DOCUMENT RESUME

ED 119 994 SE 020 396

TITLE	Mathematics Guide K-8.
INSTITUTION	Del Mod System, Dover, Del.; Seaford School District, Del.
SPONS AGENCY	National Science Foundation, Washington, D.C.
REPORT NO	NSF-GW-6703
PUB DATE	Jun 74
NOTE	143p.;
AVAILABLE FROM	Mr. John F. Reiher, State Supervisor of Science and Environmental Education, Dept. of Public Instruction, John G. Townsend Building, Dover, Delaware 19901 (Free while supply lasts)
EDRS PRICE	MF-$0.83 HC-$7.35 Plus Postage
DESCRIPTORS	Basic Skills; Curriculum; *Curriculum Guides; *Elementary School Mathematics; Elementary Secondary Education; *Geometric Concepts; Instruction; Learning Activities; Mathematics Education; *Number Concepts; Objectives; *Secondary School Mathematics; Teacher Developed Materials
IDENTIFIERS	*Del Mod System; National Science Foundation; NSF

ABSTRACT

This mathematics curriculum guide for grades K-8 was developed and evaluated by teachers in the Seaford School District, Delaware. It sets out concepts and skills to be mastered at each grade level. Suggested learning activities are described for each curricular objective identified. The curricular topics addressed include number concepts, operations, and relations; geometric concepts; money and time, pattern recognition, and measurement. (SD)

MATHEMATICS GUIDE K-8

Prepared by

Seaford School District

June 1974

Printed and disseminated through the office of the Del Mod Component Coordinator for the State Department of Public Instruction, John G. Townsend Building, Dover, Delaware 19901

Preparation of this monograph was supported by the National Science Foundation Grant No. G.W. 6703 to the Del Mod System, P. O. Box 192, Dover, Delaware 19901

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INTRODUCTION

The K-8 Mathematics Guide has been developed by teachers, evaluated by teachers, revised by teachers and submitted by teachers for adoption. Each level includes the following:

1. Concepts
2. Skills
3. Suggested Activities and/or Procedures
4. Student participation in practical situations.

This guide is intended to be a sequence of concepts and skills that a child is expected to know at each grade level, rather than a blueprint of how to teach. The activities are only suggestions and we encourage teachers to add to these suggestions whenever possible.

3/74

C O N T E N T S

KINDERGARTEN

CONCEPTS AND SKILLS	ACTIVITY/PROCED
K-a. Quantitative Comparisons of Two Objects (or more) (length, weight, height, size, hardness, etc.)	K-a. Have two students stand be Help members of the class one is tall or taller and short or shorter. Variation: Have the total pairs and follow verbal di by the teacher such as: 1. "Will the tall (taller your hand?" 2. "Will the short (short stoop?"
K-b. Recognition of Geometric Basic Shapes 1. Two dimensional (triangles, squares, circle)	K-b. Give the student an assort metric shapes. Show him a ask him to find a like sha Variation: Give some stud carry around in the classr something having the same
K-c. Duplication of patterns.	K-c. Given a pattern consisting geometric shapes a student arrange his geometric shap same pattern.
K-d. Visual Motor Matching of Two Sets of Objects (one to one)	K-d. Collect an assortment of ob ordinarily go together such and bats, milk cartons and

	ACTIVITY/PROCEDURE
	K-a. Have two students stand before the class. Help members of the class determine which one is tall or taller and which one is short or shorter. Variation: Have the total group stand in pairs and follow verbal directions given by the teacher such as: 1. "Will the tall (taller) person raise your hand?" 2. "Will the short (shorter) person stoop?"
	K-b. Give the student an assortment of geometric shapes. Show him a triangle and ask him to find a like shape. Variation: Give some students a shape to carry around in the classroom and find something having the same shape.
	K-c. Given a pattern consisting of several geometric shapes a student tries to arrange his geometric shapes in the same pattern.
	K-d. Collect an assortment of objects that ordinarily go together such as balls and bats, milk cartons and straws,

KINDERGARTEN

CONCEPTS AND SKILLS	ACTIVITY/PROCE
K-d. cont'd	K-d. hammers and nails, nuts a Have students group the s to determine if the items matching set matches one
K-e. Counting Objects Up to Ten	K-e. Have one child come to th room to be the leader. H the ball any number of ti between 1 and 10. Then h someone in the room to cl same number of times. If called on claps the corre he may be the new leader.
K-f. Recognition of Sets of Objects Up to Three Without Counting	K-f. Have a group of students class and kneel behind a approximately 2 feet high will designate certain st up and kneel (in a flash) students to tell how many up.
K-g. Relationship of Sets of Objects Up to Five (more, less, equal)	K-g. Have two groups of childr front of the class facing to 5 students in each grou each member of one group a bon streamer to hold by c the members of the other g other ends. The children determine the relationship two sets of children.

	ACTIVITY/PROCEDURE
	K-d. hammers and nails, nuts and bolts, etc. Have students group the sets properly to determine if the items in each matching set matches one to one.
	K-e. Have one child come to the front of the room to be the leader. He will bounce the ball any number of times he chooses between 1 and 10. Then he will call on someone in the room to clap his hands the same number of times. If the student called on claps the correct number of times, he may be the new leader.
	K-f. Have a group of students come before the class and kneel behind a screen or shield approximately 2 feet high. The teacher will designate certain students to stand up and kneel (in a flash). Ask other students to tell how many students stood up.
	K-g. Have two groups of children stand in front of the class facing each other (2 to 5 students in each group). Give each member of one group a six foot ribbon streamer to hold by one end. Have the members of the other group hold the other ends. The children can readily determine the relationship between the two sets of children.

CONCEPTS AND SKILLS	ACTIVITY/PROCE
K-h. Recognition and Ordering of Numerals of Nine	K-h. Cut a dachshund from tagb[illegible] dog in two pieces. Make and label from one to nin take turns in making the Place the dog on a chalk flash cards out to studen number at a time in order one. Each student must d numeral he is holding and chalk tray in proper orde
K-i. Introduction of numeral zero.	K-i. Have children search room elephants.
K-j. Writing Numerals from Zero to Nine	K-j. Write a series of 1's, 2' chalkboard in large size. group of children come to trace the number with a f child trace the number in holding his finger close while verbalizing the mot Variation: Have children in the sand, fingerpaint,
K-k. Basic Understanding of Time - Day, Night, Morning, Afternoon	K-k. Informally question stude their activities related home in the designated voc

ACTIVITY/PROCEDURE

K-h. Cut a dachshund from tagboard; cut the dog in two pieces. Make nine flash cards and label from one to nine. Have children take turns in making the dog grow longer. Place the dog on a chalk tray. Pass the flash cards out to students and call one number at a time in order beginning with one. Each student must determine the numeral he is holding and place in on the chalk tray in proper order.

K-i. Have children search room for live elephants.

K-j. Write a series of 1's, 2's, etc. on the chalkboard in large size. Have a small group of children come to the board and trace the number with a finger. Have each child trace the number in the air by holding his finger close to the chalkboard while verbalizing the motion.

Variation: Have children make numerals in the sand, fingerpaint, etc.

K-k. Informally question students as to their activities related to school and home in the designated vocabulary.

TEACHER'S NOTES

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCED
1-a. Quantitative Comparisons of More Than Two Objects	1-a. Have several students sta the class and let others one is the tallest and wh shortest.
1-b. Directional Understanding Left-right, over-under, before-after, up-down	1-b. Draw a large circle on the of the eye and hand level dents. Make a red X at th circle, and a red X to the the circle. Have one stud right hand at the top of t X) and move the hand clock X on the right side and st When this motion is perfor say, "This is my right han X at the top of the same c left side of the red X and the left side of the circl student place his left han X at the top and move it c to the green X on the left circle. When this motion should say, "This is my le
1-c. Finding Coordinate Locations (column, row)	1-c. Arrange student chairs in f group forming three or four chairs placed side by side. dents come to the front and designated chair. Example: first chair in the first ro Variation: Draw a diagram seating arrangement on the

	ACTIVITY/PROCEDURE
	1-a. Have several students stand in front of the class and let others determine which one is the tallest and which one is the shortest.
	1-b. Draw a large circle on the chalkboard of the eye and hand level of the students. Make a red X at the top of the circle, and a red X to the right side of the circle. Have one student place his right hand at the top of the circle (red X) and move the hand clockwise to the red X on the right side and stop at this point. When this motion is performed, he should say, "This is my right hand." Make a green X at the top of the same circle to the left side of the red X and a green X to the left side of the circle. Have the student place his left hand on the green X at the top and move it counter clockwise to the green X on the left side of the circle. When this motion is performed he should say, "This is my left hand."
	1-c. Arrange student chairs in front of the group forming three or four rows with chairs placed side by side. Have students come to the front and sit in a designated chair. Example: "Sit in the first chair in the first row." Variation: Draw a diagram of the same seating arrangement on the chalkboard.

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
1-c. cont'd	1-c. Have students who are seat designated chairs make an gram to show his location.
1-d. Pattern Reproduction	1-d. Display a design by which concrete item is used such placed side by side. Give an opportunity to observe and tell what they see. I dents to conclude that thi made by repeating the same and over again. This sugg extended to include two or rotation to form a more co Example: 1. boy-girl-boy- 2. boy-chair-boy 3. girl-chair-bo
1-e. Sorting of Objects as to a Single Attribute	1-e. Collect an assortment of b Have the children sort the in the following manner: 1. Find the buttons that h 2. Find the buttons that h 3. Find the buttons that h 4. Find the buttons that h 5. Find the red, blue or g
1-f. Basic Geometric Shapes	1-f. Have students identify the geometric shapes by using

	ACTIVITY/PROCEDURE
	1-c. Have students who are seated in the designated chairs make an X in the diagram to show his location.
	1-d. Display a design by which a single concrete item is used such as 4 chairs placed side by side. Give the group an opportunity to observe the display and tell what they see. Lead the students to conclude that this pattern was made by repeating the same shape over and over again. This suggestion can be extended to include two or more items in rotation to form a more complex design. Example: 1. boy-girl-boy-girl 2. boy-chair-boy-chair 3. girl-chair-boy-chair, etc.
	1-e. Collect an assortment of buttons. Have the children sort the buttons in the following manner: 1. Find the buttons that have 2 holes. 2. Find the buttons that have 3 holes. 3. Find the buttons that have 4 holes. 4. Find the buttons that have no holes. 5. Find the red, blue or green buttons, etc.
	1-f. Have students identify the following geometric shapes by using concrete ob-

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
1-f. cont'd	1-f. jects: (circles, squares, triangles, ovals). Cut o ment of geometric shapes tion paper in various siz Divide some of the shapes by cutting into halves, q Have students match the p to form various geometric
1-g. Recognition of three-dimensional shapes (cone, sphere, cube)	1-g. Give the student an assor three dimensional shapes. cube and have him find li
1-h. Temperature Comparisons (hot, cold, hotter than, colder than, etc.)	1-h. Display 4 containers of w container should contain finite temperature variat warm, cool). Two thermom used to show the comparis tures between hot and col thermometers cannot be ob diagram of 4 thermometers the chalkboard. Various readings can be t the sketch so that childr stand the following: 1. The mercury goes up w ature is hot. 2. The mercury goes down temperature is cold.

