50 counters
 	
Procedure:
  . Student counts as counters are placed one at a time in a box.
  . Student records the number of counters that were counted.
  . The other student takes the counters out of the box one at a time counting aloud.
  . The final "out loud count" is compared with the recorded count.
		Baratta-Lorton, Mary, Workjobs, Addison-Wesley, 1972, pp. 142-143

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Suggested Objective Placement   1

Student Learning Objective(s) The student is able to count objects to 50.

State Goal	1,7
District Goal	
Program Goal	1,2,5

Related Area(s)

Suggested Activities: Grade(s) 1	Suggested Monitoring Procedures	Possible Resources
Title: Count Me Out **Group Size:** partners **Materials:** 50 counters Procedure: . One student is the "caller". This student selects and says any number from 1 to 50, for example, thirty-seven. . The other student counts out loud as each counter is separated from the set of 50 until thirty-seven counters are removed from the original set.		Oberlin, Lynn, Let's Play Games in Mathematics, Volume One, National Textbook Co., 1970, pp. 23-24
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement ___1-2___

Student Learning Objective(s) __The student is able to count by 2's to 100.__

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)_____

Suggested Activities: Grade(s) _1-2_	Suggested Monitoring Procedures	Possible Resources
Title: Counting by Two's **Group Size:** individual **Materials:** large quantity of counters (beans, buttons, beads, styrofoam packing pellets, etc.), recording paper Procedure: . Each student places a pile of counters on one side of his/her desk top. . The student removes two counters at a time from the pile saying, "2, 4, 6", etc., writing these numbers on recording paper as he/she counts. **Title:** Counting Chains **Group Size:** individual or partners **Materials:** light gauge wire in 5 ft. lengths, buttons or styrofoam pellets Procedure: . Working alone or in pairs, students thread a piece of wire with 100 counters (wire can be stuck through styrofoam like a needle). There will be some extra length of wire left. . Partner slides counters, two at a time, to the end, counting by 2's to 20. Then the other partner continues the process from 20 through 40. Repeat the procedure from 42 to 60 and on up by 2's to 100.	**Mini-Test:** "Counting by 2's" **Group Size:** one student **Procedure:** . Teacher asks student to count by 2's to 100.	May, Lola J., _Mathematics in Elementary School_, New York: The Free Press, (Macmillan Co.), 1970, pp. 27-29 Marks, John L., _Teaching Elementary School Mathematics for Understanding_, McGraw-Hill Book Co., 1970, pp. 83-84 Thyer, Dennis, _Teaching Mathematics to Young Children_, Holt, Rinehart and Winston, 1971, p. 52 **District Resources**

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources

Title: Counting Board

Group Size: individual or partners

Materials: teacher-made counting board with rows of nails or pegboard hooks to hold number tags 1 to 100—odd numbers in red, even numbers yellow, and a second set in blue tags for numbers which are multiples of 5 (for counting by 5's, 10's); use paper punch to make a hole in each tag for hanging on board (see illustration)

Procedure:

. Student places all numbers on board in order. Student reads the yellow number tags in order across the board. (If desired, student may remove the red tags.) Point out to student that the yellow number tags form vertical rows on the board. Ask: "Which numbers are common in these rows?" (Answer: 2, 4, 6, 8, 0.)
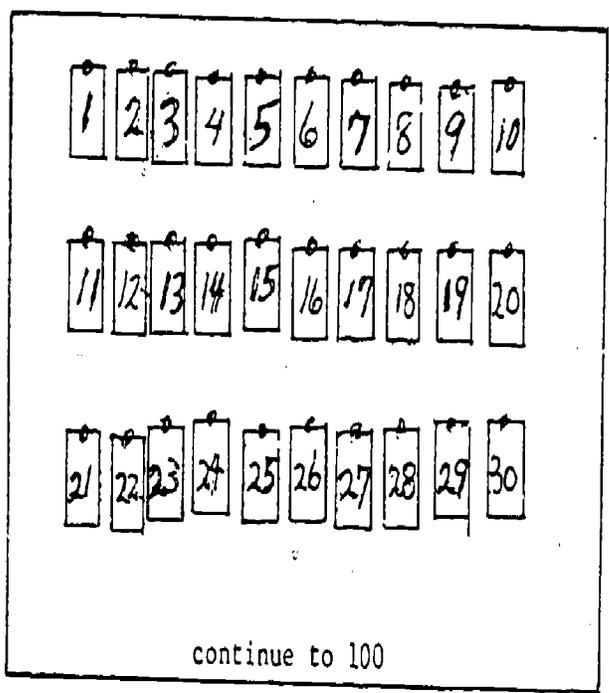
continue to 100

District Resources

Suggested Objective Placement __1-2__

Student Learning Objective(s) __The student is able to count by 2's to 100.__

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s) _____

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources

Suggested Activities:

Title: Swish
Group Size: small group
Materials: none

Procedure:
- The group will count out loud but instead of saying "two" or any multiple of two, the word "swish" will be substituted.
- Every time a mistake is made, that is, instead of "swish" a multiple of two such as "four" or "eight" is said, the group must begin again.
- Repeat until the group reaches 100.
- Compare the group's time with that of another group.

Title: Counting by Two's
Group Size: entire class
Materials: worksheet with puzzle

Procedure:
- Students decide what part of the puzzle is missing and fill in the correct number.

2			8
	6		
6			12
8	10		
10	12		16

Possible Resources:

Henderson, George, Let's Play Games in Mathematics: Volume 2, National Textbook Co., 1970, p. 21

Computation and Structure, The Nuffield Foundation, 1967, pp. 43-44

District Resources

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources

Title: Counting by Two's
Group Size: partners
Materials: teacher-made card marked with
             even numbers 0-38,   etc,
                          2   4
             30 counters, 2 game cards (3"x5"
             matrix with arrangements of multiples
             of 2 from 2 through 40--vary the
             arrangements on the two cards.

Sample of one game card:

4	10	8	20	12
2	26	4	30	24
22	16	40	36	6

District Resources

Procedure:
. Teacher designates student (or partners select one)
  to shuffle numeral cards.
. Students place the cards face down between them.
. Students take turns turning over the top card one
  card at a time.
. Students place a counter on a numeral that means 2
  more than the numeral on the card just turned over.
. The first player to cover all the numerals in a row
  or column wins.
Extension:
. Count student's shoes, eyes, ears by one's, with
  emphasis on the idea there are pairs of each.
  sets of two's by one's, emphasizing the even
  (e.g., one, two, three, four, etc.).

Student Learning Objective(s) __The student is able to count by 5's to 100.__

Related Area(s) _____

State Goal	1
District Goal	
Program Goal	1,3,5

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Title: Five Fingers **Group Size:** small group or entire class **Materials:** chalkboard and chalk Procedure: . Students, one at a time, trace their hand on the chalkboard and write in the number on each hand. . Students then write the number 5 times more than the preceding hand. This procedure should continue until the students reach 100. **Title:** Counting by 5's on the Number Line **Group Size:** small group/entire class **Materials:** chalk and chalkboard Procedure: . Draw a large number line across the chalkboard (0-100) . Have group count by 5's and have one student circle each multiple of 5's.	Students record the sets by five. Teacher listens to the students taking turns counting the hands by five, or the counters by fives, orally. **Mini-Test:** "Counting by 5's" **Group Size:** one student **Procedure:** . Ask the student to count by 5's to 100.	May, Lola, J., <u>Teaching Mathematic</u> <u>in the Elementary School</u>, New York The Free Press, (Macmillan Co.), 1970, pp. 27-29 Marks, John L., <u>Teaching Elementar</u> <u>School Mathematics for Understand-</u> <u>ing</u>, McGraw-Hill, 1965, pp. 132-13 Henderson, George, <u>Let's Play</u> <u>Games in Mathematics: Vol. 2,</u> National Textbook Co., 1970, pp. 31-32 Bead Frame

	Suggested Monitoring Procedures	Possible Resources

Title Counting by 5's
Group Size: pairs
Materials: numeral cards from 5 to 70 in multiples of 5, 18 counters, 2 game cards--teacher makes two different game cards; in a 3"x3" matrix write different arrangements of multiples of 5 from 5 through 70.

Sample of one game card:

10	75	15
30	55	20
25	40	35

Procedure:
. Teacher gives the following directions to students:
  (a) Shuffle the numeral cards.
  (b) Place the cards face down between the two students.
  (c) Take turns turning over the top card.
  (d) Place a block on the numeral that means 5 more than the numeral on the card turned over.
  (e) The first to cover all the numerals in a column or row wins.

Pagne, Joseph N., _Mathematics Learning in Early Childhood_, National Council of Teachers of Mathematics, 1976, p. 174

District Resources

Student Learning Objective(s) <u>The student is able to count by 5's to 100.</u>

State Goal | 1

District Goal |

Program Goal | 1,3,5

Related Area(s) _____

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources

Title: Solve The Puzzle
Group Size: entire class
Materials: worksheet of puzzle

Procedure:
. Students decide what parts of the puzzle are missing and fill in the correct number.

District Resources

5	10	15	20
10		20	
15	20		30
	25		35
25			40
30	35	40	
	40	45	

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) <u>The student is able to count by 10's to 100.</u>

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)_____

Suggested Activities: Crade(s 1-2	Suggested Monitoring Procedures	Possible Resources
Title: Groups of Ten **Group Size:** individual or small group **Materials:** counters, beads Procedure: . The student will group the counters into groups of ten and then count these by ten. **Title:** Graphs **Group Size:** entire class, small groups **Materials:** 1/2" graph paper Procedure: . Teacher directs student to cut graph paper into strips of ten and then count the strips by ten to 100.	**Mini-Test:** "Counting by 10's" **Group Size:** one student **Procedure:** . Ask the student to count by 10's to 100.	May, Lola J., <u>Teaching Mathematics in the Elementary School</u>, New York: The Free Press (Macmillan Co.), 1970, pp. 27-29 D'Augustine, Charles H., <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, pp. 69-72 Pagne, Joseph N. (editor), <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, pp. 141-142 Sharp, F.A., <u>These Kids Don't Count</u>, Academic Therapy Publications, 1971, pp. 57-59 Bead Frame Hundreds Chart
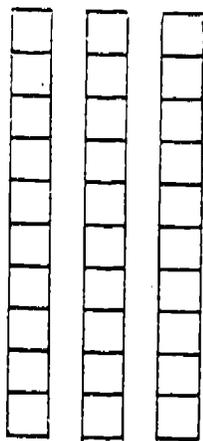
Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: Ten Strips **Group Size:** individual or small groups, entire class **Materials:** strips of colored paper or dittos cut into strips Procedure: . . Students will separate the paper strips into groups of ten. Students then count by ten's to see how many make 100. Variation: . Tongue depressors or bean sticks in bundles of ten may be used. **Title:** Counting by 10's on the Number Line **Group Size:** small group/entire class **Materials:** chalk and chalkboard Procedure: . Draw a large number line across the chalkboard (0-100). . Have the group/class count by 10's and have one student circle each multiple of tens.		 Henderson, George, Let's Play Games in Mathematics: Vol. 2, National Textbook Co., 1970, pp. 31-32 District Resources

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Student Learning Objective(s) ___The student is able to identify the position of objects first___

___through tenth.___

	State Goal	1
	District Goal	
	Program Goal	1,3,5

Related Area(s)_____

Suggested Activities: Grade(s) ___K-1___	Suggested Monitoring Procedures	Possible Resources

Title: Train
Group Size: entire class divided into groups
               of 10
Materials: 10 chairs
 	
Procedure:
. Teacher places a row of 10 chairs in front of the group (train fashion).
. Students sit in the chairs.
. Teacher gives the following directions orally:
  (a) The first person in each train raise your hand, clap, stand up, etc.
  (b) The second person raise your hand, etc.
. Teacher continues to give directions until each member has participated.
. Change train positions until each student has been in each chair.
 	
Title: First Through Tenth
Group Size: class divided into groups of 5
Materials: none needed
 	
Procedure:
. Teacher lines up the class into groups of five.
. Teacher gives directions orally, such as:
  (a) The fifth person touch the floor.
  (b) The third person tap the second person on the shoulder.
. Teacher continues until each student has been given a direction.
	Mini-Test "Ordinals"
	Group Size: one student
	Materials: 10 counters
	Procedure:
	. Ask the student to place the 10 counters in a (horizontal) line in front of him/her.
	. Then ask:
	  . Show me the second counter, the fifth counter, etc., until all ordinals are tested.
		Moore, Dan, Explorations in Number Concepts, Denoyer-Gepper, 1972.
		
		Pagne, Joseph N., Mathematics Learning in Early Childhood, N.C.T.M., 1976, p. 135
		
		Skip, Donald E., Developing Arithmetic Concepts and Skills, Prentice Hall, Inc., 1964, p. 75
		
		Henderson, George L., Let's Play Games in Mathematics, National Textbook Co., 1970, pp. 10-11

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources

Title: Popsicle Sticks
Group Size: entire class
Materials: 10 popsicle sticks per student,
              beans (at least 10 per student),
              glue

Procedure:
. Teacher gives each student a set of popsicle sticks
  and at least 55 beans.
. Teacher suggests that the student make a set of
  bean sticks by gluing one to ten beans on each of
  the 10 sticks.
. When the glue is dry, the students play a game of
  ordering their bean sticks, placing them from
  first to last.
  Variation:
. Students may color the bean sticks different
  colors (for example, the first bean stick red).

Title: Moving Counters
Group Size: individual, small group
Materials: 10 counters per student

District Resources

Procedure:
. Give the following directions to students:
  (in reference to the initial position)
  (a) Place the counters in line from left to right.
  (b) Remove the third counter.
  (c) Place the second counter above the first
       counter.
  (d) Place the fourth counter below the fifth
       counter, etc.

Student Learning Objective(s) ___The student is able to identify the position of objects first___

___through tenth___

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s) _____

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
Title: Place Me In Order **Group Size:** small or large group **Materials:** 10 comic strip pictures, 10 cards with the ordinal numbers first through tenth Procedure: . Cut out and mount five frames of a comic strip on separate sheets of tagboard. . Place the comic strip frames in order from left to right. . Beneath each comic strip frame, place the ordinal word name. . Check your answer by turning over each picture and matching the ordinal names. **Title:** Ordinal Relay Race **Group Size:** small or large group **Materials:** chairs for each student Procedure: . Arrange students in two equal rows. Assign each student a name, indicating the position in the row (first, second, etc.--these can be written for the students to refer to). . Each student stands behind a chair. The teacher directs: "Third person put hands on head." The student who complies first and correctly sits down. . The teacher continues to give directions in this manner. The first row which is seated wins.		Nelson, Doyle, _Mathematical Experiences in Early Childhood_, Encyclopedia Britannnica, Inc., 1972, pp. 48-5⬤ Liedtke, Werner, _Mathematical Experiences, Primary Division_, Encyclopedia Britannica, 1974, pp. 28-30 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement   K-1

Student Learning Objective(s) <u>The student is able to name the number before, after or between any</u>

<u>number to 10.</u>

State Goal

District Goal

Program Goal

	1
	1,3,5

Related Area(s)_____

Suggested Activities: Grade(s) __K-1__

Suggested Monitoring Procedures	Possible Resources

Title: Covered Number Line
Group Size: small group
Materials: 10 9"x12" laminated numerals,
10 9"x12" laminated covers

Procedure:

. Teacher tapes laminated numerals in a number line. Tape covers on the number line to facilitate covering and exposing the numerals.

. Teacher uncovers any number and asks students what number comes before, what number follows.

. Uncover every other number and ask students what number comes between the two numerals.

Title: Long Doggie
Group Size: individual
Materials: 9"x12" tagboard dachshund, 9"x12" tagboard numerals, 0-10
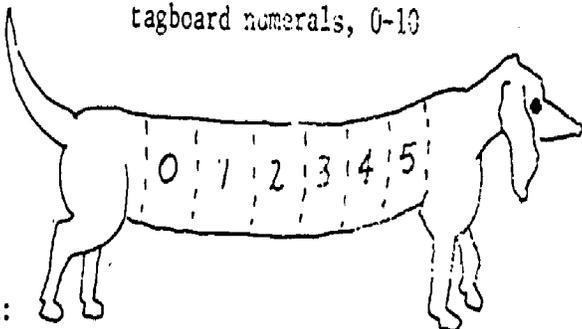
Procedure:

. Teacher places tagboard numerals in reverse order face down on a table.

. Teacher directs students to take the first number (0) and place it between the head and the tail.

. If the student can name the next numeral, he/she may place that number next to 0.

. process continues until the student has completed the game or said an incorrect number.

Mini-Test: "Before, After, Between"
Group Size: entire class
Materials: written exercise as below

Procedure:

. Ask students to complete the following:

Before	After	Between
___ 4	1 ___	5 ___ 7
___ 6	9 ___	8 ___ 10
___ 1	7 ___	3 ___ 5

Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart, Winston, 1973, p. 123

Kelley, Jeanne, <u>Learning Mathematics Through Activities</u>, James E. Freel * Associates, Inc., 1973, p. 24

Hundreds Board

District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __The student is able to name the number before, after or between any__   State Goal

__number to 100.__   District Goal

Program Goal

	1
1,3,5	

Related Area(s)_____

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: Counting Cards **Group Size:** small group **Materials:** cut tagboard or construction paper cards 2"x3", crayons or marking pens Procedure: . Teacher gives the following directions: Individual students write ten consecutive numerals on ten cards. Student A may write 1 through 10, student B from 11 to 20, student C from 21 to 30, and so on until there is a card for each numeral 1 through 100. . Shuffle cards and give each _pair_ of students about 20 cards. One student holds up a card and the partner must give either the number which would come before or after that numeral. (Keep the entire deck of cards for remedial drill.)	Teacher observes student's response to drill cards or verbal questions. See previous Mini-Test.	Pagne, Joseph N. (editor) Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 149 Hundreds Board Step-Counting Board District Resources

Suggested Monitoring Procedures	Possible Resources

Title: Counting Puzzle
Group Size: individual and partners
Materials: 10"x10" tagboard lined into 100
             squares

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Procedure:

. Teacher writes numeral 1 to 100 consecutively, 10
  numbers per row. Laminate or cover with clear
  contact paper. Cut out random squares from the
  puzzle. (Cut on marked lines to form puzzle
  pieces.)
. Have students assemble the puzzle by taking a
  number, naming the number which comes before and
  after.
. Students then place the number in the appropriate
  place in the puzzle.

District Resources

Student Learning Objective(s) ___The student is able to name the number before, after or between any___   State Goal | 1

number to 100. _____   District Goal |

_____   Program Goal |

Related Area(s)_____   1,3,5

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Bureau of Missing Numbers **Group Size:** small group **Materials:** none needed Procedure: . Teacher gives clues involving descriptions of numbers and students guess the answers. . Examples: "Attention all detectives! We have a missing number. He is even. He has an older sister who is four. Can you identify him?" (2) "Attention all detectives! A number is missing. I'. was last seen around the middle of the numeral line. It has five tens, it is odd and it is smaller than 53. What is it?" (51) "All cars be on the lookout for a missing number. It's hundred's place is an even number between 6 and 10. It's ten's place is 7. It's one's place is an odd number less than three. What is it?" (871)		Kennedy, Leonard M., <u>Models for Mathematics in the Elementary School</u>, Wadsworth Publishing Co., 1967, p. 38 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __The student is able to name the number before, after or between any__   State Goal

number to 1,000.   District Goal

Program Goal

Related Area(s) _____

	State Goal	1
District Goal	
Program Goal	1,3,5

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Bureau of Missing Numbers **Group Size:** small group **Materials:** none needed Procedure: . Teacher says to class: "Today you may be detectives and investigate some missing numbers. Listen carefully for their descriptions. If you think you know the answer, raise your hand." Examples: "Attention all detectives! We have a missing number. It is even. It comes between 5 and 10. Can you identify it?" (6 or 8) "Officer's attention! Pick up a blue car doing just over 90. How fast is it going?" (91) "Robbery at the bank! Attention all squads! The robber got just under $1,000. What did he/she get?" ($999)	Teacher observes student's responses or verbal questions. See previous Mini-Test.	 District Resources

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
 Title: Fishbowl Group Size: small groups Materials: tagboard cards (3"x5"), fishbowl Procedure: . Teacher directs students to make cards 3"x5". Put the numerals on it to 1,000. Place the cards in a fishbowl. . One student draws out a card and names the number that comes before or after it. . All the correct answers receive 1 point. The player with the most points after all the cards are drawn is the winner. Variation: . The student draws two cards and names any numeral that comes between. Give a point for a correct answer.		
		Possible Resources
		District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Equality and Inequality

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

	Page	Suggested Grade Placement
. the symbol "=" means "equal to".)	43–	1–3
. the symbol "＞" means "greater than".) one activity		1–3
. the symbol "＜" means "less than".)		1–3

The student is able to:

	Page	Suggested Grade Placement
. use one-to-one matching with sets of objects less than 10.	39–	K–1
. compare sets of objects for equality and inequality using the words: "more than", "less than", and "equal to".	41–	K–1
. compare the sets of objects by the use of symbols "＞", "＜", "=",	45	1
*. compare numbers to 100 by the use of symbols "＞", "＜", "=".	47–	1–2
. compare numbers to 999 by the use of symbols "＞", "＜", "=".	47–	
*. compare numerical expressions by the use of the symbols "＞", "＜", "=", i.e.,	5	

$$3 + 2 \quad \boxed{} \quad 4 + 1$$

$$10 + 4 \quad \boxed{} \quad 14 - 3$$

$$1 + 6 \quad \boxed{} \quad 10 - 1$$

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION

MUSIC

SOCIAL STUDIES

ART

LANGUAGE ARTS

MATH

SCIENCE

HEALTH

READING

CAREER EDUCATION

ENVIRONMENTAL EDUCATION

OTHER _____

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Student Learning Objective(s) __The student is able to use one-to-one matching with sets of objects__   State Goal | 1 |

__less than 10.__   District Goal

Program Goal | 3,4,5,7 |

Related Area(s) _____

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
Title: Mailing Time **Group Size:** one student **Materials:** 9 envelopes, 9 letters, 8 word stamps Procedure: . Have students match the letters to the envelopes. . Student determines if there are enough stamps for each envelope.	Paper and pencil test Teachers elicit verbal response Teacher observes daily activities in the classroom	Baratta-Lorton, Mary, Workjobs, Addison-Wesley Publishing Co., 1972 Kennedy, Leonard M., Models in the Elementary School, Belmont, California, Wadsworth Publishing Co., Inc., 1967. pp. 2-11
Title: Musical Chairs **Group Size:** small or large group **Materials:** matched number of chairs with students Procedure: . As music is played, students circle around the chairs. The teacher moves a chair, stops the music and a student who fails to find a chair is eliminated. Repeat.	Mini-Test "Matching Objects" Group Size: one student Materials: 6 counters Procedure: . Teacher forms 2 sets of counters, a set of 3 and a set of 3 counters. . Teacher asks student to match the 2 sets	Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel & Associates, Inc., 1973, pp. 18-19 Liedtke, Werner, Mathematical Experience, Primary Division, Encyclopedia Britannia Publications, Ltd., 1974, pp. 12-14 Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 131-133
Title: Dot Cards **Group Size:** one student **Materials:** index cards Procedure: . Place the cards dot side down. Student picks a card. He/she must match the dots one-to-one with a set of objects. Students may select any set of objects. Students may continue the game until the [cards] have been matched correctly		

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
Title: Matching Jars and Lids **Group Size:** one **Materials:** set of jars (varying in style) set of lids (varying in style) Procedure: . Have students match lids to jar by screwing lids on jars. **Title:** Color Match **Group Size:** one **Materials:** 5 tongue depressors, 5 crayons of different colors Procedure: . Teacher colors each tongue depressor with a different color crayon. . Match each colored tongue depressor to a crayon of the same color. **Title:** Number Cans **Group Size:** individual **Materials:** 9 orange juice cans covered with contact paper, round adhesive labels, tongue depressors (may be spray painted to resist soil) Procedure: . Teacher puts dots on can - each can having a different number of dots from 1-9. . Student places tongue depressors into the can as indicated by the dot on outside of can.		Ginsberg, Herbert, <u>Children's Arithmetic: The Learning Process</u>, D. Van Nostrand Co., 1977, chapter 2 Bean Sticks Step Board Magnetic One-More-Than Strips Set Cards Ice Cream Cones Art-Foam Sets Number and Numeral Puzzle District Resources

Suggested Objective Placement K-1

Student Learning Objective(s) <u>The student is able to compare sets of objects for equality and inequality using the words "more than", "less than" and "equal to".</u>

State Goal	1
District Goal	
Program Goal	3,4,5,7

Related Area(s)_____

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
Title: Sets **Group Size:** small or large group **Materials:** paper, crayons Procedure: . Each student draws a set on a piece of paper using no more than nine members to the set. . Select a student to come to the front of the group and show his/her set to the class. Ask the student who have a set with more members, fewer members or the same number of members to show their sets. **Title:** Dots **Group Size:** small group **Materials:** 12 3"x5" index cards on which are drawn sets of dots (1 to 5) Procedure: . Place the index cards face down in the rows of 4 each. A student turns over one card and then a second. If the second card has fewer dots than the first, the student keeps the pair. . If the second card has more dots or the same number of dots, both cards are turned face down, and the other player gets a turn. <u>Variation:</u> . If the second card has more dots the student keeps the pair. If the cards have an equal number of dots, the cards are turned down.	**Mini-Test:** "Comparing Sets" **Group Size:** one student **Materials:** 7 counters <u>Procedure:</u> . Teacher forms 2 sets, one with 4 counters, the other with 3 counters. . Student compares the 2 sets using any method and determines which set contains "more than" or "less than" the other. . Then ask the student what must be done to make one set "equal to" the other.	May, Lola J., Teaching <u>Mathematics</u> in <u>the Elementary</u> School, New York: The Free Press (Macmillan Co.), 1970, pp. 23-25 D'Augustine, Charles H., <u>Multiple Methods</u> of <u>Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, pp. 59-61 Schminke, C. W., <u>Teaching the Child Mathematics</u>, The Dryden Press, Inc., 1973, pp. 100-105 Ginsburg, Herbert, <u>Children's Arithmetic</u>, <u>The Learning Process</u>, D. Van Nostrand Co., 1977, chapter 2 Bean Sticks
		District Resources

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources

Title: Fall Walk
Group Size: small or large group
Materials: park or school yard with leaves,
             twigs, rocks, pine cones

Procedure:

. Take the students on a visit to a park or the
  school yard during the fall.

. Teacher gives directions using objects from the
  environment.

  Example
. "Find 6 rocks and 5 leaves. Which set has more?
    Which set has less?"
  "Find a set of rocks that is less than 5."
  "Find a set of leaves that is more than 3."
  "Find a set of twigs less than 7."
  "Now find a partner who has 1 less than you."
  "Find a partner who has 1 more than you."

  Can also do two more or two less:
  "Find 3 leaves. Arrange them so that the middle
   leaf is greater than the one on the left and
   less than the one on the right."

Note: Be sure students return the objects to where
       they found them and discuss why.

District Resources

Student Learning Objective(s) **A.** The student knows the symbol "=" means "equal to". **B.** The student State Goal
knows the symbol "＞" means "greater than". **C.** The student knows the symbol "＜" means "less than". District Goal

Program Goal

State Goal	1
District Goal	
Program Goal	3,4,5,7

Related Area(s) _____

Suggested Activities: Grade(s) _1-3_

	Suggested Monitoring Procedures	Possible Resources

Title: Equalities and Inequalities
Group Size: partners
Materials: 2 sets of cards (symbol and word cards)

=		equal		>		greater than

<		less than	12 cards in each set.

Procedure:

- One player lays down one card at a time.
- The partner must match each card, e.g.

<		<	or	<		less than

- If the match of cards is correct the player keeps both cards.
- If the cards do not match, the cards are placed in a discard pile.
- After all cards are played, record the number of cards that were kept.
- Reverse roles.
- The winner is the player who took the most cards.

Possible Resources

Henderson, George L., _Let's Play Games in Mathematics_, National Textbook Co., 1970, p. 34

District Resources

Suggested Activities: Grade(s) _1-3_	Suggested Monitoring Procedures	Possible Resources

<u>Title:</u> Symbol Cards ☐1☐ ☐2☐ ☐3☐ etc.
<u>Group Size:</u> three students
<u>Materials:</u> two sets of numeral cards (1-9);
cards about the size of regular
playing cards; three symbol cards
marked "<", ">" and "=" e.g.,

☐<☐ ☐>☐ ☐=☐

Procedure:
- One player takes the symbol cards, sits between
  the other two players, and turns the symbol cards
  face up.
- The other two players each take a set of numeral
  cards (1-9), shuffle them and place them face
  down in front of each other.
- The player to the left of the player having the
  symbol cards takes one numeral card and turns it
  face up.
- The player to the right of the player having the
  symbol cards takes a numeral card off the top of
  the deck and turns it face up.
- The third player places the correct symbol card
  (>, <, or =) between the two numeral cards. If
  the correct symbol card is played, the player who
  played the correct symbol card keeps both numeral
  cards and takes back the symbol card that was
  played.
- If the wrong symbol card is played, the two numeral
  cards are placed in a discard pile.
- After all the numeral cards have been played, the
  player with the symbol cards counts and records
  the number of numeral cards he/she has.
- Players exchange positions until all three have a
  turn playing the symbol cards.
- The winner is the player who took the most numeral
  cards.

Possible Resources:
Henderson, George L., <u>Let's Play</u>
<u>Games</u> <u>in</u> Mathematics, <u>Vol.</u> <u>3</u>,
National Textbook Cc., 1970, p. 14

District Resources

102

Student Learning Objective(s) __The student is able to compare the sets of objects by the use of__

__symbols ">", "<" and "=".__

State Goal		1
District Goal		
Program Goal		5

Related Area(s) _____

Suggested Activities: Grade(s) __1-2__

Suggested Monitoring Procedures	Possible Resources

Suggested Activities:

Title: Greater Than, Less Than Wheel
Group Size: individual, partners or group
Materials: 5"x7" cards of railroad board, one for each student

Procedure:

. Using a brad attach a 3" circle in the center of the rectangle, allowing the circle to rotate. Cut parallel slits in each side of the circle.
. On the circle mark symbols for "less than" and "greater than" and "equal".
. Use strips of paper or vinyl to slide through the slits showing numbers 0 to 9. (Ends of strips can be glued together to form loops so they won't slip out.) Students can help making these cards.
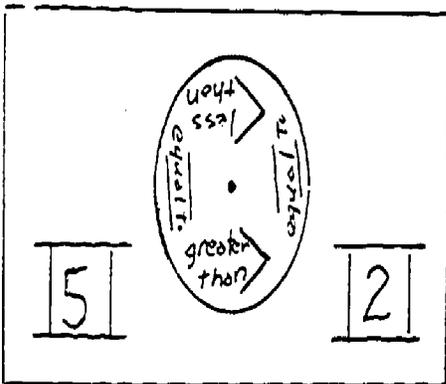
. Partners use card, moving number strips and adjusting symbol wheel to make a true statement. Partners check each other. Or, one student can move both number strips and the partner can adjust the symbol wheel to make a true statement.

Suggested Monitoring Procedures:

Mini-Test: "Symbols"
Group Size: small group
Materials: set of 3 symbol cards for each student ☐< ☐> ☐ and counters

Procedure:

. Ask the students to form a set of four counters on their left and a set of five on their right.
. Place the correct symbol card ☐> between the two sets of objects.
. Ask the students to form a set of two counters on their left and a set of five counters on their right.
. Place the correct symbol card ☐< in position.
. Form equivalent sets so that ☐= card is used.

Possible Resources:

D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, 1973, pp. 68-69

District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

1_5

1_6

Student Learning Objective(s) __A. The student is able to compare numbers to 100 by the use of__   State Goal

__symbols "<", ">", and "=".__   __B. The student can compare the numbers to 999 by the use of symbols__   District Goal

__"<", ">", "=".__

Program Goal

Related Area(s) _____

State Goal	1
District Goal	
Program Goal	3,6

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures	Possible Resources

Title: Greater Than Or Less Than Cards
Group Size: small group
Materials: cards or slips of paper with numbers from 1-100 (for each student)

Procedure:
- (Note: Students should have prior knowledge of meaning of "<", ">", and "="; should be able to count to 100 and to 999.
- Student shuffle slips of paper or cards and place them face down.
- Each player then draws the top slip of card. The player having the greater number says: "My _____ is greater than your _____, so I win."
The winner keeps the cards face up in another pile.
  Variation:
- Use numbers from 100-200, 1-999, etc.

Title: Who Is Greater Or Less Than?
Group Size: entire class divided into two teams
Materials: 2 sets of large cards with the number you are working with, 2 sets of large cards with "<" and ">" drawn on them.

Procedure:
- Teacher gives each team a set of numeral cards and a "<" and a ">" sign.
- Teams stand on opposite sides of the room.
- Teacher calls out two numbers, e.g., 50 and 3.

Suggested Monitoring Procedures

Mini-Test: "Comparing Numbers"
Group Size: entire class
Materials: written exercise as below.

Procedure:
- Ask the students to compare: Use =, >, <.

3	____	7
45	____	46
19	____	19
248	____	127

Possible Resources

D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 68-69

Step Counting Board

District Resources

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources

. The first two students on each team find the
numbers. The third student picks out the correct
sign. The students then go to the front of the
room and position themselves correctly:
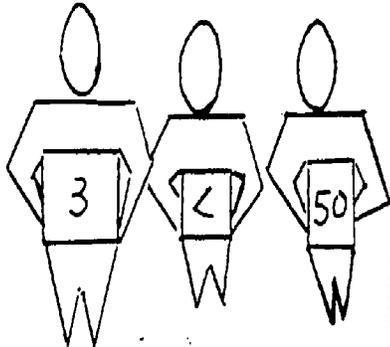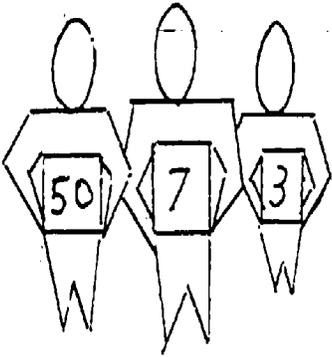
. Award a point to the first team whose three members
have positioned themselves correctly. The students
with the highest number possible get a point. Con-
tinue playing for a predetermined number of turns.
Example: spin numbers 3, 7, 5. Possible combina-
tions would be 753 (the largest) or 573, 375, 735,
etc.

Variation:

. Smallest number gets winning point. Add two sets
of 3-place numbers to get the largest or smallest
answer.

District Resources

Student Learning Objective(s) <u>A. The student is able to compare numbers to 100 by the use of</u> . State Goal

<u>symbols "K", "7" and "=". B. The student can compare the numbers to 999 by the use of symbols</u> . District Goal

<u>K", ">", "=".</u>

Program Goal

1

Related Area(s) _____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Spatt Card Game **Group Size:** small groups, pairs **Materials:** spinner card (dice could be used) record sheet (ditto or student-made) with columns marked H (hundreds), T (tens) and 0 (ones) 		
Procedure:		·District Resources
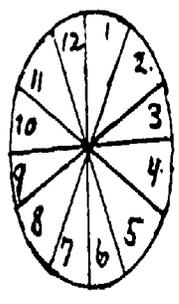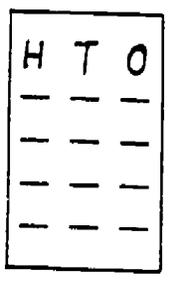
. Teacher gives each student a record sheet and a
   pencil.
. One player spins the spinner. All the players
   write the numbers on their record sheets in any
   column they want (hundreds, tens, ones).
.. The leader spins the spinner two more times. After
   each spin, the students fill in another place value
   blank.
. The object is to make the largest possible number,
   but chance may overrule logic.		

111   113

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District R·sources
1̲1̲3̲		1̲1̲4̲

Suggested Objective Placement

Student Learning Objective(s) <u>The student is able to compare numerical expressions by the use of the</u> State Goal

<u>symbols ">", "<", and "=", i.e., 3 + 2 $\boxed{\cdot}$ 4 + 1</u> District Goal

10 + 4 $\boxed{>}$ 14 - 3 Program Goal

Related Area(s) 1 + 6 $\boxed{<}$ 10 - 1

State Goal	1
District Goal	
Program Goal	

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Paper Clip Chains **Group Size:** one student **Materials:** 33 paper clips Procedure: . Make chains of 3, 8 and 10 paper clips. . Put two chains together to show 3 + 8. . Compare the 3 + 8 chain with the 10 chain. . Use $<$, $=$, or $>$ to complete this sentence: 3 + 8 ___ 10 . Make chains for the numbers in each of the following sentences. Use them to help you complete each sentence. 9 + 4 ___ 13 3 + 6 ___ 11 - 3 8 + 8 ___ 17 - 2	**Mini-Test** "Number Phrases" **Group Size:** entire class **Materials:** written exercise, as below Procedure: . Teacher asks student to compare: Use $=, <, >$. 2 + 3 $\boxed{\vdots}$ 3 + 2 4 + 5 $\boxed{}$ 6 + 2 2 + 7 $\boxed{}$ 5 + 5	Lovell, Kenneth, <u>The Growth of Understanding in Mathematics</u>, Holt, Rinehart and Winston, 1971, pp. 63-65 Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart and Winston, 1973, p. 155 **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

1:7

1:.j

SUBJECT: __Mathematics__

SPECIFIC AREA: ___Whole Numbers: Reading and Writing Numerals___

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

The student is able to:

	Page	Suggested Grade Placement
. read the numerals to 10.		
*. read the numerals to 100.	55-	K
. read any of the numerals to 999.	59-	1-2
*. read any of the numerals to 9,999.	61-	2-3
. write the numerals to 10.	63	3-4
. write the numerals to 100.	65-	K
. write any of the numerals to 999.	69-	1-2
. read and write the number words to 10.	73	2-3
. read the critical number words, i.e., ones, tens, hundreds, ten, twenty, thirty, etc.	75-	1-2
. write the numerals by two's to 100.	79	2-4
. write the numerals by five's to 100.	81-	1-2
*. write the numerals by ten's to 100.	81-	1-2
	81-	1-2

The student values:

	Page	Suggested Grade Placement
. the ability to read and write numerals as a useful skill in daily living.	91	K-3

113

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
/ P.T.	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

12

121

Suggested Objective Placement ___K___

Student Learning Objective(s) ___The student is able to read the numerals to 10.___

State Goal	1
District Goal	
Program Goal	5

Related Area(s)_____

Suggested Activities: Grade(s) ___K___	Suggested Monitoring Procedures	Possible Resources
Title: **Group Size:** small group/entire class **Materials:** one large number line to be hung from top of the chalkboard or laid out on the floor — each number has an attached cover which may be flipped over one at a time. `0 1 2 3 4 5 6 7 8 9 10` **Procedure:** . Write the numbers 0-10 very large. Place them in order side by side. Tape or laminate the sheets into one continuous strip. (Student models could also be made.) . Have the student cover the number as the student reads it, or. . Have the student guess and uncover what comes next.	**Mini-Test:** "Reading Numerals to 10" **Group Size:** one student **Materials:** numerals from 0-10 presented in random order on chalkboard, flannelboard, paper, etc. **Procedure:** . Teacher points to numerals one at a time and has the student name the numeral. **Example:** 8 3 7 2 5 0 4 1 9 6	Number Concept Cards Peg Numbers Picture Number Puzzle Available through Jays Catalog, 1976, p. 3 --- **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources
124		125

Suggested Objective Placement ___K___

Student Learning Objective(s) _____The student is able to read the numerals to 10._____

State Goal | 1, 8

District Goal |

Program Goal | 1, 5

Related Area(s) _____

Suggested Activities: Grade(s) _K_	Suggested Monitoring Procedures	Possible Resources
Title: Number Line Count Group Size: small group/entire class Materials: large numer line to 10 Procedure: . Cover "0". . Students read numerals in order from 1-10. . Unocver "0" and students read. . Teacher, then, points to the numerals in random order and students give the word name for each.		Sharp, F.A., These Kids Don't Count, Academic Therapy Publications, 1971, p. 27
		District Resources

1:0

1:7

ERIC

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

125

125

Student Learning Objective(s) <u>The student is able to read the numerals to 100.</u>

State Goal	1,8
District Goal	
Program Goal	1,5

Related Area(s) _____

Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: small group Materials: pointer, number line to 100 Procedure: .. Student or teacher points to any number on the number line, calling on another student to give the word names to five different numerals. . If the student can do this he/she can take a turn with the pointer and call on any student to name five other numerals. . The rest of the student monitor this and if the one who is reading the numeral makes a mistake, another student is chosen to read the numerals. Title: Group Size: student or students Materials: flash cards with numbers to 100 Procedure: . Two students take turns giving the flash cards to each other or one student gives the cards to a group. . The first person in the group who gives the correct response receives the card. The winner has the most cards and that student, in turn, holds up the individual cards for the other(s) to say. . This activity can be done by the teacher with an entire group.	Mini-Test: "Reading Numerals to 100" Group Size: one student Materials: selected numerals from 0-100 presented in random order on chalkboard, flannelboard, paper, etc. Procedure: . Teacher points to the numerals one at a time and has the student name the numeral	Sharp, F.A., <u>These Kids Don't Count</u>, Academic Therapy Publications, 1971, pp. 20-25 District Resources

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: small group with similar reading/ spelling skills Materials: dictionary with numerals to 100 or more for each student Procedure: . The teacher writes word on chalkboard for students to find in their dictionary. As students find the word they stand up. . When three, four or five people are standing, the teacher asks one of the students to give the page number on which the word is found.		
		District Resources

102

103

Suggested Objective Placement   2-3

Student Learning Objective(s) ___The student is able to read any of the numerals to 999._____

State Goal | 1

District Goal |

Program Goal | 2,5,7

Related Area(s)_____

Suggested Activities: Grade(s) __2-3__	Suggested Monitoring Procedures	Possible Resources
Title: Say It Right **Group Size:** entire classroom/groups **Materials:** any of the following: numbered cards 0-999, number line 0-999, number board 0-999; pointer or number line which goes around the room Procedure: . Teacher points to a numeral at random. Students are to read them, or hold up a flash card and have student read it. **Title:** Color Out **Group Size:** small group or entire class **Materials:** worksheet with number boards to 999 (can be made by students), crayons	**Mini-Test:** "Reading Numerals to 999" **Group Size:** one student **Materials:** selected numerals from 0-999 presented in random order on chalkboard, flannelhoard, paper, etc. Procedure: . Teacher points to the numerals one at a time and has the student name the numeral.	Sharp, F.A., _These Kids Don't Count_, Academic Therapy Publica- D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 77-78. District Resources

```
| 0  1  2  3  4  5  6  7  8  9  10 |
| 11 12    13  14  15  16  17  18  |
|                                  |
|                                  |
|               to                 |
|                                  |
|                                  |
|              999                 |
```

1ა4

1ა5

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students to count by one's, ten's, five's, two's, etc. . Students circle each numeral as it is called or read out. . Students draw red circles for the ten's, blue for the five's, and so on. . After each, students describe any pattern they see.		