	ACTIVITY/PROCEDURE
	1-f. jects: (circles, squares, rectangles, triangles, ovals). Cut out an assortment of geometric shapes from construction paper in various sizes and colors. Divide some of the shapes into segments by cutting into halves, quarters, etc. Have students match the proper segments to form various geometric shapes.
	1-g. Give the student an assortment of three dimensional shapes. Show him a cube and have him find like shapes.
	1-h. Display 4 containers of water. Each container should contain water with definite temperature variations (hot, cold, warm, cool). Two thermometers may be used to show the comparisons of temperatures between hot and cold. If large thermometers cannot be obtained, a simple diagram of 4 thermometers can be made on the chalkboard. Various readings can be transferred to the sketch so that children can understand the following: 1. The mercury goes up when the temperature is hot. 2. The mercury goes down when the temperature is cold.

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCE
1-h. cont'd	1-h. Let the children take tu merging the thermometer water and determine the variations are possible temperature.
1-i. Simple Measurement (length, weight, etc.)	1-i. Bring four 2" by 4" piec into the classroom. Eac vary in length (8 feet, 1 foot). Lay the 8 foot floor. Have the childre walking beside this piec to the other by beginnin gether. Have each tell he took. Variation: Lay all four floor parallel to each o leaving ample walking sp Have one student stand b and take turns walking f other when directed. He mine who took the most s variations are possible activity.
1-j. Introduction to Time (clock face, to the hour, to the 1/2 hour, calendar)	1-j. Use chalk or masking tap make a very large clock classroom floor. Omit t two ribbon streamers. H in the center of the clo of each ribbon. Let one

	ACTIVITY/PROCEDURE
	1-h. Let the children take turns submerging the thermometer into the water and determine the reading. Many variations are possible in understanding temperature.
	1-i. Bring four 2" by 4" pieces of lumber into the classroom. Each piece should vary in length (8 feet, 4 feet, 2 feet, 1 foot). Lay the 8 foot piece on the floor. Have the children take turns walking beside this piece from one end to the other by beginning with feet together. Have each tell how many steps he took. Variation: Lay all four pieces on the floor parallel to each other but leaving ample walking space between each. Have one student stand beside each piece and take turns walking from one end to the other when directed. Help children determine who took the most steps. Why? Many variations are possible in this kind of activity.
	1-j. Use chalk or masking tape (cloth) to make a very large clock face on the classroom floor. Omit the hands. Take two ribbon streamers. Have a child sit in the center of the clock to hold one of each ribbon. Let one ribbon (the

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCED
1-j. cont'd	1-j. minute hand) extend to th clock. Make the other ri hand) noticeably shorter. helpers to hold the ribbo be Mr. Hour, and the othe Minute. Mr. Hour may hol ribbon and walk around to say the different hours t calls. Miss Minute may h ribbon at twelve until sh work of Mr. Hour. Let ea children show several exa
1-k. Money Values (penny, nickel, dime)	1-k. Have children bring to sc boxes, jars and cans of f Stick small squares of m each item. Write the pri item keeping prices below table or desk as a displa use of real money is most However, play money may b the money in a box when n Have children play storek shopper. Many variations in this activity. Example: Have different the store to buy certain each show the group the t
1-l. Recognition of Objects Up to 5	1-l. Have several students sta screen out of sight. The

	ACTIVITY/PROCEDURE
	1-j. minute hand) extend to the rim of the clock. Make the other ribbon (the hour hand) noticeably shorter. Choose two helpers to hold the ribbons which will be Mr. Hour, and the other will be Miss Minute. Mr. Hour may hold the short ribbon and walk around to make the clock say the different hours that the teacher calls. Miss Minute may hold her long ribbon at twelve until she learns the work of Mr. Hour. Let each pair of children show several examples.
	1-k. Have children bring to school empty boxes, jars and cans of food items. Stick small squares of masking tape on each item. Write the prices on each item keeping prices below 11¢. Use a table or desk as a display counter. The use of real money is most practical. However, play money may be used. Keep the money in a box when not in use. Have children play storekeeper and shopper. Many variations are possible in this activity. Example: Have different children go to the store to buy certain items. Have each show the group the total cost.
	1-l. Have several students stand behind a screen out of sight. The teacher

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCED
1-l. cont'd	1-l. designates certain member to stand either to the le the screen so that they c the class. However, they vanish out of sight as di member can be labeled as carrots, pears, oranges, bers of the class must ob mine how many came out. are possible.
1-m. Introduction of Ten-ness	1-m. Collect one dozen egg car proximately 120 plastic e Cut off the ends of each reducing the capacity to child take turns by counti each carton. Display the cartons with eggs and have childr are in each carton with li lids closed. Place a card carton of eggs with ten w show that there are 10 eg Write numeral 10 on the c to the class: "We think as one ten and no ones." ton is closed, students s that we have one carton o Duplication of above activ ten and twenty eggs. Reco boxes and number of eggs

	ACTIVITY/PROCEDURE
	1-l. designates certain members of the group to stand either to the left or right of the screen so that they can be seen by the class. However, they must quickly vanish out of sight as directed. Each member can be labeled as follows: apples, carrots, pears, oranges, etc. The members of the class must observe and determine how many came out. Many variations are possible.
	1-m. Collect one dozen egg cartons and approximately 120 plastic easter eggs. Cut off the ends of each carton thereby reducing the capacity to 10. Have a child take turns by counting and filling each carton. Display the cartons filled with eggs and have children tell how many are in each carton with lids open - with lids closed. Place a card beside each carton of eggs with ten written on it to show that there are 10 eggs in each carton. Write numeral 10 on the chalkboard and say to the class: "We think of the numeral 10 as one ten and no ones." When the egg carton is closed, students should understand that we have one carton of ten and no ones. Duplication of above activity using between ten and twenty eggs. Record number of boxes and number of eggs over.

GRADE 1

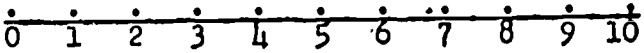
CONCEPTS AND SKILLS	ACTIVITY/PROCED
1-n. Positional Value (ordinal)	1-n. Have five students come to the room and stand one behi facing the class. Have the side step one step to his l "first," the next repeats t say, "second" and so on unt to the left. Have another front of the class and form walk across the front of th various students in this fo such directions as: 1. Will the first person jum 2. Will the third person wa 3. Will the second person c 4. Will the fourth person t 5. Will the fifth person tu place?
1-o. Ordering (sets, numbers)	1-o. Write large numerals on the from one to ten. Have the unison 1-10. Next, divide groups such as: 1 in the fi in the second group, etc. choose a leader. Make a nu 1-10 across the front of th chalk or masking tape. 0 1 2 3 4 5 6 When directed, the group le his group to the proper num

ACTIVITY/PROCEDURE

1-n. Have five students come to the front of the room and stand one behind the other facing the class. Have the first student side step one step to his left and say "first," the next repeats the motion and say, "second" and so on until all have moved to the left. Have another group come to the front of the class and form a line as if to walk across the front of the room. Have various students in this formation follow such directions as:

1. Will the first person jump up and down?
2. Will the third person wave goodbye?
3. Will the second person clap his hands?
4. Will the fourth person touch his toes?
5. Will the fifth person turn around in place?

1-o. Write large numerals on the chalkboard from one to ten. Have the class count in unison 1-10. Next, divide the class into groups such as: 1 in the first group, 2 in the second group, etc. Have each group choose a leader. Make a number line from 1-10 across the front of the room with chalk or masking tape.



When directed, the group leader will lead his group to the proper numeral on the line.

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
1-o. cont'd	1-o. Example: Group one should numeral one, five should numeral five, etc.
1-p. Counting Backwards	1-p. Place a walk-on number lin Have one student stand out space numbered "one." Di into the first space and as he progresses from 1-2- member of the class should (the walk can gradually p slow run.) Next, have on forward to five and backwa counting each way (1-2-3-4 forward to 10 and backward Let everyone participate. are possible.
1-q. Counting Up to 50 Objects.	1-q. Have child come to front count the number that are
1-r. Skip Count by 2's, 5's and 10's	1-r. Assemble a group of studen the classroom (from 10 to Counting by 2's can be int following manner: Give on of 5" by 5" cards numbered in proper order. Have him of 10 students standing si will give every other stud the proper order.

	ACTIVITY/PROCEDURE
	1-o. Example: Group one should stand on numeral one, five should stand on numeral five, etc.
	1-p. Place a walk-on number line on the floor. Have one student stand outside the space numbered "one." Direct him to step into the first space and count each step as he progresses from 1-2-3-, etc. Each member of the class should take turns (the walk can gradually progress to a slow run.) Next, have one student walk forward to five and backwards to one but counting each way (1-2-3-4-5, 5-4-3-2-1); forward to 10 and backward to 1, etc. Let everyone participate. Many variations are possible.
	1-q. Have child come to front of room and count the number that are having milk.
	1-r. Assemble a group of students in front of the classroom (from 10 to 20 students.) Counting by 2's can be introduced in the following manner: Give one student a set of 5" by 5" cards numbered by 2's to 10 in proper order. Have him count a group of 10 students standing side by side. He will give every other student a card in the proper order.

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCE
1-s. Addition to Sums of 10 (use of +, =)	1-s. Collect an assortment of objects that the childre on an independent basis. (puzzles, construction a crayons, etc.) Divide t groups and have them pla sections of the classroo the play period, have th together to form one lar an activity to show how played with various thin Example: How many girls played wi How many boys played wit Results: 3 girls + 2 boy Many variations are poss
1-t. Addition of Equivalent Sets up to 10	1-t. Have two equal groups of in front of the class. determine how many are i Example: (4 boys and 4 by asking: 1. How many girls do yo 2. How many boys do you 3. How many children do Results: 4 girls + 4 boy 8 girls and boys

	ACTIVITY/PROCEDURE
	1-s. Collect an assortment of games and objects that the children can manipulate on an independent basis. Examples: toys (puzzles, construction sets, clay, dolls, crayons, etc.) Divide the class into groups and have them play in designated sections of the classroom. At the end of the play period, have the children come together to form one large group. Conduct an activity to show how many children played with various things. Example: How many girls played with dolls? How many boys played with trucks? Results: 3 girls + 2 boys = 5 children Many variations are possible.
	1-t. Have two equal groups of children stand in front of the class. Have the class determine how many are in the group. Example: (4 boys and 4 girls) Proceed by asking: 1. How many girls do you see? 2. How many boys do you see? 3. How many children do you see in all? Results: 4 girls + 4 boys = 8 children or 8 girls and boys

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCE
1-u. Subtraction of Sums to Ten	1-u. Have designated groups o (1-10) stand on a walkin beam. Let the group det many are on the beam. W numeral on the chalkboard. Example: 4 children on Ask 2 to step off. The follows: 4 children - 2 children on the walking beam. Many variations are poss the walking and balance
1-v. Separation of Equivalent Subsets	1-v. Assemble four children i room, have class separat equal teams for an erase
1-w. Understanding of 1/2 and 1/4	1-w. Have two boys come to th room. Have both stand t walking board. Let membe determine how many are i to the class: "I am goin set of 2 boys in half." step down to the left. boy step down to the rig readily see that there a to the left side of the to the right side of the

	ACTIVITY/PROCEDURE
	1-u. Have designated groups of children (1-10) stand on a walking or balance beam. Let the group determine how many are on the beam. Write the correct numeral on the chalkboard. Example: 4 children on walking beam. Ask 2 to step off. The results are as follows: 4 children - 2 children = 2 children left on the walking beam. Many variations are possible with both the walking and balance beam.
	1-v. Assemble four children in front of the room, have class separate them into two equal teams for an eraser tag game.
	1-w. Have two boys come to the front of the room. Have both stand together on a walking board. Let members of the class determine how many are in the set. Say to the class: "I am going to divide the set of 2 boys in half." Have one boy step down to the left. Have the other boy step down to the right. Students can readily see that there are just as many to the left side of the board as there is to the right side of the board. Many

GRADE 1

CONCEPTS AND SKILLS	ACTIVITY/PROCE
1-w. cont'd	1-w. variations are possible 1/2 and 1/4.

	ACTIVITY/PROCEDURE
	1-w. variations are possible in showing 1/2 and 1/4.

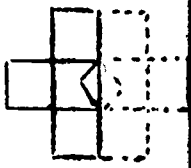
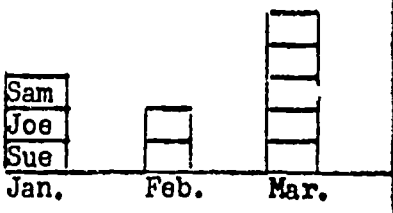
TEACHER'S NOTES

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCE
2-a. Sort Objects According to Two Attributes	2-a. Using objects such as bu bolts, construction pape bans, etc. sort accordin butes (characteristics) shape, size and color, c
2-b. Quantitative Comparison of More Than 2 Objects	2-b. Look around the classroo objects as to: length, For example: using 3 boo heights have child deter tallest. Books can also determine heaviest (weig
2-c. Descriptions of Geometric Shapes	2-c. Through discussion, dete child can identify some teristics of square, cir triangle, etc. Show squ Are they the same? Why makes the difference? Give child different mat cleaners, straws) and ha the geometric shapes.
2-d. Congruence (Matching Geometric Shapes)	2-d. Using objects in the roo textbooks, sheets of pap shoe tracings, hands, tes will match in shape and on top of the other to c

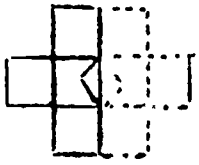
	ACTIVITY/PROCEDURE
	2-a. Using objects such as buttons, nuts and bolts, construction paper shapes, rubber bans, etc. sort according to two attributes (characteristics) e.g. size and shape, size and color, color and shape.
	2-b. Look around the classroom and compare objects as to: length, height, weight. For example: using 3 books of various heights have child determine which is tallest. Books can also be used to determine heaviest (weight).
	2-c. Through discussion, determine that child can identify some of the characteristics of square, circle, rectangles, triangle, etc. Show square and rectangle. Are they the same? Why or why not? What makes the difference? Give child different materials (pipe cleaners, straws) and have him construct the geometric shapes.
	2-d. Using objects in the room such as: textbooks, sheets of paper, erasers, shoe tracings, hands, test to see which will match in shape and size (place one on top of the other to check).

GRADE 2

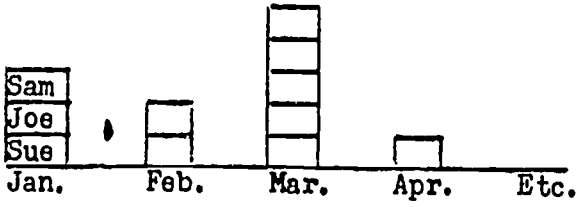
CONCEPTS AND SKILLS	ACTIVITY/PROCED
2-e. Symmetry (Pattern Completion)	2-e. Prepare geometric shapes struction paper. For a s sign, have one half of d Give a child necessary r and have him complete th 
2-f. Record Findings by Graph or Chart from Results of Practical Investigation	2-f. After having written the months on the chalkboard, child write his name ove month of his birthdate. paper (notebook paper) ha names by months (abbrevia line near the bottom of t one space for each child.  Questions can be used suc month has the most birthd a month that has no birth many more birthdays are t than in January? Variati to this type of graph: t

ACTIVITY/PROCEDURE

2-e. Prepare geometric shapes from construction paper. For a symmetrical design, have one half of design completed. Give a child necessary remaining shapes and have him complete the design. Example:



2-f. After having written the names of the months on the chalkboard, have each child write his name over the proper month of his birthdate. Using lined paper (notebook paper) have child write names by months (abbreviated) along one line near the bottom of the page. Use one space for each child. Example:



Questions can be used such as: Which month has the most birthdays? Is there a month that has no birthdays? How many more birthdays are there in March than in January? Variations can be used to this type of graph: types of pets

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCE
2-f. cont'd	2-f. in the classroom; brothe only child.
2-g. Ordering Numbers by 1's, 2's, 5's, 10's	2-g. Give a child 5 number ca 75, 74, 76, 73, 77 and h them in correct order fr to largest. Give cards to several ch them arrange themselves front of the room from s largest according to the Similar activities can b two's, five's, ten's.
2-h. Counting By 2's, 5's, 10's - Starting at Any Number	2-h. Begin at number 17, coun Begin at number 27, coun Begin at number 11, coun Give child copy of 100 c him shade in the boxes t counting by two's. Coun mark an X in the boxes o Discuss relationships. out of seat, tell how ma are in the room; how man
2-i. Skip Counting by 3's and 4's	2-i. Same idea with 100 chart used for skip counting b starting with a number o

	ACTIVITY/PROCEDURE
	2-f. in the classroom; brothers, sisters, only child.
	2-g. Give a child 5 number cards such as: 75, 74, 76, 73, 77 and have him arrange them in correct order from smallest to largest. Give cards to several children and have them arrange themselves in order in front of the room from smallest to largest according to their number. Similar activities can be done for the two's, five's, ten's.
	2-h. Begin at number 17, count by 2's. Begin at number 27, count by 5's. Begin at number 11, count by 10's. Give child copy of 100 chart and have him shade in the boxes that would show counting by two's. Count by five's and mark an X in the boxes on same chart. Discuss relationships. (Without getting out of seat, tell how many ears there are in the room; how many toes.)
	2-i. Same idea with 100 chart (above) can be used for skip counting by 3's and 4's starting with a number other than 1.

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCED
2-i. cont'd	2-i. Number line may also be u Counting off by 3's and l classroom is good practic Putting numbers in series completed lists, counting Example: 13, 16, 19, ___
2-j. Calendar Days of week Months of year Days in month	2-j. Construct a large bulleti calendar for one month. the type of weather (eg. sun, etc.)
2-k. Time to Nearest 1/4 Hour.	2-k. Construct a clock from a cardboard hands. Using t divide the clock face int the child that the minute quarter of the way around one quarter hour. Bring in an old clock for purposes.
2-l. Money Values Less Than a Dollar	2-l. Display assortment of coi nickels, dimes, quarters) child to tell you total v ment. Note: Total value must be kept less than a

	ACTIVITY/PROCEDURE
	2-i. Number line may also be used. Counting off by 3's and 4's in the classroom is good practice. Putting numbers in series from partially completed lists, counting forward. Example: 13, 16, 19, ___, ___, ___, 31
	2-j. Construct a large bulletin board calendar for one month. Record daily the type of weather (eg. snow, rain, sun, etc.)
	2-k. Construct a clock from a paper plate and cardboard hands. Using the chalkboard divide the clock face into quarters. Tell the child that the minute hand moves one quarter of the way around the clock in one quarter hour. Bring in an old clock for investigation purposes.
	2-l. Display assortment of coins (pennies, nickels, dimes, quarters) and instruct child to tell you total value of assortment. Note: Total value of assortment must be kept less than a dollar.

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
2-l. cont'd	2-l. Put several coins in a bo it. On the outside of th the value of the coins in number of coins. Have ch mine what coins could be
2-m. Measuring by Standard Units to Nearest Inch ; Centimeter Cup Nearest 10 degrees	2-m. Display measuring instrum meter, ruler, cup. Measure objects in school to nearest inch and centi Using both Centigrade and record outside temperatur 10^{o} (5^{o} if a good student every hour during a schoo graph results on paper. be kept on the bulletin b Give the children a group objects and have them fin heaviest. More advanced order from lightest to he scale. Give the child various sh and a measuring cup. Ask out which container holds how many cups of water do tainer hold? No conversions between Ce Fahrenheit readings.
2-n. Volume	2-n. Give a group of children 2 1 large and 1 small. Have how many small ones will f

ACTIVITY/PROCEDURE

2-l. Put several coins in a box and seal it. On the outside of the box write the value of the coins inside and the number of coins. Have children determine what coins could be in the box.

2-m. Display measuring instruments: thermometer, ruler, cup.

Measure objects in school and home to nearest inch and centimeter.

Using both Centigrade and Fahrenheit record outside temperature to nearest 10^{o} (5^{o} if a good student is recording) every hour during a school day and graph results on paper. The graph could be kept on the bulletin board.

Give the children a group of various objects and have them find the lightest, heaviest. More advanced students can order from lightest to heaviest on balance scale.

Give the child various shaped containers and a measuring cup. Ask him to find out which container holds the most water; how many cups of water does each container hold?

No conversions between Centigrade and Fahrenheit readings.

2-n. Give a group of children 2 containers, 1 large and 1 small. Have child determine how many small ones will fill the large.

CONCEPTS AND SKILLS	ACTIVITY/PROCED
2-o. Facts to 18 - addition - subtraction	2-o. Use a decoding activity in number facts. Write numerals in the answer b write the corresponding message boxes. 3 8 +4 -7 Answer ☐ ☐ Message ☐ ☐ Stress 10-ness when worki sums. Use beans and egg only 10 parts each. Add full box plus 3 beans rem 1 ten + 3 ones = 13.
2-p. Memorization of Basic Addition and Subtraction Facts	2-p. Use "Travel" to practice
2-q. Addition Where Sum Is Less Than 100	2-q. Draw a circle on the chal a 2 digit number in the c tween the spokes, place c Have children proceed aro for correct sums.

ACTIVITY/PROCEDURE

2-o. Use a decoding activity for practice in number facts. Write the correct numerals in the answer boxes. Then write the corresponding letters in the message boxes.

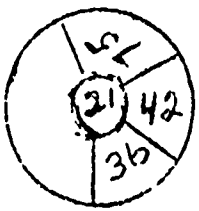
	3 +4	8 -7	9 -5	5 +3
Answer	☐	☐	☐	☐
Message	☐	☐	☐	☐

CODE	
8	C
4	A
7	N
1	V

Stress 10-ness when working with basic sums. Use beans and egg cartons with only 10 parts each. Add 8 + 5 = 1 full box plus 3 beans remaining, then 1 ten + 3 ones = 13.

2-p. Use "Travel" to practice basic facts.

2-q. Draw a circle on the chalkboard. Place a 2 digit number in the center. In between the spokes, place other addends. Have children proceed around the wheel for correct sums.



CONCEPTS AND SKILLS	ACTIVITY/PROCE
2-r. Relationship of Addition and Subtraction (number families)	2-r. Write the related number equation or picture: (e.g. $5 + 3 = 8$, $3 + 5 = 8$, $8 - 5 = 3$, $8 - 3 = 5$) For further practice, du sheet such as:
2-s. Subtraction of Sums Less Than 100	2-s. Make addition-subtractio must be sure that the la in the first two squares. the first two squares in e.g.