District Resources

1:37

1:3:

Student Learning Objective(s) _The student is able to read any of the numerals to 9,999._ ___ State Goal

_____ District Goal

_____ Program Goal

1
5

Related Area(s)_____

Suggested Activities: Grade(s) _3-4_	Suggested Monitoring Procedures	Possible Resources
Title: Tic-Tac-Toe **Group Size:** partners with teacher supervision **Materials:** worksheet for tic-tac-toe, 1"x2" cards with numerals to 9,999 written on them. Procedure: . Teacher makes flash cards with numerals to 9,999 and places them face down on table. Students have one tic-tac-toe worksheet. . One student takes a card from the stock and if he/she reads it correctly, places an X or an 0 in the square of his choice. If he/she is incorrect and the other student knows the answer, the other student gets to place an X or 0 in the square of his choice. . If both students are incorrect, teacher reads the numeral to both students and places it back in the piles. . Follow these procedures until one student gets a tic-tac-toe.		D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, p. 79 **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

1.

1

SMALL SCHOOL PROJECT

Student Learning Objective(s) __The student is able to write the numerals to 10.__

State Goal | 1
District Goal |
Program Goal | 2,5

Related Area(s)_____

Suggested Activities: Grade(s) ___K___	Suggested Monitoring Procedures	Possible Resources
Title: Formboards **Group Size:** group of ten **Materials:** 10 pie tins, plaster of paris into each pie tin Procedure: . Trace out a numeral in each pie tin. After the numerals have hardened, have each student trace his/her finger over the shape. . Lay a sheet of paper over the form and the student writes the number, tracing the form. **Title:** Salt Boxes **Group Size:** small group **Materials:** old ditto boxes, salt or sand Procedure: . Pour salt or sand into the boxes and students practice tracing numerals in the salt box. . Have students practice making the numerals in the air. . Have students write the numerals first on extra large sheets of paper, gradually reducing the size of the paper.	**Mini-Test:** "Writing Numerals to 10" **Group Size:** entire class **Materials:** paper and pencil **Procedure:** . Teacher says the numerals to 10 in random order. . Students write each numeral in turn . Teacher asks students to write numerals in order from memory (1-10)	Baratta-Lorton, Mary, <u>Mathematics Their Way</u>, Addison-Wesley Publishing Co., pp. 44-47, p. 50. Pagne, Joseph N., <u>Mathematics Learning in Early Childhood</u>, National Council of Mathematics, 1976, p. 135. Sharp, F. A., <u>These Kids Don't Count</u>, Academic Therapy Publications, 1971, pp. 15-16 Ginsburg, Herbert, <u>Children's Arithmetic: The Learning Process</u>, D. Van Nostrand Co., 1977, chp. 5 Kennedy, Leonard M., <u>Models for Mathematics in the Elementary School</u>, Wadsworth Publishing Co., 1967, p. 17 Reisman, Fredricka K., <u>A Guide to the Diagnostic Teaching of Arithmetic</u>, Charles E. Merrill Publishing Co., 1972, p. 91 Shipp, Donald E., <u>Developing Arithmetic Concepts and Skills</u>, Prentice-Hall, Inc., 1964, p. 81

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources

Title: Step Board Trace
Group Size: individual
Materials: step board
 	
Procedure:
. Have students place paper over numerals of a step board and trace the numerals.
 	
Title: Writing Numbers Rhyme
Group Size: individual/entire class
Materials: paper, pencils
 	
Procedure:
. As students practice writing the numbers, teach them the following rhymes:
 	
   0 A <u>zero</u> goes around for a ride with nothing inside.
 	
   1 A straight line down is <u>one</u> - that's fun.
 	
   2 Around and back on a railroad track - <u>two</u>, two, two.
 	
   3 Around a tree and around a tree - is <u>three</u>.
 	
   4 Down and over - then down once more - that's <u>four</u>.
 	
   5 <u>Five</u> goes down and around. Put a hat on and see what you've got.
 	
   6 Down to a loop. A <u>six</u> rolls a hoop.
 	
   7 Across the sky and down from heaven - that's <u>seven</u>.
 	
   8 Around to me; away around; down and back to me; then cross up and away.
		District Resources

Suggested Objective Placement   K

Student Learning Objective(s) __The student is able to write the numerals to 10.__

State Goal | 1

District Goal

Program Goal | 2,5

Related Area(s)_____

Suggested Activities: Grade(s) __K__ | Suggested Monitoring Procedures | Possible Resources

9   Round a loop and down a line - makes a <u>nine</u>.

10   A one and a zero. Big <u>ten</u> is a hero.

<u>Title</u>: /   Math Recording
<u>Group Size</u>: individual
<u>Materials</u>:   10 6"x6" squares of cardboard,
            objects to form sets from 0-10,
            marking pen, glue, answer card

Teacher observation of student activities.

Procedure:

. Teacher glues objects to cards and labels each
  card, e.g., _____ pegs.
. Student records what he/she sees on each answer
  sheet.
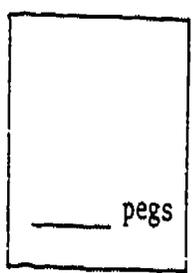
| 3 pegs | answer card

_____ pegs

6"x6" card

District Resources

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Numerals and Stars Group Size: individual Materials: laminated cards with the numerals 0-10 on them, marking pencil Procedure: • Teacher writes numerals 0-10 on the laminated cards. Student draws on sets of stars corresponding to the correct numeral. Title: Show and Write Group Size: individual Materials: counters, paper, pencil Procedure: • Make 10 sets of counters. • Let set one contain one object. • Write the numeral representing the set. • Let set two contain two objects. • Write the numeral representing the set. • Let set three contain three objects. • Write the numeral representing the set. • Continue making sets until the last set is made with ten objects. • Write the numeral representing the last set. • Put the numerals in order from one to ten. • Have students use these sets when writing the numerals to ten.		
		District Resources

1 :·

1 :·

Student Learning Objective(s) _____ The student is able to write the numerals to 100. _____ State Goal

_____ District Goal

_____ Program Goal

State Goal	1
District Goal	
Program Goal	7

Related Area(s) _____

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: entire class Materials: 1" graph paper, pencil, color Procedure: . Students place the numerals in the squares to see how many squares, or writes the numerals in the squares. (Write 1 to 10 on the first row, 11 to 20 on the second, 21 to 30, etc.) Title: One Hundred Group Size: individual or small groups Materials: graph paper (or ordinary paper), pencil Procedure: . Teacher gives random number between 0 and 100. Student will continue writing the consecutive numbers to 100 or another predetermined number less than 100.	Mini-Test: "Writing Numerals to 100" Group Size: entire class Materials: paper and pencil Procedure: . Teacher asks students to write selected numerals in random order. . Students write each numeral in turn. . Teacher asks students to write numerals in order (1-100) from memory in rows of 10.	Sharp, F.A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 18-19 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Student Learning Objective(s) __The student is able to write the numerals to 100.__

_____ State Goal

State Goal	1
District Goal	
Program Goal	7

Related Area(s)_____

Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: **Group Size:** entire class **Materials:** 1" graph paper, pencil Procedure: . Students place the numerals in the squares to see how many squares, or writes the numerals in the squares. (Write 1 to 10 on the first row, 11 to 20 on the second, 21 to 30, etc.) **Title:** Missing Number Puzzle **Group Size:** individual or entire class **Materials:** worksheet puzzle Procedure: . Have students fill in the missing numerals to the puzzle. Example:	Teacher checks the written work of the students. Students check each other's work.	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 148

47	48		50	
		50		52
49	.50		52	
		52		54
51				55

District Resources

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Title: Grab Bag **Group Size:** partners **Materials:** a bag with a large set of objects, pencil and paper Procedure: . One student reaches into the bag and removes his/her choice of the objects. . This student writes a numeral representing the number of objects that were taken. . The partner counts the remaining objects in the sack and records the number.		Henderson, George, Let's Play Games in Mathematics: Volume 2, National Textbook Co., 1970, p. 7 District Resources

1⸛⸛   1⸛⸛

Student Learning Objective(s) ___The student is able to write any of the numerals to 999.___

State Goal

District Goal

Program Goal

	1
	3,5,7

Related Area(s) _____

Suggested Activities: Grade(s) __2-3__

Suggested Monitoring Procedures	Possible Resources

Title: Numeral Sequence
Group Size: entire class
Materials: 1/2" graph paper, pencil, coloring crayon

Procedure:
. Students write the numerals in the squares to see how many squares there are.
Extension:
. Color the multiples of three's orange, four's green, five's yellow, etc. "Is there a pattern?"

Title: Write One and Ten More
Group Size: small group or entire class
Materials: pencil, paper

Procedure:
. The students will write the numbers as the teacher calls them off, or,
. The students will write the numbers, read off by the teacher or a student, and the following ten numerals (e.g., teacher says "789". Student writes 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799.).

Mini-Test: "Writing Numerals to 999"
Group Size: entire class
Materials: paper and pencil
Procedure:
. Teacher asks class to write selected numerals given in random order.
. Students write each numeral in turn.

Sharp, F. A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 60-65

Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 11-12

District Resources

1

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __The student is able to read and write the number words to ten.__   State Goal

1

District Goal

Program Goal

1,2,5

Related Area(s)_____

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources
Title: Lacing Board **Group Size:** individual **Materials:** 9"x11" lacing board and yarn (shoelace, string) Answer Card	**Mini-Test:** "Write and Read Number Words" **Group Size:** entire class write number words/individuals read number words **Materials:** paper and pencil **Procedure:** . Ask the class to write the number words from zero to ten as they are dictated by the teacher in random order. . Students read the number words back to the teacher. After the words have been written, they are read back too in random order. The teacher points to each word to be read.	Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, p. 122 Shipp, Donald E., _Developing Arithmetic Concepts and Skills_, Prentice-Hall, Inc., 1964, pp. 79-80. Kane, Robert, _Helping Children Read Mathematics_, American Book Co., 1974, pp. 62-63 **District Resources**
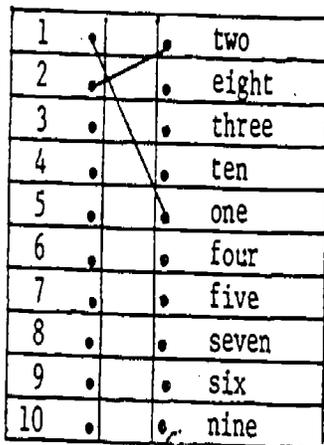
Answer Card:

1. one	1 → two
2. two	2 → eight
3. three	3 → three
4. four	4 → ten
5. five	5 → one
6. six	6 → four
7. seven	7 → five
8. eight	8 → seven
9. nine	9 → six
10. ten	10 → nine

punched holes

Procedure:

. Student laces numbers with respective number words. When the lacing is completed, the student may check response by using the answer card in the pocket behind the board.

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources

Title: Number Words and Stars
Group Size: partners
Materials: 11 blank cards for each student
 	
Procedure:
. Have the students:
  . Write the number words zero to ten on the blank cards.
  . Place the cards in order from left to right beginning with zero.
  . Draw stars on each number card to show the number named by each number word.
  . Compare the order of their number cards with that of their partners'.
  . Compare the number of stars on each card with their partners'.
 	
Title: Number Words
Group Size: partners
Materials: slate or yarn
 	
Procedure:
. Have students practice writing number words with partners on small chalk slates and write number words using yarn on colored paper.
		District Resources

1⊃⁴

1⊃⊃

Suggested Objective Placement   1-2

Student Learning Objective(s) __The student is able to read and write the number words to ten.__   State Goal

_____   District Goal

_____   Program Goal

State Goal	1
District Goal	
Program Goal	1,2,5

Related Area(s)_____

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources

Title: Number Wheel
Group Size: individual
Materials: 10 clothes pins (clip-on kind)
             with numbers 1-10 written on them
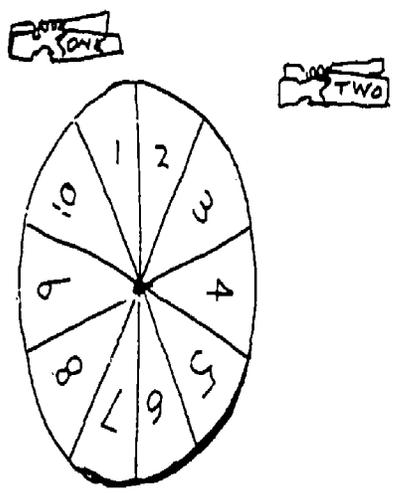 	
Procedure:
. The student takes a clothespin and pins the
  number word to correspond with the number on the
  wheel. The number word is written on the back
  so the student can check his own.
	Give a spelling test of number words written from 1-10.
	
	The student will be able to write these correctly.
		
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement   2-3

Student Learning Objective(s) ___The student is able to read the critical number words, e.g., ones,___
___tens, hundreds, ten, twenty, thirty, etc.___

State Goal	1
District Goal	
Program Goal	1,2

Related Area(s)___Reading, Spelling, Language___

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: What's Your Hangup? Group Size: small group Materials: clothesline, paper socks with the number words on them, clothespins Procedure: . Hang a clothesline (or wire) across one end of the room (e.g., between two tables or across the bottom of a bulletin board). . Mark regularly spaced intervals with a magic marker along the rope. . Provide one or more sets of "socks". Each sock should bear a number word. . Provide a sack of clothespins and a sack for the socks. . Ask students to order the numerals in each set and hang them at the proper intervals.	Mini-Test: "Critical Number Words" Group Size: one student Materials: cards with the critical number words printed on them Procedure: . Ask the student to shuffle the critical number words and place them face down on a table. . Student turns over the number words one at a time and reads the number words to the teacher or his/her partner. . Words are placed in two piles when read, the "correct" pile and the "incorrect" pile. . At the end of the Mini-Test student copies and studies any number words that were incorrect.	District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resource

1.

Student Learning Objective(s) <u>A. The student is able to write the numerals by two's to 100. B. The</u> State Goal

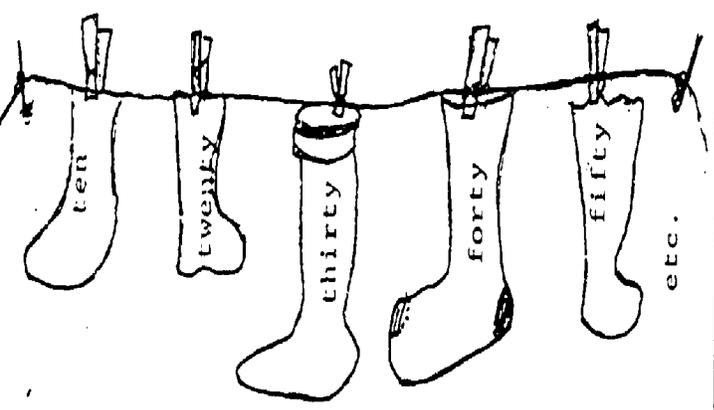<u>student is able to write the numerals by five's to 100. C. The student is able to write the numerals</u> District Goal

<u>by ten's to 100.</u> Program Goal

1.7
5

Related Area(s)_____

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources
Title: Counting by Two's **Group Size:** small/large **Materials:** 1/2" ruled graph paper, crayon, pencil	Teacher checks the students' written work of 2's, 5's and 10's to 100 with a test sheet. **Mini-Test:** "Writing by Two's and Five's" **Group Size:** entire class **Materials:** written exercise such as one below	May, Lola, <u>Mathematics Games for All Grades</u>, Teacher's Publishing Corporation, 1969, pp. 12-13 May, Lola J., <u>Teaching Mathematics in the Elementary School</u>, The Free Press (Macmillan Co.), 1970, pp. 27-29
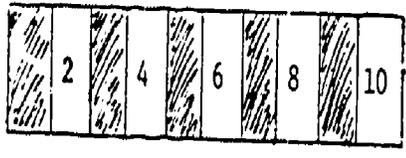
Procedure:

- Each student is given a graph paper of 100 squares and will color the first square, skip the second, color the third, etc. Thus, the student will color every other square.
- When the student has finished, each student will take his/her pencil and write the numerals by two's in every square that is not colored.

Procedure:
- Ask students to write the missing numerals:

District Resources

Title: Counting by Five's
Group Size: students or student/small group
Materials: graph paper, scissors, pencil

Procedure:
- The student will cut the graph paper into sets of five and then record the numbers by 5's to 100.

Suggested Activities: Grade(s) _1-2_	Suggested Monitoring Procedures	Possible Resources

Title: Counting by Ten's
Group Size: small
Materials: graph paper, scissors, pencil

Procedure:

. Students cut graph paper into strips of ten squares each out of the 100 square paper. After cutting the paper into ten-squared paper, the students record their findings by 10's.

                                 Etc.

   10   20   30

District Resources

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Student Learning Objective(s) __A. The student is able to write the numerals by two's to 100.__   State Goal

__B. The student is able to write the numerals by five's to 100.   C. The student is able to write__   District Goal

__the numerals by ten's to 100.__   Program Goal

Related Area(s) _____

State Goal	1,7
District Goal	
Program Goal	5

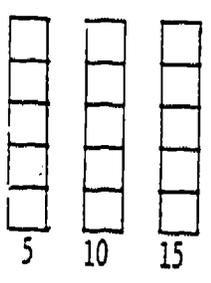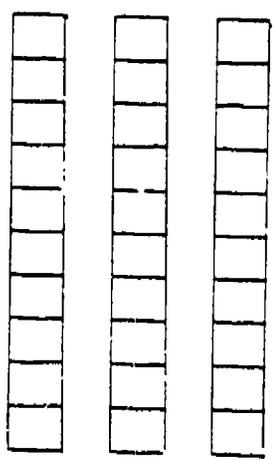| Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: student or students Materials: 1/2" ruled graph paper, crayon, pencil Procedure: • Each student is given a graph paper of 100 squares and will color the first square, skip the second, color the third, etc. Thus the student will color every other square. • When the student has finished each student will take his/her pencil and write the numerals by two's in every square that is not colored. 178	Teacher checks the students' written work of 2's, 5's and 10's to 100 with a test sheet.	May, Lola J., _Teaching Mathematics in the Elementary School_, New York The Free Press (Macmillan Co.), 1970, pp. 27-29 District Resources 179

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources

Title:

Group Size: students or student/small group

Materials: graph paper, scissors, pencil

Procedure:

. The student will cut the graph paper into sets of five and then record the numbers by 5's to 100.

5   10   15

District Resources

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Student Learning Objective(s) ___The student is able to write the numerals by two's to 100.___

_____

_____

Related Area(s)_____

	State Goal	1, 7
	District Goal	
	Program Goal	5

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: Write the Next "Two" or Write the Next Even Number **Group Size:** small group/entire class **Materials:** pencil and paper Procedure: . Student or teacher says an even number between 0 and 98. . Other students write the next "two" or even number.		
		District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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Suggested Objective Placement   1-2

Student Learning Objective(s) _The student is able to write by five's to 100._   _____ State Goal | 1, 7 |

_____ District Goal | |

_____ Program Goal | 5 |

Related Area(s)_____

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: The Next Five **Group Size:** small group/entire ass **Materials:** pencil and paper Procedure: . Student or teacher says a multiple of five between 0 and 95. . Other students write the next five or multiple of five.		
		District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement   1-2

Student Learning Objective(s) ___The student is able to write numerals by ten's to 100.___

Related Area(s)_____

	State Goal	1, 7
	District Goal	
	Program Goal	5

Suggested Activities: Grade(s) __1-2__

	Suggested Monitoring Procedures	Possible Resources
Title: The Next Ten **Group Size:** small group/entire class **Materials:** pencil and paper Procedure: . Student or teacher is the "caller" and says a multiple of 10 between 0 and 90. . The other students write the next ten or multiple of 10.		Sharp, F. A., <u>These Kids Don't Count</u>, Academic Therapy Publications, 1971, pp. 99-100
		District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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SMALL SCHOOL PROJECT

Student Learning Objective(s) __The student values the ability to read and write numerals as a__

__useful skill in daily living.__

State Goal | 1, 7

District Goal |

Program Goal |

| 1,3,5 |

Related Area(s) _____

Suggested Activities: Grade(s) __2-3__	Suggested Monitoring Procedures	Possible Resources

Title: Our Numbers
Group Size: large group
Materials: none needed
 	
Procedure:
. Discuss some ways that numbers are used in their daily life, e.g., clock, telephone, street numbers, house numbers, money, etc.
. Ask students if all the numbers were removed from these things how would they:
  . Know what time it was?
  . Dial the telephone?
  . Find streets?
  . Find homes?
  . Know how mucy money they have?
  . Etc.
	Discuss problems students confront when no numbers are used. Monitor by their actions and answers to discussion questions.
	
	Have students share ways they use numbers in reading and writing and how they would feel without them.
		Martin, Bill, Sounds of Mystery, Holt, Rinehart and Winston, 1967 pp. 368-371 (story: "The Day Numbers Disappeared")
		
		Local Newspaper

Title: Our Numbers **Group Size:** large group **Materials:** newspapers for each student **Procedure:** . Have students cross out all the numbers they find in the newspaper. . Then ask the students to read, or the teacher can read, various articles without the numbers in them. Point out how numbers are very important in gaining information.		**District Resources**

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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197.

SUBJECT: ___Mathematics___

SPECIFIC AREA: ___Whole Numbers: Place Value___

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

- the place value of ones and tens in base ten numeration.
- the place value of hundreds in base ten numeration is the third numeral from the right.
- the place value of thousands in base ten numeration is the fourth numeral from the right.

Page	Suggested Grade Placement
95–	1–2
99	2–3
101–	3–4

The student is able to:

- write the expanded form of any two-digit number, i.e., 34 = three tens + four ones.
- write the corresponding numeral from any two-digit number written in expanded form, i.e., three tens + four ones = 34
* - write the expanded form of any three-digit number, i.e., 342 = three hundreds + forty tens + two ones.
- write the corresponding numeral from any three-digit number written in expanded form, i.e., three hundreds + four tens + two ones = 342.
- write the expanded form of any four-digit number, i.e., 4,322 = four thousands + three hundreds + two tens + two ones.
- write the corresponding numeral from any four-digit number written in expanded form, i.e., four thousands + three hundreds + two tens + two ones = 4,322.
* - round numbers to the nearest ten and hundred

Page	Suggested Grade Placement
95–	1–2
95–	1–2
99	2–3
99	2–3
101–	3–4
101–	3–4
105	3–4

The student values:

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OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Student Learning Objective(s) __A. The student knows the place value of ones and tens in base 10__   State Goal

__numeration. B. The student is able to write the expanded form of any two digit numeral, e.g., 34 =__   District Goal

__3 tens + 4 ones. C. The student is able to write the corresponding numeral from any two digit__   Program Goal

numeral written in expanded form. (3 tens + 4 ones = 34)

Related Area(s) _____

	1,8
	1,2,3

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Title: What Number Am I? **Group Size:** two to twelve students **Materials:** chalkboard and chalk Procedure: • Choose one student who stands before the group and makes a statement such as: "I am thinking of a number that is one ten and three ones. If you know what the number is, raise your hand." • The leader then calls on a student who goes to the board and writes the numeral. If it is correct this player becomes the leader. **Extension:** • The idea of hundreds and of thousands could also be practiced using this game.	Circle the number that has 5 tens. 65 59 81 72 etc. Record the number correct. or Paper and pencil test with items similar to the following: 37 = (3) tens and (7) ones 46 = (4) tens and (6) ones and 4 tens and 7 ones = (47) 2 tens and 9 ones = (29) **Mini-Test:** "Ones and Tens" **Group Size:** entire class **Materials:** exercise as below Procedure: • Complete: What does the digit 4 mean in 49? _____ What does the digit 9 mean in 49? _____ What does the digit 0 mean in 60? _____ What does the digit 6 mean in 60? _____	Kelley, S. Jeanne, _Learning Mathematics Through Activities_, James E. Freel & Associates, Inc., 1973, p. 24 _Let's Explore Mathematics_, Arco Publishing Company, Inc., N., 1966, pp. 6-29 May, Lola J., _Teaching Mathematics in the Elementary School_, The Free Press, N.Y. (Macmillan Company), 1970, p. 23 Chip Trading Activity, Book 1 Place Value Chart Cuisenaire Rods Dienes Blocks Bean Sticks

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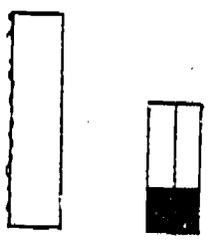| Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources

Title: Who Am I?
Group Size: whole class
Materials: paper/pencil
 	
Procedure:
 	
. Teacher prepares worksheets with the following questions and gives one to each student:
. (Record in the space provided "Who I am".)
  a. I'm greater than 40 and my digits are 3 and 4.
 	
  b. I'm greater than 39 and my digits are 5 \ and 2.
 	
  c. I'm less than 42 and my digits are 5 and 1.
 	
  d. I'm less than 65 and my digits are 5 and 6.
 	
  e. I'm less than 50 and my digits are 6 and 1.
 	
  f. I'm greater than 47 and my digits are 8 and 1.
		D'Augustine, Charles, <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, pp. 72-75
		
		Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart Winston, 1973, pp. 129-130

		District Resources

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-06-

Student Learning Objective(s) A. The student knows the place value of ones and tens in base 10   State Goal

numeration. B. The student is able to write the expanded form of any two digit numeral, e.g., 34 =   District Goal

3 tens and 4 ones. C. The student is able to write the corresponding numeral from any two digit   Program Goal

numeral written in expanded form.   (3 tens + 4 ones = 34)

Related Area(s)_____

State Goal	1,8
District Goal	
Program Goal	1,2,3

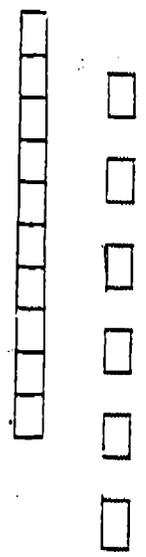| Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Show Me The Number **Group Size:** whole class **Materials:** 1/2" graph paper and 12" x 18" construction paper **Procedure:** . Fold construction paper in half length wise, then fold up 4" from the bottom. Cut 1/2" graph paper in groups of 10 and in individual units. **Example:** 205 . Teacher asks: "Who can show me 3?"		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, N.C.T.M., 1976, pp. 143-147 **District Resources** 206
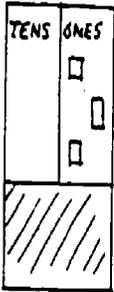
Keep asking for numbers with a single digit, then ask, "Who can show me 12?" Some students will respond with 12 ones and some will use a ten stick and two units or ones. Teacher can then talk about the differences. Keep calling numbers until the students have the idea.

Game: Show Me A Larger Number

Ask the student to show a number with the paper squares then write their number on a sheet of paper and slip under flap.

Example:
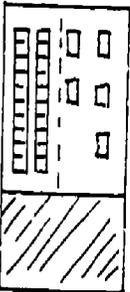
Under flap place a paper with 25 on it.

Teacher comes around, says a number and the student lifts flap and shows the teacher.

a. Divide class into two teams. Again have each student make a number, record that number and place under the flap.

b. Pass out 6 markers, counters, bottle caps or beans to each student.

c. Have one team get up and read as many numbers as they can within a certain time period. One or two minutes. Each time they name a number correctly the other students gives up a marker. The object is to read as many numbers as you can and collect as many markers as you can.

d. If a student calls out a number incorrectly that student must give up a marker.

e. Teacher calls time and the other team has a turn.

Winner - team with the most counters.

District Resources

Student Learning Objective(s) A. The student knows the place value of 100's in base 10 numeration   State Goal

is the third numeral from the right. B. The student is able to write the expanded form of any three-   District Goal

digit numeral, i.e., (342 + 3 hundreds + 4 tens + 2 ones) C. The student is able to write the   Program Goal
corresponding numeral from any three-digit number written in expanded form (3 hundreds + 4 tens + 2 ones = 342)
Related Area(s) _____

State Goal	1,8
District Goal	
Program Goal	1,2,5

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources

Same activities expanded to include hundreds, as described for objectives related to ones and tens.
 	
  Title: What Three-Digit Number Am I?
  Group Size: entire class
  Materials: paper/pencil
 	
Procedure:
 . Record Who I Am.
 	
(a) I have three digits: 2,4,6.
  I am the largest number possible.
(b) I have three digits all the same.
  I am between 250 and 400.
(c) I have three digits: 2,3,5.
  I am egen. My tens digit is 5.
(d) I have three digits: 3,6,9.
  I am between 550 and 700, and I have 9 in one's place.
(e) I have three digits. I am less than 400.
  My tens digit is greater than my ones digit.
  My ones digit is greater than my hundreds digit. My digits are: 5,7,3.
 	
Level of Difficulty: Recommended as an activity for your "front runners" or the more able.
	Mini-Test: "Place Value"
	Group Size: entire class
	Materials: written exercise as below
	
	Procedure:
	In what place is each underlined digit?
	
	_____ 23<u>9</u> ones
	_____ 5<u>6</u>7 _____
	_____ <u>3</u>75 _____
		Experiences in Mathematical Ideas, Vol. 1, National Council of Teachers of Mathematics, 1970, pp. 11-18 .
		
		May, Lola J., Teaching Mathematics in the Elementary School, The Free Press (Macmillan Co.), New York, 1970, p. 27
		
		Twin Choice 3,4,5
		Dienes Block
		Place Value Chart
		
		District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

211   212

Suggested Objective Placement   3-4

Student Learning Objective(s) _A. The student knows the place value of thousands in base numeration_ State Goal
is the fourth numeral from the right. B. The student is able to write the expanded form of any four-
digit numeral, e.g., 4,322 = 4 thousands + 3 hundreds + 2 tens + 2 ones. C. The student is able to
write the corresponding numeral from any four-digit number written in expanded form, e.g., 4 thousands District Goal
+ 3 hundreds + 2 tens + 2 ones = 4,322.

Program Goal

State Goal	1,8
District Goal	
Program Goal	1,2,5

Related Area(s) _____

Suggested Activities: Grade(s)   3-4

	Suggested Monitoring Procedures	Possible Resources
Title: Expanded Notation Cards Group Size: small group; entire class Materials: cut a set of Expanded Notation Cards Be sure that they fit together. Place the cards together so that the longest is on the bottom up to shortest on the top. The notch on the lower right corner of each card should match. When the cards are all together, they are in their standard form. $\boxed{4000}$ $\boxed{200}$ $\boxed{30}$ $\boxed{3}$	Paper and pencil test with items like the following: 3567=(3) thousands + (5) hundreds + (6) tens + (7) ones and 5 thousand + 4 hundreds + 0 tens + 3 ones = (5,403) Circle the number that has 6 hundreds: 3762 6372 7632 3726	
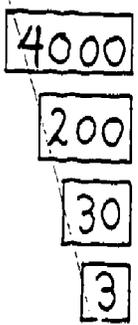
Procedure:
. Teacher calls out a 3 or 4 digit number. Student
then puts the appropriate cards together to show
the number.
Example:
. Teacher says 3,742. The student puts down 3,000,
places 700 on top, then 40 on that and finishes
by placing 2 on the very top. By holding the
number at the notched corner, the student can
display 3742. The teacher should be sure to
include some numbers with zero in them, i.e,,
3402. The student would have no tens card but
only 3000, 400, and 2.

District Resources

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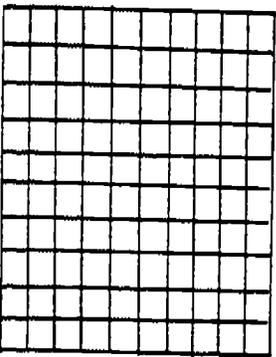| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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Student Learning Objective(s) <u>A. The student knows the place value of thousands in base ten numeration</u> State Goal
<u>is the fourth numeral from the right. B. The student is able to write the expanded form of any four-</u>
<u>digit number, i.e., 4,322 = four thousands + three hundreds + two tens + two ones. The student is</u> District Goal
<u>able to write the corresponding numeral for any four-digit number written in expanded form, i.e., four</u>
<u>thousands + three hundreds + two tens + two ones = 4,322.</u>   Program Goal

Related Area(s)_____

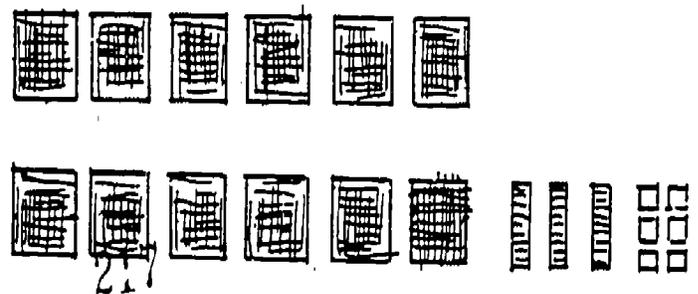| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: Models of Four-Digit Numbers Group Size: small groups; entire class Materials: graph paper to show: units of one □ units of ten units of 100 units of 1000 = 10 units of ten	Mini-Test: Expanded Form Group Size: Entire class Materials: Written exercise as below Procedure: Write in expanded form: 5,326 = _____ thousands + _____ hundreds + _____ tens + _____ ones	Experiences in Mathematical Ideas. Volume 1, National Council of Teachers of Mathematics, 1970 pp. 19-27 Mathematics for Elementary School Teachers, NCTM, 1966, pp. 28-33

Procedure:

- Teacher says a 4-digit number, i.e., 1,236.
- Students form various combinations of the above units to represent the number.
- Students then write the 4-digit number and write it also in expanded form, e.g., 1,236 =

District Resources

218

217

Title: Charting 4-Digit Numbers
Group Size: Entire class
Materials: Place Value Chart (see below)
4 counters

Procedure:

- Teacher names a 4-digit number, say 8,653.
- Students place a counter on appropriate digit in each column.
- Students write the number.
- Students write number in expanded form, e.g.,
  8,653 = 8000 = 600 = 50 = 3

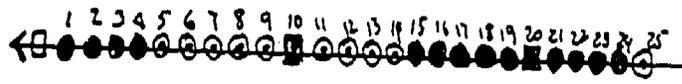| 9	9	9	9
(8)	8	8	8
7	7	7	7
6	(6)	6	6
5	5	(5)	5
4	4	4	4
3	3	3	(3)
2	2	2	2
1	1	1	1
0	0	0	0
Thousands	Hundreds	Tens	Ones

District Resources

220

Suggested Objective Placement ___3-4___

Student Learning Objective(s) _The student is able to round numbers to the nearest ten and hundred._ State Goal

District Goal

Program Goal

	1,8
	1,2,3

Related Area(s)_____

Suggested Activities: Grade(s) _3-4_

Suggested Activities	Suggested Monitoring Procedures	Possible Resources

Title: Number Line Rounding
Class Size: partners
Materials: Adding machine tape (100"); a blade, green and red crayons, counting chips or markers
 	
Procedure:
· Work together. Use a black crayon to draw a line from end to end.
· Add arrows, dots, and number the dots (0-100).
· Draw boxes around the dots for multiples of 10.
· Color the first box red, the second green, the third red, the fourth green, and so on.
· Draw circles around all of the other dots.
· Color them to match the box for the nearest ten.
 	
· The teacher names a number.
· The students place a counting chip or marker on the number.
· Move the marker to the left or the right on the number line to the closer 10 in order to round to the nearest ten.
· If neither is closer move the counter to the ten on the right.
	Mini-Test: "Rounding Numbers"
	Group Size: Entire class
	Materials: Exercises as below
	
	Procedure:
	. Round to nearest ten:
	    56 _____
	    21 _____
	    83 _____
	
	. Round to nearest hundred:
	    572 _____
	    144 _____
	    776 _____
		Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Harper, Row & Winston, 1973, pp. 177-78.
		
		District Resources

221

222

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

223

224

SUBJECT: _____ Mathematics _____

SPECIFIC AREA: _____ Whole Numbers: Addition _____

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4

The student knows:

		Page	Grade
• addition is the combining of numbers.		109	K-1
• an addend is one of a set of numbers to be added. 4+2+3=9		111	1-3
• a sum is the total of all addends.		111	1-3
• that adding zero to a number does not affect the sum.		113-	1-2
• the addition facts with sums to nine. (mastery)		117-	1-2
• the addition facts with sum to 18. (mastery)		127-	2-3
• that the order in which two numbers are added does not change their sum (commutative property), i.e., 3+5 = 8 or 5+3 = 8.		139-	2-3
• when adding three or more numbers the way addends are grouped does not affect the sum (associative property), i.e., (1+2) + 4 = 1 + (2+4)		141-	1-3

The student is able to:

		Page	Grade
*. add two two-digit numbers without renaming (carrying), i.e., 21 + 32 = 53.		145-	1-2
• add three or more one-digit numbers.		141	1-2
• add two three-digit numbers without renaming (carrying), i.e., 123 + 234 = 357.		147	2
• add three or more two-digit numbers with a sum of less than 100 without renaming (carrying), i.e., 21+23+14 = 58.		149	2-3
*. add any numbers with two or more digits that require renaming (carrying), i.e., 26+48 = 74.		151	2-3
• add any three or more two-digit numbers, i.e., 39+65+87+88 = 279		153	3-4
• add any two or more three-digit numbers with renaming.		155	3-4
*. add any two or more four-digit numbers with renaming.		155	3-4

The student values:

225

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

226

227

Suggested Objective Placement ___K-1___

Student Learning Objective(s) _The student knows addition is the combining of numbers._

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s) _____

Suggested Activities: Grade(s) ___K-1___

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Bead Cards **Group Size:** pairs/small groups/entire class **Materials:** laminated bead cards with elastic to hold the 10 beads in place for counting. Draw a line down the middle of the card for sub-sets. **Procedure:** . Students will work in pairs. One student will divide the beads into two sets, e.g., 6 and 4. The other students will count the beads in each set, e.g., 6 and 4. The student then will count them all together, i.e., 10. Now the students change jobs. The counting student now makes the sets and the set making student does the counting. They continue making as many sets as they can noting their sets always add to 10. Teacher asks: "How many combinations can you make?" . Give students an opportunity to combine and determine the sum of a variety of sets of objects such as chips, students, books, sticks, etc. **Variation:** . Give students worksheets to record answers.	Show sets of objects. Student tells the number of objects contained in both sets. Teacher observation.	Kennedy, Leonard M., _Models for Mathematics in the Elementary Schools_, Wadsworth Publishing Company, Inc., 1967, Belmont, Ca., pp. 47-69 Turner, Ethel M., _Teaching Aids for Elementary Mathematics_, Holt, Rinehart and Winston, Inc., 1966, New York, p. 5 D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, p. 83 Pagne, Joseph N. (editor), _Mathematics Learning in Early Childhood Education_, NCTM, 1976, p. 167 Bead Fact Finder **District Resources**
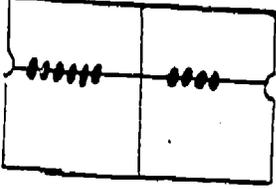
228

229

Suggested Activities: Grade(s)	Suggested Monitoring Procedures	Possible Resources
		District Resources

230

231

Student Learning Objective(s) __A. An addend is one of a set of numbers to be added. B. A sum is__

the total of all addends.

State Goal

District Goal

Program Goal

1,7,10

Related Area(s)_____

Suggested Activities: Grade(s) ___1-3___	Suggested Monitoring Procedures	Possible Resources
Title: Number Sentence Vocabulary (Addition) Group Size: entire class Materials: paper, pencil, counters, word names on tagboard for: addend (2 cards) sum symbols on tagboard for: "+" and "="		Baratta-Lorton, Mary, Mathematics Their Way, Addision-Wesley, 1976, pp. 219-220 Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 149

Procedure:

. Teacher and students form a physical model for
  3+2=5 with counters.

. Teacher and students write the number sentence for
  the model.

. Teacher and students read the number sentence
  together "Three plus two equals five."

. One student places the word name for | addend | on
  the chalkrail beneath "3".

. Another student places the card for | + | between
  the two numbers.

. Another student places the word name | addend |
  beneath the number "2".

. Another student places the symbol card | = | in
  position.

. Finally another student places the word name | sum |
  below the number "5".

Note: An addend is defined as one of a set of
      numbers to be added.

    ☐☐☐   ☐☐

Thus: 3   +   2   =   5

   | addend | | + | | addend | | = | | sum |

District Resources

203

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

234

235

-11

Suggested Objective Placement ___:-2___

Student Learning Objective(s) _The student knows that adding zero to a number does not affect the_ State Goal

sum. District Goal

Program Goal

1,7,10

Related Area(s)_____

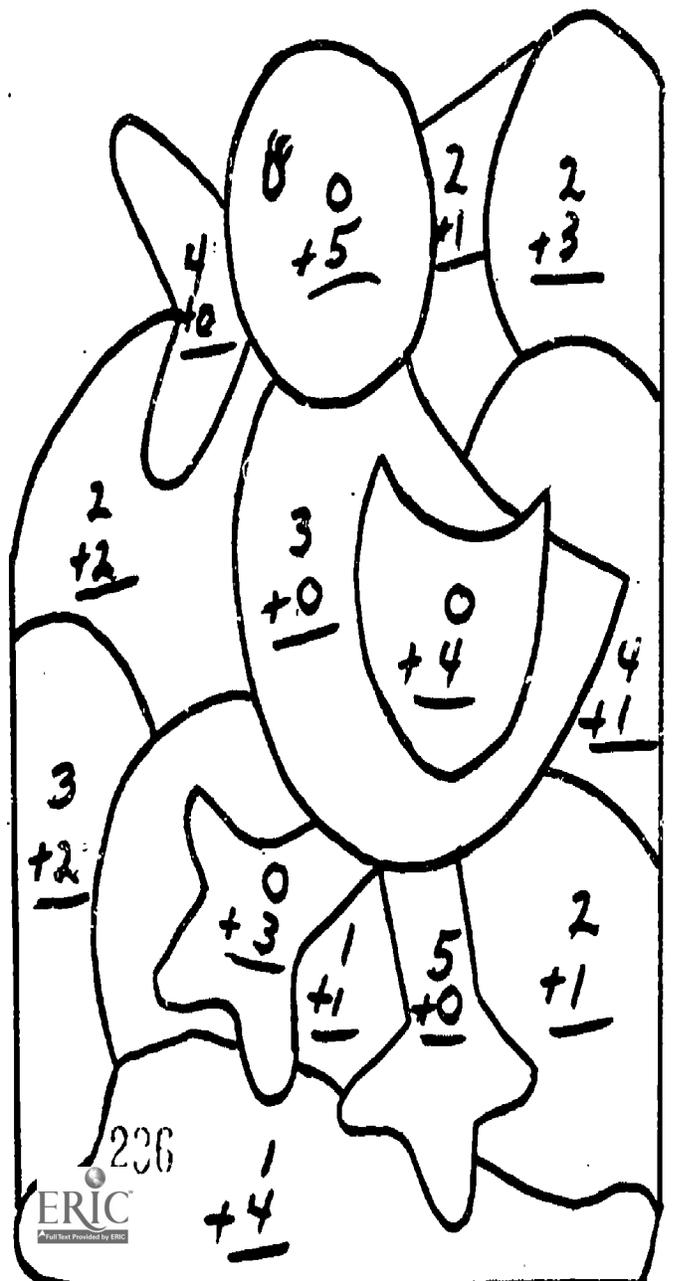| Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Can We Handle Zero? **Group Size:** individual or entire class **Materials:** worksheet and crayons 	Oral questioning Paper and pencil test **Mini-Test:** "Adding Zero" **Group Size:** entire class **Materials:** exercise such as example below **Procedure:** . Ask the students to circle problems where the sum is the same as the larger of the two addends. **Example:** $$\begin{array}{ccccc} 2 & 3 & 0 & 1 & 6 \\ +0 & +4 & +8 & +2 & +1 \\ \hline \end{array}$$	D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 87-88
		District Resources

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237

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Procedure: • Students are asked to add all problems, recording the sums. Then they are to color all the problems that have a zero in the equation. • Ask the student what happens to the sum when zero is one of the addends. <u>Note:</u> See diagram. <u>Title:</u> <u>Group Size:</u> small group <u>Materials:</u> 10 styrofoam cups, 15 counters paper and pencil **Procedure:** • Set up five stations in different parts of the room. • At each station there are two cups, paper and pencil. • At each station place one to five counters in the first cup and none in the second. • Directions to students: (a) Go to each station and count the number of counters in each cup. (b) Determine the number of objects there will be when the counters in the two cups are joined in one cup. (c) Write the addition fact involving zero to describe what has taken place in the activity with the cups.	Oral questioning Paper, pencil worksheet	
		District Resources

$$2 + 0 = 2$$

238

239

Suggested Objective Placement   1-2

Student Learning Objective(s) The student knows that adding zero to a number does not affect

the sum.

Related Area(s)

	State Goal	1,7,10
	District Goal	
	Program Goal	

Suggested Activities: Grade(s) _2_

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: Concentration **Group Size:** 2 or 3 players **Materials:** two sets of cards. One set with equations where zero is added to a number 20 or less (example: $\boxed{20+0}$, $\boxed{15+0}$). One set of cards will be the corresponding answer cards to the equation cards, (example: $\boxed{20}$ $\boxed{15}$	Paper-pencil test Student gives verbal response to flash cards	Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart and Winston, 1973, p. 147

Procedure:

. Shuffle both sets of cards together. Lay all the cards face down in 5 or 6 rows. In turn, each player turns 2 cards face up. If they match, the student keeps the pair and takes another turn. If the cards do not match, they are placed face down in their former positions. The next player takes a turn, following the same procedure. The player having the most cards when all the cards have been matched, wins the game.

District Resources

240

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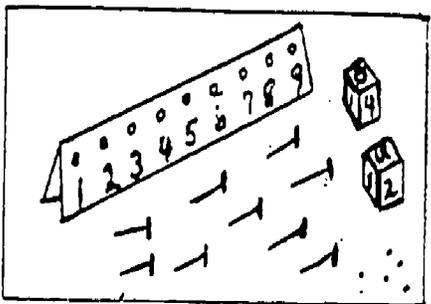| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

212

213

Suggested Objective Placement   1-2

Student Learning Objective(s) __The student knows the addition facts with sums to nine (mastery).__   State Goal

District Goal

Program Goal

| 1,7,10 |

Related Area(s)_____

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Title: Nine Holes **Group Size:** pairs of students **Materials:** 2 tagboard strips with 9 holes, 2 cubes, one cube marked with numbers 0-5 and another cube marked with numbers 0-4 plus an extra 0. 9 golf tees for each student (18 total) 	Student often uses manipulative aids or other aids. Mastery of addition facts with sums to nine implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+3?" or if shown $\boxed{\begin{matrix}6\\+3\end{matrix}}$ or $\boxed{6+3}$ in written form, the student responds instantly from memory. Check __one__ student at a time.	D'Augustine, Charles H., _Multiple Methods_ _of_ _Teaching Mathematics_ _in the_ _Elementary_ _School_, Harper and Row, 1973, pp. 91-93

Procedure:
. Teacher directs as follows:
  (a) First player rolls the dice.
  (b) Player adds the addends and says the equation aloud (e.g., "Zero plus five equals five.").
  (c) Player then puts a golf tee in the hole representing that sum (5).
  (d) The next player takes a turn, following the same procedure.
  (e) The first player to fill all 9 holes with golf tees wins the game.
  (f) When there are only 2 or 3 holes left to

District Resources

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources

fill, and a player does not get the needed combination, next player takes one turn.

Note: Golf tees fit best if put through only one hole or piece of tagboard, rather than two.

Kelley, S. Jeanne, <u>Learning Mathematics Through Activities</u>, James E. Freel and Associa..., Inc., 1973, p. 31

Title: Rocks, Paper, Scissors
Group Size: pairs of students
Materials: four fists (see diagram)

Diagram 1

Student A

Student B

Diagram 2
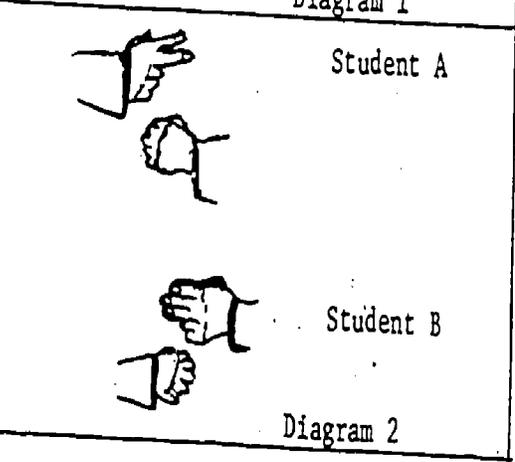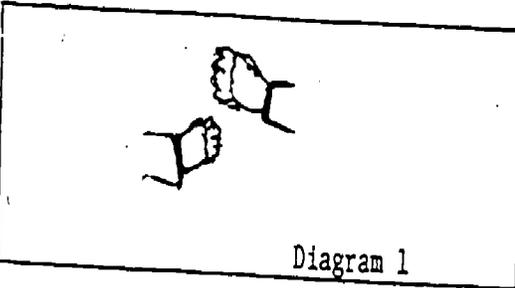
District Resources

Procedure:

. Teacher demonstrates to students the positions for rock, paper, scissors.

. Teacher then gives the following directions:

(a) Students pound their fists together 3 times. On the third time, they each thrust out as many fingers as they want (up to 5).

(b) Each student then adds the two sets of fingers together (adding both students' fingers).

(c) The first student to call out the correct answer gets a point. The one with the most points wins.

(d) Teacher can set a time limit of 10 minutes.

217

Student Learning Objective(s) <u>The student knows the addition facts with sums to nine. (mastery)</u>   State Goal

District Goal

Program Goal

1,7,10	

Related Area(s)_____

Suggested Activities: Grade(s) __2__	Suggested Monit ring Procedures	Possible Resources
Title: Match Boxes **Group Size:** individual **Materials:** flat box (nylon stocking box), cardboard or tagboard to be cut into pieces to match the regions on the inside of the box lid, colorful picture to glue on the back of the cardboard or tagboard.	Paper, pencil test Student answers flashcards	Kennedy, Leonard M., <u>Models for Mathematics in the Elementary School</u>, Wadsworth Publishing Co., 1967, pp. 62-70

Procedure:

. Making the match box:

(a) Cut tagboard to fit inside of box lid. (Make length and width 1/4" smaller than the box lid.)

(b) Glue picture to the tagboard with rubber. cement.

(c) Rule inside of the box lid into rectangles of the same size. (Three rows of four regions each works well.)

(d) Rule the tagboard (not the picture side) into rectangles that match those of the box lid.

(e) Write problems and answers on a piece of paper, making sure that no problem or answer is repeated. Write the <u>problems</u> on the inside of the box lid, and the corresponding answers on the matching rectangles on the tagboard.

(f) Cut out the tagboard rectangles.

District Resources

218

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|	Suggested Monitoring Procedures	Possible Resources

· Instructions for use:
  (a) Place answer pieces on the matching problem regions on the inside of the box lid.
  (b) Put the bottom of the box inside the lid. Press down firmly and turn the box and lid over. If each piece has been put in the correct place, the picture will have been put together and can be seen by removing the lid.

Title: Speedo - (Game)
Group Size: large group
Materials: spinning wheel marked 0 to 9, equation cards without answers:
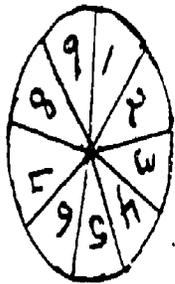
$3+5=$

(Make cards for every possible addition with sums 9 or less)
(If equation cards are 1"x3", they can all fit into a cottage cheese carton, and the spinner wheel can be made on the lid for a completely stored game.)

Procedure:
· Leader gives each student four equation cards. Students lay them on their desks and study them.
· The leader spins the spinner and calls out the number. Any student who has an equation card whose sum is that number, calls out "Speedo". The first person to call out gets to read his/her equation card. If it makes a true equation, he/she gets to turn that equation card face down. (If the equation card does not match the number called out, the student does not turn over the equation card and if he/she has any cards turned over from previous turns, he/she must turn one back up.)

Possible Resources

District Resources

250

251

Suggested Objective Placement ___1-2___

Student Learning Objective(s) __The student knows the addition facts with sums to nine. (mastery)__

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s) _____

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
• The game continues until a student has turned over all four cards. That student wins and becomes the next "leader". Variation: • Make equation cards with: (a) Sums to 18. (b) Subtraction facts 9 or less. (c) Subtraction facts with sums 18 or less.		
		District Resources

252

253

253

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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Student Learning Objective(s) __The student knows the addition facts with sums to nine. (mastery)__   State Goal

_____   District Goal

_____   Program Goal

	1,7,10

Related Area(s)_____

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources

Title: What Number Am I Now?
Group Size: whole class
Materials: paper-pencil

Procedure:

. Record the number I am now in the following:

Paper-pencil test
Student answers flash cards

I am
the number 7.
Add 2 to me.
What number
am I now?

_____

I am
the number 3.
Add 6 to me.
What number
am I now?

_____

I am
the number 4.
Add 0 to me.
What number
am I now?

_____

District Resources

256

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

259

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ERIC
Full Text Provided by ERIC

Student Learning Objective(s) <u>The student knows the addition facts with sums to nine. (mastery)</u>   State Goal

_____ District Goal

_____ Program Goal

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)_____

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Round-n-Round Group Size: entire class Materials: paper-pencil Procedure: . Give the missing number in each spoke of the wheel:		
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

202

203

Student Learning Objective(s) __The student knows the addition facts with sums to 18. (mastery)__   State Goal
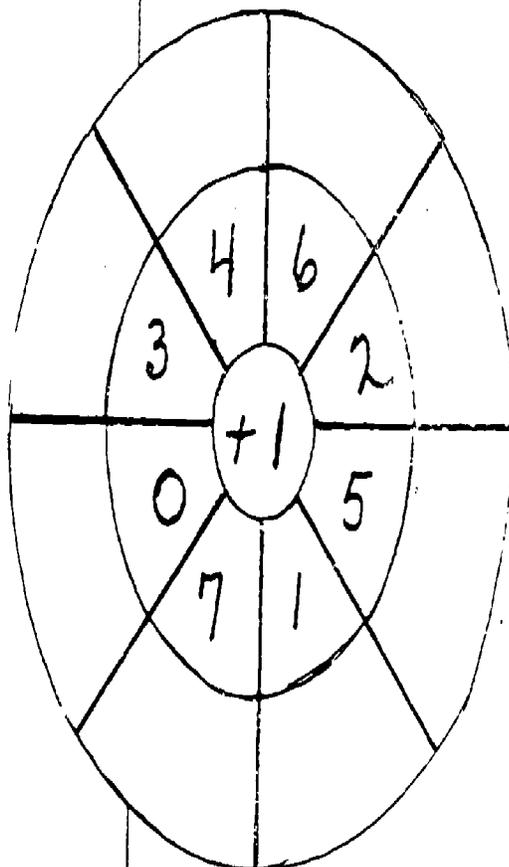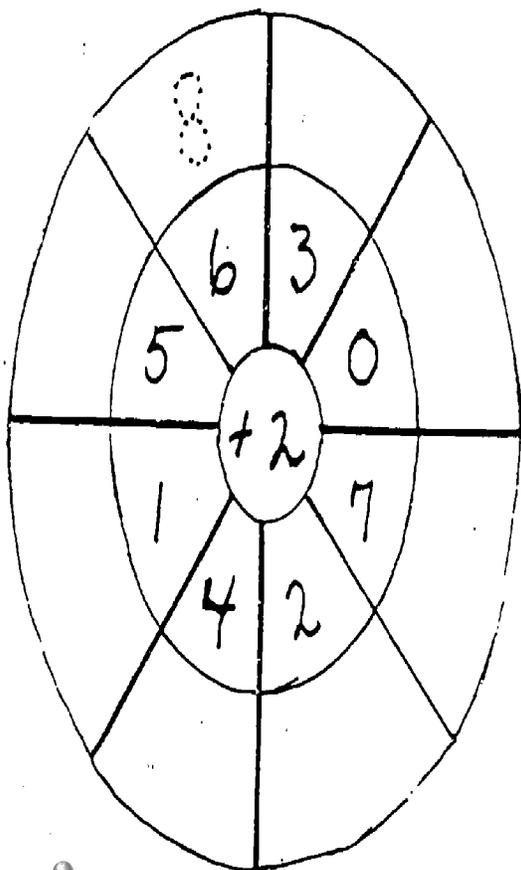
District Goal

Program Goal

	1.7.10

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: Bean Bag Toss Group Size: partners Materials: two bean bags, large chart (to be placed on the floor) Sample: | 9	8	3
7	6	2
5	4	1
	0	| Procedure: • Throw two bean bags onto the chart. • Add the two numbers shown in the squares in which the bean bags land. • The player with the higher score wins one point. • The first to score 10 points wins the game.	Mastery of addition facts with sums to 18 implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+7?" or if shown $\boxed{\begin{array}{r}6\\+7\end{array}}$ or $\boxed{7+6}$ in written form, the student responds instantly from memory. Check <u>one</u> student at a time.	Pagne, Joseph N., <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, pp. 178-180 Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart and Winston, 1973, pp. 150-156 District Resources

204

255

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: Circle Sums **Group Size:** entire class **Materials:** paper/pencil Procedure: . Circle adjacent squares that add to a particular sum, e.g., 11. (Adjacent swuares are squares that have a common side.) . Note the horizontal and vertical examples.	Student answers flash card Paper/pencil test	

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

District Resources

2_0

2_7

Student Learning Objective(s) _The student knows the addition facts with sums to 18. (mastery)_ _____ State Goal

_____ District Goal

_____ Program Goal

| 1.7.10 |
| |
| |

Related Area(s) _____

_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources

Title: Thinking
Group Size: entire class
Materials: paper/pencil

Procedure:

. Examine the one example that is given.
. Now think about what is required and complete the
  six tables.

11
6	[5]
9	
4	
3	

12

13
4	
5	
7	
9	

14

15
7	
9	
3	
8	

16

208

209

Title: Complete the Sentences
Group Size: entire class
Materials: paper/pencil

Procedure:

(a) ▭ ◯ = 2 different numerals
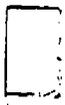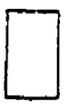
▭ ▭ ■ same numerals

(b) Complete the number sentences by writing the missing numerals in the frames:

◯ + ▭(6) = 13
◯ + ▭ = 13
◯ + ▭ = 13·

▭ + ▭ = 14
◯ + ▭ = 14
◯ + ▭ = 14

◯ + ▭ = 15
◯ + ▭ = 15
◯ + ▭ = 15

▭ + ◯ = 16
▭ + ◯ = 16
▭ + ▭ = 16
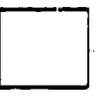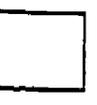
District Resources

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Student Learning Objective(s) __The student knows the addition facts with sums to 18. (mastery)__

State Goal

District Goal

Program Goal

| 1,7,10 |

Related Area(s) _____

Suggested Activities: Grade(s) __3__

	Suggested Monitoring Procedures	Possible Resources

Title:

Group Size: individual

Materials: ditto copy of cut away worksheet or tagboard cut up in squares, scissors (if worksheet is used)

Procedure:

. Cut out the squares. Fit them together so that the edges that touch name the same numbers.

Example:
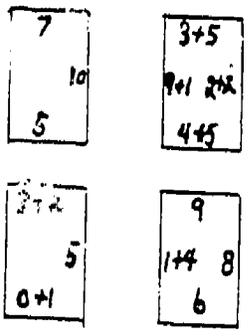
Variation:

. Match other cards to all sides of original card.

Diagram of cut-away worksheet:
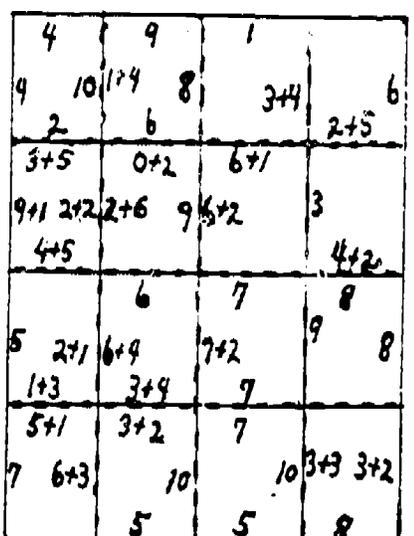
Suggested Monitoring Procedures

Teacher uses flash cards to check facts.

Teacher observes student in math activity.

Paper and pencil test of math facts with sums to 18.

Possible Resources

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 33-34

District Resources

273

Suggested Monitoring Procedures	Possible Resources

Title: Solitary

Group Size: individual

Materials: cards with addition facts to 18
and sums to correspond to the facts.
Include ten, twenty, or twenty-
five facts.

Example: Cards 3"x2"

$6+2$	8
$2+9$	8

Procedure:

. Shuffle the cards.

. Place them face down on the table in a pile.

. Turn up one card at a time, placing it face up on
the table, not in pile.

. When a fact and a sum match place them in a
separate pile face up.

$7+1$	8
$1+2$	8

. Continue until all the cards have been matched.

District Resources

Title: Search 'n Circle

Group Size: individual

Materials: worksheet of Search 'n Circle

Procedure:

. Give copies of this number puzzle to students.

. Ask them to follow the written directions. (See
below.)

   Written directions:

     Circle 10 addition equations.

Variation:

. Circle 10 subtraction equations. Can you find more?

   Example:

$$\frac{7}{9}$$

275

Student Learning Objective(s) __The student knows the addition facts with sums to 18.__   State Goal

State Goal	1,7,10
District Goal	
Program Goal	

_____ District Goal

_____ Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Diagram of Search 'n Circle game:		

Diagram of Search 'n Circle game grid:

4	7	11	9	2	8	10	4	14
9	6	15	8	+7	6	13	+4	9
13	1	12	3	9	2	7	8	5
2	10	12	5	7	9	11	6	4
11	8	19	3	16	1	18	2	1
5	1	6	10	12	8	4	17	+12
6	+8	14	4	10	6	4	9	13
+6	3	9	2	12	9	3	8	8
1?	4	16	-8	8	15	10	-5	5

District Resources

-133-

2?7

	Suggested Monitoring Procedures	Possible Resources

Title: Peek-A-Fact
Group Size: individual
Materials: These cards are made by the teacher:
Two 3"x6" tagboard cards divided
into squares 1½"x1½". Staple the
addition equation on the corres-
ponding answers.

STaple			
9 $+9$	3 $+7$	5 $+0$	6 $+6$
$8+4$	$4+6$	← TOP CARD These are cut individ- ually and stapled on the bottom card where the answer matches the equation.	

STaple			
18	10	5	12
Staple 12	PEEK-A-FACt	3	

Bottom CARD

Procedure:

The student reads the number fact that is on the
top of the card, e.g., (9+9). Then they deter-
mine what they think is the answer and check them-
selves by lifting up the card and find the correct
answer.

District Resources

279

Student Learning Objective(s) __The student knows the addition facts with sums to 18. (mastery)__

Sr̲_____ | 1,7.10

Dis̲_____

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Variation: . Write the number fact, say 9x9, and then the answer you think it is, say 18. Then peek to see if you are right. . Counters can be used if needed. Title: Spin-A-Sum Group Size: pairs Materials: 9x12 sheets that look like the following. These should be laminated or covered with contact paper, crayon. **Procedure:** . Each student needs a sheet like the above and a crayon. In turn, the students spin their own spinner and determine the difference. They then		
		District Resources
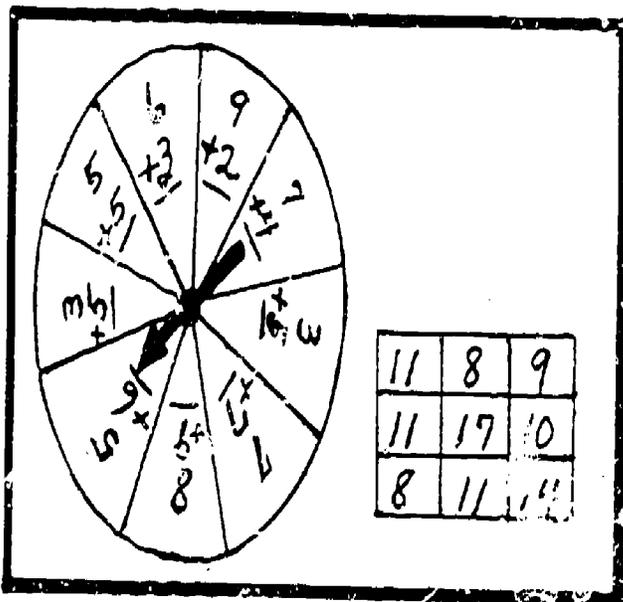
mark the answer with an "x" on the 3x3 grid (e.g.,
the spinner points to +4. The answer, 11, is
marked with an "x" on the grid only once. The

11	8	9
11	17	10
8	✗	14

next player follows the same pro-
cedure on their own 9x12 sheet. The
first player to get 3 in a row wins.
Up and down, across, etc. When they
are finished, the student wipes the
sheet off with a paper tissue for the next player.

Note: See following page for directions on how
to make a spinner.

District Resources

292

293

Of the several ways that spinners may be constructed, the method described below is one of the simplest.

Materials needed: spinner dial(s)
                    chipboard on which to mount spinner dial(s)
                    clear self-stick plastic
                    spinner arrow(s) – ticket board or plastic
                    No. 4 (1 inch) brass fastener(s)
                    small washer(s)
                    plastic drinking straw
                    glue
                    masking tape

Step 1 – Cut spinner dial to fit chipboard or vice versa.

Step 2 – Attach spinner dial to chipboard.

Step 3 – Cover spinner dial with clear self-stick plastic: overlap, fold over, and secure plastic to underside of chipboard (cut off the excess plastic at each corner so that it will fold neatly without "bunching" up).

Step 4 – Make a small slit at the center of each spinner dial with a pointed Exacto blade. (Do not make the slit any larger than needed in order to be able to force through a brass fastener -- see Step 9.)

Step 5 – Cut a 5mm length of plastic drinking straw for each spinner.

Step 6 – Make a small washer from ticket board for each spinner if you do not have a metal washer. (Just punch a quarter-inch hole and trim to a hexagonal shape.)

Step 7 – Make a spinner arrow from ticket board or plastic for each spinner: the arrow should be about one-half inch wide and from two to two and a half inches long. The hole should be punched as nearly in the middle as possible.

Step 8 – Put the piece of straw, arrow and washer on the brass fastener: make sure that the straw is inside the washer and arrow holes and that the arrow is nearest the head of the fastener.

Step 9 – Push the fastener through the slot in the spinner board, bend the fastener prongs flat against the chipboard and use masking tape to hold them in this position.

> If assembled correctly, the small piece of drinking straw will hold the head of the fastener away from the spinner dial and the washer will keep the arrow from rubbing on the dial, allowing it to rotate freely.

294

Student Learning Objective(s) __The student knows that the order in which two numbers are added does__
__not change their sum.   (commutative property) e.g., 3+5 = 8, or 5+3 = 8.__

State Goal	1,7,10
District Goal	
Program Goal	

Related Item(s) _____

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: Fido Facts **Group Size:** individual or small group **Materials:** 11 heavy duty paper plates (small size 20 brads (brass fasteners) brown railroad board 1 9x12 red construction paper glue or rubber cement Teacher makes 20 dog ears from brown cardboard and 10 dog faces (on plates) On each ear write a numeral 0-9. (There will be 2 ears for each number.) On the dog's red tongue write a number 0-11.	Individual students can show teacher commutative property using counters and recording on paper using equations.	D'Augustine, Charles H., _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 85-87 Baratta-Lorton, Mary, _Mathematics Their Way_, Addison-Wesley, 1976, pp. 181-182 Kelley S., Jeanne, _Learning Mathematics Through Activities_, James E. Freel and Associates, Inc., 1973, p. 36

Procedure:

. Students choose a plate, look at the number on the tongue, and find two ears whose sum equal that number. Fasten ears to dog with brads.

The students will see that the sum will remain the same no matter which side of the dog either ear is placed. They will also find that there are various combinations of numbers making one sum.

District Resources

285

286

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: Pebbles In A Bag **Group Size:** small group or whole class **Materials:** paper bag, pebbles Procedure: . Have a student put several pebbles in a bag as the class observes. (Class watches, hears, pebbles drop, and participant feels pebble.) Record the number of pebbles on the board. 1. 3 . Have another student add more pebbles to the bag. Write the number sentence on the board. 2. $3+5=$. Class guesses how many pebbles are in the bag. A student can then remove all the pebbles from the bag and answer the equation. 3. $3+5=8$. Leave the equation on the board, going through steps 1 through 3 again, only reversing the equation to read $5+3=8$. . Have the students "make a rule" about the two equations. (Elicit the law of commutativity.)	Student demonstrates commutativity using objects and recording number sentence.	Marks, John L., _Teaching Elementary School Mathematics for Understanding_, McGraw-Hill, 1965, p. 154 E.S.D. 109 Film: F-1887a "Commutativity" **District Resources** 258
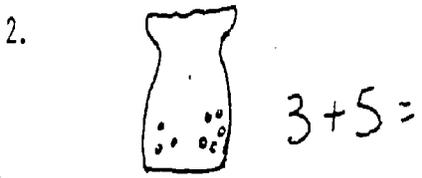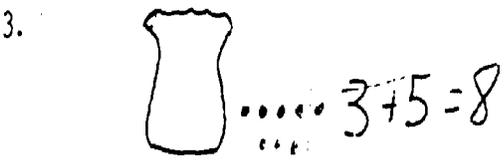
257

Student Learning Objective(s) A. The student knows that when adding three or more numbers the way addends are grouped does not affect the sum, associative property, e.g., (1+2)+4 = 1+(2+4). B. The student is able to add three or more one-digit numbers.

State Goal   1,7,10

District Goal

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Title: Trains		

Suggested Activities: Grade(s) _1_

Title: Trains
Group Size: 4
Materials: 2"x3" cards with numerals 0-4 on the cards

| 0 | 1 | 2 | 3 | 4 |
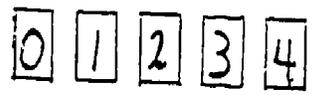
Procedure:

. Three students stand one behind the other, each holding a numeral card. The "conductor" looks at each card and adds orally "2+3=5 and 5+1=6". Then, the "conductor" begins adding the numbers in reverse order, "1+3=4, 4+2=6". If the two sums do not agree, and the "conductor" is wrong, the "conductor" is fired and a new "conductor" takes over. If the "conductor" is right, the "conductor" gets to add again. The "train" picks new or different numbers for the "conductor" to add.

Title: Cops and Robbers
Group Size: pairs
Materials: two sets of cards: one with two facts together, e.g., | 3+1 | | 2+3 | | 0+2 |, etc. One with a single numberal on it, e.g., | 4 | | 5 | | 2 |, etc.

Procedure:

. The "robber" holds two cards, | 2+2 | and | 2 | for example. When the "cop" says "Hands up" the "robber" holds the cards up. If the "cop" cannot name the sum correctly, the "robber" escapes.

Suggested Monitoring Procedures

Mini-Test   "Grouping Property of Addition"
Group Size: one student
Materials: 10 or more counters
Procedure:

. Ask the student to create a physical model of the problem 1+2+4 with counters.
. Student shows:

. Ask student to group counters (1+2)+4, then 1+2(2+4) and compare results.
. Are their sums the same?
. What do you conclude:

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1976, pp. 88-90

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, 1973, pp. 37-38

District Resources

250

299

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Title: **Group Size:** individual, entire class **Materials:** containers such as dixie cups or paper plates or pie plates with numerals on them (1+9); counters, beans or paper straws		
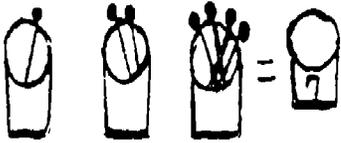
Procedure:

. Students are given straws in a cup with the number of straws labeled on the cup. Students are also given three empty cups in which they rearranged the straws into three different groupings using all the straws. The students record their findings with paper and pencil.

District Resources

Student Learning Objective(s) __A. The student knows that when adding three or more numbers the__

__way addends are grouped does not affect the sum (associative property) (13+12)+14 = 14+(13+12).__

B. The student is able to add three or more one-digit numbers.

Related Area(s)_____

				State Goal	1,7,10
District Goal	
Program Goal	

Suggested Activities: Grade(s) __2-3__ .

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Group-A-Pin **Group Size:** entire class **Materials:** cord or rope for clothesline or edge of box and set of clothespins of 3 different colors. Procedure: . Snap groups of the colored clothespins onto the clothesline or box edge. . e.g., 3 red, 1 yellow, and 2 green clothespins. . Ask how many clothespins altogether. . Then slide middle groups next to the first group. How many? 3+1+4. . Then add the total to the last group (2) to get 6. . You can write the equations on the chalkboard: $(3+1) + 2 = 6$ ⫯⫯ ⫯⟍ ⫯⫯ . Then regroup the clothespins, placing the middle pin with the last group, etc.	Paper and pencil test. Teacher observes students in an activity.	Pagne, Joseph N., _Mathematics Learning in Early Childhood_, National Council of Teachers of of Mathematics, 1976, p. 173 Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, pp. 168-170 --- District Resources

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources

Title: Target Practice
Group Size: small groups or pairs
Materials: 75 by 90 cm tagboard, 5 aluminum foil pie pans and brass paper fasteners
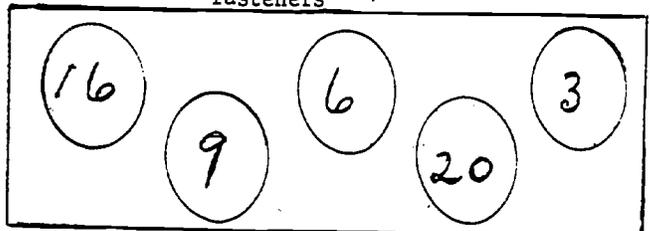
Procedure:
- Make a target - practice board by fastening five aluminum-foil pie pans to the tagboard with paper fasteners.
- For scoring, paint numerals as shown (or with your own variation of) numbers.
- Lay the tagboard on the floor and mark a throwing line 1.5 meters from it.
- Let each student throw three bean bags.
- The student then totals the points scored.
- The student with the highest sum gets a point.
- The first student to get 10 points is the winner.

District Resources

Student Learning Objective(s) __The student is able to add two two-digit numbers without renaming__
__(carrying), e.g., 21+32 = 53.__

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)_____

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Title: Spin-A-Sum Group Size: pairs of students Materials: 9"x12" tagboard worksheets laminated or covered with clear contact paper, two different colored crayons and cleaning rag, spinner with addition problems. 	Teacher checks worksheet with addition of two 2-digit numbers	May, Lola J., Teaching Mathematics in the Elementary School, The Free Press (Macmillan Co.), New York, 1970, pp. 69-74 __District Resources__
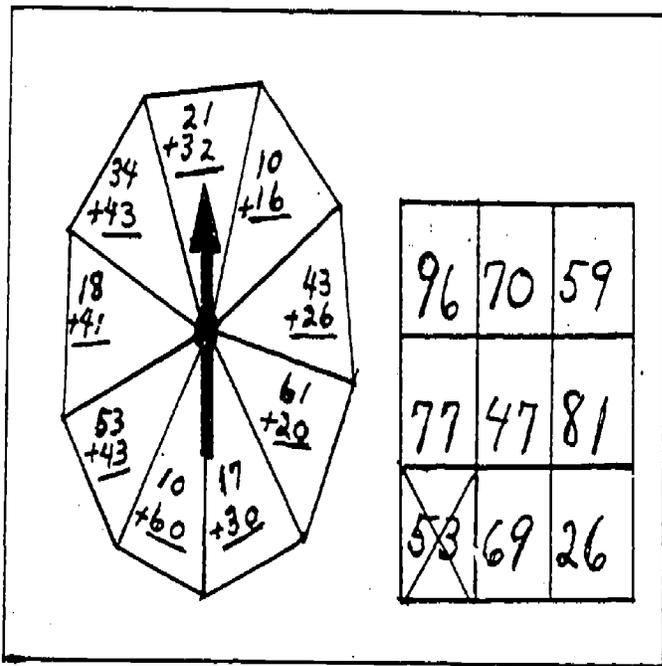
Procedure:

. Teacher gives each student a sheet and crayon,
   and the following directions:
   (a) Each student takes turns spinning the
       spinner and determines the sum.

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
(b) The student then marks the answer with an "x" on the 3X3 grid (e.g., spinner points to 43 and the answer is 69. +26 Student puts an "x" on 69 (only once). (c) The next student follows the same procedure on his/her own sheet. (d) The first student to get 3 "x's" in a row wins. (e) When the game is over, students wipe the sheets off with a tissue or rag. (f) Students should check each other for the correct answers.		

Title: Beansticks
Group Size: small or large group
Materials: beansticks and individual beans
            (beansticks: paste 10 beans on a
            tongue depressor); paper plates
            (white and colored)

Procedure:

. Teacher gives each student three paper plates (one
  should be a different color), and a supply of bean-
  sticks and loose beans.
. Teacher gives students addition problems to solve
  involving two-digit numbers (e.g.,   23
                                      +41
  The beansticks represent units of ten and the loose
  beans units of one.
.. Teacher directs students to place the beansticks
  necessary to add up to the first addend (23 would
  require two beansticks and 3 single beans) in one
  plate. The student then places 4 beansticks and
  one single bean in another plate.(41). On the
  third or colored plate, student joints the two
  sets and finds the total is 6 tens and 4 ones, or

District Resources

300

Student Learning Objective(s) _The student is able to add two 3-digit numbers without renaming_ State Goal

(carrying), e.g., 123 + 234 = 357. District Goal

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s).

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Spin The Answer Group Size: pairs of students Materials: 8½"x11" card with spinner and tic-tac-toe grid with the answer to the problems on the spinner. (Mount on colored paper 9"x12" and laminate.) markers	Paper/pencil test.	Kennedy, Leonard M., _Models for Mathematics in the Elementary School_, Wadsworth Publishing Co., Inc., Belmont, Calif., 1967, pp. 60-62

478	567	547
569	689	889
788	897	657
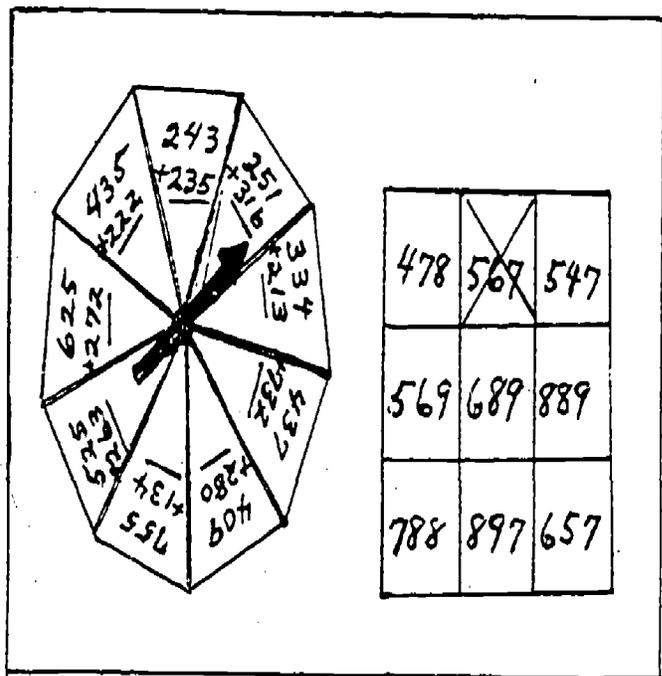
District Resources

Directions: The pairs of students play against each other. Each student has a playing card. Player A spins spinner to a problem, then places a marker on the answer to the problem on the board. Player B follows the same procedure, placing a marker on his own tic-tac-toe chart. The first player to have three markers in a row on a card wins.