Find the Pattern. Complete t	
Start	6 2 8 4 7 1 5 3
Add	+3+5+2+6+4+1+8+7
Sum	9 7
Subtract	-3-5-2-6-4-1-8-7
Finish	6 2

↓	21	75	96
−	5	63	68
	16	12	28

For regrouping, use money

ACTIVITY/PROCEDURE

2-r. Write the related number facts from one equation or picture:

(e.g. $5 + 3 = 8$
$3 + 5 = 8$
$8 - 5 = 3$
$8 - 3 = 5$

For further practice, duplicate a worksheet such as:

Find the Pattern. Complete the Table	
Start	6 2 8 4 7 1 5 3
Add	+3+5+2+6+4+1+8+7
Sum	9 7
Subtract	-3-5-2-6-4-1-8-7
Finish	6 2

2-s. Make addition-subtraction boxes. You must be sure that the larger digits are in the first two squares. You fill in the first two squares in each of two rows.

e.g.

	→	+	
↓	21	75	96
−	5	63	68
	16	12	28

For regrouping, use money situations to

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCED
2-s. cont'd	2-s. show the changing of 1 d pennies to complete the Example: I have 3 dimes I want to buy a comic bo What will I have to do?
2-t. Introduction of Multiplication Operation	2-t. Supply each child with 1 the chalkboard show 2 se Let each child duplicate beans. How many sets? set? How many in all? show this? 2 x 3 = 6 Show me another example.
2-u. Place Value Thru Hundreds (expanded notation)	2-u. Write a 3 place number o such as 361. Have child digit is in tens place, dreds place. Ask for th sequence and vary order number. Show expanded form on ch this: 500 + 70 + 3. Th come and write standard vide class into 3 groups group cards with hundred 400, 600, etc.) give one with tens (10, 40, 80); ones. Call out a number students come forth to s Then someone may write t board in standard form.

ACTIVITY/PROCEDURE

2-s. show the changing of 1 dime to 10 pennies to complete the transaction. Example: I have 3 dimes and a nickel. I want to buy a comic book for 19¢. What will I have to do?

2-t. Supply each child with 10 beans. Using the chalkboard show 2 sets of 3 each. Let each child duplicate this with his beans. How many sets? How many in each set? How many in all? How could we show this? $2 \times 3 = 6$ Show me another example.

2-u. Write a 3 place number on the chalkboard such as 361. Have child identify which digit is in tens place, ones place, hundreds place. Ask for the places out of sequence and vary order with each additional number.

Show expanded form on chalkboard by writing this: 500 + 70 + 3. Then have child come and write standard form: 573. Divide class into 3 groups. Give one group cards with hundreds on them (300, 400, 600, etc.) give one group cards with tens (10, 40, 80); one group with ones. Call out a number and have the students come forth to show the number. Then someone may write the number on the board in standard form.

GRADE 2

CONCEPTS AND SKILLS	ACTIVITY/PROCED
2-v. Fractional Parts of a Group (1/2, 1/4)	2-v. Use 10 paper clips. Giv 5 clips each. What part does each child have? Use 8 clips. Give 4 chi each. What part of the each child have?

ACTIVITY/PROCEDURE

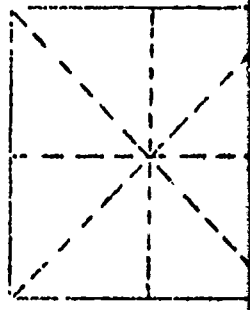
2-v. Use 10 paper clips. Give 2 children 5 clips each. What part of the total does each child have?

Use 8 clips. Give 4 children 2 clips each. What part of the total does each child have?

TEACHER'S NOTES

GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
3-a. Quantitative Comparisons of Many Objects	3-a. Comparing objects in the regard to weight, height, length. Before Level 3 objects compared was limi many objects are compared
3-b. Sorting Objects as to Three Attributes	3-b. Use objects such as butto shapes, multicolored rubb different length and widt
3-c. Identify Lines of Symmetry - Folding, Cutting, Drawing	3-c. Use a sheet of notebook by folding the 2 lines o of the paper. Make a sq sheet of paper. Show by square on the perpendicul the four lines of symmet long the fold lines.

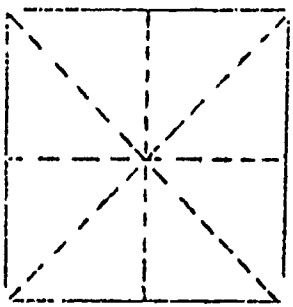


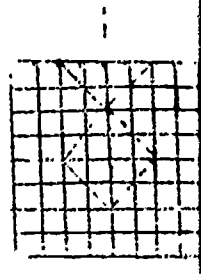
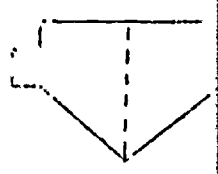
ACTIVITY/PROCEDURE

3-a. Comparing objects in the classroom with regard to weight, height, number, length. Before Level 3 the number of objects compared was limited to 2, now many objects are compared.

3-b. Use objects such as buttons, geometric shapes, multicolored rubber bands of different length and width, and pencils.

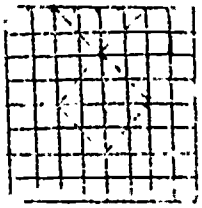
3-c. Use a sheet of notebook paper. Show by folding the 2 lines of symmetry of the paper. Make a square from your sheet of paper. Show by folding the square on the perpendiculars and diagonals the four lines of symmetry. Draw along the fold lines.



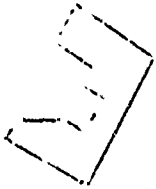
CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-d. Complete Symmetry Patterns	3-d. On graph paper draw 1/2 (design. Have child comp 
3-e. Geometric Shapes - Square, Circle, Triangle, Oval, Rectangle Cone, Sphere, Cube, Pyramid Congruence, symmetry by folding drawing, cutting, and duplicating. Interior and exterior regions; closed and open figures.	3-e. Have children fold a pie in half. Cut a piece fr edge. Example:  When the cut piece is un line of symmetry can be also congruence. 

ACTIVITY/PROCEDURE

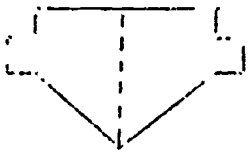
3-d. On graph paper draw 1/2 of a simple design. Have child complete the design.



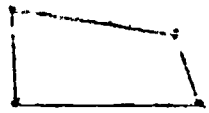
3-e. Have children fold a piece of paper in half. Cut a piece from the folded edge.
Example:



When the cut piece is unfolded, a line of symmetry can be identified and also congruence.

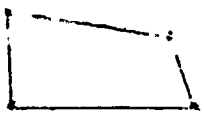


GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-e. cont'd	3-e. As a group activity, dir mark 4 points on their p that no 3 of them are in use your ruler to connec like:  (Teacher may do the acti chalkboard as students d desks.) Have the children determ the inside and outside r (interior and exterior). Have children join hands open and closed figures. Display several open and and have children identi Discuss characteristics closed figures. General can be drawn: Open figu have an inside or outsid figures do.
3-f. Ordering Any Given Set of Numbers	3-f. Given cards with numbers 42 54 36 140 arrange from smallest to from largest to smallest.

ACTIVITY/PROCEDURE

3-e. As a group activity, direct class to mark 4 points on their paper being sure that no 3 of them are in a line. Now use your ruler to connect the points like:



(Teacher may do the activity on the chalkboard as students do it at their desks.)
Have the children determine where the inside and outside regions are (interior and exterior).

Have children join hands and display open and closed figures.

Display several open and closed figures and have children identify each.

Discuss characteristics of open and closed figures. Generalization that can be drawn: Open figures do not have an inside or outside region; closed figures do.

3-f. Given cards with numbers such as

42	54	36	140	301

arrange from smallest to largest or from largest to smallest.

GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-g. Skip Counting by 5's, 10's, 3's, 4's, 100's Forward or Backward	3-g. A possible game activity skip counting: 1. Divide class into Tea 2. Let each student on T and write down a numb and 40. Cannot chang 3. Allow 3 students of T count by using those listed in concept. (1 time, beginning at 0. 4. If student counting s student from Team A m through his number. 5. After 3 students have remaining numbers are score. 6. Teams interchange rol 7. High score wins.
3-h. Place Value -Expanded Notation -Monetary Notation	3-h. Use cans in graduated si thousands, hundreds, ten Put counters in each can child write the number r Introduce dollar sign an By using set of coins an the value in money. (Ex.
3-i. Number Patterns Such As: -odd and even numbers -multiples of a given number	3-i. Draw a number line. Ski starting at 0. Result: Skip count by 2's starti

ACTIVITY/PROCEDURE

3-g. A possible game activity for practicing skip counting:

1. Divide class into Team A and B.
2. Let each student on Team A select and write down a number between 0 and 40. Cannot change number.
3. Allow 3 students of Team B to skip count by using those numbers listed in concept. (1 student at a time, beginning at 0.)
4. If student counting says the number, student from Team A must cross through his number.
5. After 3 students have counted, all remaining numbers are Team A's score.
6. Teams interchange roles and repeat.
7. High score wins.

3-h. Use cans in graduated sizes for thousands, hundreds, tens, and ones. Put counters in each can and have child write the number represented.

Introduce dollar sign and cent sign. By using set of coins and bills, write the value in money. (Ex. $3.45; 46¢)

3-i. Draw a number line. Skip count by 2's, starting at 0. Result: even numbers. Skip count by 2's starting at 1. Result:

CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-i. -commutative property of addition- use of coordinate chart to show symmetry -multiplication by 1's, 10's, 5's, 11's, 0's	3-i. odd numbers. Given the a 2-digit number, tell w will be odd or even. Use hundreds chart to di when counting by 1's, 4' 11's. Use tracing paper hundreds chart to show p when counting by 4's, 5' Fold along dotted line f

1	3	5	7
4	6	8	10
5	8	10	12
7	10	12	14
9	12	14	16

Lead children to see tha
is multiplied by 1 the p
number; multiplied by 10
that number with 0 in th
multiplied by 5 the produ
either 5 or 0.

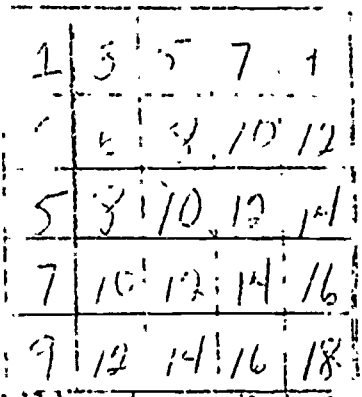
When at least 1 factor in
cation problem is even, t
even; when both factors a
product is odd.

ACTIVITY/PROCEDURE

3-i. odd numbers. Given the ones digit of a 2-digit number, tell whether number will be odd or even.

Use hundreds chart to discover patterns when counting by 1's, 4's, 5's, 10's, 11's. Use tracing paper to place over hundreds chart to show pattern formed when counting by 4's, 5's, etc.

Fold along dotted line for symmetry.



Lead children to see that when a number is multiplied by 1 the product is that number; multiplied by 10 the product is that number with 0 in the ones column; multiplied by 5 the product ends in either 5 or 0.

When at least 1 factor in a multiplication problem is even, the product is even; when both factors are odd, the product is odd.