301

302

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

303

301

Student Learning Objective(s) <u>The student is able to add three or more 2-digit numbers with a sum</u>   State Goal

<u>of less than 100 without renaming (carrying), e.g., 21 + 23 + 14 = 58.</u>   District Goal

Program Goal

1

Related Area(s) _____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
<u>Title:</u> <u>Group Size:</u> small group of 2-3 students <u>Materials:</u> 3"x4" cards numbered 0-9, a box to hold the cards, a dittoed recording sheet for each student. <u>Example:</u> Student No. 1 Student No. 2		Grossnickle, Foster E., <u>Discoverin</u> <u>Meanings in Elementary School</u> <u>Mathematics</u>, Holt, Rinehart and Winston, 1973, pp. 164-167
		District Resources

Procedure:
- Put the mixed number cards in the box.
- One student picks a card with a number on it and the other students write that digit in any square on their record sheet.
- Put that number card back on the table. (You may put it back in the box if you wish.)
- Continue to draw numbers until all blanks are filled.
- When all blanks are filled, add up the addends.
- The winner is:
  - (a) The player who builds the least sum, or
  - (b) The player who builds the largest sum.

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

3u7

3u9

-150-

ERIC

Student Learning Objective(s) <u>The student is able to add any numbers with two or more digits that</u>
<u>require renaming (carrying), e.g., 26 + 48 = 74.</u>

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
Title: Shopping Group Size: Materials: catalogs: Sear's catalog, seed catalog, toy catalog, discount store catalog, book catalog, camping goods catalog, appliance catalog, automotive parts catalog, sporting goods catalog, etc. Procedure: . Using 3X5 cards, write a series of tasks requiring students to locate items, write amounts, and add numbers in order to solve problems. Example:		Experiences in Mathematical Ideas: Volume 1, National Council of Teachers of Mathematics, pp. 56-61

Bicycle	59.95
Bookcase	34.50
	Total

price of each

District Resources

- Have a sheet on which students can compute and share their answers.
- Students can make a poster advertising the product they choose as the best buy, or
- Show students how to make books containing one coupon for each item they decide to buy.
  Note: If the cards were laminated, the student could solve the problem on the cards.

3ᴜ9

310

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

311

312

Suggested Objective Placement 3-4

...rning Objective(s) __The student is able to add any three or more 2-digit numbers, e.g.,__

__ + 88 = 279.__

State Goal | 1,7,10

District Goal

Program Goal

...a(s)

...tivities: Grade(s) 3-4	Suggested Monitoring Procedures	Possible Resources
Patchwork Snake Size: two or three ...als: fabric, pins, glue, plastic lamination and needles. ...e students sew together scraps of fabric, ...ut a foot in length, to make a long walk ...e". ...ection pin or write a proble (these could ...ted and glued on so the student may write	Paper/pencil test Observe the student in an activity.	Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, p. 171 District Resources
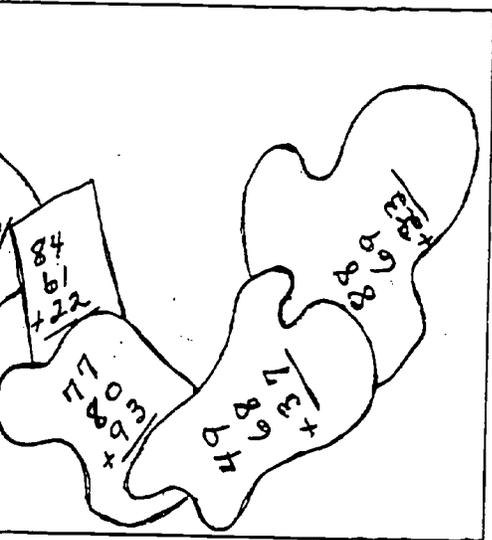
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311

Suggested Activities: Grade(s) 3-4	Suggested Monitoring Procedures	Possible Resources
. To play the game, all players begin at <u>start</u>. A non-playing official will hold the answer sheet to check the answers. . Player throws the dice and moves the number of patches indicated. .·The player must work the problem on which he or she lands and call out the answer. . If the player does not have the correct answer the player must go back to the starting point. . The first player to reach the finish is the winner. Title: Newspaper Idea Group Size: individual or small group Materials: newspapers, scissors, paste, pencil and paper Procedure: . Give students a list of groceries needed for dinner. Have the students locate the advertised price of the items in the newspaper. Then, have them cut and paste their grocery list with the prices to a plan sheet of newsprint. Last, have the students total the price of the items listed.		
Title: Weigh-In Group Size: small group Materials: bathroom scale, paper and pencil Procedure: . Have the students weigh themselves on the scale and record their weight. Then have the students determine the total weight of the group by adding all the individual weights. . Extension: Have students compare their total group weight to the weight of a car, truck, refrigerator, water bed, etc. This will force the students to research (ask questions of the experts or read) about the specific items.		District Resources

315

316

Suggested Objective Placement _____

Student Learning Objective(s) __A.__ The student is able to add two or more 3-digit numbers with | State Goal
renaming. __B.__ The student is able to add two or more 4-digit numbers with renaming. | District Goal
| Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _3-4_	Suggested Monitoring Procedures	Possible Resources
Title: Addition on a Place Value Chart **Group Size:** small group, entire class **Materials:** paper, pencil or crayon, 50 counters Procedure: . Make a place value chart by dividing the paper into 3 parts and labeling each column as shown. . Use these steps to find the sum of Ⓐ numbers that are each less than 500: . (a) Put counters for each number on your chart. (b) Regroup counters if there are 10 or more in a column. Ten ones are replaced by one 10. Ten tens are replaced by one 100. (c) Write the addition problem that is shown by your display. . Choose other pairs of numbers and Ⓑ find their sums.	Paper and pencil test. 385 +455 $\overset{11}{385}$ +455 840	D'Augustine, Charles, <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, p. 105 Kelley, S. Jeanne, <u>Learning Mathematics Through Activities</u>, James E. Freel and Associates, Inc., 1973, pp. 39-40 District Resources
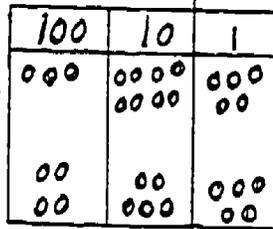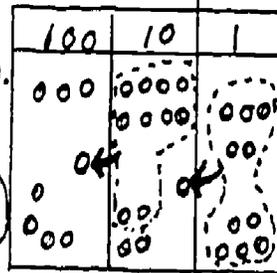
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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

3^{10}_{c}

3^{20}_{c}

SMALL SCHOOLS PROJECT

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Subtraction

			Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

	Page	Suggested Grade Placement
• that subtraction is the inverse of addition.	159-	1-3
• that subtracting zero from a number does not affect the sum.	165	1
• the minuend is the quantity from which another quantity is to be subtracted, i.e., 6 - 3 = 3.	167	1-2
• the subtrahend is the quantity to be subtracted from another, i.e., 4 - 1 = 3.	167	1-2
the subtraction facts with sums less than five. (mastery)	169	1-2
the subtraction facts with sums less than nine. (mastery)	171-	2
the subtraction facts with sums of 18 or less. (mastery)	171-	2-3
• the difference is the result of subtracting one quantity from another, i.e., 5 - 3 = 2.	167	1-2

The student is able to:

	Page	Suggested Grade Placement
• subtract a one-digit number from a one- or two-digit number without renaming (borrowing), i.e., 8 - 2 = 6, 25 - 2 = 23.	175-	1-2
*. subtract a two-digit number from a two-digit number without renaming (borrowing), i.e., 48 - 26 = 22.	175-	1-2
• subtract a one-digit number from a two-digit number requiring renaming (borrowing), i.e., 17 - 8 = 9.	177	2-3
*. subtract a two-digit number from a two-digit number requiring renaming (borrowing), i.e., 37 - 28 = 9.	177	3
• subtract a one-, two- or three-digit number from a three-digit number requiring renaming (borrowing), i.e., 463 - 7 = 456, 463 - 27 = 436 and 463 - 187 = 276.	179	3

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

322

323

Student Learning Objective(s) __The student knows that subtraction is the inverse of addition.__

State Goal	1,7,10
District Goal	
Program Goal	6,7

Related Area(s)_____

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Title: Blastoff **Group Size:** individual or entire class **Materials:** duplicated rocket worksheet Procedure: . Student makes the rocket blast off by working problems correctly from bottom to top. **Variation:** . Teacher draws rocket on blackboard and students place answers on a separate piece of paper.	Teacher observation Paper-pencil test Student verbalization **Mini-Test:** "Related Sentences" **Group Size:** entire class **Materials:** exercises to develop the related subtraction sentences from given addition sentences Procedure: . Write the related subtraction sentences for: $3 + 4 = 7$ _____ $4 + 3 = 7$ _____	Addition and Subtraction Are Related, (filmstrip), Audio-Visual Division, Holt, Rinehart and Winston, Inc. District Resources
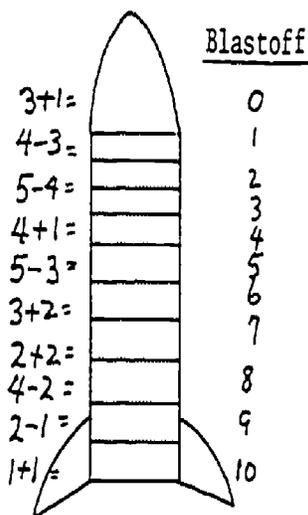
324

325

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources

Title: Pebble Bag
Group Size: whole class or small group
Materials: paper bags, pebbles

Teacher observation.

Students record the other's results.

Teachers check recorded results.

Procedure:

- Pre-determine an equation, such as $3 + 5 = 8$.
- Call on student to put 3 pebbles in a bag (class will <u>see</u> and <u>hear</u> pebbles drop into bag). Draw a bag on the board with 3 pebbles in it.
- Another student can <u>add</u> 5 more pebbles to the bag. As he/she does, the teacher <u>adds</u> a set of 5 pebbles to the board drawing.

Board Drawing:
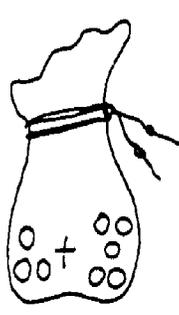
- Ask: "How many pebbles are in the bag? Someone prove it."
- A student can take the pebbles out of the bag, dropping each on the table while the class counts aloud. Put all 8 pebbles back in the bag.
- Restate the addition equation. Show the inverse by having students remove 3 pebbles (erase set of 3 on the board, having class participate in same manner).
- Remove the remaining pebbles, which the students discover will be <u>5</u> by counting. Write equation under drawing $8 - 3 = 5$.

District Resources

327

-1

Student Learning Objective(s) _The student knows that subtraction is the inverse of addition._

State Goal	1.7.10
District Goal	
Program Goal	6,7

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_

Suggested Monitoring Procedures	Possible Resources
Teacher observation.	_Mathematics for Elementary School Teachers_, National Council of Teachers of Mathematics, 1966, pp. 71-73
Paper-pencil test.	
Student verbalization.	

Title: Number Trail
Group Size: individual or entire group
Materials: duplicated number trail

Procedure:
. Have students work through the trail to find the
  ending number by adding or subtracting the number
  indicated. Example of trail:

Start   End

[9]   [ ]

(+9)   (-9)   (+3)   (-6)   (+6)   (-3)

District Resources

Variation:
. Supply the ending number and have students work
  through to find the starting number.

3⌇⌇

3⌇⌇

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

330

331

Suggested Objective Placement ___1-3___

Student Learning Objective(s) ___The student knows that subtraction is the inverse of addition.___

State Goal	1,7,10
District Goal	
Program Goal	7,6

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: Basic Fact Wheel **Group Size:** pairs of students **Materials:** tagboard, compass, scissors, Procedure: . Each student begins with ten points, chips or any object that could refer to points. . The first student takes his/her turn by moving the window on the wheel spinner, adding 4 to show a number (2, for example); the second student gives the answer 6. A point is lost if the answer is incorrect. . Turns alternate in choosing the basic facts. The answer to each basic fact will appear in the window on the opposite side of the wheel as:	Give ten problems in the form 4+2=6. The student should give subtraction form 6-2=4.	Kennedy, Leonard M., _Models for Mathematics in the Elementary School_, Belmont, California, Wadsworth Pub. Co., Inc., 1967, pp. 80-82

. The game ends when one student has lost all the points. Notice that one side of the basic fact wheel shows one operation; the other side shows the opposite operation.

Title: Flash Cards
Group Size: pairs
Materials: tagboard, felt marker

Procedure:
. Make flash cards with addition facts on one side and subtraction opposite on the other side.
Example:

Front   Back

```
 _____        _____
|            |      |  6-2       |
|   4 +2     |      |  6-4       |
|_____|      |_____|
```

. Give each pair of students 20 cards. One student flashes and the other student gives the opposite fact(s) in subtraction or addition form. If the student gives the right answer, he/she gets the card.
. After each student has the opportunity to be a flasher, each adds their total cards. The one that has the most cards is the winner.

District Resources

Student Learning Objective(s) __The student knows that subtracting zero from a number does not__ __affect the sum.__

State Goal	1,7,10
District Goal	
Program Goal	6,7

Related Area(s) _____

Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Concentration Group Size: 2 or 3 players Materials: make two sets of cards, one with equations where 0 is subtracted from a number--example: 4-0=? 5-0=? Second set of cards will have the corresponding answer to the equation cards--example: 4 5	Paper-pencil test, or students give verbal response to flash cards. Mini-Test: "Subtracting Zero" Group Size: entire class Materials: exercise in sub- traction with zero as the subtrahend Procedure: . Ask students to circle problems where the difference is the same as the minuend. Example:	Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, p. 190

Procedure:
- Teacher shuffles both sets of cards together and lays all cards face down in 5 or 6 rows.
- Student, in turn, turns two cards over.
- If cards match, student keeps the pair and gets another turn.
- If the cards do not match, they are placed face down in former positions.
- The game ends when all cards have been taken by the players and the student with the most pairs wins.

6	2	8	5	9
-0	-1	-2	-0	-8

District Resources

336   337

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __A. The minuend is the quantity from which another quantity is to be__ | State Goal

__subtracted, i.e., 6-3=3. B. The subtrahend is the quantity to be subtracted from another, i.e.,__ | District Goal

__4-3=1. C. The difference is the result of subtracting one quantity from another, i.e., 5-3=2.__ | Program Goal

Related Area(s) _____

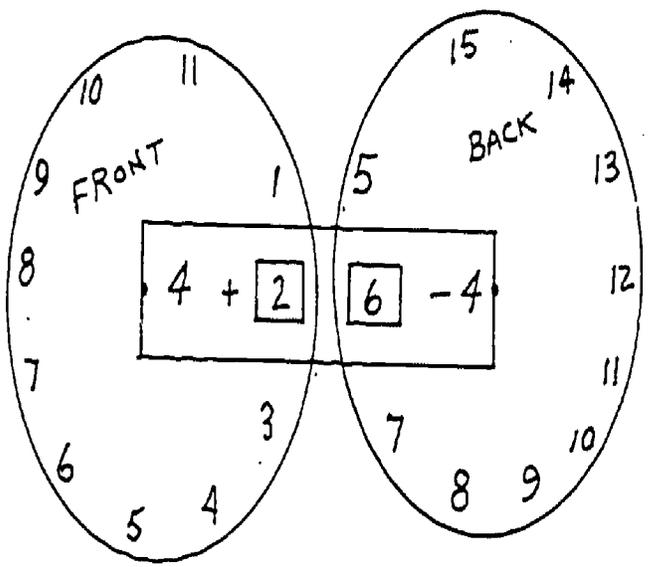| Suggested Activities: Grade(s) _1-2_	Suggested Monitoring Procedures	Possible Resources
Title: Number Sentence Vocabulary (Subtraction) **Group Size:** entire class **Materials:** paper, pencil, counters, word names on tagboard for: minuend / subtrahend symbols on tagboard for: "+" and "-"	**Mini-Test:** "Vocabulary in a Subtraction Sentence" **Group Size:** entire class **Materials:** see exercise below	Pagne, Joseph N., _Mathematics Learning in Early Childhood_, N.C.T.M., 1976, pp. 168-169 D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 112-113 Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, p. 175 _Mathematics for Elementary School Teachers_, N.C.T.M., 1966, p. 71

Procedure:
- Teacher and students form a physical model for 5-3=2.
- Teacher and students write the number sentence for 5-3=2.
- Teacher and students read the number sentence together: "five minus three equals two"
- One student places the word name card for |minuend| on the chalkrail beneath 5.
- Another student places the card for |-| between the two numbers.
- Another student places the card for |subtrahends| on the chalkrail beneath the number 3.
- Another student places the symbol card |=| in position.
- Another student places the word name for |difference| below the number 2.

Procedure:
- Ask students to do the following in the number sentence 5-2=3:
- Draw a circle around the minuend.
- Enclose the subtrahend with a triangle.
- Place a box or square around the difference.

District Resources

3 10

3 11

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

312

313

Suggested Objective Placement ___1___

Student Learning Objective(s) ___The student knows the subtraction facts with sums less than five. (mastery)___

Related Area(s) _____

State Goal	1,7,10
District Goal	
Program Goal	2,6

Suggested Activities: Grade(s) ___1___

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Spin-A-Difference **Group Size:** pairs of students **Materials:** 9" x 12" sheets, laminated or covered with contact paper, 2 crayons Procedure: • Give one sheet to each student. • Teacher directs students to spin his/her spinner and determine the difference. • The student marks the answer with an "X" on the grid (inset) only once. • The next player does the same with his/her own sheet. • The first player to get 3 in a row wins. • When finished, students wipe the sheets off with a tissue for the next players.	Mastery of subtraction facts with sums less than 5 implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 5 minus 2?" or if shown $\begin{array}{r}5\\-2\end{array}$ or $\boxed{5-2}$ in written form the student responds instantly from memory. Check one student at a time.	May, Lola J., _Teaching Mathematics in the Elementary School_, New York: The Free Press (Macmillan Co.), 1970 pp. 61-67 Baratta-Lorton, Mary, _Mathematics Their Way_, Addison-Wesley, 1976, pp. 221-224 **District Resources**

	Suggested Monitoring Procedures	Possible Resources

Title: Peek-A-Fact
Group Size: individual
Materials: 3"x6" cards made by teacher

Procedure:
. Staple the top card to the bottom card where the answers match the equation.

STAPLE HERE   STAPLE HERE

4 -3	2 -1	3 -0	5 -3

TOP CARDS — these are cut individually and stapled onto the bottom card where the answers match the equation.

1	3	3	2
—	PEEK-A-FACT		

BOTTOM CARD

. Student reads the number fact that is on the top of the card (e.g., 4-3).
. Student then determines the answer and checks by lifting up the card and finding the correct answer.

District Resources

Student Learning Objective(s) __A. The student knows the subtraction facts with sums less than nine.__   State Goal

__B. The student knows the subtraction facts with sums of 18 or less.__   District Goal

_____   Program Goal

Related Area(s) _____

State Goal	1,7,10
District Goal	
Program Goal	6

Suggested Activities: Grade(s) _2-3_

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Barn Spin Group Size: individual or teams of two and four Materials: make barn wheel and subtraction cards from heavy tagboard (fold up on dotted line to hold cards) Attach wheel to barn with paper fastener. Have subtraction facts on cards.	Mastery of subtraction facts with sums to 18 implies that a student responds to oral or written queries without hesitation. That is, if asked, "What is 13-7?" or if shown $\begin{array}{r}13\\-7\end{array}$ or $\boxed{13-7}$ in written form, the student in written form, the student responds instantly from memory. Check _one_ student at a time.	May, Lola M., _Teaching Mathematics in the Elementary School_, New York The Free Press, (Macmillan Co.), 1970, pp. 61-67 District Resources
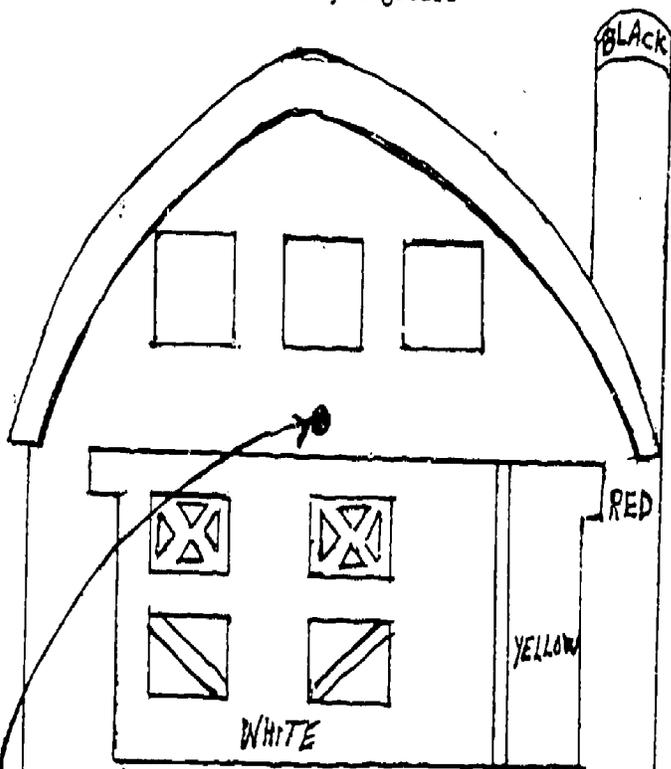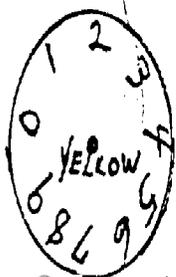
319

Suggested Activities: Grade(s) _2-3_	Sugges... Monitoring Procedures	Possible Resources

Procedure:
- Teacher deals the cards to the students or teacher can select one student to deal.
- Each student takes turns spinning the spinner. The player tries to spin a sum that is found on one of the playing cards. If the sum matches the card held by the player, the subtraction card is placed in the barn pocket.
- The object is to get rid of all the cards.

Title:	Subtract A Square
Group Size:	Individual
Materials:	worksheet

Procedure:
- Teacher directs student to fill in the correct answer in the blank squares.

Subtract A Square

9	6	3
5	2	3
4	4	

- Teacher directs students to subtract across and down.

District Resources

Student Learning Objective(s) __A. The student knows the subtraction facts with sums less than__ | State Goal | 1,7,10

__nine. (mastery) B. The student knows the subtraction facts with sums of 18 or less. (mastery)__ | District Goal

Program Goal | 6

Related Area(s)_____

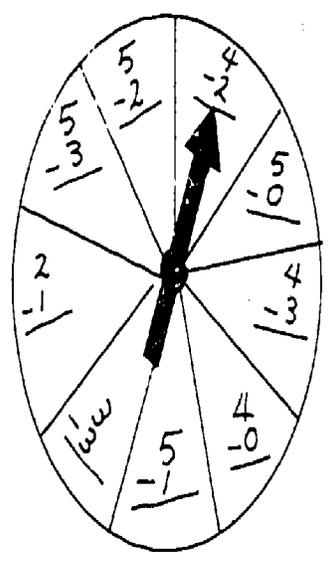| Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Subtraction Cards Group Size: small group Materials: write 20 subtraction combinations on cards with sums less than nine; write the answers on 20 other cards.	See previous page for suggested procedure.	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, NCTM, 1976, pp. 178-180

Procedure:

. Teacher mixes the cards and deals six to each of
four players (teacher may select one student to
deal).

. Teacher directs students to lay the remaining cards
in the set of 40 face down on the table. For ex-
ample, suppose the following were one player's
cards:

$$\begin{array}{|c|}\hline 15 \\ -5 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 8 \\ -4 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 10 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 18 \\ -8 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 4 \\ \hline \end{array}$$

District Resources

. The student may lay down one pair (15-5) or (18-8)
with the same answer card (10), as only one combin-
ation card and one answer card may be used at the
same time.

. Teacher directs student to tell the other player
that he/she has a 15-5 and wants its answer. If
the other player has the card, he must give it to
the requesting player and the first player then
puts down another pair.

. The player may continue to call for a combination
card until he/she fails to receive a mate for it.

3̄5̄2̄

3̄5̄3̄

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Then the player must draw. If the card drawn is a match, player may draw again. If card is not a match, player gives up turn. . The first player to lay down all the cards in pairs is the winner.		
		District Resources

3C1

3C5

Student Learning Objective(s) __A. The student is able to subtract a one-digit number from a two-__ State Goal

__digit number without renaming (borrowing), e.g., 25-2=23. B. The student is able to subtract a two-__ District Goal

__digit number from a two-digit number without renaming (borrowing), e.g., 48-26=22.__ Program Goal

	1,7,10
	1,2,6

Related Area(s) _____

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: Bean Sticks and Beans **Group Size:** any number **Materials:** bean sticks (10 beans glued to a tongue depressor), beans, ditto worksheet or laminated card (for individual work) Procedure: . Teacher demonstrates to the students how to use the bean sticks as 10's units and the loose beans as one's units when computing answers to problems on worksheets. . Leave space by each problem to lay out beansticks and beans. Example:	Paper-pencil test. Teacher observes students making new sets using bean sticks and beans and recording answer.	Pagne, Joseph N. (editor) Mathematical Learning in Early Childhood, NCTM, 1976, pp. 175-177. District Resources
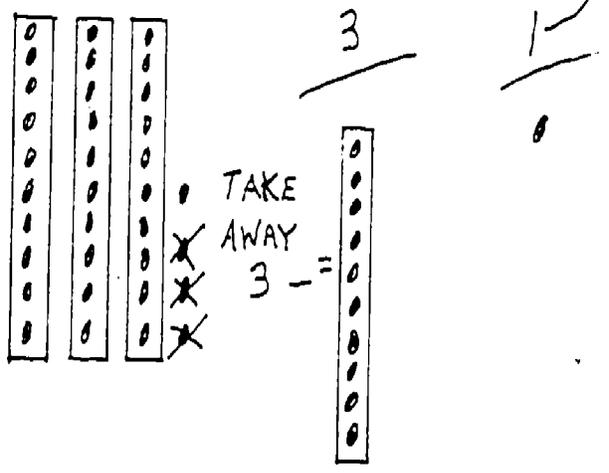
Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) A. The student is able to subtract a one-digit number from a two-
digit number, requiring (borrowing), e.g., 17-8=9. B. The student is able to subtract a two-digit
number from a two-digit number, requiring renaming (borrowing), e.g., 37-28=9.

Related Area(s)_____

State Goal	1,7
District Goal	
Program Goal	6

Suggested Activities: Grade(s) 2-3

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Stump The Experts **Group Size:** entire class **Materials:** duplicated worksheet of items like those shown below: $\begin{array}{r}34\\-6\\\hline 28\end{array}$ $\begin{array}{r}41\\-7\\\hline 33\end{array}$ $\begin{array}{r}36\\-8\\\hline 28\end{array}$ $\begin{array}{r}25\\-7\\\hline 16\end{array}$ $\begin{array}{r}94\\-8\\\hline 86\end{array}$ $\begin{array}{r}86\\-9\\\hline 67\end{array}$ $\begin{array}{r}20\\-3\\\hline 17\end{array}$ $\begin{array}{r}77\\-8\\\hline 59\end{array}$	Paper-pencil test on these types of problems. Record success on practice sheets with suggested types of problems.	

Procedure:
- Teacher directs students to circle the incorrect answers and write correct answer below. Several students could have a race to see who finishes first, or work against the clock.

Extension:
- Include the subtraction of two-digit numbers from two-digit numbers requiring renaming.

Variation:
- Make worksheet with two-digit numbers subtracted from two-digit numbers requiring renaming, i.e.,

$\begin{array}{r}34\\-16\\\hline 18\end{array}$ $\begin{array}{r}26\\-17\\\hline 9\end{array}$ $\begin{array}{r}45\\-26\\\hline 19\end{array}$

- Have students circle incorrect answers and write correct answer below.

District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

302

303

Student Learning Objective(s) A. The student is able to subtract a one-, two- or three-digit

number from a three-digit number, requiring renaming (borrowing), e.g., 463-7=456; 463-27=436 and

463-187=276.

Related Area(s)

State Goal	1,7,10
District Goal	
Program Goal	6

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Subtraction 500 Group Size: individual or pair of students Materials: racetrack with worksheets Procedure: . On a bulletin board or large table make a racetrack with Start, Finish and four pit stops. . At the Start, and each pit stop, place an envelope with five subtraction problems more difficult at each stop. or example, Start--should have problems in which a one-digit number is subtracted from a 3-digit number; pit stop #1, problem in which a 2-digit number is subtracted from a 3-digit number; at pit stop #2, etc. . Each student begins with the start sheet. When these problems are correctly solved, the student moves the car to the first pit stop, solves problems and moves to the next pit stop, and so on until he/she has finished the race. . Choose one student to be official "checker" for each pit stop. Give that student an answer sheet for the problems. 		Experiences in Mathematical Ideas, Volume 1, NCTM, 1970, pp. 62-65 Grossnickle, Foster E., Discoverin Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 176-177 District Resources

304.

305

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources

SUBJECT: ___Mathematics___

SPECIFIC AREA: ___Whole Numbers: Multiplication___

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4

The student knows:

- that multiplication can be pictured as the combination of equal sets.
- a factor is one of two or more quantities having a designated product.
- a product results when two numbers are multiplied.
- the product of any number multiplied by the factor of zero is zero (6 x 0 = 0).
- the product of any number multiplied by the factor of one is that number (3 x 1 = 3).
- *. the multiplication facts with products through 81 (mastery).

Item	Page	Grade
sets	183	3
factor	185	3
product	185	3
zero	187	3
one	189	3
facts	193	3-5

The student is able to:

*. multiply one-, two- and three-digit numbers by a one-digit
number: 4 x 5 = 20   22   222
                      x5   x 5
                      110   1,110

- estimate products using concepts of "greater than" and less than".

Page	Grade
195	3-5
	4-6

The student values:

- the quick and accurate recall of facts.

Grade
3-8

-181-

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

ROJECT

...ning Objective(s) __The student knows that multiplication can be pictured as the__   State Goal

..of equal sets. _____   District Goal

_____ Program Goal

(s)_____ graphs, science _____

State Goal	1,7,10	
District Goal		
Program Goal		

...tivities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
..Size: large group ..als: use 1/2" graph paper, overhead projector transparency ..the squares that represent the multiplica- ..binations you have selected. ..d or overhead projector to introduce the .. Using graph paper, show the combinations. 3 X 3 = 9 X 3 = 6	Mini-Test: "Showing Multiplica- tion Through Equal Sets: Group Size: entire class Materials: pencil and paper Procedure: . Make a drawing to show 3 x 2 by means of sets Solution 3 x 2	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 181-183 Kelley S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 70 and p. 77 Teaching Elementary School Mathematics for Understanding, Marks, Purdy and Kinney, ch. 6, pp. 125-157 Number Line Peg Board Bead Frame
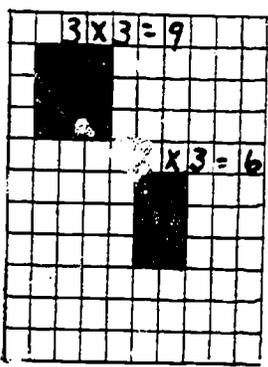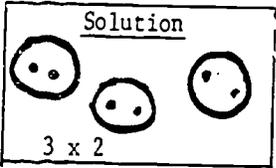
District Resource

372

371

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources

Title: Multiplication Using Sets
Group Size: entire class
Materials: three disjoint sets, i.e., sets in which no member belongs to any other set

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 34

Procedure:

. Ask each student to determine the number of items in each of the three sets.

. Write the multiplication sentences for the three sets., e.g.,

$$3 \times 2 = 6$$

No. of
$$\boxed{Sets} \times \boxed{\begin{array}{c}No. \\ in \\ each \\ set\end{array}}$$
$$\boxed{Product}$$
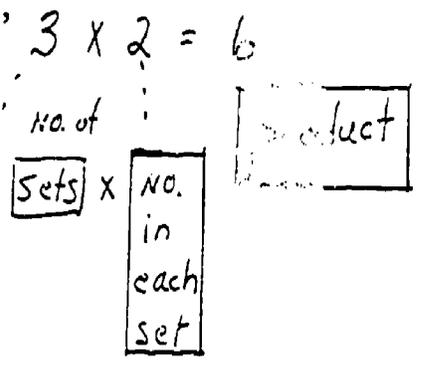
District Resources

Student Learning Objective(s) <u>A. The student knows a factor is one of two or more quantities having</u> State Goal

<u>a designated product. B. The student knows that a product results when two numbers are multiplied.</u> District Goal

Program Goal

	1,7,1?

Related Area(s)___

Suggested Activities: Grade(s) ___	Suggested Monitoring Procedures	Possible Resources

Title: Multiple Ways of Reading Multiplication Sentences
Group Size: small group or entire class
Materials: counters
 	
Procedure:
. Have students make an array to show six sets of five counters.   .....
. Then have students write the   .....
   multiplication sentences that   .....
   describe their picture.   .....
. Have students read these number   .....
   sentences together: "Six times 5 equals 30."
         $6 \times 5 = 30$
. Have students read to indicate they know how to describe these sentences using the terms <u>factors</u> and <u>product</u>:
    "The <u>product</u> of the <u>factors</u> 6 and 5 equals 30."
		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 183
		
		D'Augustine, Charles, <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, p. 136
		
		District Resources

3.?

3.?

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

3.7

3.8

Student Learning Objective(s) __The student knows the product of any number multiplied by the factor__ | State Goal
__of zero is zero, e.g., 6 x 0 - 0.__ | District Goal | 1,7,10
| Program Goal

Related Area(s)_____

Suggested Activitie Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources
Title: Using Zero as A Factor Group Size: entire class Materials: overhead projectors Procedure: . Use an overhead projector or chalkboard to develop examples such as the following with the students: $2 \times 2 = 4$ $1 \times 2 = 2$ $0 \times 2 = 0$. Do several more examples such as 2 x 0, 3 x 0, 5 x 0, to develop what happens to the products when 0 is used as a factor.	Mini-Test: "Factors of Zero" Group Size: entire class Materials: exercise with a variety of one-digit factors including zero Procedure: . Students are to circle all problems where the product is "0". Example: 0 8 4 5 1 x1 x0 x1 x2 x7	May. Lola J., <u>Teaching Mathematics in the Elementary School</u>. The Free Press: (Macmillan Co.), New York, 1970, pp. 104-105 Marks, John L., <u>Teaching Elementary School Mathematics for Understanding</u>, McGraw-Hill, 1965, pp. 136 Pagne. Joseph N. (editor), <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics. 1976, p. 154

Suggested Activities: Grade(s) ___3___	Suggested Monitoring Procedures	Possible Resources
Title: Special Property of Zero **Group Size:** entire class or small groups **Materials:** paper cups, buttons or beans Procedure: . Divide the class or group and give them six cups and twelve buttons or beans. Have each group use four of the six cups and place two buttons or beans in each cup. Ask them how many cups they are using, how many buttons or beans are in each cup and how many buttons or beans in all. Write a multiplication sentence on the board showing the total number of beans. . Have the groups use three cups with <u>no</u> buttons or beans. Ask them how many cups they are using and how many buttons or beans in all. . Have a student write a multiplication sentence on the board showing how many buttons or beans in all. Repeat this procedure until the concept of zero as a factor is well understood.		
		District Resources

3 1

3 2

Student Learning Objective(s) __The student knows the product of any number multiplied by the__
__factor of one is the number, e.g., 3 x 1 = 3.__

State Goal | 1,7,10

District Goal

Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources
Title: One As A Factor **Group Size:** entire class **Materials:** overhead projector, 1/2" graph paper Procedure: . Teacher draws a grid on the overhead, similar to students' graph paper. . Teacher gives multiplication problem (e.g., 3 x 1) and teacher marks it off on the grid and students on their graph. . Teacher gives students various problems using the factor of one (e.g., 1 x 3, 1 x 2, 2 x 1, etc.) Grid on overhead and graph paper.	**Mini-Test:** "Factors of 1" **Group Size:** entire class **Materials:** Exercise with a variety of one-digit factors including 1 Procedure: . Students are to circle all problems where one factor neither increases or decreases the other factor. **Example:** 0　　5　　2　　1　　4 x2　　x1　　x7　　x6　　x0	Marks, John L., Teaching Elementary School Mathematics for Understanding, New York, McGraw-Hill Book Co., 1970, p. 1 D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 140 --- **District Resources**

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources

Title: Bean Bag Toss
Group Size: pairs of students
Materials: 2 bean bags, matrix draw
on butcher paper or made with mask-
ing tape on the floor, multiplica-
tion facts are on the matrix

Procedure:

Matrix drawn on
paper on floor.

7×1	1×2	6×1
3×1	1×5	12×1
10×1	1×9	4×1

. Each player tosses a bean bag and tells the answer
to the combination in that square. The player
having the greater product scores a point.
. If the products are equal, neither player scores
a point. The player with the most points wins
the game.

Student Learning Objective(s) _The student knows the product of any number multiplied by the factor_   State Goal | 1,7,10

of one is the number, e.g., 3 x 1 = 3.   District Goal

_____   Progra Goal

Related Area(s)_____

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Factor of One **Group Size:** small group/entire class **Materials:** crayon, newsprint Procedure: • Have students draw an array to show 1 x 4 = 4 and label their drawing. • Have students draw an array to show 4 x 1 = 4 and label their drawing. • Have students aw an array to show 1 x 7 = 7, label it, and so on.		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 183
		District Resources

357

339

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

300

Student Learning Objective(s) <u>The student knows the multiplication facts with products through</u>   State Goal

<u>81 (mastery).</u>

District Goal

Program Goal

1,7,10

Related Area(s)_____

Suggested Activities: Grade(s) 3-5	Suggested Monitoring Procedures	Possible Resources
Title: Egg Carton Multiplication **Group Size:** partners **Materials:** egg carton 81 counters Procedure: · [7's] Start by putting 7 counters in one pocket. ·· Write the multiplication fact $\begin{array}{r}7\\ \times 1\\ \hline 7\end{array}$ · Put 7 counters in the second pocket, and so on until counters have been put in each of 9 pockets. · Write the multiplication fact that is shown by the display each time counters are put in another pocket. · [8's] Do the same thing with sets of 8 counters. · [9's] Do the same thing with sets of 9 counters. 301	<u>Mastery of Multiplication facts</u> implies that a student responds to oral or written queries without hesitation. That is, if asked, "What is 6 times 7?" or shown in written form 6x7 or $\begin{array}{r}6\\ \times 7\end{array}$ the student responds instantly.	Pagne, Joseph N. (editor), <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, pp. 184-186 Kelley, S. Jeanne, <u>Learning Mathematics Through Activities</u>, James E. Freel and Associates, Inc., 1973, pp. 72-73 D'Augustine, Charles, <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, p. 147 District Resources 302
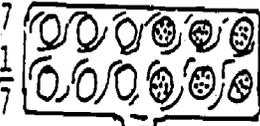
Suggested Activities: Grade(s) 3-5	Suggested Monitoring Procedures	Possible Resources

Title: Products Race
Group Size: partners
Materials: multiplication-charts

Procedure:

. Complete the multiplication chart below by writing the product where the row and the column for the factors meet.

X	8	0	6	2
3				
5				
8				
7				

. Play "Product Race" with a friend.
. Write four factors across the top of one of the blank charts and four factors at the side. Use factors that are less than 10.
. Trade charts with your friend. See who can complete the other's chart first.

X				

District Resources

Student Learning Objective(s) ___The student is able to multiply one-, two- and three-digit numbers by___ State Goal

a one-digit number: 4x5=20   22   222

$$\begin{array}{r} 22 \\ \times 5 \\ \hline 110 \end{array} \qquad \begin{array}{r} 222 \\ \times 5 \\ \hline 1110 \end{array}$$

District Goal

Program Goal

1,7,10	

Related Area(s) _____

Suggested Activities: Grade(s) __3-5__	Suggested Monitoring Procedures	Possible Resources
Title: Multiplication Toss **Group Size:** partners **Materials:** 3 cubes marked from 1 through 6 10 counters Procedure: . Roll the cubes. One player arranges them for the other player to solve. . Then the other player arranges them in a different order to make a problem for the first player to solve. In each case, the factor must be less than 10. . Each time a problem is solved correctly, the player takes a counter. . The winner is the player who receives 5 counters first.		D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, pp. 150-151 District Resources

3°5

3°°

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

307

308

SUBJECT: _____ Mathematics

SPECIFIC AREA: _____ Whole Numbers: Division

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4

The student knows:

. that division is the inverse of multiplication.	199-	3-4					
. the basic division facts (mastery).	203	3-5					

The student is able to:

. divide a one- or two-digit number by a one-digit number without remainders.	205	3-4					

The student values:

. the quick and accurate recall of facts.	207-	3					

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

400

401

Student Learning Objective(s) __The student knows division is the inverse of multiplication.__   State Goal

_____   District Goal | 1.7.10 |

_____   Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) __3-4__	Suggested Monitoring Procedures	Possible Resources

Title: Blocks and Boxes
Group Size: small group
Materials: 12 blocks for each student, 3 boxes for each student
 	
Procedure:
. Give the students each 12 blocks and 3 small boxes. The students are to fill the boxes with 4 blocks in each box. Ask students how to find the number of boxes needed and develop the sentence:
_____ x4=12.
. Then explain another way to find the answer. Since we are dividing 12 blocks into groups of four, we can write 12÷4=_____ . Ask students to find the missing factor in _____ x 4 = 12 and explain that 12÷4=3.
 	
Grades 3-4
 	
Title: Division Wheel
Group Size: individual or small group
Materials: tagboard, compass, scissors, brass fasteners (pairs). Make 2 circles of tagboard and paste them together. On the face write the numbers 1 through 9 and on the reverse, write the product of 1 through 9 multiplied by the factor you are working with. (Example: Using 8 as the factor, the numbers would be 8, 16, 24, etc.) Cut a
	Mini-Test: "Showing Division as the Inverse of Multiplication
	Group Size: one student
	Materials: 12 or more counters
	Procedure:
	. Use your counters to form an array to show 3x4=12
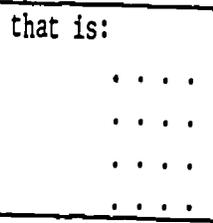	
	that is:
	. . . .
	. . . .
	. . . .
	. . . .
	
	. Now use this array to show 12÷4=3.
	  . In this number sentence what does the 12 refer to? (the entire set or product)
	  . What does the 4 refer to? (the number in each set)
	  . What does the 3 refer to? (the number of sets)
		May, Lola J., _Teaching Mathematics in the Elementary School_, New York: The Free Press (Macmillan Co.), 1970, pp. 117-124
		
		Marks, John L., _Teaching Elementary School Mathematics for Understanding_, McGraw-Hill, 1965, pp. 126-138
		
		Pagne, Joseph N., _Mathematics Learning in Early Childhood_, National Council of Teachers of Mathematics, 1976, p. 187
		
		District Resources

Suggested Activities: Grade(s) __3-4__	Suggested Monitoring Procedures	Possible Resources

around the wheel. On the face side write "8x" and on the reverse side, "÷8". Cut windows in the strip to show the numbers. (See diagram.) Attach the strip with a brass fastener.

FRONT   BACK
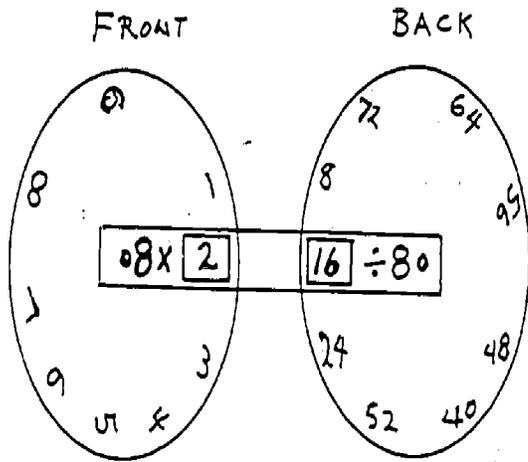
Procedure:
- Each student begins with 25 points. The first student takes a turn by moving the window on the wheel spinner (multiplying) to show a number (e.g., 2). The second student gives the answer (16). A point is lost for an incorrect answer. Turns alternate. The answer to each basic fact will appear in the window on the opposite side of the wheel as shown.
- The game ends when one student has no points left.

District Resources

401   405

Student Learning Objective(s) The student knows division is the inverse of multiplication.   State Goal

| | | | 1,7,10 |

District Goal

Program Goal

Related Area(s)

Suggested Activities: Grade(s) 3-4	Suggested Monitoring Procedures	Possible Resources
Title: Concentration **Group Size:** 2-4 for each set of cards **Materials:** set of Concentration cards -- sets need not be the same, but should be set up as follows: (a) 20 to 30 cards (b) separated into 2 equal stacks (c) make matching pairs of cards -- on one card a multiplication fact (2x6 or 2x6=12) and on the other card the division fact that is the inverse of the multiplication fact (12÷6 or 12÷6=2). Be careful not to duplicate facts (e.g., don't use the above cards, and cards for 6x2 and 12÷2, in the same set unless students are quite experienced with the concept.	Paper-pencil test as follows: A random list of multiplication facts in the left-hand column -- without answers. In the right-hand column, a list of matching division facts in a different order. Students are to draw lines from each multiplication fact to the matching division fact. Example: 4x6 30-5 5x2 24-8 3x8 28-7 4x7 24-6 6x5 10-2 Record the number correct.	Kelley, S., Jeanne, <u>Learning Mathematics</u> Through <u>Activities</u>, James E. Freel and Associates, Inc., 1973, p. 79 District Resources

Procedure:

. Mix cards thoroughly.

. Place cards in rows, upside down on the playing surface.

. First player turns over any 2 cards, laying them down in place. If they match (e.g., 2x6 and 12÷6) the player can pick them up. If they don't match, they must be turned over and left in place.

. The next player turns over any 2 cards of his/her choice. If they match, they are picked up; if not, they are turned over again.

. Players continue until all matching pairs have been picked up.

407

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

4:8

4:3

Student Learning Objective(s) __The student knows the basic divi

_____

_____

Related Area(s)_____

_____

Suggested Activities: Grade(s) _3-5___ | Sugg
                                                             | __P:

Title: Chalkboard Race   Master
Group Size: two small groups or teams   that ε
Materials: Chalk and chalkboard   or wri
                                                           itatic
'rocedure: "What
. Write two sets of numbers on the board, e.g.,   if sho
  ☐ ÷ by 6 $\frac{18\quad 36\quad 42\quad 54\quad 6\quad 24}{}$ form,
                                                           instan

  ☐ ÷ by 6 $\frac{24\quad 12\quad 48\quad 30\quad 18\quad 36}{}$

. Have two players, one from each team, go to the
  chalkboard.
. Say "Divide by 6" and have the players record the
  quotients beneath the numbers.
. The first one finished with all the correct quotients
  wins a point for his/her team.
. Use a different factor with the next pair of players.

4 i 3

s (mastery).   _____ State Goal

_____ District Goal

_____ Program Goal

_____

itoring	Possible Resources
lsion Facts implies responds to oral :ies without hes- is, if asked, rided by 3?" or ⌋ in written :nt responds memory.	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 185
	District Resources

411

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

4¹³

413

-2

Student Learning Objective(s) __The student is able to divide a one- or two-digit number by a one-__   State Goal

__digit number without remainders.__   District Goal

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) __3-4__	Suggested Monitoring Procedures	Possible Resources
Title: Egg Carton Division **Group Size:** partners **Materials:** egg carton, 25 counters Procedure: . Take turns doing Tasks 1 and 2. . Task 1: 　Pick one of the division facts given below. 　Put counters in the pockets of the egg 　　carton to show the fact. . Task 2: 　Tell the fact that is shown by the display: 　　$4 \div 2 = 2$　$6 \div 2 = 3$　$10 \div 2 = 5$　$12 \div 3 = 4$. Task 3: 　Both solve the following using any method.		Pagne, Joseph N. (editor), <u>Mathematics Learning in Early Childhood</u>, <u>National Council of Teachers of Mathematics</u>, 1976, pp. 186-187
		District Resources

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415

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

416

417

Student Learning Objective(s) <u>The student values the quick and accurate recall of facts.</u> _____ State Goal

_____ District Goal

_____ Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources

Title: The Shortcut
Group Size: partners
Materials: pencil and paper, stopwatch, set of 4 exercises, two problems in each set
 	
Procedure:
. Teacher gives two students the following problem to solve; each student does every other problem.
 	
(6x4   (7x6   (3x9   (7x7
(5x7   (5x8   (8x4   (8x8
. The first problem is to be solved by using arrays. Each student is timed by his/her partner., eg.,
6x4=   ....
         .... <u>24</u>
         .... Partners take turns solving problems.
         ....
         ....
         ....
 	
. The second problem is to be solved by using sets, e.g., 7x6=<u>42</u>
		District Resources
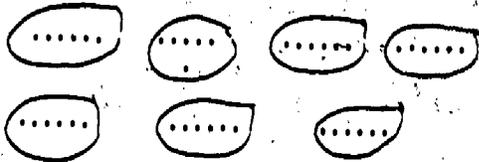
$6 \times 4 = 24$

$7 \times 6 = 42$

419

419

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
. The third problem is to be solved by repeated addition., e.g., $3 \times 9 = \quad 9+9+9 = 27$ $$\begin{array}{r} \text{or} \quad 9 \\ 9 \\ +9 \\ \hline 27 \end{array}$$. Now use the short cut method. Call on your memory bank to solve problem., e.g., $7 \times 7 = 49$. Compare times to solve problems using each method. . The value of an accurate "shortcut" method should be self-evident.		
		District Resources

4 ? ?

4 ? ?

SUBJECT: __Mathematics__

SPECIFIC AREA: ___Whole Numbers: Story Problems___

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

	Page	Sugg.
. characteristics of a number sentence are operational sign(s) and an equal sign.	211	2-8
. basic facts.	213	3-5
. that - and + are inverse operations.	215	3-4
. not all information given in a story problem may be relevant to the solution of the problem.	217	2-8
. clue words (total, sum, more, product, remainder, average, quotient).	219	3-5

The student is able to:

	Page	Sugg.
. develop (write) a story problem from a given number sentence.	221	2-8
. project a mental image (draw a picture) of the problem from an appropriate story problem.	223	2-8
. identify relevant information necessary for solution.	225	2-8
*. solve story problems with one operation.	227	2-8

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Student Learning Objective(s) <u>The student knows that the characteristics of a number sentence are</u>   State Goal

<u>operational sign(s) and an equal sign.</u>

District Goal

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Show Me The Sign
Group Size: entire class
Materials: five operational signs on cards for each student (cards about the size of regular playing cards)
 	
Procedure:
. Teacher: Students hold up correct sign card.
  . Show me the sign that is read "plus".
  . Show me the sign that is read "minus".
  . Show me the sign that is read "times".
  . Show me the sign that is read "divided by".
  . Show me the sign that is called "equals".
	Mini-Test: "Signs"
	Group Size: entire class
	Materials: exercise as below
	Procedure:
	. Complete each number sentence by placing operational and equal signs in boxes.
	
	3 ☐ 2 ☐ 5
	
	5 ☐ 2 ☐ 3
		Pagne, Joseph N., <u>Mathematical Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, pp. 259-260
		
		Kane, Robert, <u>Helping Children Read Mathematics</u>, American Book Co., 1974, pp. 58-63
		
		Ginsburg, Herbert, <u>Children's Arithmetic: The Learning Process</u>, D. Van Nostrand Co., 1977, pp. 84-85
		
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) ___ The student knows the basic facts. _____ State Goal

"_____ District Goal

_____ Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: Beat The Bounce **Group Size:** small group **Materials:** one ball Procedure: . One student takes a ball and holds it at shoulder height. . The student with the ball calls out a subtraction phrase (e.g., 9-2). . Then the student calls out the first name of another student in the group. . As the name is called, the ball is dropped. . The student whose name is called has to respond with the correct answer before the ball hits the floor. . If he/she does respond correctly, that player gets to be the questioner. . If he/she misses, the original student gets to continue dropping the ball. . The teacher or a monitor records the facts that are missed by individual students. . At the game's end, each student studies the facts he/she missed.	**Basic Facts Mastery** Mastery of the basic facts implies the ability to respond to <u>oral</u> and <u>written</u> queries without hesitation. That is, the student recalls the basic fact from memory immediately when asked.	Pagne, Joseph N. (editor), <u>Mathematics Learning in Early Childhood</u>, National Council of Teachers of Mathematics, 1976, p. 261 D'Augustine, <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, pp. 91-92 **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement ___3-4___

Student Learning Objective(s) __The student knows that - and + are inverse operations.__ _____ State Goal

_____ District Goal

_____ Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources

Title: Related Sentences
Group Size: entire class
Materials: none
 	
Procedure:
. Have two girls stand at the front of the classroom.
. Have five boys join them.
. Write the number sentence to illustrate this action, i.e., 2+5=7.
. Have five boys stand at the front of the classroom.
. Have two girls join them.
. Write the number sentence to illustrate this action, i.e., 5+2=7.
. Repeat the first action and have the five boys return to their seats and write the subtraction sentence describing the action, i.e., 7-5=2.
. Repeat the second action and have the two girls return to their seats and write the subtraction sentence describing the action, i.e., 7-2=5.
. Then discuss why the following are related sentences: 2+5=7, 5+2=7, 7-5=2, 7-2=5.
	Mini-Test: "Related Sentences"
	Group Size: entire class
	Materials: exercise as below
	Procedure:
	. Write the related number sentences for each pair of sentences:
	
	A 3+2=5 _____
	    2+3=5 _____
	
	B. 7-4=3 _____
	    7-3=4 _____
		Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 54-55
		
		District Resources

400

401

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) ___The student knows that not all information given in a story___

problem may be relevant to the solution of the problem._____   State Goal

_____   District Goal

_____   Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Find The Extra Number **Group Size:** small group **Materials:** two problems with irrelevant data Procedure: . Write problems to be discussed orally on the chalkboard. . Read each problem orally. . Determine what is asked in each problem. . Find the extra number in each problem. . Write the number sentence to describe each problem. . Solve each problem. Problem 1: Josie bought a box of 48 crayons for $.90. She gave the clerk $5.00. How much change should she receive? Extra number (48) Number sentence _____ Answer _____ Problem 2: Bill spent two hours cutting the lawn and 20 minutes helping Dad cut three bushes. How many minutes was this? Extra number (3) Number sentence _____ Answer _____		Westcott, Alvin N., _Creative Teaching of Mathematics in the Elementary School_, Allyn and Bacon, 1967, pp. 111-132 Kane, Robert, _Helping Children Read Mathematics_, American Book Co., 1974, p. 66 Schall, William E. (editor), _Activity-Oriented Mathematical Readings for Elementary Teachers_, Prindle, Weber and Schmitt, 1976, pp. 223-226 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) The student knows clue words (total, sum, more, product, remainder,   State Goal

average, quotient),   District Goal

Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) _3___	Suggested Monitoring Procedures	Possible Resources
Title: Clue Words **Group Size:** small group/entire class **Materials:** problems to discuss Procedure: Teacher: . "What is the clue word for each problem, that is, what is the word that tells the correct operation (+, -, x, ÷)? **Problem 1:** $1.50 fcr a ball $2.75 for a bat. Find total cost. Answer: _____ **Problem 2:** Three is one addend. Four is another addend. What is their sum? Answer: _____		 District Resources

4:1

4:2

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

4-0

4-1

Suggested Objective Placement   2-8

Student Learning Objective(s) __The student is able to identify relevant information necessary for__   State Goal

solution. _____   District Goal

_____   Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Problem-Solving **Group Size:** small group **Materials:** story problems Procedure: . Teacher writes one verbal problem at a time on the chalkboard for oral discussion. . Each problem presents the students with four tasks: 1. What does the problem ask? 2. What are the important facts? 3. What information is not needed? 4. Write a number sentence for each problem. Solve. Sample Problems: A. Susie bought a piece of cake for 40 cents, ice cream for 25 cents, and a ball for 69 cents. How much did she spend for food? B. There are 3 basketballs, 2 footballs, 5 hockey sticks, and 4 tennis balls in the gym. How many balls are there in all?	**Mini-Test:** "Extra Information in Problems" **Group Size:** entire class **Materials:** problems with irrelevant information (see below) Procedure: . Read the following problem carefully. . Decide what is asked. . Try to write a number sentence that illustrates the problem. . Solve the problem and indicate in the space after "Extra Number" any number that was not needed. For Example: On Tuesday 230 of the 240 children at Halley School were present. The principal said that the largest number absent any day that week was 15. How many were absent on Tuesday? Answer _____ Extra Number _____	Schall, William E. (editor), <u>Activity-Oriented Mathematics Readings for Elementary Teachers</u>, Prindle, Weber and Schmitt, Inc., 1976, pp. 223-224 Henney, Maribeth, "Improving Mathematics Problem-Solving Ability Through Reading Instruction", <u>Arithmetic Teacher</u>, April 1971, pp. 223-226 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

4:7

4:9

Suggested Objective Placement _____

Student Learning Objective(s) _The student is able to develop (write) a story problem from a given_

number sentence. .... State Goal

.... District Goal

.... Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) _2-8_	Suggested Monitoring Procedures	Possible Resources
Title: Pictures and Stories **Group Size:** small group/entire class **Materials:** chalkboard Procedure: . Teacher writes a number sentence on the chalkboard, e.g., 5+3= □ . . Students are give three tasks: 1. Make a picture for your number sentence. 2. Make up a story to go with your picture. 3. Complete the number sentence, i.e., 5+3=8. . Continue to write other number sentences involving different operations.	**Mini-Test:** "Writing Story Problems" **Group Size:** entire class **Materials:** number sentences such as the one below: Procedure: . Here is a number sentence. 5+3= □ . Make a picture for the number sentence. . Make up a story to go with your picture.	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 260 VanRoekel, Byron H., How to Read Mathematics, Harper and Row, 1973, p. 29 Schall, William E. (editor), Activity-Oriented Mathematics Readings for Elementary Teachers, Weber and Schmitt, Inc., 1976, pp. 210-214. Henderson, George L., Let's Play Games in Mathematics, Vol. 2, 1970, p. 55 Biggs, E. E., Mathematics in Primary Schools, Her Majesty's Stationary Office, 1969, p. 37

District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement _____

Student Learning Objective(s) _The student is able to project a mental image (draw a picture) of the_ ___ Stage Goal

problem from an appropriate story problem._____ ___ District Goal

_____ ___ Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: A Picture Tells The Story **Group Size:** small group or entire class **Materials:** story problems Procedure: . Teacher presents a story problem to the class such as the fllowing: "There are nine frogs by the side of the pond. One frog jumps into the pond. How many frogs are left by the side of the pond?" . Read the story to and with the students. . Then assign the following tasks: 1. Draw a picture that tells the story. 2. Write the number sentence that tells a story about the picture, i.e., 9-1=☐ 3. Solve the number sentence, i.e., 9-1=8.	**Mini-Test:** "Problem Solving With Drawings" **Group Size:** entire class **Materials:** problem solving exercises to illustrate Procedure: . Read the problem carefully and then use a drawing or diagram to help you solve it. **Example:** Al bought six valentines marked "3 for 25¢. What was the cost of his purchase?"	Kane, Robert, Helping Children Read Mathematics, American Book Co., 1974, pp. 64-66. Westcott, Alvin M., Creative Teaching of Mathematics in the Elementary School, Allyn and Bacon, 1967, pp. 111-132 Schall, William E. (editor), Activity-Oriented Mathematics Readings for Elementary Teachers, Prindle, Weber and Schmitt, Inc., 1976, pp. 210-214 Kennedy, Leonard, Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, pp. 96-97

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

405

400

Suggested Objective Placement _____

Student Learning Objective(s) _The student is able to solve story problems with one operation._

State Goal	
District Goal	
Program Goal	

Related Area(s) _____

Suggested Activities: Grade(s) __2-8__

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: For Problem Solvers Group Size: small group/entire class Materials: one-step problems Procedure: . Teacher presents group with one-step story problems writ en on chalkboard. . After the problem has been read to and with the group, three tasks are assigned: . What does the problem ask? . What are the important facts? . Write a number sentence for the problem. Solve. Example: "Seven scouts go on a camping trip. One car can hold five scouts. How many will need to ride in another car?" Problem asks: How many scouts will not be able to ride in first car? Important facts: . Number of boys who will ride in the cars. . The number who will ride in the second car. . Number sentence 7-5=☐ . Answer sentence 7-5=2	Mini-Test: "One-Step Problems" Group Size: entire class Materials: one step verbal problems Procedure: . Read the problem carefully. . Determine what is asked. . Draw a picture to illustrate the problem. . Write a number sentence to solve the problem. . Solve the problem. Example: Bill bought 18 guppies. Guppies sell at 6 for 10¢. How much did the guppies cost?	Henney, Maribeth, "Improving Mathematics Verbal Problem-Solving Ability Through Reading Instruction", Arithmetic Teacher, April 1971, pp. 223-226 Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, Chapter 4. District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources
4.3		4.3

		Page	Suggested Grade Placement		District Placement				
				K	1	2	3	4	

SUBJECT: Mathematics

SPECIFIC AREA: Fractions

The student knows:

	Page	Grade
. fractional regions of a model: halves.	231	K
. fractional regions of a model: halves, thirds, fourths.	233	1-2
. the fractional parts 1/2, 1/4, 1/3, 2/3, 2/4, 3/4 when given a set or grouping.	239	2-3
. a fraction having like denominator and numerator represents one. Example: 2/2 = 1	241	3

The student is able to:

	Page	Grade
. label models for halves, thirds, fourths.	243	2
. use > or < and = to compare fractional numbers with like denominators.	247	3-4
. add fractions with like denominators: halves, thirds, fourths.	249	3-4
. subtract fractions with like denominators.	251	3-4

The student values:

4⌁1

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Student Learning Objective(s) ___The student knows fractional regions of a model: halves

_____

_____

Related Area(s)_____

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3

Suggested Activities: Grade(s) ___K___

Title: Halves
Group Size: pairs
Materials: one 18"x24" chart, pictures drawn
             on cards showing two parts, some
             equal, some not equal

Procedure:
. Students place the cards in their proper place on
  the 18"x24" chart.

Chart

Halves	Not Halves
▮ ♥	▯ ♡

Suggested Monitoring Procedures

Mini-Test: "Halves"
Group Size: entire class
Materials: shape exercise,
              crayon

Procedure:
. Give each student a sheet with
  the following figures:

△ □ ○

. Have students shade half of
  each figure.

Possible Resources

Kelley, S. Jeanne, Learning
Mathematics Through Activities,
James E. Freel & Associates, Inc.,
1973, pp. 24-25, 27

District Resources

4.5

-231-

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) ___The student knows fractional regions of a model: halves, thirds,___

fourths.

State Goal	1,7, 9,1
District Goal	
Program Goal	1,3

_____

Related Area(s)_____

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
Title: Get It Together Group Size: small group Materials: game board 17"x21", game cards 3"x5" with pictures (hand drawn or from old math workbooks), use geometric shapes for markers 	Teacher directs student to point to a model or a drawing of a fractional region as teacher says: "Show me the item that shows 1/2, 1/4, 1/3." Mini-Test: "Matching Fractions" Group Size: entire class Materials: fraction exercise (as below) Procedure: . Ask students to match figures with symbols.	Hamilton, Virginia and Fischer, Charlotte, The Fabric of Mathematics (A Resource Book for Teachers), Hillsborough, CA, 1972, Activity Resource Co., 197, pp. 30-33

District Resources

Procedure:
. Teacher spreads cards out face down in a pile on the game board. Direct students to put markers at the start. In turn, each student selects a card and moves one space if it matches.

403

Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher spreads cards out face down in a pile on the game board. Direct students to put markers at the start. In turn, each student selects a card and moves one space if it matches. . If card does not match, student waits for next turn to select another card. . All cards are put face down in a discard pile. This pile may be when original pile is depleted. **Variation:** . Change game to an activity and the student draws a card and places it over its matching shape.		
		District Resources
		4:1

Suggested Objective Placement ___K-1___

Student Learning Objective(s) __The student knows fractional regions of a model: halves, thirds,__

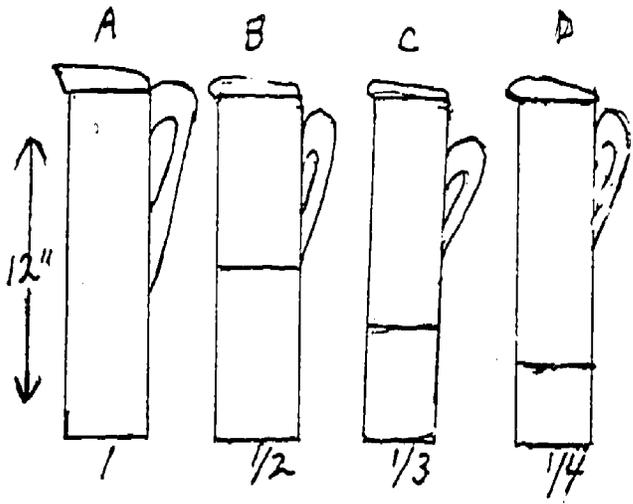__fourths.__

State Goal

District Goal

Program Goal

1
1,3

Related Area(s)__Science__

Suggested Activities: Grade(s) ___K-1___	Suggested Monitoring Procedures	Possible Resources
Title: Pitcher Measuring **Group Size:** large group or entire class **Materials:** graph paper (1" square), work-sheet with 4 pitchers drawn and marked a, b, c, d. (see diagram) Procedure: . Teacher directs students to cut a strip of graph paper 12 squares high. If students have trouble, teacher can cut 4 such strips for each student and pass them out with the worksheets. 		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 195-197

District Resources

Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
. Teacher directs the students to put 1 strip with 12 squares in (paste on) pitcher "A". Then fold the next strip in half, cut and put the resulting 6 squares in pitcher "B". Fold next strip into thirds, cut and put in pitcher "C". . Finally, students take the last strip, fold and cut into fourths, or have them count and cut 3 squares and put into pitcher marked "D". Variation: . Pass out worksheets with 4 pitchers with fractional regions marked. Direct students to color the regions.		
		District Resources

4.5

4.3

-2

Student Learning Objective(s) __The student knows the fractional parts 1/2, 1/3 and 1/4 when given__   State Goal

__a set or grouping.__   District Goal

_____   Program Goal

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2,4

Related Area(s)_____

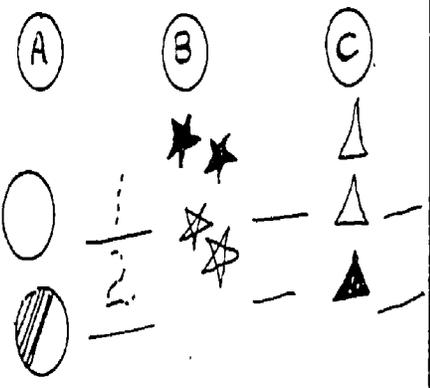| Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Pieces of Pie **Group Size:** individual or small groups **Materials:** ditto sheet with pies or circles divided into parts of 1/2, 1/3, 1/4, paper plates cut into 1/2, 1/3 or 1/4 and a complete (whole) paper plate, counters to nine for 1/3 groupings, counters to ten for 1/2 groupings, counters to eight for 1/4 groupings **Procedure:** . Teacher directs students to color one of the two pieces, one of the three pieces and one of the four pieces on the ditto sheet. . Students show teacher one-half of the plate, then one-fourth and one-third of a plate. . Direct students to separate counters into equal groups such as two groups, three groups, four groups and thus realize that the counters have been divided into 1/2, 1/3, 1/4.	Student will orally identify the shaded fractional unit of different shapes divided into fractional parts of 1/2, 1/3 or 1/4 correctly. The student will be able to identify counters grouped in 1/3, 1/2, 1/4 orally. **Mini-Test:** "Write The Fraction" **Group Size:** entire class **Materials:** shape exercise as below **Procedure:** . Write the fraction for the shaded part of each set. 	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 200-201 Suydam, Marilyn N., Classroom Ideas from Research on Computational Skills, National Council of Teachers of Mathematics, 1976, pp. 31-32 District Resources

4.0

4.7

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

4.3

4.3

Student Learning Objective(s) _The student knows the fractional parts 1/2, 1/4, 1/3, 2/3, 2/4, 3/4_

when given a set or grouping.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2,5

Related Area(s)_____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Fractions Picture Game **Group Size:** small group--2 or 3 students **Materials:** game board 17"x2", markers, game cards 3"x5" showing sets of objects with fractional part circled. or a written fraction 1/2 or a shaded fractional part of an object. Example playing board:	The student constructs and labels given models by halves, thirds or fourths on a written test or on a one-to-one basis with teacher. **Mini-Test:** "Fractional Parts" **Group Size:** entire class **Materials:** fractional parts exercise (see below) **Procedure:** . Write the fraction for the shaded part of each set.	Experiences in Mathematical Ideas, Vol. 1, National Council of Teachers of Mathematics, 1970, pp. 137 and 149 Henderson, George L., Let's Play Games in Mathematics Vol. 3, National Textbook Co., 1970, p. 21
		District Resources

CARDS

GET it Together

WINNER

45?

4?1

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students as follows in order to match fractional parts of regions and sets of fractional numbers: A. Spread cards out face down. B. Teacher directs students to put a marker at start. C. Student selects a card and moves to the symbol represented by the card. D. Student to go around the board first wins.		
		District Resources

402

403

ning Objective(s) _____ .The student knows that a fraction having like denominator and _____   State Goal | 1,7, 9,10

presents one. Example: 2/2 = 1   District Goal

_____   Program Goal | 3,1

(s) _____

tivities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources
Shapes ize: individual or small groups ls: colored construction paper, acissors, marking pens or crayons, paste, newsprint (large piece) instructs students to cut various shapes he construction paper (rectangles, circles, etc.). directs each student to take one shape, cut it into two equal parts. labels each half and pastes both pieces in entence form onto newsprint (see illustra-	Teacher observes as student demonstrates how specific fractions make a whole. Mini-Test: "One Whole" Group Size: entire class Materials: fraction exercise as below Procedure: . Circle fractions that represent one whole. 2/3 1/2 4/4 2/4 2/2	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 197

$$+ \left|\frac{1}{2}\right| = \frac{2}{2} = 1$$

roceeds with other shapes, using 1/3, 1/4.

District Resources

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ERIC

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		.District Resources

496

497

Student Learning Objective(s) ___The student is able to label models for halves, thirds and fourths.___

State Goal | 1,7, 9,10

District Goal

Program Goal | 1,2,5

Related Area(s) ___Art___

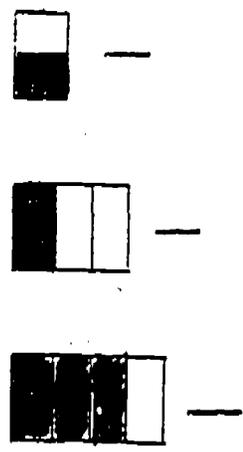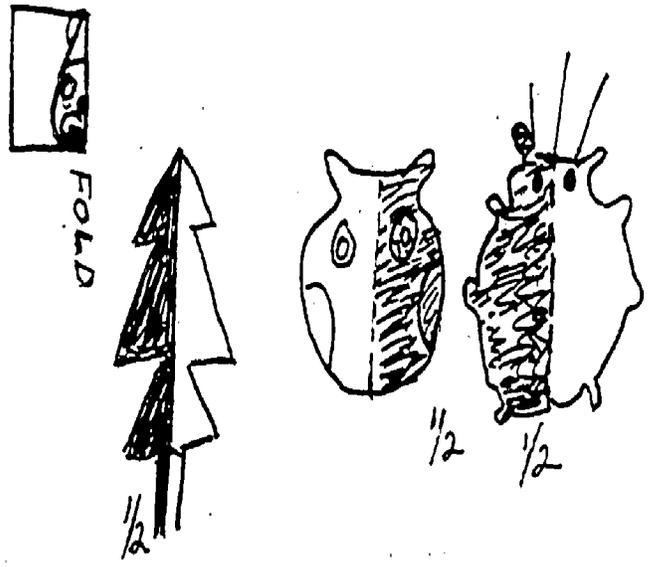| Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: **Group Size:** entire class **Materials:** construction paper--several 6"x6" and one large 18"x21", colors, scissors, pencil Procedure: . Have the students fold a piece of construction paper in half. Now have the students draw a half of an object. Cut it out. Color only one-half of the object. Now label the colored part "1/2"? 	Given models of halves, thirds and fourths, the student can read and write the correct fractions. **Mini-Test:** "Identifying Models" **Group Size:** entire class **Materials:** exercise with fractional models to label Procedure: . Label the shaded part of each fractional unit. 	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, p. 198 Kelley S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 27 Health Elementary Mathematics, Dilley-Rucker-Jackson **District Resources**

Title:
Group Size: entire class
Materials: cut squares, rectangles and/or circles about 4"x4", crayons

Procedure:
. Have students divide (by folding) a square or rectangle into thirds--3 equal parts. Have them color on one of the parts and ask for the fraction of the square that is colored.

. The fraction of the colored part is one-third.
. The paper could have been folded long ways and any one of the three areas be colored in.

. Divide into fourths. Color one part. The fraction of the colored part is one-fourth.
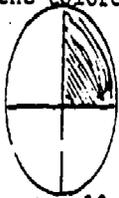
. The student pastes 12 of the best models he/she made on a 18"x21" construction paper in any order.
. The student now writes the fraction for each model.
. Have some students show their models and read the fractional part which is colored.
. Continue the activity having students color in the given fraction square.

District Resources

Student Learning Objective(s) _The student is able to label models for halves, thirds and fourths._   State Goal | 1,7, 9,10

District Goal

Program Goal | 1,2,5

Related Area(s) ___Art___

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources
Title: Make It – Divide It – Eat It **Group Size:** Two, three or four **Materials:** peanut butter, jelly, butter, knives, bread, paper towels, paper plates **Procedure:** . At a center the students make a peanut butter and jelly sandwich on a paper plate . The students are to cut the sandwich into halves, thirds or fourths. When this has been done, the students can eat the equally divided sandwich. **Variations:** . The class could make a cake, cookies, etc. Then divide them equally among the class.	Henderson, George L., _Let's Play Games in Mathematics_, Vol. 3, National Textbook Co., 1970, pp. 59-62	
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

401

405

Student Learning Objective(s) <u>The student is able to use < or > and = to compare fractional numbers</u>

<u>with like denominators.</u>

_____

Related Area(s)_____

State Goal	1,7,9, 10
District Goal	
Program Goal	1,2,5

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Fractions on File **Group Size:** individual **Materials:** worksheets, file box for sheets -- teacher prepares several sheets of varying levels of difficulty (see diagram) Teacher covers the pages with plastic and files them in order. Provide answer sheets so students may check own work. **Procedure:** . Teacher directs student to take a sheet and answer the questions by writing a number sentence below the diagram. . Teacher directs student to check answers and proceed to more difficult fractions. (See back for example.)	Teacher flashes card. Student responds orally by reading the number sentence, including "greater than", "less than" or "equal to". Examples of flash cards: **Mini-Test:** "Comparing Fractions" **Group Size:** entire class **Materials:** fraction exercise as below **Procedure:** . Compare. Use < or >. ┌──────────┐ ┌──────────┐ │ 3/4 ∴ 1/3 │ │ 2/3 2/4 │ └──────────┘ └──────────┘ ┌──────────┐ ┌──────────┐ │ 1/2 1/3 │ │ 1/4 1/3 │ └──────────┘ └──────────┘ -247-	Henderson, George L., <u>Let's Play Games in Mathematics</u>, <u>Vol. 3</u>, National Textbook Co., 1970, -. 25 District Resources

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
(Cards will wipe clean for re-use) Example:		

Student answer

District Resources

Suggested Objective Placement ___3-3___

Student Learning Objective(s) ___The student is able to add fractions with like denominators.___ State Goal | 1,7, 9,10
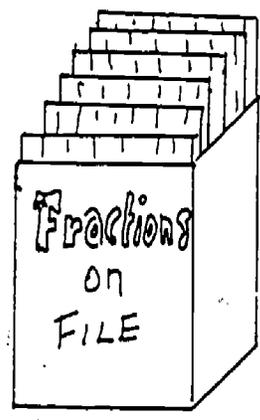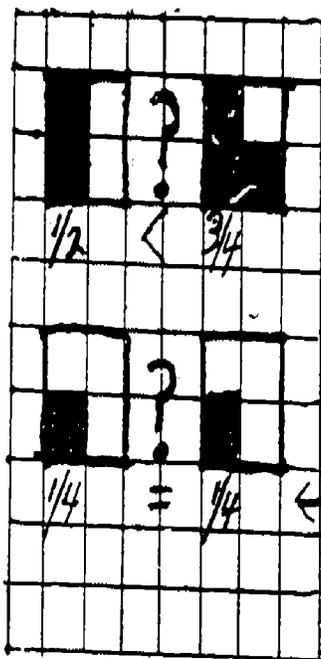
District Goal

Program Goal | 1,2, 3,7

Related Area(s)_____

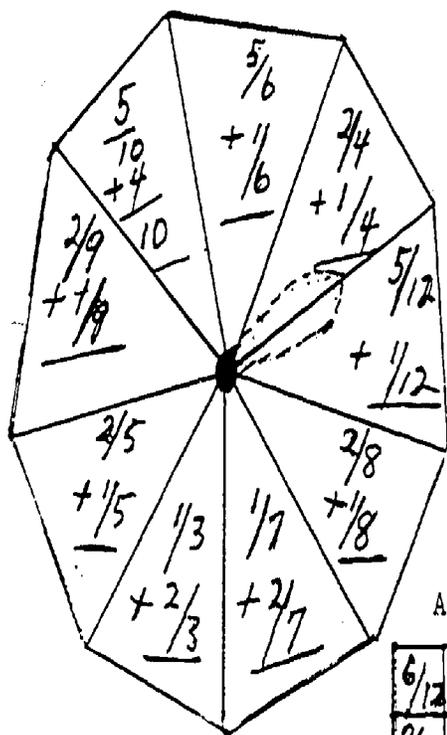| Suggested Activities: Grade(s) _3___	Suggested Monitoring Procedures	Possible Resources
Title: Spin the Spinner **Group Size:** individual or partners **Materials:** Use the diagram as a model to make a gameboard 8"x12". Write in the problems and answers. Laminate. (Make several as you will want to put different problems on each. Make a spinner from laminated paper and place in the center of the board.)	**Mini-Test:** "Adding Like Frac Fractions: **Group Size:** entire class **Materials:** fraction exercise as below **Procedure:** . Add: 3/5 1/3 +1/5 +1/3	Reisman, Fredricka K., _A Guide to the Diagnostic Teaching of Arithmetic_, Charles E. Merrill Publishing Co., 1972, p. 96 D'Augustine, Charles, _Multiple Methods of Teaching Mathematics_ in the Elementary School, Harper and Row, 1973, pp. 208-210

Directions

Answers

Spinner

District Resources

501

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students to use a crayon to write answers to the problems. . Student spins spinner and writes answer to the problem to which the spinner points. . Student then finds the answer in the box (see diagram), and crosses it out with the crayon. . Continue until student has three in a row crossed out, or . Play alone and cross out all the answers.		
		District Resources

5፡2

5፡3

-50-

ning Objective(s) ___The student is able to subtract fractions with like denominators.___ State Goal | 1,7, 9,10

District Goal |

Program Goal | 1,2, 3,6

(s)_____

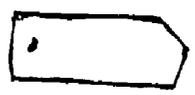| tivities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Carton Calculators Size: individual or small groups als: decorated egg cartons, plastic covered problem sheets, small bag of beans pastes directions inside the cover of the ons. demonstrates how the egg carton can be used problems with denominators of 1, 2, 3, 4, 6 For addends or sums greater than 1, use two directs student to fill the number of representing the first fraction and sub- e number represented by the second fraction. then counts what remains in the carton. n: can cut apart cartons to represent 1/2, 1/3, ample: Cut 1/2 and color red; cut 1/4 and ue. Fit these sections, one on top of into whole egg carton--colors will show t fractional parts in relation to whole. way, teacher can aid student in visualizing carton as a whole, halves, thirds, fourths, twelves.	Paper-pencil test.	D'Augustine, Charles, <u>Multiple Methods of Teaching Mathematics</u> in the Elementary School, Harper and Row, 1973, pp. 214-216. Kennedy, Leonard M., <u>Models for Mathematics in the Elementary School</u>, Wadsworth Publishing Co., 1967, p. 184 District Resources

5⌣4

5⌣5

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

SUBJECT: _Mathematics_

SPECIFIC AREA: _Geometry_

The student knows:

- the positional terms, i.e., left, right, top, bottom, in front of, behind, below, next to, on, above, middle, between, inside and outside. — 257 — K-1
- the term "line segment" refers to part of a line and has two endpoints. — 259 — 2-3
- a line segment is named by its endpoints. — 259 — 2-3
- a pentagon is a closed shape with five sides. — 261 — 3
- a hexagon is a closed shape with six sides. — 261 — 3
- an octagon is a closed shape with eight sides. — 261 — 3
- the radius is a line segment from the center of a circle to a point on the circle. — 263 — 3-4
- the diameter is a line segment that goes from one side of a circle to another and passes through the center. — 263 — 3-4

The student is able to:

- *. identify geometric shapes: square, circle, triangle and rectangle. — 265 — K
- *. locate positions, i.e., left, right, top, bottom, in front of, behind, below, next to, on, above, middle, inside and outside. — 257 — K-1
- . identify congruent shapes, i.e., circles, squares, rectangles, triangles. — 267 — K-1
- . identify the left side and right side of objects. — 257 — K-1
- . use a straightedge to draw line segments to form recognizable shapes: square, rectangle and triangle. — 269 — 2-3
- . name a line segment by its endpoints. — 259 — 2-3
- . identify an angle and a right angle. — 255 — 2-3
- . put a radius or diameter on a circle. — 263 — 3-4

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Student Learning Objective(s) <u>The student is able to identify an angle and a right angle.</u>

State Goal | 1,10

District Goal

Program Goal

Related Area(s) <u>Physical Education (sit ups = right angle; flat = 180° angle)</u>

Suggested Activities: Grade(s) ___3___	Suggested Monitoring Procedures	Possible Resources
Title: Angleboard Group Size: entire class Materials: large bulletin board, yarn, colored string or tape, numbers 	Teacher observes students identifying angles.	May, Lola J., <u>Teaching Mathematics in the Elementary School</u>, New York: The Free Press, 1970, pp. 253-257
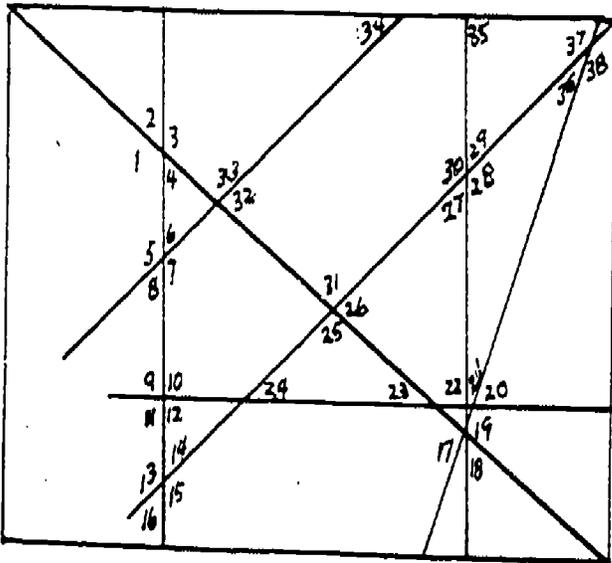
Procedure:
- Make a large line design with several parallel and intersecting lines. Use yarn, colored string or tape to form the lines. Use a number to label each angle forward.
- Have students make individual charts on which they classify the angles by number. Have them designate which angles are right angles or not right angles.