GRADE 3

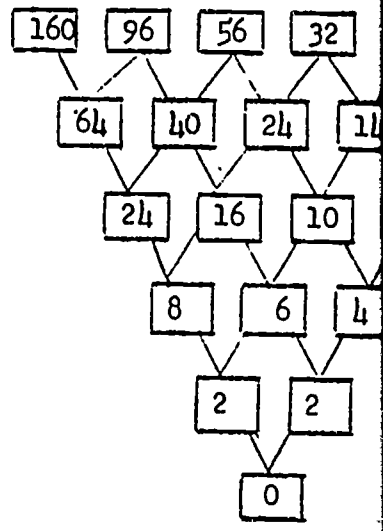
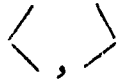
CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-j. Graphing - Results of related classroom activities.	3-j. Classroom activities suc apparel, i.e. (shoes) th on sneakers, buckle shoe slip-ons; hair color - b brunettes, blackhaired, brought/bought lunch dur period.
3-k. Using Money Values and Change Up to $2.00; addition and subtraction of money	3-k. Imagine you are taking a Woolworth's. You have $ spend. Draw and color a at least 2 items that yo to own. Under the pictu of the item. (Place the on the chalk ledge and d addition and subtraction.
3-l. Telling Time to the Nearest Five Minutes; Projection of Time in One Hour Segments.	3-l. Use questions of telling practical applications, day (time for recess, lu dismissal); T.V. shows.
3-m. Calendar Equivalent measures: day, week, month, year 7 days = 1 week 12 months = 1 year	3-m. Choose some future date (birthday, holiday). How until then? Convert int

	ACTIVITY/PROCEDURE
	3-j. Classroom activities such as: wearing apparel, i.e. (shoes) those who have on sneakers, buckle shoes, tie shoes, slip-ons; hair color - blondes, brunettes, blackhaired, redheads; who brought/bought lunch during a week's period.
	3-k. Imagine you are taking a trip to Woolworth's. You have $2.00 to spend. Draw and color a picture of at least 2 items that you would like to own. Under the picture put the cost of the item. (Place these pictures on the chalk ledge and do problems with addition and subtraction.)
	3-l. Use questions of telling time with practical applications, such as: school day (time for recess, lunch time, dismissal); T.V. shows.
ar	3-m. Choose some future date in month (birthday, holiday). How many days until then? Convert into weeks.

GRADE 3

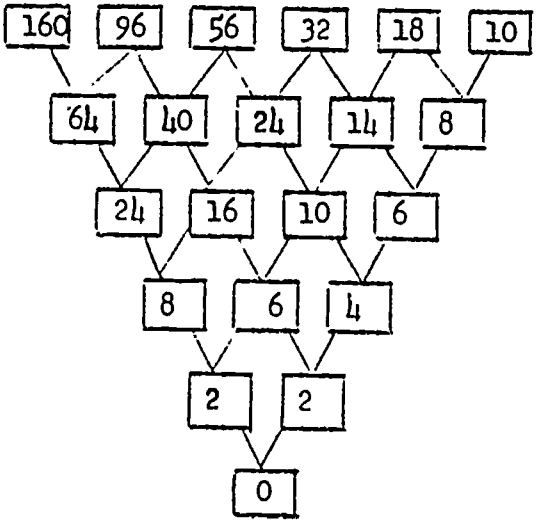
CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-n. Measurement - Use standard units to measure: length to 1/4 in. weight to 1 lb. volume to 1/2 cup (liquid) cube (solid)	3-n. It is best to use rulers 1/4 inches. Measure obj classroom. Use anythin have in his desk or pock Bring in bathroom scales from nurse's office to weigh themselves. Use graduated measuring variety of containers. Use 1 inch cubes to fill
3-o. Relationship of 1 Unit to Another: inches to 1 foot to yard pints to quart to gallon centimeters to meter	3-o. Show on ruler how many 1 equal 1 foot. Fill a quart container b Compare English to Engli metric. Do not convert f another.
3-p. Addition of Up to 4-5 Addends. Sums to 999.	3-p. Numbers can be enclosed circles, boxes, or any g to vary the presentation
3-q. Subtraction of Sums Up to 999.	3-q. Use upside down pyramid practice. You do not ha each time. For subtract

	ACTIVITY/PROCEDURE
	3-n. It is best to use rulers marked with 1/4 inches. Measure objects in the classroom. Use anything the child may have in his desk or pocket. Bring in bathroom scales or use scales from nurse's office to have children weigh themselves. Use graduated measuring cups to fill variety of containers. Use 1 inch cubes to fill boxes.
	3-o. Show on ruler how many 1 inch lengths equal 1 foot. Fill a quart container by using pints. Compare English to English and metric to metric. Do not convert from one to another.
	3-p. Numbers can be enclosed in clouds, circles, boxes, or any geometric shape to vary the presentation for addition.
	3-q. Use upside down pyramid for subtraction practice. You do not have to get to 0 each time. For subtraction the top row

CONCEPTS AND SKILLS	ACTIVITY/PROCE
3-q. cont'd	3-q. should be filled in. 
3-r. Mathematical Sentences - Equations	3-r. Use pictures, abacus, or blems to have children w proper equation. 5 + 3 = □ 00000 + 000 = □ (Stress meaning of = con
3-s. Introduce Symbols for Inequalities 	3-s. Help the children to com ways that would help ther to use the symbols. A s be smaller end points tow number; wide end toward l

ACTIVITY/PROCEDURE

3-q. should be filled in.



3-r. Use pictures, abacus, or story problems to have children write the proper equation.

$5 + 3 = \square$

00000 + 000 = $\square$

(Stress meaning of = concept).

3-s. Help the children to come up with any ways that would help them remember how to use the symbols. A suggestion would be smaller end points toward smaller number; wide end toward larger number

GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCE
3-s. cont'd	3-s. in every case. At this level, it is no for them to remember sy Give children practice 2 numbers for size befo symbol <, >
3-t. Relate Repeated Addition to Multiplication Use of Multiplication Symbol (x)	3-t. Continue with previous adding on more sets. 0 + 0 + 0 + 0 0 + 0 + 0 + 0 0 + 0 + 0 + 0 Progress from 3 + 3 + 3 4 x 3
3-u. Picture Multiples of a Given Set	3-u. Through activities lead to visualize groups of than counting each one. What do you see? Two g four each or some may s 0 0 0 0 0 0 0 0

ACTIVITY/PROCEDURE

3-s. in every case.

At this level, it is not necessary for them to remember symbols.

Give children practice in comparing 2 numbers for size before using the symbol $<, >$

3-t. Continue with previous activity by adding on more sets.

0 + 0 + 0 + 0
0 + 0 + 0 + 0
0 + 0 + 0 + 0

Progress from 3 + 3 + 3 + 3 to 4 x 3

3-u. Through activities lead children to visualize groups of objects rather than counting each one.

What do you see? Two groups of four each or some may see 8 objects.

0 0
0 0
0 0
0 0

GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-v. Multiplication of 2 or More Digits by a 1 Digit Multiplier	3-v. Begin your problems by s child what he is doing i Second: 42 x 3 Do th: 40 x 3 Leave problem until solv parts, then go to origin solve. Do plenty of practice wi of problem.
3-w. Multiplication Facts to 9's	3-w. Continue pictures to rep facts and then build mul tables.
3-x. Memorization of Multiplication Facts	3-x. Use flash cards, Quizmo,
3-y. Division by Separation into Equivalent Sets and/or Repeated Subtraction	3-y. Use beans or paper clips can actually group object equivalent sets.
3-z. Relate Simple Division Facts to Multiplication Facts	3-z. Review inverse relationsh traction and addition.

ACTIVITY/PROCEDURE

3-v. Begin your problems by showing the child what he is doing in this manner:

Second	Do this First	
42	40	2
x 3	x 3	x3
	+	

Leave problem until solved in its 2 parts, then go to original problem and solve.

Do plenty of practice with this type of problem.

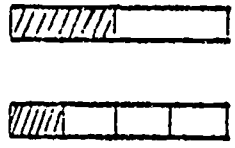
3-w. Continue pictures to represent facts and then build multiplication tables.

3-x. Use flash cards, Quizmo, etc.

3-y. Use beans or paper clips so child can actually group objects into equivalent sets.

3-z. Review inverse relationship of subtraction and addition.

GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCED
3-z. cont'd	3-z. Use array to show multip Then divide into groups objects.
3aa. Introduce division algorithm symbol $\overline{)}$ $\div$ division with/without remainders. using 1 digit divisors.	3aa. Continue using concrete that when you group into are remainders. Write a • • • • • • • • • • • • • • $3\overline{)14}$ 4 r2 12 2 14
3bb. Comparisons of Unit Fractions	3bb. Using strips of equal le that $1/4 < 1/2$. Use this idea to compare of other sizes.  A generalization to be d would be: The greater t the smaller the size of

ACTIVITY/PROCEDURE

3-z. Use array to show multiplication fact. Then divide into groups of equal objects.

3aa. Continue using concrete objects so that when you group into sets, some are remainders. Write as an example:

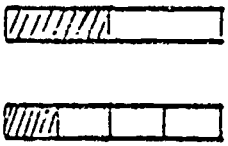
• • •
• • •
• • •
• • •
• •

$$3\overline{)14} \quad 4 \text{ r}2$$
$$\underline{12}$$
$$2$$

$14 \div 3 = 4$ r2

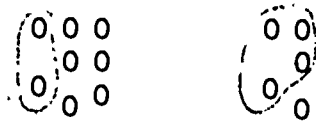
3bb. Using strips of equal length, show that $1/4 < 1/2$.

Use this idea to compare unit fractions of other sizes.



A generalization to be drawn from this would be: The greater the denominator, the smaller the size of the unit fraction.

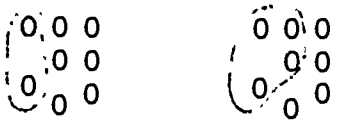
GRADE 3

CONCEPTS AND SKILLS	ACTIVITY/PROCE
3cc. Using Fractions to Compare a Group of Objects	3cc. Using a picture of obje cookies show that 1/4 o < 1/2 of the cookies. Cookies  Which plate has more coo Which is greater 1/4 of of 8?

ACTIVITY/PROCEDURE

3cc. Using a picture of objects such as cookies show that 1/4 of the cookies $<$ 1/2 of the cookies.

Cookies



Which plate has more cookies?
Which is greater 1/4 of 8 or 1/2 of 8?

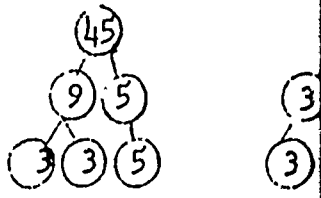
TEACHER'S NOTES

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4-a. Comparisons	4-a. Continue comparing vari Now you can compare fra shaded regions.
4-b. Sorting	4-b. Elementary school child gressed satisfactorily sort as to 3 attributes. See Level 3.
4-c. Geometric Shapes 2 dimensional } See Level 3 3 dimensional } Characteristics of shapes in proper terminology. Simulation of these shapes.	4-c. The child should begin correct terminology for common terms such as "v "corners," etc. At this level, the child pected to construct thes using geometric instrume
4-d. Reading and Using Graphic Information	4-d. Collect as large an ass as you can. Reproduce some on the c the overhead projector. Children can make up que answered from informatic Note to teacher: Line g used when information is

	ACTIVITY/PROCEDURE
	4-a. Continue comparing various objects. Now you can compare fractions by using shaded regions.
	4-b. Elementary school children have progressed satisfactorily if they can sort as to 3 attributes. See Level 3.
	4-c. The child should begin to substitute correct terminology for the more common terms such as "vertices" for "corners," etc. At this level, the child is not expected to construct these figures using geometric instruments.
	4-d. Collect as large an assortment of graphs as you can. Reproduce some on the chalkboard or use the overhead projector. Children can make up questions to be answered from information shown. Note to teacher: Line graphs, are only used when information is continuous.