District Resources

511

512

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

5±0

5±±

Student Learning Objective(s) __A. The student knows the positional terms: left, right, top, bottom,__ State Goal

__in front of, behind, below, next to, on, above, middle, between, inside, outside. B. The student is__ District Goal

__able to locate positions: left, right, top, bottom, in front of, behind, below, next to, on, above,__ Program Goal
__middle, inside, outside. C. The student is able to identify the left and right side of objects.__

Related Area(s)___ Reading_____

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
Title: Left and Right **Group Size:** entire class **Materials:** paint, paper, crayons Procedure: . Teacher directs students to make their own hand drawing on a piece of paper. . Students label the left and right hand and keep the drawings in their desks for reference. . Teacher directs students to lie on the floor on a large piece of paper or an old sheet, one at a time. . Teacher traces around the student's body with a crayon. . The students then draw in eyes, nose, mouth, clothing, etc. . Teacher discusses with class the positions of the parts of the body and asks students to identify the right eye, left arm, etc. **Title:** Right Hand, Left Hand (finger play) **Group Size:** entire class **Materials:** self Procedure: . Follow actions as rhyme indicates: Right Hand, Left Hand This is my right hand, Right hand, left hand I'll raise it up high. Roll them around. This is my left hand. Left hand, right hand. ..uch the sky. Pound, pound, pound.	**Mini-Test:** "Positional Words" **Group Size:** entire class **Materials:** diagram (see below) Procedure: . Each student is given a diagram $$\underline{7\ S\ A\ B\ C}$$ $$2$$. Each student records answers to the following questions: What number is above the straight line?_____ What letter is to the right of "b"?_____ What letter is between "a" and "c"?_____	Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, p. 62, p.111 District Resources

5

Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
Title: Top, Bottom, Middle **Group Size:** individuals or entire class **Materials:** flannel board, yarn, felt cutouts Procedure: . Teacher divides flannel board in two parts with a piece of yarn, horizontally. . Teacher asks a student to point to the top of the board and to the bottom. . Teacher distributes a variety of felt cutouts to students and asks them to take turns placing them on the top or the bottom of the flannel board. . Teacher then takes two pieces of yarn and marks off three parts, horizontally. . Modify the above activity to include the middle position, as well as the top and bottom. **Title:** On, Above, Below **Group Size:** large group **Materials:** pencil Procedure: . Teacher asks students to sit by their desks with a pencil. Ask students to place the pencil on the desk; hold it above the desk; hold it below the desk.		
Title: Next To Or Between **Group Size:** large group **Materials:** variety of objects Procedure: . Direct students to stand next to a desk, a door, another student, etc. . Teacher directs students to place an item next to something. . Direct students to place an object between two objects.		District Resources

Student Learning Objective(s) **A. The student knows a line segment is part of a line and has two**   State Goal

endpoints. B. The student knows a line segment is named by its endpoints. C. The student is able   District Goal

to name a line segment by its endpoints.   Program Goal

	1, 10

Related Area(s) _____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
After students have developed the concept that a line segment is named by its endpoints, have them do the following activity. Title: Name the Segments Group Size: individuals Materials: a worksheet with lines and label points (see diagram) Note: Be sure it is clear the figure is facing you.	Mini-Test: "Match Figures and Names" Group Size: entire class Materials: figures and names drawing as below Procedure: . Each student is asked to match figures and names. 	L.A.P. L-00051-P (from ESD 109 Instructional Materials Center) Kelley, S. Jeanne, _Learning Mathematics Through Activities_, James E. Freel and Associates, Inc., 1973, p. 47 Henderson, George L., _Let's Play Games in Mathematics_, Vol. 3, National Textbook Co., 1970, pp. 16-17 D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, p. 306 District Resources
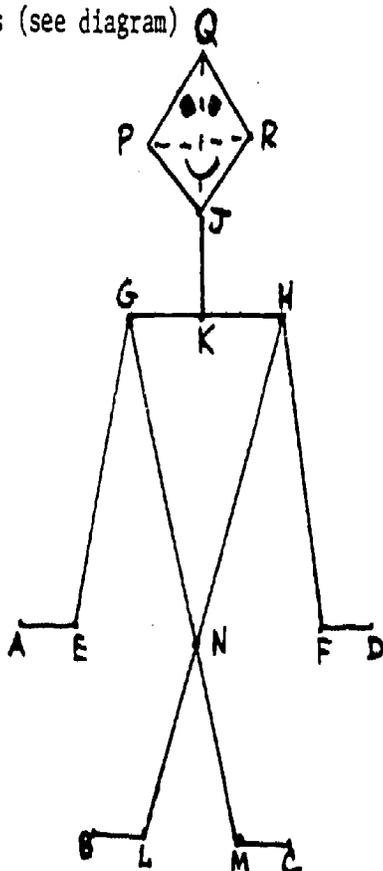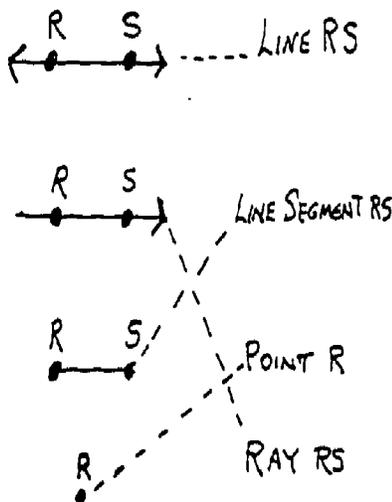
Suggested Activities: Grade(s) ___2-3	Suggested Monitoring Procedures	Possible Resources

Procedure:

- Have students answer the following questions about the line segment drawing of the man.
  1. What line segment names his left shoulder? (KH)
  2. What line segment names his right shoulder? (NL)
  3. What line segment names his left foot? (MC)
  4. What line segment names his right arm? (GE)
  5. What line segment names his neck? (JK)
  6. What line segments name his head? (PQ, QR, RJ, JP)

Variation:

- Have the points labeled and have students connect the endpoints.

District Resources

5~1

5~2

Student Learning Objective(s) __A. The student knows a pentagon is a closed shape with five sides.__   State Goal

B. The student knows a hexagon is a closed shape with six sides. **C.** The student knows an octagon   District Goal

is a closed shape with eight sides.   Program Goal

1, 10	

Related Area(s)_____

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Shapo Group Size: entire class Materials: two dittos similar to those illustrated below, markers (beans, etc.0, teacher-made set of small calling cards (2 of each) for game. On each card write a label for one of the figures shown. Need a master list for all combinations listed.	Hold up shapes and ask students to name them orally. Mini-Test: "Matching Shapes With Word Names" Group Size: entire class Materials: "shapes and names" picture Procedure: . Each student is asked to match word name with shape	D'Augustine, Charles, <u>Multiple Methods</u> <u>of</u> <u>Teaching</u> <u>Mathematics</u> <u>in</u> <u>the</u> <u>Elementary</u> <u>School</u>, Harper and Row, 1973, pp. 307-309

A.

B.

Under S
pentagon

Under H
circle

Under P
pentagon

hexagon   square   curve
octagon   right angle   closed curve
triangle   rectangle

HEXAGON

SQUARE

OCTAGON

District Resources

5~1

5~~

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
Procedure: . Students cut apart the squares on sheet A and paste them on sheet B in any arrangement. . Each student will need to cut small pieces of paper for markers (or use beans, marbles). . Each student uses the SHAPO card he/she has made and plays the game. . Teacher or student reads out the name of the shape. Student ocvers the shape with marker. . The first player to get four down, or five across or diagonally, or four corners, wins. Player must yell out "SHAPO"! . Note: Make the game easier or more difficult by varying figures used.		
		District Resources

5~5

5~5

5~5

Student Learning Objective(s) <u>A. The student knows the radius is a line segment from the center of</u>   State Goal

<u>a circle to a point on the circle. B. The student knows that the diameter is a line segment that</u>   District Goal

<u>goes from one side of a circle to the other and through the center. C. The student is able to p__ __</u>   Program Goal
radius or diameter on a circle.

1, 10

Related Area(s)_____

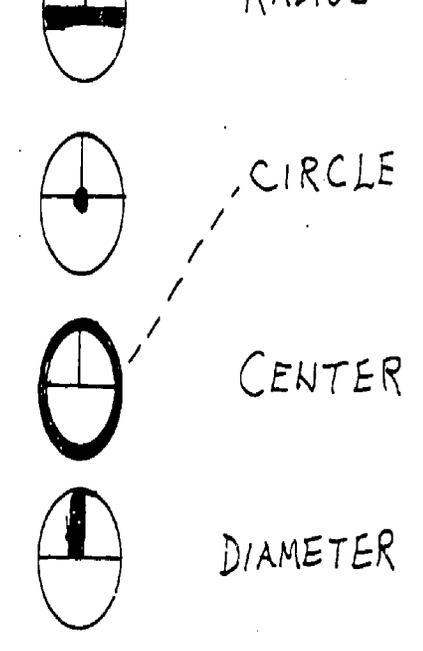| Suggested Activities: Grade(s) _3-4_	Suggested Monitoring Procedures	Possible Resources
Title: Circle Center **Group Size:** large group **Materials:** worksheets with large and small circles drawn on them (at least one sheet per student), pencil Procedure: . Have students cut out the circles and find the center by folding each circle in fourths. The center is where the folds meet. . Discuss with students the following: The fold from the center to the edge is the radius and the fold that goes all the way across is the diameter. **Title:** Radius and Diameter **Group.Size:** large group **Materials:** worksheets with circles in which the radius and diameter are shown, pencils. Procedure: . Distribute worksheets to the students. Have students point out the radii and diameters as they are marked on the circles.	Check the worksheets. Give a test sheet with several circles drawn on them. Have students draw in the radius or diameter of the circles. **Mini-Test:** "Circle Names" **Group Size:** entire class **Materials:** circle exercise (as below) Procedure: . Match the picture with the words. RADIUS CIRCLE CENTER DIAMETER	D'Augustine, Charles, <u>Multiple Methods of Teaching Mathematics in the Elementary School</u>, Harper and Row, 1973, pp. 310-311 District Resources

Suggested Activities: Grade(s) __3-4__	Suggested Monitoring Procedures	Possible Resources
Title: More Circles Group Size: large group Materials: worksheets with circles on the and with the centers of the circles marked, pencils Procedure: . Teacher distributes worksheets to students. . Have students draw the diameter and radii on the circles, starting at the center mark.		
		District Resources

Student Learning Objective(s) __The student is able to identify geometric shapes: square, circle,__   State Goal

__triangle and rectangle.__   District Goal

1, 10

State Goal / District Goal / Program Goal

Related Area(s)___ Environmental Education, Reading ___

Suggested Activities: Grade(s) __K__	Suggested Monitoring Procedures	Possible Resources
Title: Shape Walk **Group Size:** entire class **Materials:** various materials (see below) experience chart Procedure: . Take students on a "shape walk". Encourage them to notice the different kinds of shapes of things in their environment. . Have students list on experience chart the objects and their shapes seen on the walk. . Have students draw pictures of things seen on the walk. . Teacher passes out various materials to students and asks them to see how many different ways they can make shapes. **Title:** Shapes **Group Size:** entire class **Materials:** various materials Procedure: . Teacher passes out various materials and lets students make as many shapes as possible from them.	Teacher has a model of the four shapes. Teacher points to each one as the student identifies it by name. **Mini-Test:** "Match Geometric Shapes and Word Names: **Group Size:** entire class **Materials:** shape exercise as below Procedure: . Ask each student to match geometric shapes and word names. 	L.A.P. L-02012-P from ESD 109 IMC Kelley, Jeanne S., Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 45-46 Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 23-24 District Resources

Suggested Activities: Grade(s) K	Suggested Monitoring Procedures	Possible Resources
Title: Shape Lunch Group Size: small or large groups Materials: luncheon food (cottage cheese, lunch meats, cheese, bread or biscuit dough, cookie cutters, knives, rolling pin, paper plates, popsicle sticks, ice cube trays, fruit juice		

Procedure:

. Have a small group of students roll out biscuit dough and use the flat shapes to cut the dough.

. Give another group dull knives and suggest they cut cheese and luncheon meat into circles, squares, triangles and rectangles.

. Teacher places a scoop of cottage cheese on each plate, noting that the scoop is in the shape of a circle.

. Have part of the class prepare popsicles in ice cube trays for dessert.

District Resources

5つつ

5つ1

Suggested Objective Placement ___1___

Student Learning Objective(s) __The student is able to identify congruent shapes: circles, squares,__ State Goal

__rectangles, triangles.__ District Goal

	1, 10

Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: small group Materials: Cuisenaire rods or shapes out of paper or attribute blocks Procedure: . Students are given a variety of rods or shapes or attribute blocks. Students then match the shapes that are congruent (same size and shape). Title: Match the Shapes Group Size: individuals Materials: 15"x15" playing board divided into 25 squares, shapes to match those on the playing board Board Shapes Procedure: . Students match individual shapes to the board shapes.	Give students a paper with rows of shapes. They are to mark (by color or an X) the one that looks like the first in the row.	Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, pp. 42-43, 64-65 Kelley, S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 46 District Resources
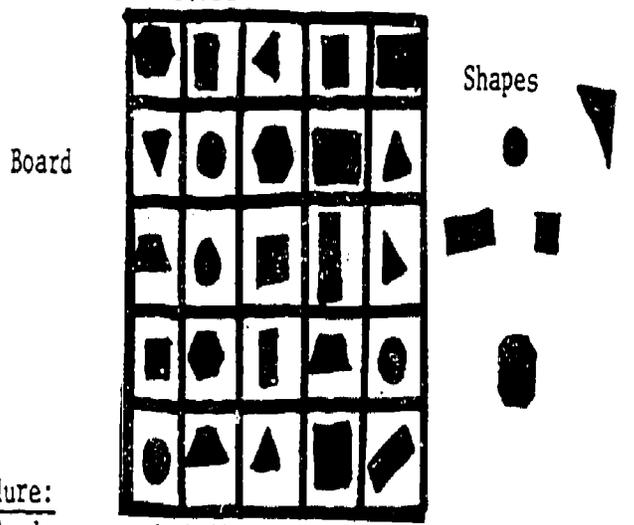
Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __The student is able to use a straightedge to draw line segments to__   State Goal

__form recognizable shapes: square, rectangle, triangle.__   District Goal

| | 1, 10 |

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: Line Segments **Group Size:** large group **Materials:** ruler Procedure: . Assuming students know what a line segment is and what a square, rectangle and triangle are, have them use the ruler to draw these geometric figures. Give them samples of each on a worksheet and have students trace the shapes with their rulers. . Students then draw their own geometric figures using graph paper and then later using plain paper.	**Mini-Test:** "D awing Shapes" **Group Size:** entire class **Materials:** paper and pencil, ruler Procedure: . Ask students to draw line segments to form a square, rectangle and circle. Label figures.	Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1970, pp. 347-348
		District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

5.1

5.2

SMALL SCHOOLS PROJECT

SUBJECT: Mathematics

SPECIFIC AREA: Graphs

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

- a picture graph (pictograph) is a visual representation of a set of data where each picture represents an object. — 275, K-1
  - a. graphs which deal with whole numbers — 275, K-3
  - b. graphs where picture represents other than whole numbers — 4-6
- a bar graph is a visual representation of a set of data where one unit may represent 1, 2, 5 or 10 items. — 281, 2-3
- a line graph represents data by specific points on a grid, the points being joined by lines to form a visual representation (or pattern). — 283, 2-4
- an ordered pair of numbers identifies a point on a grid. — 5-6
- a double bar graph compares two sets of data. — 5-6
- a circle graph shows information in terms of percentage of a fraction of the whole. — 6-7
- a table is a collection of data displayed in a specific order according to its variables. — 5-8
- a vertical axis is the vertical line along which a coordinate is measured. — 5-6
- a horizontal axis is the horizontal line along which a coordinate is measured. — 5-6
- coordinates are sets of numbers used to locate a point in space (4, 3), (2, 1). — 5-6

The student is able to:

- read and construct a picture graph (pictograph) from given and/or collected data (whole numbers). — 273, K-3
- read and construct a picture graph (pictograph) from given and/or collected data (whole numbers and fractional parts). — 4-6
- collect data. — 273, 2-4
- order or rank collected data in the form of a table. — 5-8
- plot data from tables. — 5-8
- *. read and interpret data on a simple bar graph. — 277, 2-4
- read and interpret data on a multiple bar graph. — 5-7
- *. construct a bar graph from given data or from collected data. — 277, 3-4
- construct a multiple bar graph from given data or from collected data. — 5-6
- *. construct a single line graph from given data or from collected data. — 4-5
- construct a multiple line graph from given data or from collected data. — 6-8
- read and interpret data on a circle graph. — 6-7
- construct a circle graph from given data or collected data. — 6-7

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

5·4

5·5

Student Learning Objective(s) A. The student is able to read and construct a picture graph (picto-   State Goal

graph) from given and/or collected data (whole numbers). B. The student is able to collect data.   District Goal

_____   Program Goal

Related Area(s)_____

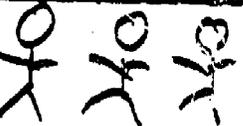| Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
Title: Birthdays **Group Size:** entire class **Materials:** graph paper, crayons Procedure: . Teacher and students develop the birthday graph (see back page). . Teacher asks: 1. In what months were there no birthdays? 2. In what months were there only one birthday? 3. In what months were there three birthdays? 4. In what month were the most birthdays? 5. In what month did only one girl have a birthday? 6. In what month did only one girl and one boy have a birthday? 7. In what month did only boys have birthdays? 8. And so on... See illustration on Page 274.		Thyer, Dennis, _Teaching Mathematics to Young Children_, Holt, Rinehart and Winston, 1971, pp. 13-56 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources

Birthdays

January	
February	
March	
April	
May	
June	
July	
August	
Sept.	
Oct.	
Nov.	
Dec.	

District Resources

Students draw themselves opposite the correct months.

ERIC

Suggested Objective Placement _____

Student Learning Objective(s) __The student knows a picture graph (pictograph) is a visual__

__representation where each picture represents an object.__

_____

State Goal	
District Goal	
Program Goal	

Related Area(s) __Graphs which deal with whole numbers__

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: Brothers and Sisters Group Size: entire class Materials: graphing paper, children, crayons Procedure: . Discuss members of the family, especially brothers and sisters. . When everyone seems certain of the correct number, then they can indicate the number of each on the graph by coloring one square for each brother and sister. . An extension of the above is to have the class determine how many brothers or sisters are older or younger.	Mini-Test: "Pictograph" Group Size: entire class Materials: pictograph as shown below for each student Procedure: . Teacher reads all word names and questions to the class. . Each students records his/her answers to the questions. each 🐢 means 1 TURTLE. Who has he most turtles?_____ Who had no turtle?_____ Who had the same number of turtles?_____ and _____	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268 Baratta-Lorton, Mary, Workjobs, Addison-Wesley, 1922, pp. 222-223 Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 157-159 Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 13-56, 138-144 Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 148-151

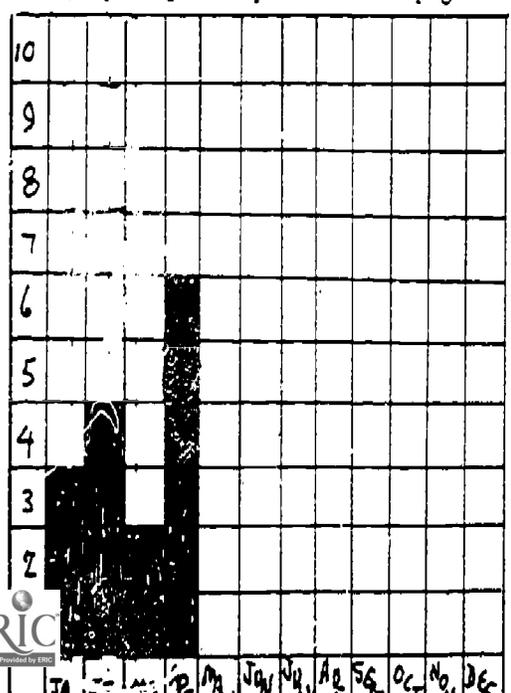| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement _____

Student Learning Objective(s) __A. The student is able to read and interpret data on a simple bar__ __graph. B. The student is able to construct a bar graph from given data or from collected data.__

State Goal	
District Goal	
Program Goal	

Related Area(s) _____

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: Pets in the Family **Group Size:** entire class **Materials:** large prepared graph as below: Procedure: . Teacher asks: 1. How many pets in Tilly's family? 2. What families have three pets? 3. Whose family has the most pets? 4. How many families have one pet?	**Mini-Test:** "Bar Graph" **Group Size:** entire class **Materials:** bar graph as shown below Procedure: . Teacher reads all the word names and questions to the class . Each student records his/her answers to the questions. Who spent 25¢? _____ How many spent 50¢? _____ How much did Mae spend? _____ Who spent the most money? _____	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268 District Resources
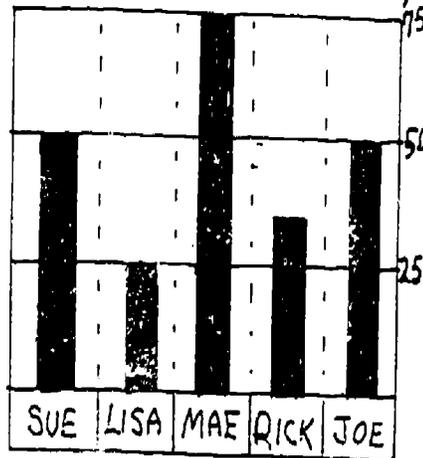
Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __A. The student is able to read and interpret simple data on a simple__   State Goal

__bar graph. B. The student is able to construct a bar graph from given data or from collected data.__   District Goal

_____   Program Goal

1, 10

Related Area(s)__Science, Social Studies__

Suggested Activities: Grade(s) _2-4_	Suggested Monitoring Procedures	Possible Resources
Title: Birthday Graph **Group Size:** entire class **Materials:** record sheet, graph paper with 1/2" squares, crayons, colored pencils or felt tip pens, student folders or other record of student's birthday **Procedure:** . Teacher lists the 12 months on the record sheet. . Teacher asks students their birthday month. . Teacher records by grouping students' names according to their birthday months. . Constructing the graph: Using the long side as the bottom of the graph paper, put the scale for the number of students having a birthday per month on the left side; put the months of the year across the bottom, spacing evenly across the page.	Teacher gives students bar graph together with questions about the interpretation of the graph. Number of correct answers indicates ability to interpret graph. Teacher gives students a set of data and a blank sheet of graph paper. Instruct students to construct a bar graph using given data. Check for correctness (compare with a model graph). Teacher gives students a topic for a graph (e.g., numbers of different reading books in the room). Ask students to collect data and make graph. Compare with model graph for accuracy. Post a bar graph with some "high interest" information in a convenient place. Observe which students take time to examine the graph and which is not.	Schminke, C. W., _Teaching the Child Mathematics_, The Dryden Press, Inc., 1973 ___District Resources___

Suggested Activities: Grade(s) 2-4	Suggested Monitoring Procedures	Possible Resources

. Construct the bars for the graph either by:
  (a) Writing the name in squares above the month
     (1 square per name), lightly coloring those
     squares with name in them, or,
  (b) Coloring one square for each student who has
     a birthday in a given month.
Variation:
. For additional practice, students can construct
  another graph, ordering the months from the most
  number of birthdays to th   st number of birth-
  days or vice-versa.
. Other ideas for graphing:
  Number of students having differ nt hair color.
  Number of students having different color eyes.
  Number of cars of different make or color in
   teachers' parking lot.
  Number of books read by students in a month.
  Number of one-syllable, two-syllable or three-
   syllable words on a page.
  Pets.
  Game scores.
  Time spent during silent reading, etc.

	Suggested Monitoring Procedures	District Resources
Title: Pet Graph	Students make a picture graph of	
Group Size: large group	the days they are present in	
Materials: flannel board, small colored	school.	
flannel-board squares, animal		
cutouts, yarn		

Procedure:
. Teacher makes four column on a flannel board using
  yarn (one column may rep   ent each pet).
. Place one animal cutout at the top of each column.
. Teacher has available a supply of flannel squares
  of different colors. Teacher directs students to
  put a square in the column of the pet they have.

Student Learning Objective(s) __The student knows a bar graph is a visual representation of a set__   State Goal

__of data where one unit may represent 1, 2, 5 or 10 items.__   District Goal

_____ Program Goal

Related Area(s) _____

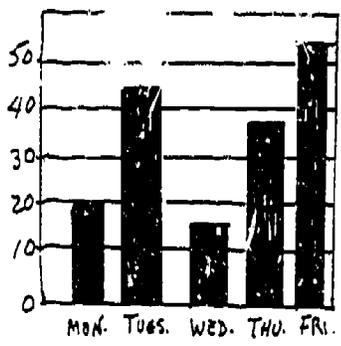| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: Children in the Family **Group Size:** small group **Materials:** large graph, crayons Procedure: . Teacher constructs graphs and writes in names of student. . Record on graph by crayoning one box for each . brother and sister. . Students then fill in bars on the graph.	**Mini-Test:** "Circulation" **Group Size:** entire class **Materials:** bar graph as shown below Procedure: . Teacher reads all the word names and questions to the class. . Each student records his/her answers.	Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268 Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, p. 160 Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 162-163

	1	2	3	4	5
Teresa		✓			
Chico	✓				
Tom		✓			
Yint				✓	
Mary					✓

MON. TUES. WED. THU. FRI.

Most books were checked out on? _____
Fewest books were checked out on? _____
20 books were checked out on? _____
44 books were checked out on? _____

District Resources

Suggested Activities: Grade(s) _____	• Suggested Monitoring Procedures	Possible Resources
		District Resources

504

505

Student Learning Objective(s) _The student knows a line graph represents data by specific points on a_ State Goal

grid, the points being joined by lines to form a visual representation (or pattern). District Goal

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _2-4_	Suggested Monitoring Procedures	Possible Resources
Title: Temperature May 2-6 **Group Size:** entire class **Materials:** large graph paper	**Mini-Test:** "Line Graph" **Group Size:** entire class **Materials:** line graph as below **Procedure:**	Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 161-162

Procedure:
. Teacher and students construct a line graph record-
ing the temperature at 10:00 a.m. each day for a
week in May.

. Teacher reads all the word
names and questions to the
class.
. Each student records his/her
answers.

Schmincke, C. W., Teaching the
Child Mathematics, The Dryden
Press, Inc., 1973, pp. 209-211
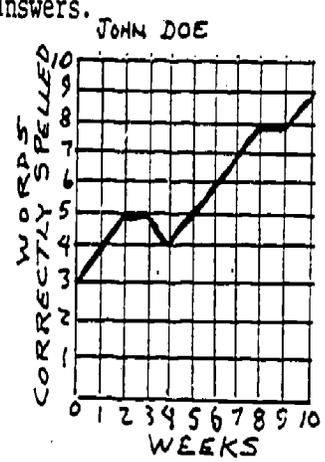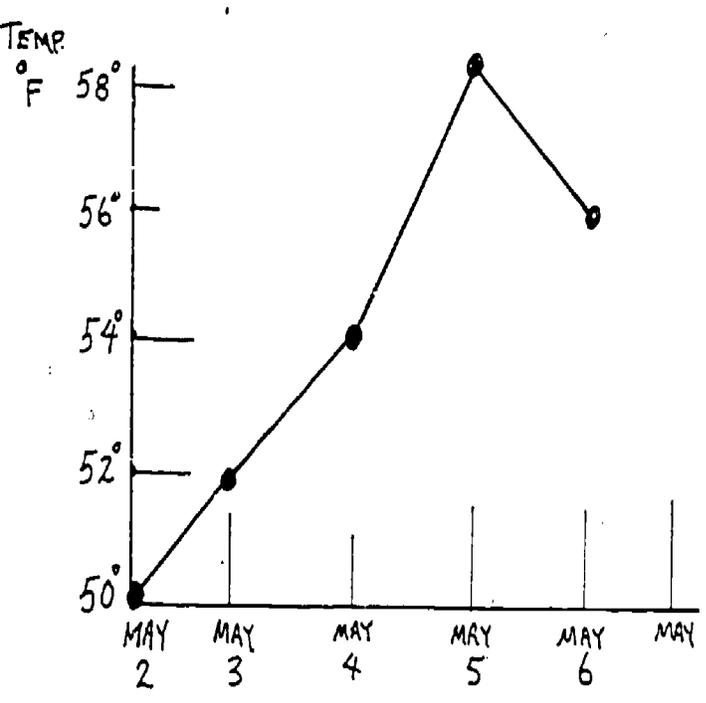
What week did John do best in
spelling?_____
How many words did John get
right in week #5?
In what week did John go down
in spelling?_____

District Resources

Suggested Activities: Grade(s) __2-4__	Suggested Monitoring Procedures	Possible Resources

. Temperature is represented by a dot each day.
. Join all dots with lines on May 6.
. Ask students: (May 6)
  1. On what day was it the coolest?
  2. On what day was it the warmest?
  3. On what day was the temperature at 54°F?
  4. and so on		

		District Resources

5℃9

5℃3

5℃3

		Page	Suggested Grade Placement	District Placement				

SUBJECT: __Mathematics__

SPECIFIC AREA: ___Measurement: Time___

			K	1	2	3	4

The student knows:

- the names of the days of the week.
- the names of the months.
- the names of the months in sequence.
- the short hand of the clock is the hour hand.
- the long hand of the clock is the minute hand.
- the term "minute" refers to a unit of time measurement.
- the term "hour" refers to a unit of time equal to 60 minutes.

Page	Grade
287	K-1
289	1-2
291	1-2
293	2
293	2
295	2
295	2

The student is able to:

*. tell time to the hour.
*. tell time to the half hour.
   tell time to the quarter hour.
*. tell time by 5-minute intervals.
*. write time in notation, i.e., 12:00, 12:30, 12:15, 12:55.

Page	Grade
297	1-2
297	1-2
305	2-3
307	3-4
309	1-4

The student values:

- estimation as a useful skill in time measurement.

Page	Grade
311	K-3

570

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Suggested Objective Placement   K-1

Student Learning Objective(s) <u>The student knows the names of the days of the week.</u>

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s) Language Arts

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
Title: My Week Booklet **Group Size:** entire class **Materials:** dittoed 9"x12" construction paper with names of the week printed on the top, paint or crayons Procedure: . Students make a "My Week" booklet by illustrating what they did on each day of the week. (Or student can write simple sentences describing what they did.) Sun.｜Mon.｜Tues.｜Wed.｜Thurs.｜Fri.｜Sat.｜My Week	Teacher observation: Observe student participation. **Mini-Test:** "Days of the Week" **Group Size:** one student **Procedure:** . Student names days of the week from Sunday through Saturday.	Thyer, Dennis, <u>Teaching Mathematics to Young Children</u>, Holt, Rinehart and Winston, 1971, pp. 166-167 District Resources

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources

Title: Days of the Week
Group Size: entire class
Materials: 9"x12" construction paper, one for each day of the week (day printed on the top)

Procedure:
. Display on bulletin board the days of the week cards in a circle to illustrate the repeating cycle of the days. Label each day with pictures illustrating what happens in the classroom on that day.
Example:
. Monday--P.E.; Tuesday--music; Wednesday--library, etc.
Variation:
. Assign students' names on a week wheel for classroom jobs.
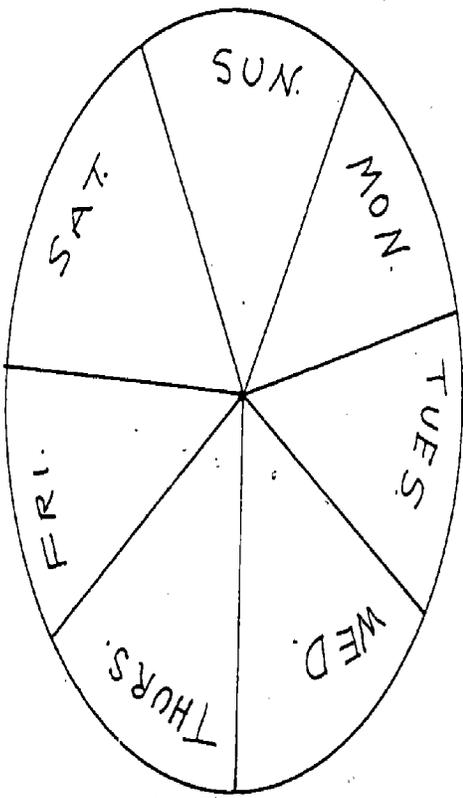
Teacher observation of student participation.

District Resources

5.5

Student Learning Objective(s) _The student knows the names of the months._

State Goal

District Goal

Program Goal

| 1,2,7 |
| |
| |

Related Area(s)_ Language Arts, Social Studies_

Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
Title: Calendar Group Size: large group Materials: one blank dittoed calendar for each student, black crayons, one large calendar Procedure: . Teacher places a large monthly calendar in view. . Teacher directs students to fill in the blank ditto. . Students circle special days such as holidays, birthdays, etc., and indicate on the right hand side of the calendar what the special day is, e.g., field trip, music concert, birthday, etc.	Students can orally name the months of the year.	Thyer, Dennis, _Teaching Mathematics to Young Children_, Holt, Rinehart and Winston, 1971, pp. 168-169 District Resources

NAME OF THE MONTH JUNE							
SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.	SPECIAL DAYS
		1	2	3	4	5	8-BIRTHDAY
6	7	⑧	9	10	11	12	20-FATHER'S DAY
13	14	15	16	17	18	19	
⑳	21	22	23	24	25	26	
27	28	29	30				

573

Suggested Activities: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources

Title: Birthday Balloons
Group Size: entire class
Materials: construction paper cut into 9"
              circles, magic marker pen, yarn

Procedure:
- Teacher directs each student to cut a 9" circle and write his/her name in the circle (teacher may have to write the names for some students).
- Teacher attaches yarn to each circle and places the circles on the bulletin board to represent the birthdays for that month. Don't forget the summer birthdays.

JUNE BIRTHDAYS
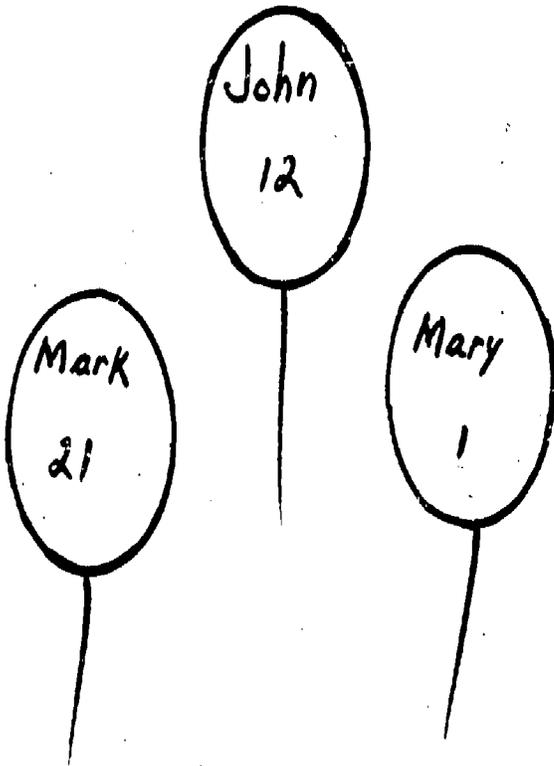
John
12

Mark
21

Mary
1

District Resources

589

589

Student Learning Objective(s) __The student knows the names of the months in sequence.__

State Goal

| | 1,2,7 |

District Goal

Program Goal

Related Area(s)___Language Arts, Math - Graphs, Social Studies___

Suggested Activities: Grade(s) _2_	Suggested Monitoring Procedures	Possible Resources

Title: Calendars
Group Size: entire class
Materials: 12"x18" sheets of colored construction
             paper, ditto master of calendar out-
             line, variety of art materials depend-
             ent upon selected art motif for each
             month
	Mini-Test: "Months"
	Group Size: one student
	Procedure:
	. Student recites names of months
	  from January to December to
	  teacher.
		Thyer, Dennis, Teaching
		Mathematics to Young Children,
		Holt, Rinehart and Winston,
		1971, pp. 168-169

Procedure: (this is a continuing project)
. Teacher directs students to fill in the calendar
  outline with month, year and days of week. Students
  fill in numerals. (Check to see that students begin
  the month on the correct day.)
. Teacher attaches calendar form to lower part of
  12"x18" colored paper. Use the remaining area for
  design representing specific month.
  Examples: Art Motifs:

MARCH

Sept.: sponge paint
        autumn tree

Oct.:   torn paper (black)
        Halloween shapes
        on orange and
        black

Nov.:   trace hand for
        body of turkey on
        yellow

District Resources

5J2

581

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: Month Riddles **Group Size:** small group **Materials:** paper, pencil **Procedure:** . Teacher directs groups to write riddles for each month of the year, using representative holidays as clues (weather or special events are also good clues). . Exchange riddles among groups. **Title:** Birthday Graph **Group Size:** individual . **Materials:** graph paper (1/2") for each student, pencil, crayon **Procedure:** . Teacher surveys class to determine how many birthdays are in each month. . Teacher organizes data and makes a bar graph showing number of birthdays per month. . Teacher directs students t: copy the bar graph on their sheets.		
		District Resources

5ɔ0

5ɔ1

Student Learning Objective(s) __A. The student knows that the short hand of the clock is the hour__ State Goal

__hand. B. The student knows that the long hand of the clock is the minute hand.__ District Goal

_____ Program Goal

	1,2,7
State Goal	
District Goal	
Program Goal	

Related Area(s)_____

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources
Title: Model Clocks **Group Size:** entire class **Materials:** paper plate for each student, blue paper strips, red paper strips, 1 brad for each student, crayons or pencils Procedure: . Teacher cuts red strips to represent hour hand on clock, or directs students to cut the strips a certain length (short). . Teacher directs students to mark numerals on the paper plate (demonstrating to students how to do it). . Teacher directs students to attach red strip to paper plate. . Students practice telling time by hour, moving hour hand to the different positions. . Teacher then directs students to place blue strips on clock (representing minute hand). . Proceed to practice with minute hand; then with both hour and minute hands.	**Mini-Test:** "Clock Hands" **Group Size:** one student **Materials:** clock **Procedure:** . The student orally explains that the short hand is the hour hand and the long hand is the minute hand.	Thyer, Dennis, _Teaching Mathematics to Young Children_, Holt, Rinehart and Winston, 1971, pp. 157-158 **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources

District Resources

Student Learning Objective(s) __A. The student knows that the term "minute" refers to a unit of__   State Goal

__time measurement. B. The student knows that the term "hour" refers to a unit of time equal to 60__   District Goal

__minutes.__   Program Goal

	1,2,7

Related Area(s)_____

Suggested Activities: Grade(s) __1-3__	Suggested Monitoring Procedures	Possible Resources
Title: Measuring Time **Group Size:** small group **Materials:** paint, paper (or cardboard or paper plate, cardboard strips, brad) Procedure: . Teacher prepares a clock, either by painting a grandfather clock (see diagram) or making a paper plate clock. . Teacher asks students to show various times on the clock. Example: 3:00, 4:30 . Teacher asks such questions as: "Show 12:00 on the clock. What time will it be in fifteen minutes?" "It is now 3:00 p.m. What time will it be in two hours?" "It is now 9:00 a.m. How long will you have to wait for morning recess?" "Set the clock for 10:30 a.m. How long will you have to wait for a movie that begins at 11:00 a.m.?"	**Mini-Test:** "Time to the Minute" **Group Size:** one student **Materials:** clock Procedure: . Teacher asks individual students to indicate specific times on the clock. Teacher observes student responses and records the responses.	LAP L-00367 (from ESD 109 collection) Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 153-154 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 1-2
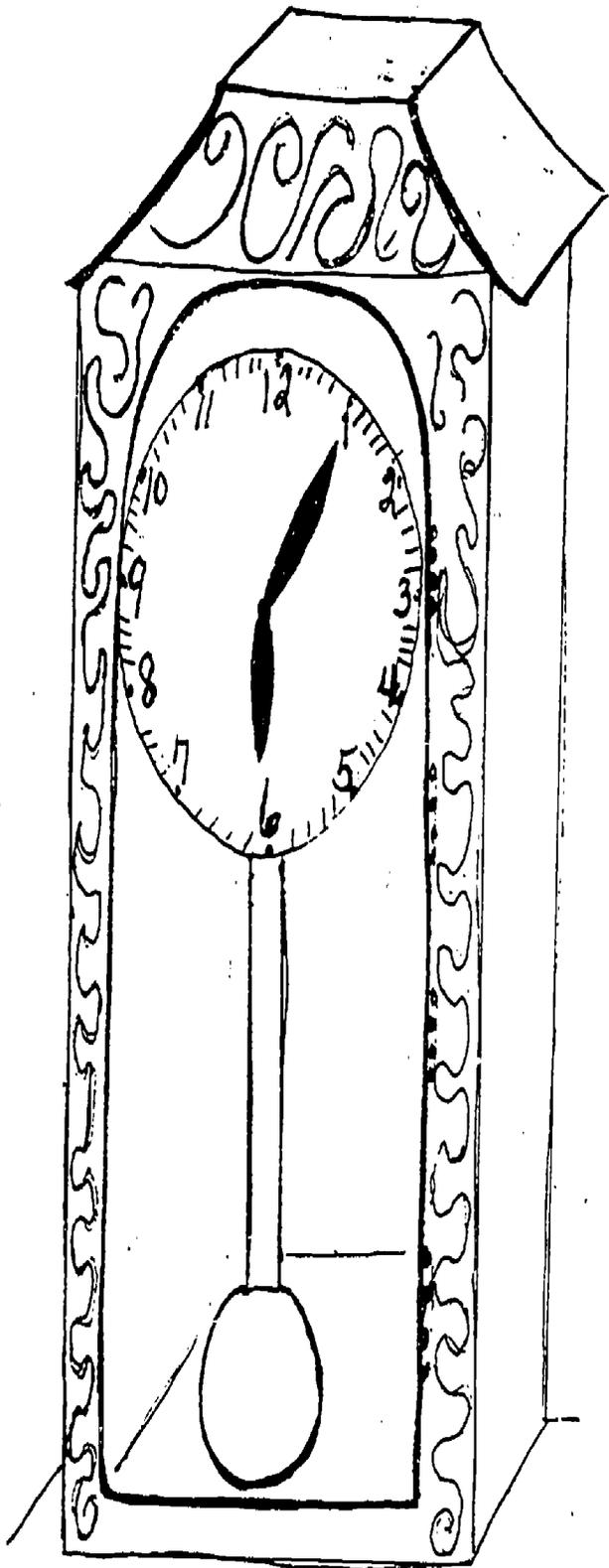
Student Learning Objective(s) A. The student is able to tell time to the hour. B. The student is able to tell time to the half hour. C. The student values estimation as a useful skill in time assessment.