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCED
4-e. Graphing Results of Relevant Activities	4-e. Make bar graphs of weig in your row. Gather in encyclopedia as to area speed of various animal Line graph would be used reading within a given
4-f. Factoring of Numbers	4-f. The numbers you multipl factors. Build a factor tree by such as:  Hopefully, students will last branches of the tr be the same for a given this activity, we do no factor. Define Prime n
4-g. Squaring Numbers	4-g. On graph paper, outline enclese that 1 square wi squares. Continue with "growing squares."

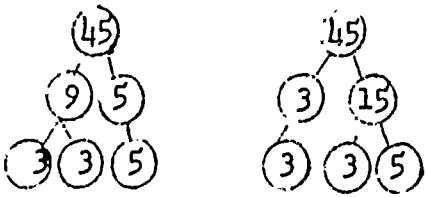
ACTIVITY/PROCEDURE

4-e. Make bar graphs of weights of children in your row. Gather information from encyclopedia as to area of states; speed of various animals, etc.

Line graph would be used for temperature reading within a given time period.

4-f. The numbers you multiply are called factors.

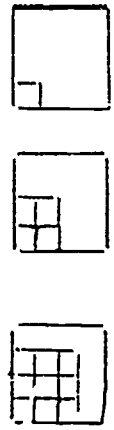
Build a factor tree by using a number such as:



Hopefully, students will see that the last branches of the tree will always be the same for a given number. For this activity, we do not use 1 as a factor. Define Prime numbers.

4-g. On graph paper, outline 1 square. Then enclose that 1 square with other squares. Continue with this to show "growing squares."

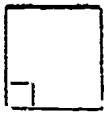
GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4-g. cont'd	4-g. 
4-h. Common Multiples	4-h. Multiples are the produc get when a number is mul any whole number. Is 18 a common multiple List multiples of 2, 3, Does 18 appear in each l it is a common multiple.
4-i. Place Value of Large Numbers; Expanded Notation	4-i. Use a chart like the fol demonstrate place value H e b f

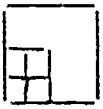
Thousands					
H	T	O	H	T	O
3	5	2	9	6	8

ACTIVITY/PROCEDURE

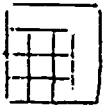
4-g.



1 x 1 = 1



2 x 2 = 4



3 x 3 = 9

4-h. Multiples are the products that you get when a number is multiplied by any whole number.

Is 18 a common multiple of 2, 3, 6?

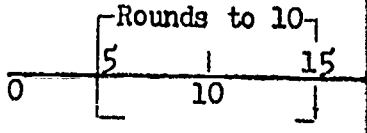
List multiples of 2, 3, 6.
Does 18 appear in each list? If so, it is a common multiple.

4-i. Use a chart like the following to demonstrate place value:

Thousands					
H	T	O	H	T	O
3	5	2	9	6	8

Have children give the expanded form of numbers from the standard form and vice versa.

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4-j. Number Patterns and Simple Arithmetic Progressions with Whole Numbers and Fractions	4-j. Progressions are patte complex nature; i.e. B the counting numbers t next number. 1 2 4 7 (+1) (+2) (+3) (+4) Number pattern for frac 1/2, 2/4, 4/8, 8/16 or or 1/3, 1/5,
4-k. Systematic Estimation - Numerical Physical	4-k. Estimate sums, differen and quotients. Estimate height of obje such as: door, windows chalkboard.
4-l. Rounding Off Numbers - Systematic Approximation	4-l. It is logical to use th to show the range for r number.  State before hand wheth down, up or to the near or 1000's.

ACTIVITY/PROCEDURE

4-j. Progressions are patterns of a more complex nature; i.e. Begin with 1, add the counting numbers to arrive at the next number.

$$1 \underset{(+1)}{} \quad 2 \underset{(+2)}{} \quad 4 \underset{(+3)}{} \quad 7 \underset{(+4)}{} \quad 11 \underset{(+5)}{} \quad 16$$

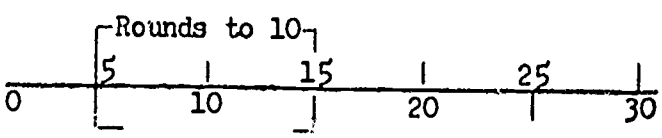
Number pattern for fractions might be:

1/2, 2/4, 4/8, 8/16 or 1/2, 1/4, 1/8, 1/16
or
1/3, 1/5, 1/7, 1/9

4-k. Estimate sums, differences, products, and quotients.

Estimate height of objects in room, such as: door, windows, ceiling, chalkboard.

4-l. It is logical to use the number line to show the range for rounding off a number.



State before hand whether you are rounding down, up or to the nearest 10, 100, or 1000's.

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4-m. Ordering Simple Unit Fractions and Fractions with Like Denominators	4-m. Write in order from lea 1/2, 1/8, 1/4, 1/9; 5/1
4-n. Mathematical Sentences Equations Inequalities	4-n. Review symbols $<, >$ See Level 3 activities. This can now be extende fractional relationship
4-o. Measurement Money problems up to $10.	4-o. Addition and subtractio Making up shopping list Giving change.
4-p. Measurement (cont'd)	4-p. Give practice with mone exercise such as: Find the value of the f 15¢ 7¢ 

ACTIVITY/PROCEDURE

4-m. Write in order from least to greatest:

1/2, 1/8, 1/4, 1/9; 5/4, 2/4, 1/4, 3/4

4-n. Review symbols $<$, $>$

See Level 3 activities.

This can now be extended to include fractional relationships.

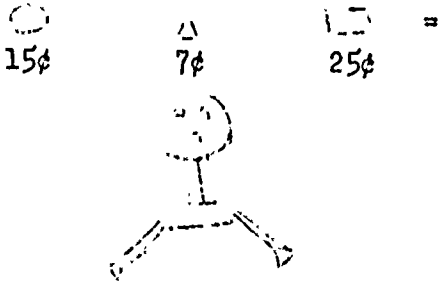
4-o. Addition and subtraction of money.

Making up shopping lists.

Giving change.

4-p. Give practice with money using an exercise such as:

Find the value of the figure if:



GRADE 4

CONCEPTS AND SKILLS	ABILITY/PROCEDU
4-q. Relationships of Standard Units English Metric	4-q. Compare English to Engli Metric. Do not convert another. Inches - feet Centi Feet - yards Decim
4-r. Linear Measurement 1", 1/2", 1/4" - Centimeter Use some perimeters	4-r. Use ruler and/or meter s concrete objects. Find distance around the objects.
4-s. Area to nearest square unit.	4-s. Use graph paper to show square units make up a g (square, rectangle, circ
4-t. Volume	4-t. Use cube units to find v
4-u. Measurement (cont'd) Temperature Nearest degree on Fahrenheit and Centigrade scales.	4-u. Reading thermometers for outside temperatures. T coordinated with Science

	ABILITY/PROCEDURE
	4-q. Compare English to English and Metric to Metric. Do not convert from one to another. Inches - feet Centimeter - decimeter Feet - yards Decimeter - meter
	4-r. Use ruler and/or meter stick to measure concrete objects. Find distance around the outside of objects.
	4-s. Use graph paper to show how many square units make up a given figure. (square, rectangle, circles, etc.)
	4-t. Use cube units to find volume.
	4-u. Reading thermometers for inside and outside temperatures. This can be coordinated with Science activity.

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCED
4-v. Weight (use standard scales)	4-v. Begin use of pan scales use standard weights fo Let children experiment objects to determine we nearest 1/2 lb.
4-w. Time - Tell time to any minute Progression in 1/2 hour segments. Equivalent time measures.	4-w. Review time units; i.e. months, year. Now stress: 60 sec., 1 30 min., 1 60 min., 1
4-x. Story Problems Use systematic approach	4-x. Use a variety of story Relate these to actual Assist child to visuali Draw a picture. Lead c identify necessary info card extraneous materia
4-y. Addition and Subtraction of Any Whole Numbers	4-y. Use appropriate story p than just giving number subtract.
4-z. Review Multiplication Facts Memorize and Drill	4-z. Use wooden cubes with di written on the faces. have the children roll t

	ACTIVITY/PROCEDURE
	4-v. Begin use of pan scales. If possible, use standard weights for balance. Let children experiment with various objects to determine weight to nearest 1/2 lb.
	4-w. Review time units; i.e. - days, weeks, months, year. Now stress: 60 sec., 1 minute 30 min., 1/2 hour 60 min., 1 hour
	4-x. Use a variety of story problems. Relate these to actual situations. Assist child to visualize problem. Draw a picture. Lead children to identify necessary information and discard extraneous material.
	4-y. Use appropriate story problems rather than just giving numbers to add or subtract.
	4-z. Use wooden cubes with digits 0 - 9 written on the faces. In small groups, have the children roll the cubes and

CONCEPTS AND SKILLS	ACTIVITY/PROCED
4-z. cont'd	4-z. multiply the two digits Using flash cards in sm one child hold up the c others in the group vie duct first. Player who correctly first gets th with the most cards at game wins. Use 40 3" x 5" cards. 1. On four cards write write 1; continue th 2. Shuffle and deal to down. 3. Each player turns up and announces the pr two cards. 4. Player with the larg all four cards. 5. At end of specified player with most car
4aa. Multiplication of Multi-Digits Factors Emphasizing Minimum Number of Partial Products.	4aa. Try to use the standard possible. Do this first: 53 x41 = 2173 ← 53 x40 = 2120 +

ACTIVITY/PROCEDURE

4-z. multiply the two digits shown.

Using flash cards in small groups, have one child hold up the card while the others in the group vie to say the product first. Player who answers correctly first gets the card. The one with the most cards at the end of the game wins.

Use 40 3" x 5" cards.

1. On four cards write 0; on four cards write 1; continue through digit 9.
2. Shuffle and deal to two players, face down.
3. Each player turns up top two cards and announces the product of his two cards.
4. Player with the larger product collects all four cards.
5. At end of specified time limit, player with most cards wins.

4aa. Try to use the standard form as soon as possible.

Do this first:

$$\begin{array}{r} 53 \\ \times 41 \\ \hline 2173 \end{array} \leftarrow \begin{array}{r} 53 \\ \times 40 \\ \hline 2120 \end{array} + \begin{array}{r} 53 \\ \times 1 \\ \hline 53 \end{array}$$

CONCEPTS AND SKILLS	ACTIVITY/PROCED
4bb. Multiplication of Multi-Digit Factors Emphasizing Minimum Number of Partial Products.	4bb. Use standard form as ir 53 x 41 53 1 x 53 2120 40 x 53 2173
4cc. Division Algorithm Emphasizing 1 Digit Division, With or Without Remainder, Using the Minimum Number of Steps as in Example 4.	4cc. 1a. Use repeated subtracti quotient: 5 (fours 4 / 20 - 4 | 1 16 - 4 | 1 12 - 4 | 1 8 - 4 | 1 4 - 4 | 1 0 | 5 (fo
It is recommended that by the end of fourth grade most students will have memorized the basic division facts. Use any of the games that were used to review multiplication facts for practice in division.	1b. 5 / 4 / 20 Relate d to multi

ACTIVITY/PROCEDURE

4bb. Use standard form as in 4aa. then use:

```
   53
 x 41
   53    1 x 53
 2120   40 x 53
 2173
```

4cc.

1a. Use repeated subtractions for finding quotient:

```
      5 (fours)(4's)
 4 / 20
    - 4 | 1
     16 |
    - 4 | 1
     12 |
    - 4 | 1
      8 |
    - 4 | 1
      4 |
    - 4 | 1
      0 | 5 (fours)
```

1b.

```
     5
 4 / 20
```

Relate division facts to multiplication facts.

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4cc. cont'd	4cc.

2.

```
       37 (fours)
 4 ) 148
     -40 |  10 (fours
     108 |
     -40 |  10 (fours
      68 |
     -40 |  10 (fours
      28 |
     -28 |   7 (fours
       0 |  37 (fours
```

3.

```
       37
 4 ) 148
    -120 |  30
      28 |
    - 28 |   7
       0 |  37
```

4.

```
       37
 4 ) 148
     -12
      28
    - 28
       0
```

The students who understand
proceed to Step 3, then 4.

Those students who do not unc
Step 2, go directly to Step

ACTIVITY/PROCEDURE

4cc.

2.

```
         37 (fours)
  4 ) 148 |
      -40 |  10 (fours)
      108 |
      -40 |  10 (fours)
       68 |
      -40 |  10 (fours)
       28 |
      -28 |   7 (fours)
        0 |  37 (fours)
```

3.

```
         37
  4 ) 148 |
     -120 |  30
       28 |
     - 28 |   7
        0 |  37
```

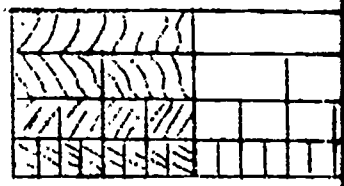
4.

```
         37
  4 ) 148
      -12
       28
     - 28
        0
```

The students who understand Step 2, proceed to Step 3, then 4.

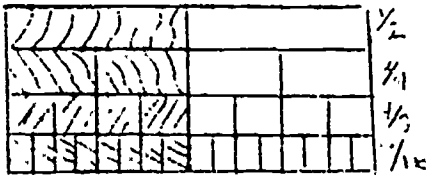
Those students who do not understand Step 2, go directly to Step 4.

GRADE 4

CONCEPTS AND SKILLS	ACTIVITY/PROCE
4dd. Simple Equivalent Fractions i.e. 1/2 = 2/4	4dd. Use fraction chart or that fractions are equ 

ACTIVITY/PROCEDURE

Add. Use fraction chart or strips to show that fractions are equal.



TEACHER'S NOTES

GRADE 5

CONCEPTS AND SKILLS	ACTIVITY/PROCED
5-a. Geometry	5-a. Draw geometric shapes a straight edge. Draw pa rectangle, rhombus, squ Students should discuss and differences of thes and therefore be able t according to its charac Draw the three types of 1. Isosceles 2. Equilateral 3. Scalene
5-b. Students should become familiar with these Geometric Terms: Parallel; Perpendicular; Intersecting; Diagonal; Vertex.	5-b. Use edges of walls, des illustrate.
5-c. Graphs	5-c. Read and record tempera half-hour intervals dur day. Construct a bar graph wi mation. To introduce line graph such as, how hot do you on quarter hours? Plot quarter-hours. Ask, "Is ature reading at all tim day?" Take a time betwe bars and plot that parti

ACTIVITY/PROCEDURE

5-a. Draw geometric shapes always using a straight edge. Draw parallelegram, rectangle, rhombus, square.

Students should discuss the similarities and differences of these quadrilaterals and therefore be able to classify each according to its characteristics.

Draw the three types of triangles.

1. Isosceles
2. Equilateral
3. Scalene

5-b. Use edges of walls, desks, etc. to illustrate.

5-c. Read and record temperatures at regular half-hour intervals during a school day.

Construct a bar graph with the information.

To introduce line graph ask questions such as, how hot do you think it was on quarter hours? Plot the points for quarter-hours. Ask, "Is there a temperature reading at all times during the day?" Take a time between each pair of bars and plot that particular point for

GRADE 5

CONCEPTS AND SKILLS	ACTIVITY/PROCED
5-c. cont'd	5-c. the temperature at that plotting points till stu to see that this is cont mation so that we have a Help student decide for data a line graph is app Example: Line graph is of students as this is r
5-d. Symmetry	5-d. Identify lines of symme room objects and around Representative Drawings sketch drawings of play on relative position of and relative size of equ
5-e. Reading and Writing Numerals	5-e. Give a child 4, 5, 6 or Write as many different can using these. Example: 9, 9, 2, 2, g 2,299 2,929 2,992 9 9,922. Be able to read the numb This activity should be involve the concepts of and expanded notation.

ACTIVITY/PROCEDURE

5-c. the temperature at that time. Keep plotting points till students are able to see that this is continuous information so that we have a line graph. Help student decide for what kind of data a line graph is appropriate.

Example: Line graph is not for height of students as this is not continuous.

5-d. Identify lines of symmetry in classroom objects and around the school.

Representative Drawings - have students sketch drawings of playground. Emphasis on relative position of play equipment and relative size of equipment.

5-e. Give a child 4, 5, 6 or 7 digits. Write as many different numbers as you can using these.

Example: 9, 9, 2, 2, given.
2,299 2,929 2,992 9,229 9,292 9,922.

Be able to read the numbers.

This activity should be extended to involve the concepts of place value and expanded notation.

GRADE 5

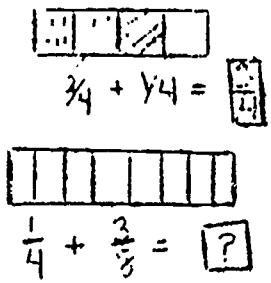
CONCEPTS AND SKILLS	ACTIVITY/PROCE
5-f. Decimal Notation (Addition and Subtraction)	5-f. Money - Penny (cent) l Pure decimal form to h Use catalog - Place or Shopping list - Grocer a picnic, etc.
5-g. Prime and Composite Numbers (Can go up to 200)	5-g. Hundreds Chart Eratosthenes Sieve - t
5-h. Area of Some Quadrilaterals and Derive Some Formulas	5-h. Give each child graph students to box in 24 ways as possible. Exp grid paper. Practical Problems: S of rug, etc.
5-i. Volume of Rectangular Prisms	5-i. How many inch cubes in Derive formulas from e
5-j. Relationships of English Units of Measure and Relation of Metric Units of Measure	5-j. Positively no conversi to Metric or vice vers

	ACTIVITY/PROCEDURE
	5-f. Money - Penny (cent) 1/100 of a dollar. Pure decimal form to hundredths. Use catalog - Place order. Shopping list - Grocery shop for a picnic, etc.
	5-g. Hundreds Chart Eratosthenes Sieve - to find primes
	5-h. Give each child graph paper. Ask students to box in 24 squares as many ways as possible. Experiment with grid paper. Practical Problems: Square yards of rug, etc.
	5-i. How many inch cubes in a box? Derive formulas from experimentation.
	5-j. Positively no conversion from English to Metric or vice versa.

GRADE 5

CONCEPTS AND SKILLS	ACTIVITY/PROCE
5-j. cont'd	5-j. Measure length of room then answer a question many METERS long is the Measure in inches, give 27 inches - 2 feet-3 in Measure in minutes, giv hours, etc. Measure in pounds, give Measure in kilograms, g grams. Measure in quarts, give gallons. Measure in pints, give
5-k. Division	5-k. Use division to solve p problems that apply to Begin dividing by 1 dig to 2-3 etc. digit divis Example: Class Trip - $110.00 - 34 pupils. H pupil? Emphasis on minimum num

	ACTIVITY/PROCEDURE
	5-j. Measure length of room in centimeters, then answer a question such as; how many METERS long is the room? Measure in inches, give answer in feet. 27 inches - 2 feet-3 inches Measure in minutes, give answer in hours, etc. Measure in pounds, give answer in ounces. Measure in kilograms, give answer in grams. Measure in quarts, give answer in gallons. Measure in pints, give answer in quarts.
	5-k. Use division to solve practical problems that apply to the group. Begin dividing by 1 digit and graduate to 2-3 etc. digit divisors. Example: Class Trip - Bus Cost $110.00 - 34 pupils. How much per pupil? Emphasis on minimum number of steps.

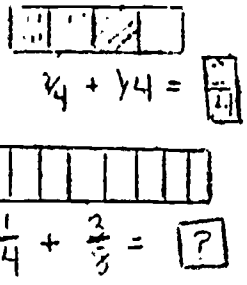
CONCEPTS AND SKILLS	ACTIVITY/PROCED
5-l. Ordering Fractional Numbers Relationship between Fractions	5-l. Given 2 congruent regi size - Fold paper #1 in Fold paper #2 into 6 eq Make comparisons such 3/ and 2/6, etc. Lead stu cover and verbalize tha Students record results paper folding activitie Have students verbalize operation that shows 1/ Example: 1/2 x 2/2 = 2/
5-m. Addition and Subtraction of Fractions	5-m.  On paper draw 8 equival Divide #1 regions into fourths. The other 6 r divided into thirds, fo eighths, ninths and twe that order. Cut 2/3 of region #1 and #2. Match these 2 parts number of parts of anot

ACTIVITY/PROCEDURE

5-l. Given 2 congruent regions of equal size - Fold paper #1 into 4 equal parts. Fold paper #2 into 6 equal parts. Make comparisons such 3/4 and 5/6, 1/4 and 2/6, etc. Lead students to discover and verbalize that 1/3 = 2/6, etc. Students record results of several paper folding activities in chart form. Have students verbalize a numerical operation that shows 1/2 = 2/4.

Example: 1/2 x 2/2 = 2/4

5-m.



On paper draw 8 equivalent regions. Divide #1 regions into thirds, #2 into fourths. The other 6 regions will be divided into thirds, fourths, sevenths, eighths, ninths and twelfths not in that order.

Cut 2/3 of region #1 and 1/4 of region #2. Match these 2 parts to an exact number of parts of another region.

CONCEPTS AND SKILLS	ACTIVITY/PROCED
5-n. cont'd	5-n. Example: 11/12 record This activity may be us traction of fractions a
5-o. Division and Multiplication of Fractions	5-o. Reiterate relationships and multiplication symb one and the same using Example: 2 groups of 8 2 x 8 = 16 Use the number line to of 1/2 = 1/4; 1/2 of 1/ Division: Take 8 piece paper. Divide these pa groups of 2 to show 8 ÷ Reiterate the meaning o whole numbers. How man get out of 8; 4. Now ta 8 pieces of paper and f fourths. How many 1/4' of 8; 32. Record: 8 ÷ 4 = 2 8 ÷ 1/4 = 32 There are many practical involving fractions tha to reinforce these new Example: How many quar half dollar? 1/2 ÷ 1/4

ACTIVITY/PROCEDURE

5-n. Example: 11/12 record $2/3 + 1/4 = 11/12$

This activity may be used for subtraction of fractions also.

5-o. Reiterate relationships between "of" and multiplication symbol as being one and the same using whole numbers.

Example: 2 groups of 8 = 16
$2 \times 8 = 16$

Use the number line to show that 1/2 of 1/2 = 1/4; 1/2 of 1/3 = 1/6, etc.