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s)_____

_____

Suggested Activities: Grade(s) 1-2

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Clock Puzzle Strips **Group Size:** pairs or small groups **Materials:** 3"x12" tagboard strips	**Mini-Test:** "Hour and Half Hour" **Group Size:** one student **Materials:** clock	Judy Clock

Procedure:

· Teacher prepares tagboard strips showing clock face on the right and written time on the left. Each clock should represent a specific hour. Cut a zig-zag line to separate clock from written time. Each zigzag line should be different (to form puzzle).

Example:

3 o'clock
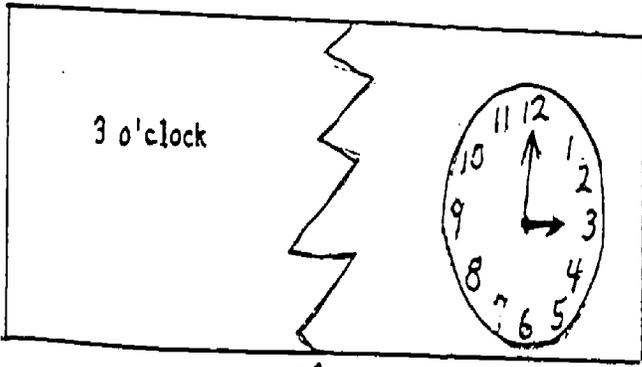
CUT↑

· Teacher directs students to fit the puzzle pieces together.
· Mark puzzle strips with half hour.

Procedure:

· Student gives correct response to teacher when asked time and shown model clock (hour and half hour).

Teacher observation of student attitudes and behavior regarding punctuality, changing activities, etc. (Does student appear to value time and know how to tell time?)

District Resources

5?9   5?1

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	Possible Resources
Title: Telling Time Group Size: any number of players Materials: one large model clock (Judy Clock), small clock faces for each player Procedure: . Teacher divides the group into two teams. A leader is selected who sets the clock. . The leader asks each player to set his/her clock to match the leader's clock. The leader checks each player's clock. . The team with the most correct answers scores a point. . The leader then resets the clock and the game proceeds. Variation: . Leader may write the time on the board and the players set their clocks accordingly.		
		District Resources

Student Learning Objective(s) __A. The student is able to tell time to the hour. B. The student is__ State Goal

__able to tell time to the half hour. C. The student values estimation as a useful skill in time__ District Goal

__assessment.__ Program Goal

1,2,7

Related Area(s)_____

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: Time Is Alive (suggested for K-1) **Group Size:** entire class, large group **Materials:** 12 large numerals Procedure: . Teacher takes group to gym. . Pin numerals 1 to 12 on each of 12 students. . Ask students to place themselves around a circle (on the gym floor) to represent a clock. . Teacher selects two students to be the hands. Ask these students to lie on the floor with their feet at the center to represent the hands of a clock. The student representing the minute hand may extend his/her arms to indicate the longer hand. 4 o'clock		District Resources
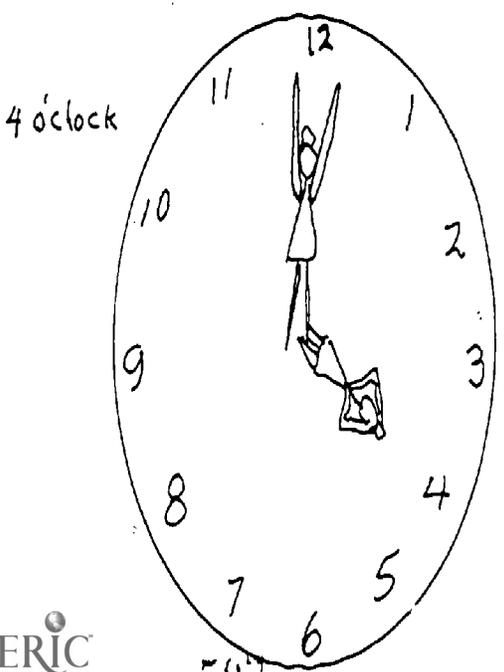
Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

500

609

Student Learning Objective(s) **A.** The student is able to tell time to the hour. **B.** The studer
is able to tell time to the half hour. **C.** The student values estimation as a useful skill in
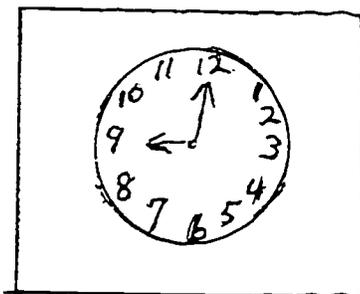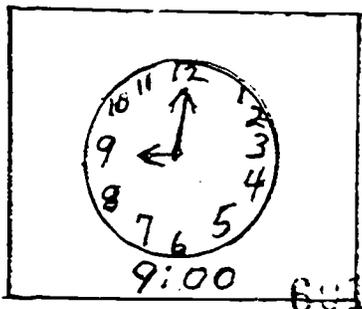measurement.

Related Area(s)_____

Suggested Activities: Grade(s) __1-2__	Suggested Monitoring Procedures	
Title: Midnight **Group Size:** two to twelve **Materials:** two packs of cards (On each card is a clock face with a certain time on it. Below the clock face the time is written. No two cards are alike. On the second pack there is a clock face but the time is not written on the card.) Prepare enough markers for each player to cover playing cards.		L- L- LA D' Me in anc Hol Ins Pub
Procedure: • Teacher (or selected student) deals eight cards (from the deck without the time written on the card) to each player. • Teacher (or selected student designated "caller") holds the cards with the time written on them. He reads them one at a time. If a player holds the appropriate clock, he puts a marker on the clock showing the time called. • The first player to cover all his cards calls out "Midnight!".		Di

ement _____1-2_____ ●

_____ State Goal | 1,2,7 |
                     |-------|
_____ District Goal | |
                     |-------|
_____ Program Goal | |

_____

ssible Resources

)233-P
)341-P
 from ESD 109 collection

gustine, Charles, Multiple
ods of Teaching Mathematics
he Elementary School, Harper
Row, 1973, p. 347

es, Emma E., Mathematics
ruction for Children, Wadsworth
ishing Co., 1968, pp. 400-401

:rict Resources

602

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement ___1-2___

Student Learning Objective(s) __A. The student is able to tell time to the hour. B. The student is__   State Goal

__able to tell time to the half hour. C. The student values estimation as a useful skill in time__   District Goal

__measurement.__

Program Goal

| 1,2,7 |

Related Area(s)_____

Suggested Activities: Grade(s) ___1___

	Suggested Monitoring Procedures	Possible Resources
Title: A Time Diary **Group Size:** entire class **Materials:** two large circles (9" diameter), yarn Procedure: . Teacher puts a clock face on one circle and an appropriate illustration on another circle. Attach with yarn. . Teacher places clocks around the room to expose students to time. <u>Variation:</u> . Illustrate lunch time, recess, daily activities, release time.		Thyer, Dennis, <u>Teaching Mathematics to Young Children</u>, Holt, Rinehart and Winston, 1971, pp. 159-160
		District Resources
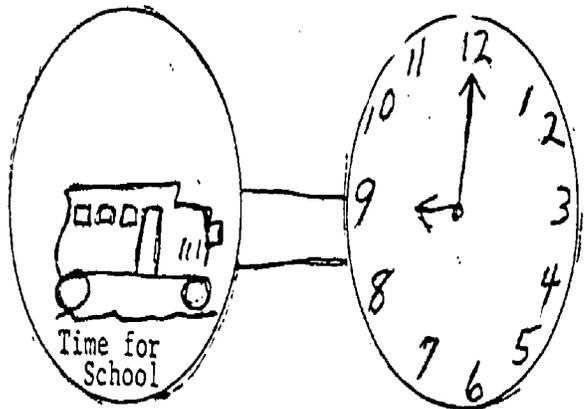
Suggested Activities: Grade(s) ___1___	Suggested Monitoring Procedures	Possible Resources

Title: Judy Clock
Group Size: individual
Materials: Judy Clock, 3"x5" time cards

Procedure:

. Teacher paints clock face on back side of a 3"x5"
  card and the appropriate time on the front side.
. Give the student a Judy Clock and several prepared
  cards. After the student reads the time on the
  card and sets the time on the Judy Clock, he/she
  turns over the card and checks the time with the
  picture.

3 o'clock

District Resources

SMALL SCHOOL PROJECT
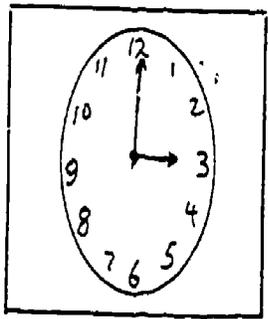
Student Learning Objective(s) __The student is able to tell time to the quarter hour.__ ___ State Goal

_____ District Goal

_____ Program Goal

Related Area(s)_____

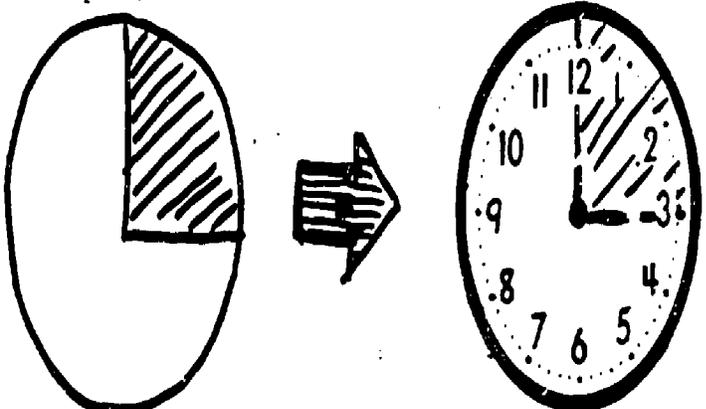| Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: The Quarter Hour **Group Size:** small group/entire class **Materials:** circular regions clock stamp and pad pencil Procedure: . Teacher directs class to fold circular region into two parts of the same size. . Shade each <u>half</u>. . Teacher directs class to fold circular region twice in order to obtain four parts of the same size. . Shade each <u>quarter</u>. . Fold a clock face into four equal parts and shade <u>one-fourth</u>. . Compare: and thus relate one-fourth of the circular region to a clock face showing quarter past 12.	**Mini-Test:** "Hands" **Group Size:** entire class **Materials:** clock faces Procedure: . Show these times: quarter past 4 quarter to 9	Thyer, Dennis, <u>Teaching Mathematics to Young Children</u>, Holt, Rinehart and Winston, 1971, pp. 160-161 Henderson, George L., <u>Let's Play Games in Mathematics</u>, <u>Vol. 1</u>, National Textbook Co., 1970, pp. 17-18; p. 52 Clock Stamp – Developmental Learning Materials, 7440 Natchex Avenue, Niles, Illinois 60648 Price: $2.90 District Resources
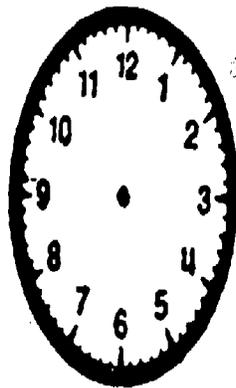
Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
. Demonstrate how and when a minute hand moves from one hour to the next it has covered one-fourth of the face of the clock when it gets to 3. . Use a series of similar activities to illustrate the concept of <u>quarter</u> to.		
		District Resources

6:1

612

ERIC
Full Text Provided by ERIC

Suggested Objective Placement ___3-4___

Student Learning Objective(s) __The student is able to tell time by five-minute intervals.__

State Goal

District Goal

Program Goal

1,2,7

Related Area(s) _____

Suggested Activities: Grade(s) ___3-4___

	Suggested Monitoring Procedures	Possible Resources

Title: Midnight
Group Size: two to twelve
Materials: Two decks of cards. One deck has
            clock faces and the time written
            on the cards; the second deck has the
            clock face only. No two cards are
            alike. Prpeare enough markers for
            each player to cover cards.

Procedure:
- Teacher selects a student to be "caller". Caller holds the cards with the written notations.
- Teacher selects student to deal the cards (about 8 to a player--just so each player has an equal number of cards).
- The caller reads his/her cards one at a time. If a player has the appropriate clock, he/she puts a marker on the clock.
- The first player to cover all his/her cards calls out "Midnight!".
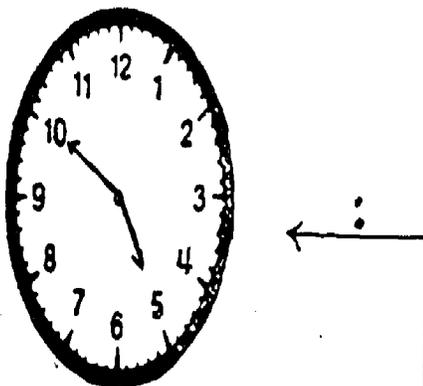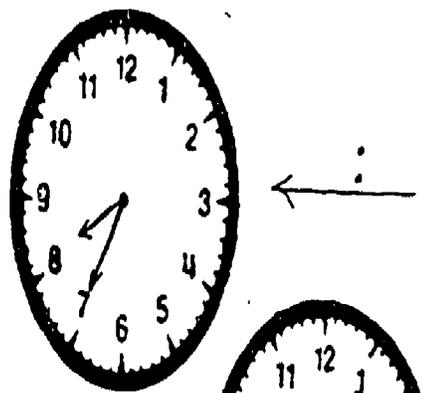
4:05

Suggested Monitoring Procedures

Mini-Test: "Five-Minute
            Intervals:
Group Size: entire class
Materials: clock faces
Procedure:
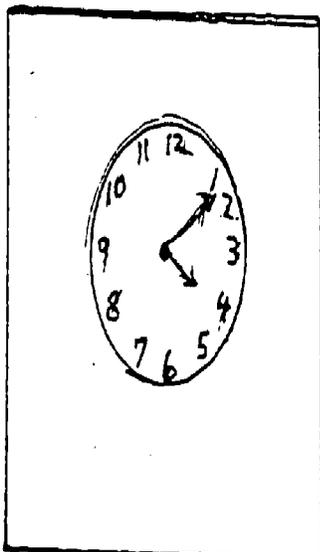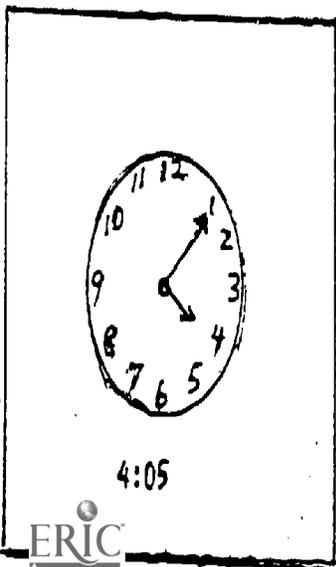. Tell these times.

Possible Resources

D'Augustine, Charles, _Multiple Methods of Teaching Mathematics in the Elementary School_, Harper and Row, 1973, p. 347

L-01119-P
LAP from ESD 109 collection

District Resources

-307-

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources
		61:
615		

SMALL SCHOOL PROJECT

Student Learning Objective(s) __The student is able to write time in notation, i.e., 12:00, 12:30,__   State Goal
__12:15, 12:55__

	1,2,7

District Goal

Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) ___3___

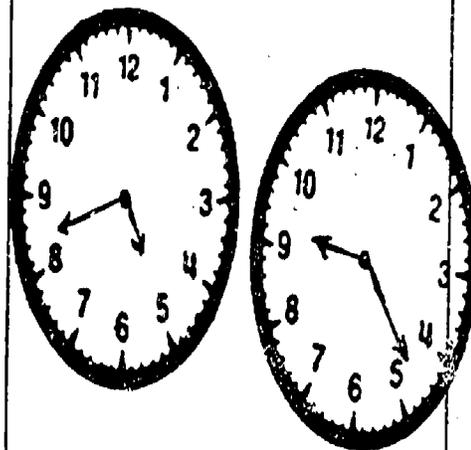|	Suggested Monitoring Procedures	Possible Resources

Title: Clock Puzzle Strips
 Group Size: individual or partners
 Materials: 3"x12" tagboard strips
 	
 Procedure:
 . Teacher prepares tagboard strips showing clock face on right and written time on the left. Cut the strip along a zig-zag line, separating the clock face from the written notation. Each zig-zag should be different (to make puzzle pieces).
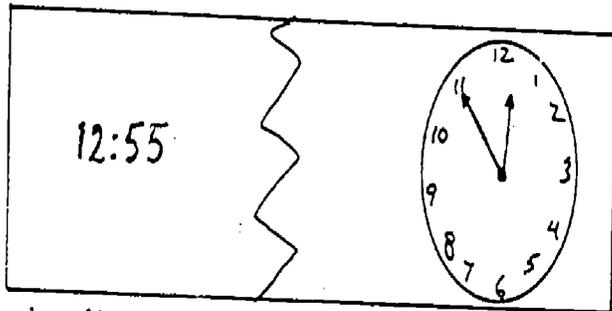 	
 . Teacher directs students to fit the puzzle pieces together.
	Paper and pencil test--teacher dictates and student writes the time.
	
	 Teacher gives students clock faces on paper. Students write the correct time below the face.
	
	 Mini-Test: "Time in Notation"
	 Group Size: entire class
	 Materials: clock faces
	                 (see below)
	 Procedure:
	 . Write time in notation.
	   Examples:
	
	 5:42 ___:___
		Digital Clock
		
		 District Resources

6...

-309-

6..

Suggested Activities: Grade(s) __3__	Suggested Monitoring Procedures	Possible Resources
Title: Paper Plate Clocks **Group Size:** individual **Materials:** paper plates, strips for hands, brads, crayon or pencil **Procedure:** . Teacher directs students to make paper plate clocks (teacher demonstrates how). . Teacher gives a time and directs students to set their clocks appropriately. **Variation:** . Select students who are quicker than the others to act as "expert watchmakers". These students may check other students' clocks and help adjust them. Older students may also be helpful. **Extension:** . Some students may make up problems for each other to solve, such as: "I usually wake up at 7:45 a.m. Today I woke up ten minutes early. What time was it?"		
		District Resources

Suggested Objective Placement _____

Student Learning Objective(s) __The student values estimation as a useful skill in time measurement.__ State Goal

District Goal

Program Goal

Related Area(s)_____

| Suggested Activities: Grade(s) _K-3_	Suggested Monitoring Procedures	Possible Resources
Title: Hour Estimate **Group Size:** two students **Materials:** pencils and paper picture of transportation vehicles with the time in hours and minutes that various members of a family spent on each in the summer (see picture on back) **Procedure:** . Each student chooses one of the elapsed times in the picture. . Each then estimates the total hours for the elapsed time for both pictures and writes the estimate on a piece of paper. . The players work together to find the exact number of hours and minutes. . A point is scored for each student whose hour estimate was correct. . Play again, choosing two elapsed times each. Score 2 points for each correct estimate. . Play again, choosing three elapsed times each. Score 3 points for each correct estimate. . Start over again with 1 elapsed time each. Continue until one student is ahead by 4 or more points. . This student is the winner. See page 312 for illustration.		District Resources 6··

Fun Time
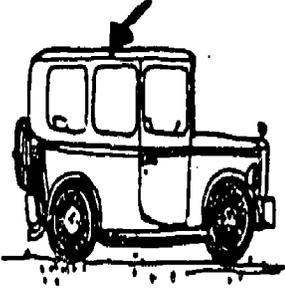
55 minutes

4 hours 17 minutes
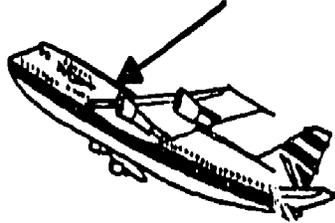
2 hours 30 minutes

2 hours 59 minutes
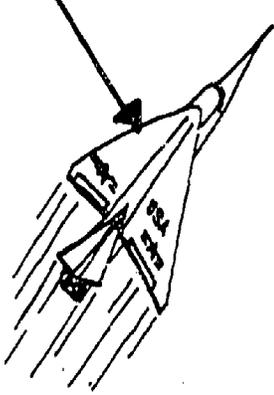
3 hours 29 minutes

1 hour 22 minutes

15 minutes
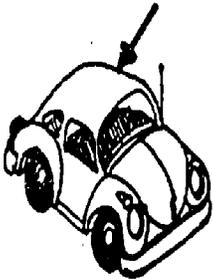
6 hours 45 minutes
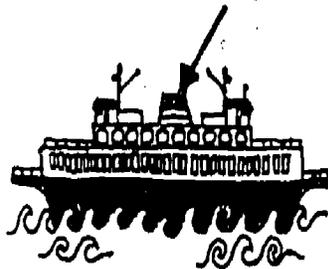
7 hours 36 minutes

_____ strict Resources

SMALL SCHOOLS PROJECT
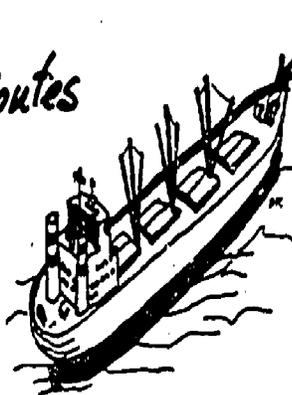
SUBJECT: Mathematics

SPECIFIC AREA: Measurement: Money

	Page	Suggested Grade Placement	District Placement	K	1	2	3	4

The student knows:

. the term "penny", "nickle", and "dime" are monetary units.	315	1
. that five pennies have the same value as one nickel.	315	1
. that ten pennies have the same value as one dime or two nickels.	315	1
. the equivalent change of coins equal to or less than 10 cents.	315	1
. 25 pennies have the same value as a quarter.	321	2-3
. a quarter is one-fourth of a dollar.	321	2-3
. the combination of coins which have the same value as a quarter	321	2-3
. the combination of coins which have the same value as one dollar.	321	2-3

The student is able to:

*. combine coins equal to or less than 10 cents.	317	1
*. combine coins that have the same value as a quarter.	317	2-3
*. combine coins that have the same value as a dollar.	321	2-3

The student values:

. estimation as a useful skill in money measurement.	323	2-3

6-

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Student Learning Objective(s) __A. The student knows the terms "penny", "nickel" and "dime" are__   State Goal

__monetary units.__ B. The student knows that five pennies have the same value as one nickel. C. The   District Goal

__student knows that ten pennies have the same value as one dime or two nickels. D. The student knows__   Program Goal

the equivalent change of coins equal to or less than ten cents.

Related Area(s)_____

State Goal box: 1,7,8,9

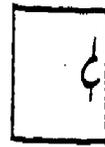| Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
Title: Cards and Money **Group Size:** small groups **Materials:** 18 3"x5" tagboard cards, 10 pennies, 4 nickels, 4 dimes **Procedure:** . Teacher provides a stack of cards (or circles), each of which has a value of 1¢, 5¢ or 10¢ written on it, and places them in a pile face down. . Teacher provides each of two students a supply of an equal number of pennies, nickels and dimes. . Teacher directs first student to take the top card and turn it over to show the value written on the other side. The student must give the other student that amount of money. . The second student takes his/her turn. . When one student runs out of coins, the student with all the coins is the winner. **Variations:** . 1. Make cards from 1¢ to 5¢ and play the same game. . 2. Make cards from 5¢ to 10¢ and play the same game. **Title:** Ring-A-Coin **Group Size:** small groups **Materials:** 1 2"x4" wood block 20" long, 5-1/4" dowel pegs, 6 1" wide rings from oatmeal cereal boxes, pennies	**Mini-Test:** "Small Change: **Group Size:** entire class **Materials:** pictures of coins **Procedure:** . Tell how much money: [¢]	Henderson, George, Let's Play Games in Mathematics, Vol. 1, National Textbook Co., 1970, p. 60, p. 66 Coin Stamps and Pad from Developmental Learning Materials --- **District Resources**

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources

Procedure:

- Students stand behind a given line and toss the rings onto the peg board. When a ring lands on a peg, the student receives the number of pennies marked on that peg.
- Student adds total number of pennies and tells the equivalent of that amount in nickels, dimes and pennies.

Title: Pick A Penny
Group Size: small groups
Materials: small box with 50 pennies, stack of 3x5 cards or construction paper in rectangles or circles

Teacher observes student to assure that he/she is removing the proper amount of money.

District Resources

Procedure:

- Teacher writes a numeral (1, 2, 3, 4 or 5) on each 3x5 card or construction paper shapes.
- Place cards face down on the table.
- Teacher directs students to take turns drawing a card.
- Student takes a card from the top of the pile, looks at the numeral and removes that number of pennies from the box and returns the card to the bottom of the pile.
- When all the pennies have been removed from the box, students count the pennies and the one with the most wins.

Variation: Add nickels and dimes and increase the numerals on the cards to 10.

Suggested Objective Placement _____

Student Learning Objective(s) _A. The student is able to combine coins equal to or less than 10_ State Goal

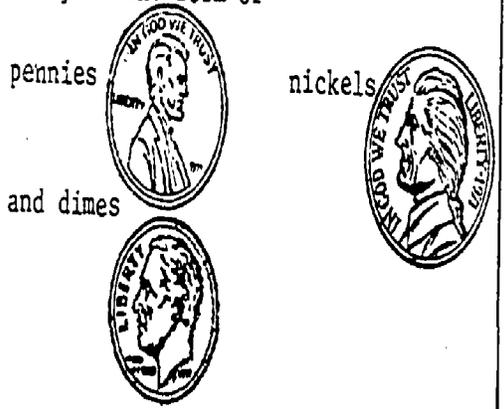cents. B. The student is able to combine coins that have the same value as a quarter._ District Goal

_____ Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
Title: Pennies, Nickels, Dimes Group Size: individuals, small group, entire class Materials: coin stamp and pad to develop play money in the form of pennies nickels and dimes Money Chart (see below)		Coin Stamps From: Developmental Learning Materials, 7440 Natchex Avenue, Niles, Illinois 60648 Price: $5.50 U.S. heads Price: $5.50 U.S. tails

Procedure:

. Use pennies, nickels, or dimes to show the amount of money in as many different ways as possible.

1 nickel
1 dime
1 quarter

District Resources

633

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) <u>A. The student knows the terms "penny", "nickel" and "dime" are</u>   State Goal

<u>monetary units. B. The student knows that five pennies have the same value as one nickel. C. The</u>   District Goal

student knows that ten pennies have the same value as one dime or two nickels. D. The student knows   Program Goal
the equivalent change of coins equal to or less than ten cents.
Related Area(s)_____

1,7,8,9

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources

Title: How Many Ways Can You Make 10?
Group Size: small group or individual
Materials: 1 dime, 3 nickels, 15 pennies,
             chart (see below)
 	
Procedure:
. Students are to find as many different ways as
  possible to find the amount of money to 10¢.
  (See diagram.)
	Mini-Test: "Cents"
	Group Size: entire class
	Materials: coin picture
	Procedure:
	. Tell how much money:
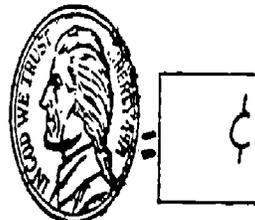	
		Henderson, George L., <u>Let's Play</u>
		<u>Games</u> in <u>Mathematics</u>, <u>Vol. 2</u>,
		National Textbook Co., 1970, p. 41

Dime	Nickel	Penny
1	0	0
0	2	0
0	1	5
0	0	10

District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Student Learning Objective(s) __A.__ The student knows that 25 pennies have the same value as a quarter. State Goal | 1,7,8,9

__B.__ The student knows that a quarter is one-fourth of a dollar. __C.__ The student knows the combination District Goal

of coins which have the same value as a quarter. __D.__ The student is able to combine coins that have   Prog am Goal

the same value as one dollar.

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources
Title: How Many Ways To Make A Quarter? **Group Size:** entire class **Materials:** sets of play coins or paper "coins" labeled according to value (these can be dittoed and cut out by students -- pennies can be dittoed on tan or rust-colored paper, other coins on gray), record sheets Procedure: . Teacher instructs the students to make as many different combinations of coins that have the same value as a quarter. . Student records the kinds and number of coins needed to make up 25 cents, e.g., 5 pennies, 2 nickels, 1 dime.	Place a number of coins on a table. Have each student select a group of coins that have the same value as a quarter, if necessary. Observe if students can do this successfully. **Mini-Test:** "Less Than A Dollar" **Group Size:** entire class **Materials:** coin picture **Procedure:** . Tell how much money:	Henderson, George L., _Let's Play Games in Mathematics_, Vol. 2, National Textbook Co., 1970, p. 48 District Resources

| Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Exchange

Group Size: 2-4 or more

Materials: sets of imitation "coins", either purchased or teacher-made, have about 100 pennies, 25 nickels, 25 dimes and 10-20 quarters; a spinner marked as follows:

Procedure:
. Teacher places coins in a "bank".
. Each student, in turn, spins the spinner.
. The number the spinner points to indicates the amount of money a player can withdraw from the bank.
. When players have accumulated 25 cents, in any combination, they may exchange them for a quarter.
. Player with the most quarters at the end of play wins.
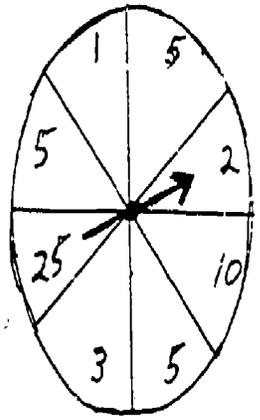
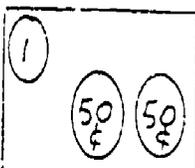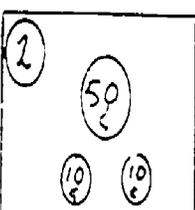Possible Resources:

District Resources

Student Learning Objective(s) A.   The student knows the combination of coins which have the same   State Goal

value as one dollar.   B.   The student is able to combine coins that have the same value as a dollar.   District Goal

C.   The student values estimation as a useful skill in money measurement.   Program Goal

1,7,8,9

Related Area(s) _____

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Dollars

Group Size: individual (or 1 student per set of cards)

Materials: a set (or sets) of numbered cards (15 to 20) that show sets of coins-- some equalling a dollar, some not-- each card should be numbered: a record sheet with numbers on it corresponding to the numbers on the cards

Record Sheet

Amount

1. ___

2. ___   .70

3. ___

4. ___

5. ___

Procedure:

. Teacher instructs students to count money shown on a card.

. The student records whether the money shown on the card has the same value as a dollar or not, with a yes or no on the appropriate line. If the answer is no, the student puts down the value of the money on the card.

Mini-Test: "Loose Change"

Group Size: entire class

Materials: coins or coin picture

Procedure:

. Tell how much money:

Silvey, Linda, Money Matters, Creative Publications, 1973, pp. 7-9

Coin stamps and stamp pad

District Resources

Suggested Activities: Grade(s) __2-3__	Suggested Monitoring Procedures	Possible Resources

Title: Dollar Exchange
Group Size: 2-4 or more
Materials: play "coins", enough to include
             100 pennies, 50 dimes, 50 nickels,
             25 quarters, 24 half-dollars, 25
             dollar bills; a box (for bank); a
             spinner marked as follows:
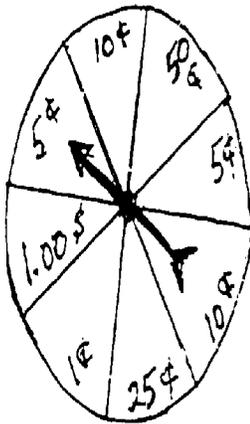
Procedure:
. Teacher places coins in a bank.
. Students take turns spinning the spinner.
. The number a spinner points to indicates the amount
  of money a player can withdraw from the bank.
. When players have accumulated a dollar in change,
  they may exchange the coins for a dollar gill.
. The player with the greatest number of dollar bills
  at the end of the game wins.

District Resources

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6.9

Suggested Objective Placement ___2-3___

Student Learning Objective(s) __The student values estimation as a useful skill in money measurement.__ State Goal

District Goal

Program Goal

Related Area(s) _____

Suggested Activities: Grade(s) __2-3__

	Suggested Monitoring Procedures	Possible Resources
Title: Best Estimator **Group Size:** ... idents **Materials:** ... of items to purchase that ... been priced **Procedure:** . Each student chooses one of the priced items in the picture (see other side). . Each then estimates the total cost of the items that were chosen and writes the estimate on a piece of paper. The estimate is to the nearer dollar. . The two students work together to find the exact total. A point is scored for each player whose dollar estimate was correct. . Play again, choosing two items each. Score 2 points for each correct estimate. . Play again, choosing three items each. Score three points for each correct estimate. . Start over with one item each. . The student who is first ahead by four points is the winner.		**District Resources**

6⁻⁹

6⁻⁹

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources

Model Sale

$1.99

$2.49

$4.18

$3.75

$1.85

District Resources

$2.25

50¢

$3.35

		Page	Suggested Grade Placement	District Placement	K	1	2	3	4
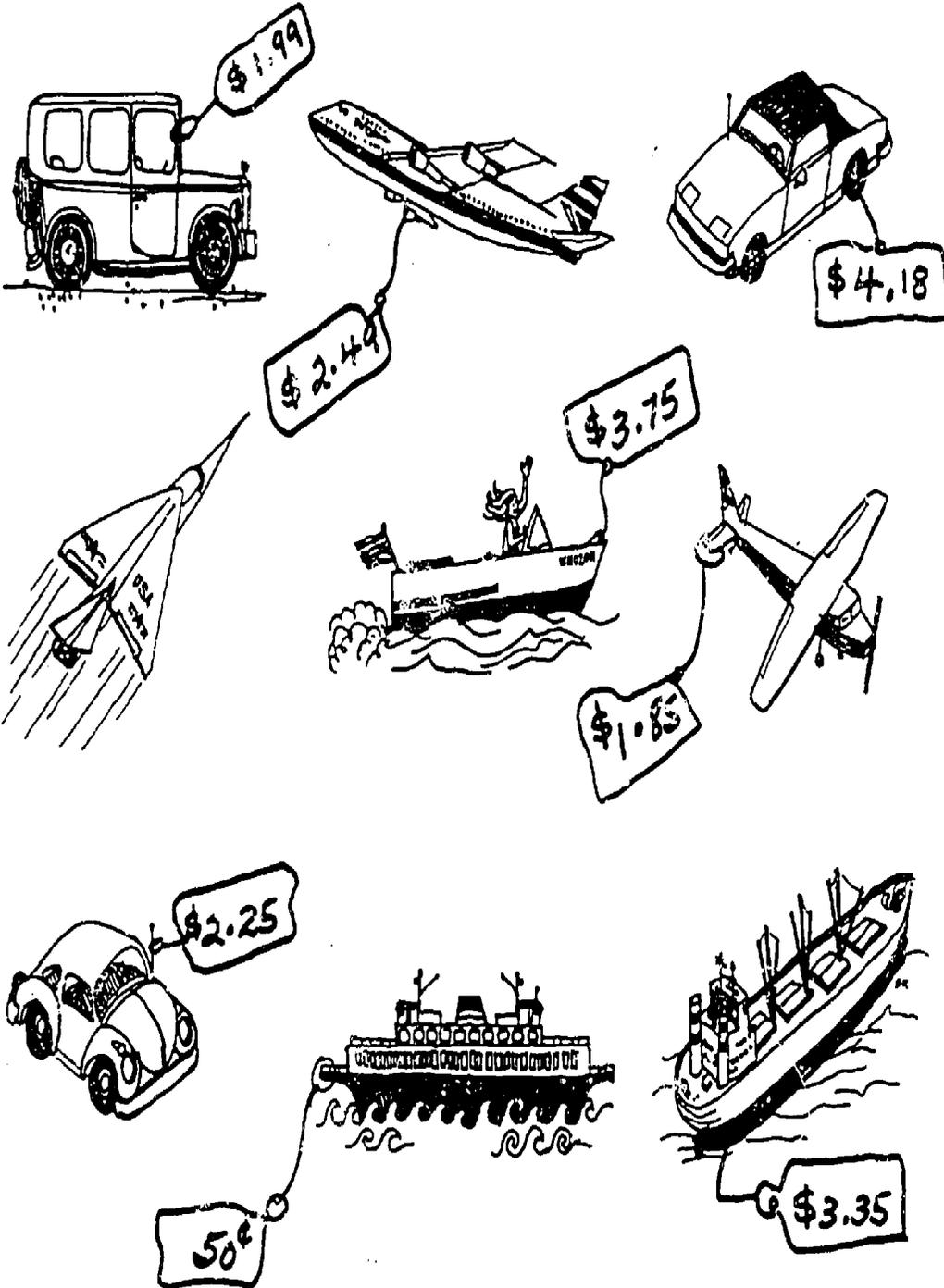
SUBJECT: __Mathematics__

SPECIFIC AREA: __Measurement: Linear__

The student knows:

	Page	Suggested Grade Placement
• the term "centimeter" refers to a metric unit of linear measurement.	329–	1
• the term "inch" refers to a customary unit of linear measurement.	333	1
• the term "meter" refers to a metric unit of linear measurement equal to 100 centimeters or 10 decimeters.	335–	2
• the term "foot" refers to a unit of linear measurement equal to 12 inches.	337–	2
• the term "yard" refers to a unit of linear measurement equal to 3 feet or 36 inches.	339	2
• the term "half-inch" is a unit of linear measurement.	341–	3
• the term "quarter-inch" is a unit of linear measurement.	343	3
• two quarter inches equal one-half inch.	343	3-4
• four quarter inches equal one inch.	343	3-4
• four quarter inches equal two half inches.	343	3-4
• the term "kilometer" is a metric unit of linear measurement.	345	3-4
• the term "perimeter" refers to the linear measurement around a given space. (geometry)	347–	3-4
• the term "mile" is a customary unit of linear measurement used to indicate distance.	355	3-4

The student is able to:

	Page	Suggested Grade Placement
*. compare size using the following terms: longer, smaller, largest, smallest, taller, tallest, longest, shortest, same.	349–	K-1
*. measure an object(s) using centimeters.	329–	1
*. measure the length of an object(s) using inches.	333	1
*. measure length using a meter stick.	335–	2
*. measure length using a foot ruler.	337–	2
*. measure length using a yardstick.	339	2
*. estimate lengths.	351–	2-3
• measure a specific length to the nearest half-inch.	343	3-4
• measure a specific length to the nearest quarter-inch.	343	3-4
• measure the perimeter of a simple geometric figure.	347	3-4
• compute distance in miles.	355	3-4

The student values:

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Suggested Objective Placement __1__

Student Learning Objective(s) __A. The student knows the term "centimeter" refers to a metric__ unit of linear measurement. B. The student is able to measure an object(s) using centimeters.

State Goal	1,6,7,9
District Goal	
Program Goal	1,3,4

Related Area(s) _____

Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
Title: Mystery Message **Group Size:** any number can play **Materials:** centimeter ruler, ditto puzzle, answer sheet Procedure: . Duplicate copies of a puzzle with the letters for a message placed at specific distances (in centimeters) from a center point. . Teacher tells students that something has disappeared in the classroom and that they can find a clue hidden in a mystery measuring maze.	**Mini-Test:** "Centimeter Measure" **Group Size:** entire class **Materials:** centimeter ruler Procedure: . Find the length of your mathematics textbook in centimeters.	District Resources
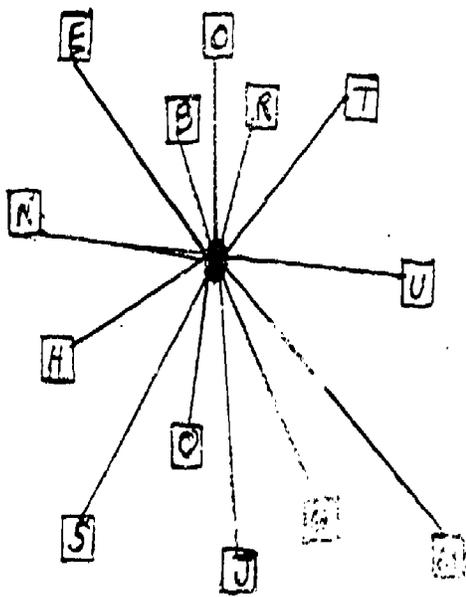
Suggested Activities: Grade(s) __1__	Suggested Monitoring Procedures	Possible Resources
• Teacher gives students a list of measurements to find and asks them to find which letters have lines with those lengths. • Students then unscramble the letters and combine them into words to discover the message. • For this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or special privilege.		

```
┌─────────────────────────────────────────┐
│                                         │
│   Example Answer Sheet                   │
│   ──────────────────                     │
│                                         │
│   Fill in blanks with the letter of the line │
│   that measures each length.             │
│                                         │
│                                         │
│   ___   ___   ___   ___   ___   ___      │
│    6     3    12    10    16    8        │
│                                         │
│                                         │
│   (Numbers refer to centimeter measurements.) │
│                                         │
└─────────────────────────────────────────┘
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District Resources

6CG

6CG

Suggested Objective Placement   1

Student Learning Objective(s) __A. The student knows the term "centimeter" refers to a metric__

__unit of linear measurement. B. The student is able to measure an object(s) using centimeters.__

Related Area(s) _____

State Goal	
District Goal	
Program Goal	1,3,4

Suggested Activities: Grade(s) __1__

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Measure Up! Group Size: pairs of students Materials: game board as follows: game cards 3"x8" with pictures of objects to be measured in centimeters, 2 rulers (actual rulers or drawn at bottom of game board)	Given a paper with objects drawn on it, students will measure in centimeters and record their answers.	Film: F-1946, Metric Measures Made Easy (ESD 109 collection) L-00016-P LAP from ESD 109 collection

Can You Measure Up?

Yours			Mine	
4 Centimeters	6 cm		4 cm	6 cm
5 cm	2 cm		5 cm	2 cm
1 cm	3 cm		1 cm	3 cm
3 cm	1 cm		3 cm	1 cm
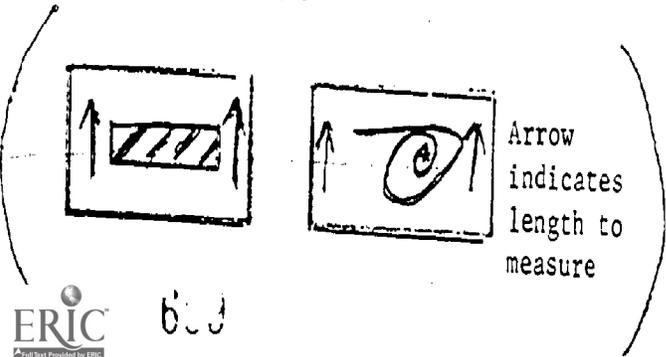
18" X 24"

Arrow indicates length to measure

District Resources

Suggested Activities: Grade(s) _1_	Suggested Monitoring Procedures	Possible Resources
Procedure: - Student selects a side of the board. Cards are placed face down in a pile. - Student draws a card and measures, using a ruler between the arrows shown on the card. If it matches a measurement on their side of the board, the card is placed next to that measurement. If it does not match, the card is put at the bottom of the pile. - The first student to complete his/her side of the board wins.		
		District Resources

6.1

6.2

Suggested Objective Placement ___1___

Student Learning Objective(s) __A. The student knows the term "inch" refers to a customary unit of__ ___ State Goal

__linear measurement. B. The student is able to measure an object(s) to the nearest inch.__ ___ District Goal

State Goal	1,6,7,9
District Goal	
Program Goal	1,3,4

Related Area(s) _____

Suggested Activities: Grade(s) ___1___

	Suggested Monitoring Procedures	Possible Resources
Title: Shadow Measure **Group Size:** pairs of students **Materials:** chalk, ruler, record sheet Procedure: · Teacher picks a sunny day to take students to a spot where they can see their shadows. · Students will mark their partner's shadow. Each student then measures his/her own shadow with the ruler, to the nearest inch. · The students can measure their shadow five times during the day, e.g., 9:30, 10:30, 12:30, 1:30 and 2:30 and compare the differing lengths. **Variations:** · Students can make graphs to show the different lengths. · Questions teacher can ask: "How much taller is the tallest shadow?" "How much shorter is the shortest shadow?"	Given a paper with objects drawn in inches, the students measure with rulers and record answers next to object. **Mini-Test:** "Inch Measure" **Group Size:** entire class **Materials:** inch ruler, pencils (new) Procedure: · Find the length of a new No. 2 pencil in inches.	Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, pp. 371-372 Henderson, George L., _Let's Play Games in Mathematics_, _Vol. 2_, National Textbook Co., 1970, p. 62 **District Resources**

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement __2__

Student Learning Objective(s) __A. The student knows the term "meter" refers to a metric unit of__ State Goal

__linear measurement equal to 100 centimeters or 10 decimeters. B. The student is able to measure__ District Goal

__using a meter stick.__

Program Goal

State Goal	6
District Goal	
Program Goal	1,3,4

Related Area(s) _____

_____

Suggested Activities: Grade(s) __2__

Suggested Activities	Suggested Monitoring Procedures	Possible Resources

Suggested Activities:

Title: Measuring With Meter Stick
Group Size: small group
Materials: meter stick

Procedure:

. Give the students each a meter stick. Ask them first to find the number of centimeters and then the number of decimeters.

Title: Measuring The Room
Group Size: individual
Materials: meter stick, record sheet

Procedure:

. The students are to measure the room dimensions, sidewalk, wall, etc., with the meter stick and record the measurements.

Suggested Monitoring Procedures:

Mini-Test: "Meter Measure"
Group Size: small group
Materials: meter sticks
Procedure:

. Each student measures one of the following using a meter stick:

. length of hallway
. width of hallway
. your height
. the length of five of your paces (strides)

Possible Resources:

District Resources

607

608

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources
Title: Metric Train Group Size: small groups Materials: tagboard 2 cm wide and 10 cm long, pencil, meter stick for each student Procedure: . The teacher measures and marks the centimeters on 20 tagboard rulers. . The students count the centimeters in each tagboard ruler (which is a decimeter long). The student then makes a train next to the meter stick of the decimeter rulers to equal a meter. . The student then counts the decimeters and can now count the centimeters 1 to 100, or he/she can add ten. 10 times.		
		District Resources

6.1

6.9

Student Learning Objective(s) __A.__ The student knows the term "foot" refers to a unit of linear

measurement equal to 12 inches. __B.__ The student is able to measure using a foot ruler.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3,4

Related Area(s)_____

Suggested Activities: Grade(s) __2__

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Inches **Group Size:** individual, small group, large group **Materials:** ruler marked only in inches Procedure: . Give a ruler to each student and ask students to count the inches. **Title:** Foot/Inches. **Group Size:** individual, small or large group **Materials:** tagboard strips an inch in length, tagboard strips a foot in length Procedure: . Teacher lays out twelve inch-long strips and compares them with a one-foot strip **Title:** Room Measure **Group Size:** individual **Materials:** 1-foot rulers, worksheets Procedure: . Teacher directs student to measure various objects in the room, e.g., window width, student height, etc.		Henderson, George L., _Let's Play Games in Mathematics_, National Textbook Co., 1970, pp. 60-61 . District Resources

Suggested Activities: Grade(s) __2__	Suggested Monitoring Procedures	Possible Resources

Title: Shadow Measure
Group Size: pairs of students
Materials: foot ruler, pencil, record sheet, sunny day

Procedure:
- Teacher takes students outside on a sunny day and has them measure shadows of various objects to the nearest foot, e.g., trees, playground equipment, principal, etc. These can be measured at different times of the day by the same students or different students.
- Record the findings on the bulletin board or chalk-board. These answers can be used for discussion in related area of science.

Title: Tree Shadows
Group Size: entire class
Materials: rulers, tree (must be short enough so that students can reach the top using stools or kitchen step ladder)

District Resources

Procedure:
- Teacher and students select a suitable tree and measure its height. Students then measure the tree's shadow.
- Measure students' heights and have them lie down head to head, or feet to feet, to determine the height of the tree.

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6̈.)

Student Learning Objective(s) A. The student knows the term "yard" refers to a unit of linear

measurement equal to 3 feet or 36 inches. B. The student is able to measure using a yardstick.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3,4

Related Area(s) _____

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: **Group Size:** individual, small group, entire class **Materials:** yardstick Procedure: . Give each student a yardstick and have them count the inches. Ask: "How many inches in a yard? How many feet in a yard?" . Measure objects in room. Write equivalent measurements. Desk is 1 yard 6 inches, or 42 inches, or 3 feet 6 inches. **Title:** **Group Size:** any number **Materials:** tagboard strips 1-foot long Procedure: . Lay out foot strips and compare to length of yardstick.	**Mini-Test:** "Yard Measure" **Group Size:** small group **Materials:** yardsticks Procedure: . Each student measures one of the following using a yardstick: . width of classroom . length of chalkboard . height of doorway . width of window . length of bulletin board	 District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

6.

6.

Student Learning Objective(s) __A. The student knows the term "half-inch" is a unit of linear__   State Goal | 1,7,10

__measurement. B. The student is able to measure a specific length to the nearest half-inch.__   District Goal |

Program Goal | 1,2, 3,7

Related Area(s)_____

Suggested Activities: Grade(s) ___3___	Suggested Monitoring Procedures	Possible Resources
Title: Mystery Message Group Size: entire class Materials: worksheets with a puzzle like the example below: Procedure: . Tell the students that something has disappeared in the classroom and they can find a clue hidden in a mysterious maze. . Duplicate copies of a puzzle with the letter for a message placed at specific distances from a center point. . Give students a list of measurements to find and ask them to find which letters have lines with those lengths. . Students then unscramble the letters and combine them into words to discover the message.	The student will measure drawings to the nearest half-inch, using a ruler. Teacher observes the student using the ruler. Mini-Test: "Nearest Half-Inch" Group Size: entire class Materials: inch rulers with one-half unit marks Procedure: . Draw a line 5½ inches long.	Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1973, pp. 371-372 Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, p. 50 District Resources

ERIC

Suggested Activities: Grade(s) _3_	Suggested Monitoring Procedures	Possible Resources
. Doing this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or a special privilege for each individual.		

Direction and Answer Sheet

Fill in blanks with the letter of the line that
measures each length:

___   ___   ___   ___   ___
$6\frac{1}{2}"$ $2\frac{1}{2}"$ $5\frac{1}{2}"$ $3\frac{1}{2}"$ $4\frac{1}{2}"$

District Resources

Student Learning Objective(s) __A. The student knows the term "quarter-inch" is a unit of linear measurement. B. The student knows that two quarter-inches equal one-half inch. C. The student knows that four quarter-inches equal one inch. D. The student knows that four quarter-inches equal ~~Rala measurement~~ two half-inches. E. The student is able to measure a specific length to the nearest half-inch. F. The student is able to measure a specific length to the nearest quarter inch.__

State Goal	
District Goal	
Program Goal	

Suggested Activities: Grade(s) __3__

Suggested Activities	Suggested Monitoring Procedures	Possible Resources
Title: Mystery Message Group Size: small group Materials: yardstick with quarter-inch divisions Procedure: . Tell the students that something has disappeared in the classroom and they can find a clue hidden in a mysterious measuring maze. . Duplicate copies of a puzzle with the letters for a message placed at specific distances from a center point. . Give each student a list of measurements to find and ask him/her to find which letters have lines those lengths. . Students unscramble the letters and combine them into words to discover the message. . For this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or a special privilege for each individual. . Clue might be <u>bookcase</u> (word 7). When the students have unscrambled the letters they will look in the bookcase for a surprise coupon.	The student will measure to the nearest quarter or half-inch objects or drawing given by the teacher. Mini-Test: "Nearest Quarter Inch" Group Size: entire class Materials: rule with quarter-inch units Procedure: . Have students draw a line 3-3/4 inches long.	Grossnickle, Foster E., <u>Discovering Meanings in Elementary School Mathematics</u>, Holt, Rinehart and Winston, 1973, pp. 371-372 District Resources
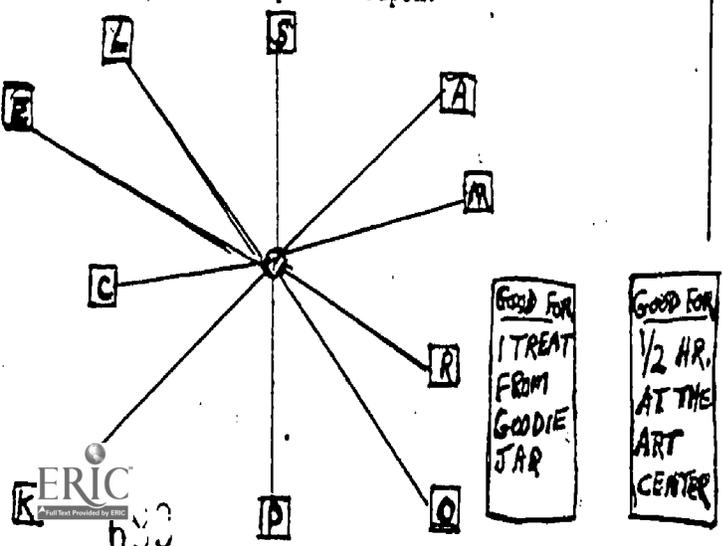
-343-

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement ___3___

Student Learning Objective(s) _____ The student knows the term "kilometer" is a metric unit of _____

linear measurement.

State Goal	1,6, 7,10
District Goal	
Program Goal	1,3,4

Related Area(s)_____

Suggested Activities: Grade(s) __3__

	Suggested Monitoring Procedures	Possible Resources
Title: Group Size: small group Materials: meter stick Procedure: . Before introducing kilometer, you may ask different students to use meter sticks to mark off distances of 2, 3 and 4 meters. Develop the idea of how long these distances are. . Using their meter sticks, the student may measure off 100 meters and get some idea that 10 times that distance is quite a large unit. It is a kilometer. At this point measure in meters, or kilometers. Meters . Distance in playground: . Distance of room: Kilometers . Distance from town to town: . Distance across countries: . Some hints: Kilometers are used to measure large distances. "Kilo" means 1000. One kilometer is the same length as 1000 meters.	Ask the student when would he/she use the kilometer to measure distance. Mini-Test: "Long Distances" Group Size: entire class Procedure: . If centimeter is used to measure common lengths, for example body measurements, and the meter is used to measure intermediate lengths, for example room dimensions, what is used to measure long distances, for example, from one city to another?	 District Resources

607

608

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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6́0

-3

Student Learning Objective(s) __A.__ The student knows the term "per:

measurement around a given space (geometry). B. The student is at

a given figure.

Related Area(s)_____

Suggested Activities: Grade(s) __3__	Suggest Proc

__Title:__
__Group Size:__ small group or entire class
__Materials:__ transparencies, overhead
projector, ruler

Procedure:
- Make a grid on transparency. Show it, using an overhead projector. __Example:__
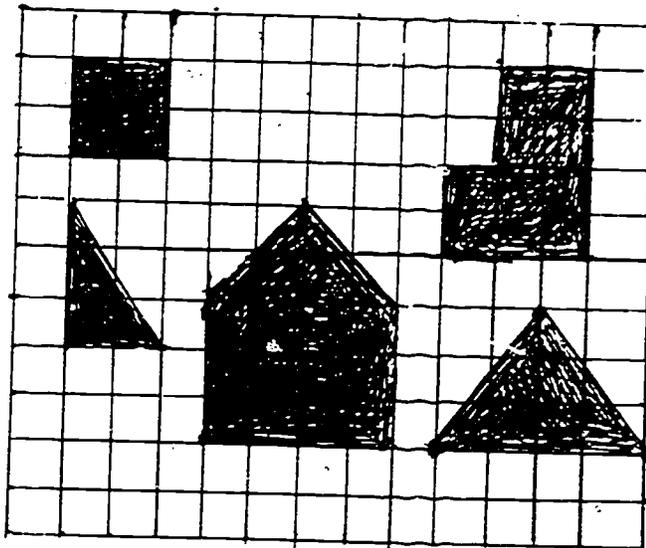
- Students may come up and show how to measure the perimeter.

601

Observe s
perimeter

Paper-pen
perimeter

Mini-Test
Group Siz
Materials
Procedure
- Find th
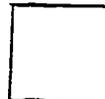
Suggested Objective Placement ___3___ ●

r" refers to the linear _____ State Goal

o measure the perimeter of _____ District Goal

_____ Program Goal

State Goal	1,7,10
District Goal	
Program Goal	1,2, 3,4

ʔnitoring ʔs	Possible Resources
nt while measuring	Grossnickle, Foster E., _Discovering Meanings in Elementary School Mathematics_, Holt, Rinehart and Winston, 1973, pp. 379-381
test to measure	
Perimeter	
entire class	
centimeter ruler	
ʔimeter:	
	District Resources

cm

602

. Students who have difficulty with the perimeter
may work with cut-outs which have the measures
written on each side, or blank on each side, or
blank on one side. These could be laminated so
they would last.

. Students will enjoy measuring the distances around
various objects in the room: for example, a small
window, the teacher's desk, their own desk or some
books. This can be done in inches or centimeters.

. Students may be challenged to find the pattern in
the following: Give them a triangle, square,
pentagon and a hexagon. The sides of each shape
are either 3 inches or 8 centimeters in length.

. Chart to record:

No. of Sides	Length of Each Side	Distance Around
3	8 cm	24 cm
4	8 cm	
5	8 cm	

District Resources

jective(s) __The student is able to compare size using the following terms:__

__...gest--smallest; taller--longer--shorter; tallest--longest--shortest; same.__

State Goal	1,7, 9,10
District Goal	
Program Goal	3

Reading--Visual Discrimination

...: Grade(s) _K-1_	Suggested Monitoring Procedures	Possible Resources
...hort and Tall ...mall or large group ...agboard graph ...ide a large space on bulletin board ...n of objects ranging in size from ...students to draw in pictures that ... and tall part of the graph. TALL ...graph from short to long. 	Teacher works individually with students. From a collection of objects varying in length, the student selects object in response to teacher questions or directions. Sample questions or directions: "Which pencil is shorter, the red one or the blue one?" "Which pencil is the longest?" "Pick up the shortest crayon." "Put the smallest bead in the box." Mini-Test: "Comparing" Group Size: entire class Materials: figures on paper to compare Procedure: . Mark with an X the largest and with a ✔ the smallest. . Mark with an X the longest and with a ✔ the shortest.	Nelson, Doyle, Mathematical Experiences in Early Childhood, Encyclopedia Britannica Publications, Inc., 1972, pp. 62-83 District Resources
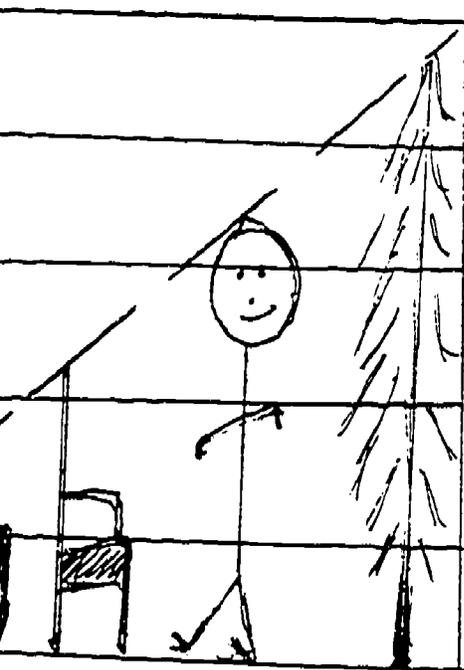
-349-

696

Suggested Activities: Grade(s) __K-1__	Suggested Monitoring Procedures	Possible Resources
	. Mark with an X the shapes that are the same. Teacher elicits verbal response. Teacher observation.	

Title: Cylinders
Group Size: individual
Materials: cardboard tubing cut into graduated sizes

Procedure:
. Teacher gives following directions: "Students arrange tubing from tallest to shortest."
. Teacher discusses with students the tubes that are short, tall, shorter, taller, shortest, tallest.
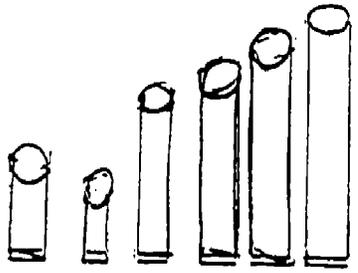
Title: Straw Comparisons
Group Size: individual, small group, entire class
Materials: cards labeled as follows--Same, Longest, Shortest, Longer, Shorter Taller, Smaller; 7 drinking straws, (some of which are the same length)

Procedure:
. Teacher gives the following directions to students:
  (a) Find two straws of the same length.
  (b) Find the longest straw--label it.
  (c) Find the shortest straw--label it.
  (d) Find two straws of different lengths. Label the shorter straw.
  (e) Prop two straws on end against the side of ur desk. If they are of different lengths, bel one "taller" and the other "shorter".

District Resources

PROJECT

Suggested Objective Placement   2-3

...ming Objective(s) ___The student is able to estimate lengths.___

State Goal	1
District Goal	
Program Goal	3

...a(s)_____

...ctivities: Grade(s) __2-3__

	Suggested Monitoring Procedures	Possible Resources
Size: entire class **...als:** a strip of cardboard or a string that has been pre-measured to equal foot, yard or a meter, a record sheet, a set of objects (or objects in the classroom)-- can list some on the chalkboard ...e record sheet in 3 columns shown, putting ...gth of the cardboard or string in the blank:	Teacher observes success during the listed activity. Keep a record of success in doing the activity on several different occasions. <u>Mini-Test:</u> "Estimating Lengths" <u>Group Size:</u> one student <u>Procedure:</u> . Ask student to find objects that he/she estimates to be the same or different in length. . Ask student to tell <u>why</u> these objects are the same or different and determine the logic of the answers. . Ask student to estimate distances between two places in the room, and tell why he/she estimates a difference. . Determine whether estimates and reasoning are logical.	ESD 109 films F - 1670 A Changing Size

Longer than	About the same as	Shorter than
____	____	____

	District Resources

...e objects in the set or observing objects
...he room, estimate if they are longer than,
...e same or shorter than, the model. Record
...mates in the appropriate columns on the
...neet.
...ents, one at a time, or in small groups (or
...her), can use the model to demonstrate that
...ect is longer than, about the same or short-
...the model. Mark mistakes or make
...ns.

6...

-351-.

7...

Suggested Activities: Grade(s) _2-3_	Suggested Monitoring Procedures	Possible Resources

Title: Centimeter Measure

Group Size: individual, small group or whole class

Materials: 10 objects commonly found in any classroom

Procedure:
. Draw a table, such as:

May sub-
stitute
pictures
of objects
for object
words.

Object	Guess in Centimeters	The Measurement
Pencil		
Crayon		
Chalk		
Eraser		
Etc.		

. Guess the length of each object in centimeters. Record in guess column.
. Measure the length of each object in centimeters. Record the answers in the table.

District Resources

7.2

7.3

Suggested Objective Placement   2-3

Student Learning Objective(s) __The student is able to estimate lengths.__

State Goal	1,7, 9.10
District Goal	
Program Goal	3

Related Area(s)_____

Suggested Activities: Grade(s) __2-3__

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Title: Thumb Measures **Group Size:** partners **Materials:** book Procedure: . Guess how many thumbs wide your book is. . Count the number of thumbs needed. . Compare your answer with your partner's answer. **Title:** Span Measures A <u>span</u> is the distance from your thumb to your little finger when you spread your fingers out as wide as possible. **Group Size:** partners **Materials:** paper and pencil to record answers Procedure: . Guess the length of your desk in spans. . Measure the length of your desk in spans. Start with your thumb on the left side of your desk. . Use one hand only, opening it to its fullest. . Then close it by moving the thumb to the littlest finger each time. . Count the spans needed and record your answer. . Get your partner to measure desk with his/her span. . Compare your answers.		District Resources

ERIC 7 3

7 1

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Discover My Pattern

> A cubit is the distance from the tip of your middle finger to your elbow when your fingers are spread out as far as possible.

Group Size: one, small group or class
Materials: paper, pencil

Procedure:

. Choose 10 objects to measure and record your answers on a chart like this:

Object	Number of Spans	Number of Cabits
Door		
My Desk		
Etc.		

. Find a pattern in your chart.
. If you can find a pattern, what does it mean?

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol 2., National Textbook Co., 1970, pp. 20-21, p. 30

District Resources

ERIC
Full Text Provided by ERIC

Suggested Objective Placement ____

Student Learning Objective(s) __A. The student knows the term "mile" is a customary unit of linear__ | State Goal
__measurement used to indicate distance. B. The student is able to compute distance in miles.__ | District Goal

| Program Goal

Related Area(s)_____

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources

Title: The Estimate A Mile Contest
Group Size: small group
Materials: chalk, yardstick, odometer, pedometer, or cyclometer
 	
Procedure:
. Teacher marks off a mile by use of odometer, pedometer, or cyclometer.
. Students are organized in pairs.
. The problem is to determine a mile given:
  1. a yardstick and chalk,
  2. the starting point from which to measure,
  3. the direction in which to measure.
. Students are allowed to measure the first ten yards only with the yardstick.
. Each pair marks with chalk the point at which they estimate to be the "end".
. Each pair determines their own strategy to "solve" the problem.
	Mini-Test: "A Long Distance"
	Group Size: one student
	Procedure:
	. Ask each student what customary unit of measure is used to measure long distances, e.g., distance between two cities.
		D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 349-351
		
		District Resources

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Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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7.)

SUBJECT: ___Mathematics___

SPECIFIC AREA: ___Measurement: Capacity (Volume)___

	Page	Suggested Grade Placement	District Placement				
			K	I	2	3	4

The student knows:

- the term "liter" refers to a metric unit of volume measurement.
- the terms "cup", "pint", "quart" and "gallon" refer to units of capacity measurement.
- two cups equal one pint.
- four cups or two pints equal one quart.

	Page	Suggested Grade Placement
the term "liter"...	363	1-3
the terms "cup"...	359+	1-3
two cups equal one pint.	359+	1-4
four cups or two pints equal one quart.	359+	1-4

The student is able to:

- measure capacity using the liter as the unit of measurement. 363 1-3
*. measure capacity using a "cup", "pint", "quart" or "gallon" as the unit of measure. 359+ 1-3

The student values:

7 ? ?

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

Suggested Objective Placement ___1-3___

Student Learning Objective(s) __A. The student knows that the terms "cup", "pint", "quart" and "gallon"__ State Goal

__refer to units of capacity measurement. B. The student is able to measure capacity using a cup, pint,__ District Goal

__quart or gallon as the unit of measurement. C. The student knows that two cups equal one pint.__

D. The student knows that four cups or two pints equal one quart.   Program Goal

	1,7,9

Related Area(s)_____

Suggested Activities: Grade(s) ___1-3___

	Suggested Monitoring Procedures	Possible Resources
Title: Fill 'Em Up! **Group Size:** small group **Materials:** old suitcase or box, beans, rice, unpopped popcorn, buttons, beads, containers of these sizes -- cup, pint, quart, gallon (label each container appropriately) Procedure: • Teacher asks questions of students who respond orally, or questions may be written on a list and placed by the box or suitcase. • Sample questions: _____ cups = 1 pint _____ cups = 1 quart _____ pints = 1 gallon _____ quarts = 1 gallon _____ cups = 1 galloon	**Mini-Test:** "Liquid Measure" **Group Size:** one student **Materials:** cup, pint, and quart containers, a large jar to hold water, water supply Procedure: • Ask each student to find the capacity of the large jar in cups, pints and quarts and to record each answer.	Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 364-365 **District Resources**

722   723

Suggested Activities: Grade(s) 1-3	Suggested Monitoring Procedures	Possible Resources
Title: Cups and Quarts **Group Size:** individual, small groups **Materials:** cup and quart measures, beans, rice, etc.		

Procedure:
- Teacher instructs students to fill the cup with beans, then pour them into the quart measure. Students continue to do this, counting the number of cups used to fill the quart measure.
- Use the same procedure for above questions.

Note: Students need time by themselves, filling and refilling containers of many sizes, when developing concept of capacity. It is recommended that several jars or bottles and materials like beans, rice, etc., be available to students for practice in comparing and predicting capacity of containers.

District Resources

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7_7

Student Learning Objective(s) <u>A. The student knows that the terms "cup", "pint", "quart" and "gallon"</u> State Goal

| 1,7,9 |

<u>refer to units of capacity measurement. B. The student is able to measure capacity using a cup,</u>   District Goal

<u>pint, quart, or gallon as the unit of measurement. C. The student knows that two cups equal one</u>   Program Goal

<u>pint. D. The student knows that four cups or two pints equal one quart.</u>

Related Area(s)_____

Suggested Activities: Grade(s) ___1-3___	Suggested Monitoring Procedures	Possible Resources
Title: Cups, Pints, Quarts, Gallons **Group Size:** individual or small group **Materials:** paper, paste, magazines, label Procedure: . Students make a chart with 4 columns labeled:	Observe and record the success of the students as they do the activities.	L-00360-P LAP ESD 109 collection

Cup	Pint	Quart	Gallon
Coffee Tea	CREAM Paint Thinner	MILK	Gasoline

. List things (words or pictures) that would usually be measured with the different measures.

<u>Note:</u> Before introducing this activity, ask students to check at home, in stores and neighbors' homes and with parents, etc., about liquids and container sizes. On the following day, have students make the charts, using knowledge gained out of school, along with labels or pictures of products which they were able to secure. Display charts around the room.

District Resources

Suggested Activities: Grade(s) _____	Suggested Monitoring Procedures	Possible Resources
		District Resources

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ERIC

Suggested Objective Placement   2-3

Student Learning Objective(s) __A. The student knows that the term "liter" refers to a metric unit__   State Goal

__of volume measurement. B. The student is able to measure capacity using the liter as the unit of__   District Goal

__measurement.__

Program Goal

	1,6,7,9

Related Area(s)_____

Suggested Activities: Grade(s) __2-3__

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Liter Measure
Group Size: entire class in groups of 2, 3 or 4
Materials: Assemble the following material for each group:
  large pitchers of water
  liter measure marked in milliliters
  plastic funnel
  several empty containers such as:
    paper drinking cup
    coffee can
    cottage cheese carton
    salad dressing jar
    soft drink can
    catsup bottle
    large bleach bottle
    plastic mixing bowl
    instant coffee jar
  record sheets
  plastic bucket or large pan
	Mini-Test "Liter Measure"
	Group Size: one student
	Materials: liter pitcher, four containers of varying sizes labeled A, B, C and D, water supply, recording sheet
	
	Procedure:
	. Ask student to find the capcity in liters of all four containers and to record capacity of each container.
		Thyer, Dennis, _Teaching Mathematics to Young Children_, Holt, Rinehart and Winston, 1971, pp. 187-188

		District Resources

Procedure:

. Students take five of the containers and fill them with water. Then pour the water into the liter measure. Students record whether the container held less than a liter, more than a liter, or a liter.

	More	Less	One
Paper cup		X	

722

Suggested Activities: Grade(s) __2-3__	Suggested Monitoring Procedures	Possible Resources

. Using five other containers, have students first estimate whether each container will hold less or more than a liter, or a liter exactly. Record on the record sheet. Students then check the estimates by following directions in the first paragraph.

. Using the plastic bucket or large pan and the liter measure, have students place a given number of liters of water in the large container, e.g., measure five liters of water into the bucket.

Title: Liter Measure
Group Size: entire class
Materials: 5 different containers (#10 can, dishpan, pail, large bowl, sink), one liter measure, water

Teacher observes the student as the measurement is being done.

Kids' Stuff Math

Procedure:
. Copy the following table:

Container	Estimated Number of Liters	Actual No. of Liters
#10 can		
Dishpan		

District Resources

. Record your liter estimates.
. Have five different students fill each container using the liter measure. Students record to the nearest liter the actual number of liters.

7 1

7 3

SMALL SCHOOLS PROJECT

SUBJECT: __Mathematics__

SPECIFIC AREA: __Measurement: Weight__

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4

The student knows:

- the term "kilogram" refers to a metric unit of weight.
- the term "gram" refers to a metric unit of weight.
- the term "pound" refers to a unit of weight.

	Page	Grade
	367	2-3
	369	2-3
	371	2-3

The student is able to:

- weigh objects to the nearest kilogram.
- weigh objects to the nearest gram.
- weigh objects to the nearest pound.

	Page	Grade
	367	2-3
	369	2-3
	371	2-3

The student values:

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER _____

7.

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Suggested Objective Placement ___2-3___

Student Learning Objective(s) ___A. The student knows the term "kilogram" refers to a metric unit___
___of weight. B. The student is able to weigh objects in the nearest kilogram.___

State Goal

District Goal

Program Goal

1,6,7

Related Area(s)_____

Suggested Activities: Grade(s) ___2-3___

Suggested Activities	Suggested Monitoring Procedures	Possible Resources

<u>Title:</u>   Measuring Activities
<u>Group Size:</u> 10 students at a time
<u>Materials:</u> 1 metric bathroom scale (for entire group)
     5 balance scales and metric weights
     5 cans of soup, corn
     5 tea bags
     10 oranges
     2 kg dried beans
     5 cans of coffee
     5 boxes of crackers
     5 bars of soap
     1 large box of laundry detergent
     5 boxes of cereal
     5 pennies
     5 large books
	Teacher observation of individual student weighing objects
	
	In small groups, have the student demonstrate ability to weigh objects, e.g., marbles.
	
	Have students weigh several objects, recording the weights on a record sheet. Teacher checks sheet for accuracy.
	
	<u>Mini-Test:</u> "Nearest Kilogram"
	<u>Group Size:</u> one student
	<u>Materials:</u> empty 3 lb. coffee can, water supply, kilogram weights, simple balance
		Laycock, Mary and Watson, Gene, <u>The Fabric of Mathematics (A Resource Book for Teachers)</u>, Hayward, California: Activity Resource, 1971, pp. 140-142
		
		Metric Bathroom Scale

Procedure:
. Teacher directs students to weigh each object and record the weight:
     Soup ___g
     Cereal box ___g
     15 beans ___g
     1 tea bag ___g.
	Procedure:
	. Ask each student to fill the 3 lb. coffee can with water to determine its weight to the nearest kilogram.
		District Resources

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7⁵⁺

Suggested Activities: Grade(s) __2-3__	Suggested Monitoring Procedures	Possible Resources
• Teacher directs students to estimate the weight of the following objects, then weigh them:		

	Est.	Actual
Can of corn	___g	___g
Crackers	___g	___g
10 pennies	___g	___g
1 orange	___g	___g
Can of coffee	___g	___g
1 large book	___g	___g
1 large book	___kg	___kg
Student	___kg	___kg

• Teacher directs students to measure out the following portions, then check for accuracy:

(a) 1 kg of oranges
(b) 500 g of laundry soap
(c) 250 g of dried beans

District Resources

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SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) __A. The student knows the term "gram" refers to a metric unit of__

__weight. B. The student is able to weigh to the nearest gram.__

State Goal

District Goal

Program Goal

| 1,6,7 |

Related Area(s)_____

Suggested Activities: Grade(s) _2-3_

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Grams
Group Size: entire class in groups of 2 or 3
Materials: Collect a set of the following for each group of 2 or 3 students:
  1 metric scale (a balance scale with weights, a kitchen scale or a combination of these scales as available)
  a variety of items to weigh such as:
    can of soup
    a book
    several coins
    a ruler
    bags of dried beans or pebbles, or paper clips
    an orange
    a pencil
    a tablet
    a ball of clay
	Teacher observation of individual student weighing objects.
	
	In small groups, have the student demonstrate ability to weigh objects, e.g., marbles.
	
	Have students weigh several objects, recording the weights on a record sheet. Teacher checks sheet for accuracy.
	
	Mini-Test: "Gram Measures"
	Group Size: one student at a time
	Materials: 10 crayons, 10 pencils, chalkboard eraser, 5 pencils, simple balance, gram weights, chart to complete
		Laycock, Mary and Watson, Gene, The Fabric of Mathematics (A Resource Book for Teachers), Hayward, California: Activity Resource, 1971, pp. 140-142
		
		Centicubes
		
		--- 	
		
		District Resources

Procedure:
. Teacher directs students to:
(a) Weigh 10 of the objects and record the weight in grams. Make a record of your observations.
(b) Take several objects not weighed before and:
  1. estimate their weight
  2. measure their weight
  3. make a record of the estimate and actual weight

Procedure:
. Ask student to estimate the weight of each in grams and then to find weight of each.

	Guess	Actual Weight
10 crayons		
10 pennies		
chalkboard eraser		
5 pencils		

700

369

704

Suggested Activities: Grade(_____)	Suggested Monitoring Procedures	Possible Resources

Est.   Actual

<u>3 g</u>   _____ g paper clip
_____   _____ g pencil

(c) Using beans, coins, paper clips or something similar, students:

1. Select an amount equal to a given weight; then weigh to see how accurate the estimate was.

<u>Example:</u>

                                        Actual wt.

Find 500 g of paper clips: _____

. Centicubes: Centicubes are a versatile and useful metric tool for primary students. Each edge is 1 cm, each surface 1 cm^2; volume 1 cm^3; weight 1 gram. The weight is surprisingly accurate. They come in 10 attractive colors, are durable, non-toxic, etc.

<u>Title:</u>   Gram Measurements
<u>Group Size:</u> small group
<u>Materials:</u>   various objects less than 50 g, 50 centicubes for each student

Procedure:
. Teacher directs students to:
(a) Find 7 objects you estimate to be less than 50g
(b) Students complete the chart:

<u>Object</u>   <u>Est. Wt.</u>   <u>Measured Wt.</u>
giant can
paper clip
2 washers

(c) Put the objects in order, lighest first.
(d) Try again with 7 other objects, Teacher asks: "Are your estimates improving?"

District Resources