Division: Take 8 pieces of notebook paper. Divide these papers into 4 groups of 2 to show $8 \div 4 = 2$. Reiterate the meaning of division of whole numbers. How many 2's do we get out of 8; 4. Now take each of the 8 pieces of paper and fold them into fourths. How many 1/4's do we get out of 8; 32.

Record: $8 \div 4 = 2$
$8 \div 1/4 = 32$

There are many practical applications involving fractions that may be used to reinforce these new concepts.

Example: How many quarters are in a half dollar? $1/2 \div 1/4 = 2$

GRADE 5

CONCEPTS AND SKILLS	ACTIVITY/PROCED
5-p. cont'd	5-p. How many 1/8 inches are 1/2 + 1/8 = 4

ACTIVITY/PROCEDURE

5-p. How many 1/8 inches are 1/2 inch?

1/2 ÷ 1/8 = 4

TEACHER'S NOTES

GRADE 6

CONCEPTS AND SKILLS	ACTIVITY/PROCED
6-a. Large Numbers - Practical Application	6-a. Read numerals and number Population of states; ar space travel, etc. Sort reading, writing, graphi
6-b. Problem Solving - involving all operations using whole numbers, fractional numbers and decimal fractional numbers.	6-b. Problems should be varie worded so that they have mation and some, insuffi tion to solve given prob may be built around a sh traveling, party plannin event, etc.
6-c. Common Factors	6-c. Assign 2 students to a t each team the same 2 num member factors one of th the team decides what th is. The team who finds first is the winning tea Practical Application - fractions.
6-d. Place Value of Decimal Fractions - Emphasis to Thousandths.	6-d. Students should always r notation as fraction, (1 one-half or one divided read decimal notation as is read as twenty-five h relationship between sim fractions and common fra

ACTIVITY/PROCEDURE
6-a. Read numerals and number word. Population of states; area of states; space travel, etc. Sorting, ordering, reading, writing, graphing of these.
6-b. Problems should be varied. Some may be worded so that they have excess information and some, insufficient information to solve given problems. Problems may be built around a shopping list, traveling, party planning, or sport event, etc.
6-c. Assign 2 students to a team. Give each team the same 2 numbers, each team member factors one of the numbers, then the team decides what the common factor is. The team who finds the common factor first is the winning team. Practical Application - Reducing fractions.
6-d. Students should always read fractional notation as fraction, (1/2 is read as one-half or one divided by 2); and read decimal notation as decimal (.25 is read as twenty-five hundredths). Show relationship between simple decimal fractions and common fractions, i.e.,

GRADE 6

CONCEPTS AND SKILLS	ACTIVITY/PROCE
6-d. cont'd	6-d. 1/2 = 50/100 = .50. Sh ship between equivalent fractions, i.e., .5 = .
6-e. Addition, Subtraction of Decimal Fractions	6-e. Extend these operations notations to include op any decimal fractions. Example: .37 + .256 =
6-f. Multiplication of Decimal Fraction	6-f. .1 x .1 = 1/10 x 1/10 = .2 x .6 = 2/10 x 6/10 = .4 x .12 = 48/1000 = .048 .142 x .35 710 426 .04970
6-g. Division of Decimal Fractions Review Equivalent Fractions Unnecessary Time Should Not Be Spent on Items 1 Through 3 so that Everyone Would Get to Item 4.	Si 6-g. (1) 2/3 x 2/2 = 4/6 (2/ 3/4 x 10/10 = 30/40 4/5 x 100/100 = 400/ (2) .2 ÷ .1 = 2/10 ÷ 1/1 2/10 x 10/ 2.4/.8 = 2.4/.8 x 10

ACTIVITY/PROCEDURE

6-d. 1/2 = 50/100 = .50. Show relationship between equivalent decimal fractions, i.e., .5 = .50 = .500.

6-e. Extend these operations from money notations to include operations with any decimal fractions.

Example: .37 + .256 = ____

6-f. .1 x .1 = 1/10 x 1/10 = 1/100 = .01

.2 x .6 = 2/10 x 6/10 = 12/100 = .12

.4 x .12 = 48/1000 = .048

$$\begin{array}{r} .142 \\ \times\ .35 \\ \hline 710 \\ 426 \\ \hline .04970 \end{array}$$

6-g. (1) 2/3 x 2/2 = 4/6 (2/2 = 1) Since
3/4 x 10/10 = 30/40 (10/10 = 1)
4/5 x 100/100 = 400/500 (100/100 = 1)

(2) .2 ÷ .1 = 2/10 ÷ 1/10
2/10 x 10/1 = 2

2.4/.8 = 2.4/.8 x 10/10 = 24/8 = 3

CONCEPTS AND SKILLS	ACTIVITY/PROCED
6-g. cont'd	6-g. (3a) $.1\overline{).2}$ work p decimal $1\overline{)2}$ now te _____ = tenth answer is the wh (3b) $.2\overline{).24}$ Tenths times ____ hundredths; there 12 tenths so 1.2. (4a) $.2\overline{).24}$.= .2 Therefore the prob $2\overline{)2.4}$ (4b) $.32\overline{)6.4}$ = 6.4/.3 Therefore the prob $32.\overline{)640.}$ (4c) $1.32\overline{)\dot{.}7\dot{4}6}$ because we multipl
6-h. Percent	6-h. A basketball player make foul shots. If he shoot the same rate he would m 100 shots. Since "Perce 100, we can write it as 75% or 3/4 = 75/100 = .7

ACTIVITY/PROCEDURE

6-g. (3a) $.2\overline{).2}$ work problem as if no decimals

$1\overline{)2}$ now tenths times

_____ = tenths; therefore answer is the whole number 2.

(3b) $.2\overline{).24}$ $2\overline{)24}$ (12)

Tenths times _____ = hundredths; therefore answer is 12 tenths so 1.2.

(4a) $.2\overline{).24}$ = .24/.2 x 10/10 = 2.4/2

Therefore the problem we have is $2\overline{)2.4}$

(4b) $.32\overline{)6.4}$ = 6.4/.32 x 100/100 = 640/32

Therefore the problem we have is $32.\overline{)640.}$

(4c) $1.32\overline{).746}$

because we multiplied by 100/100.

6-h. A basketball player makes 3 out of 4 foul shots. If he shoots 100 times at the same rate he would make 75 of the 100 shots. Since "Percent" means per 100, we can write it as 3/4 = 75/100= 75% or 3/4 = 75/100 = .75 = 75%.

CONCEPTS AND SKILLS	ACTIVITY/PROCE
6-h. cont'd	6-h. Note: In working with level, emphasize just another way hundred. Studen to write the int step rather than Saving 10 or 25¢ of you School Savings Fund. H you save? Use simple whole number tions that will be mean students. e.g.: 5%, 1
6-i. Accurate Measurement in English and Metric Systems	6-i. Linear to nearest 1/8"; milimeter; weight, time, temperature. Measure in meters and e kilometers. Assign each child somet at home for comparison. much larger is your bed Johnny's?
6-j. Area	6-j. Areas of Quadrilaterals tation. (△'s on grid Derive Formulas for area

ACTIVITY/PROCEDURE

6-h. Note: In working with percent at this level, emphasize that percent is just another way to write, per hundred. Students should be made to write the intermediate(s) step rather than go from 3/4 to %.

Saving 10 or 25¢ of your allowance for School Savings Fund. How much would you save?

Use simple whole number percent applications that will be meaningful to the students. e.g.: 5%, 10%, 20%, 25%, etc.

6-i. Linear to nearest 1/8"; to nearest milimeter; weight, time, volume, temperature.

Measure in meters and express it in kilometers.

Assign each child something to measure at home for comparison. Example: How much larger is your bedroom than Johnny's?

6-j. Areas of Quadrilaterals by experimentation. (△'s on grid paper)

Derive Formulas for areas of triangles.

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
6-j. cont'd	6-j. Derive formulas for area parallelograms.  Derive formulas for area Practical applications (face areas of rectangle Relationship of measurem in area e.g.: Sq. ft. to Sq. meters
6-k. Volume	6-k. Use of volume of rectang in practical application of cement. Relationship of measurem volume e.g.: cub. ft. to Note: When students are and volumes they should swers using correct unit
6-l. Geometry	6-l. Draw geometric patterns and compasses. Identify some geometric Make some geometric soli Example: cube. Identify, draw, and reco

	ACTIVITY/PROCEDURE
	6-j. Derive formulas for areas of all parallelograms.  Derive formulas for areas of trapezoids. Practical applications (including surface areas of rectangle prisms) Relationship of measurements used in area e.g.: Sq. ft. to sq. in. Sq. meters to sq. cm.
	6-k. Use of volume of rectangular prisms in practical applications; cubic yds. of cement. Relationship of measurements used in volume e.g.: cub. ft. to cub. inch Note: When students are finding areas and volumes they should give their answers using correct units. e.g.: sq. in.
	6-l. Draw geometric patterns using rulers and compasses. Identify some geometric solids. Make some geometric solids by folding. Example: cube. Identify, draw, and recognize the

GRADE 6

CONCEPTS AND SKILLS	ACTIVITY/PROCED
6-l. cont'd	6-l. characteristics of all by observation and comp Quadrilateral (2) Trape Parallellogram (4) Rect (6) Square
6-m. Simple Scale Drawing	6-m. Give students a scale d room and the scale. Ha the dimensions of the r Give the students a ske with dimensions in whol scale. Example: 1/2 i foot. Let them draw th scale. Assignment - Construct of the 1st floor of the nearest whole unit, usi scale.
6-n. Graphing	6-n. Continue graphing of in all kinds of graphs so Using information from make comparisons and pr relevant information fr Social Studies classes. Introduce simple circle fractional parts of a c e.g. 1/2 students came Bus 36

	ACTIVITY/PROCEDURE
	6-l. characteristics of all quadrilaterals by observation and comparison. (1) Quadrilateral (2) Trapezoid (3) Parallellogram (4) Rectangle (5) Rhumbus (6) Square
	6-m. Give students a scale drawing of a room and the scale. Have them find the dimensions of the room. Give the students a sketch of floor plan with dimensions in whole units and a scale. Example: 1/2 inch measure 1 foot. Let them draw the sketch to scale. Assignment - Construct a scale drawing of the 1st floor of their home to nearest whole unit, using their own scale.
	6-n. Continue graphing of information using all kinds of graphs so far presented. Using information from all graphs to make comparisons and predictions. Use relevant information from Science and Social Studies classes. Introduce simple circle graphs using fractional parts of a circle. e.g. 1/2 students came to school on Bus 36

GRADE 6

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
6-n. cont'd	6-n. 1/4 students came to scho Bus 22 1/4 students came to scho Bus 17 Note: May use other simp
6-o. Introduction of Negative Integers	6-o. Use thermometer - Space c Borrowing money for a new Simple informal calculati Game "Mother May I"

	ACTIVITY/PROCEDURE
	6-n. 1/4 students came to school on Bus 22 1/4 students came to school on Bus 17 Note: May use other simple fractions
	6-o. Use thermometer - Space count down- Borrowing money for a new bicycle etc. Simple informal calculations. Game "Mother May I"

TEACHER'S NOTES

GRADE 7

CONCEPTS AND SKILLS	ACTIVITY/PROCEDU
7-a. Rational Numbers and Its Subsets Systematic Development of the Rational Number System	7-a. Using the number line 1. Plot the set of natur 2. Add zero to complete whole numbers. 3. Extend the number lin the set of integers 4. Extend this procedure the set of all ration
7-b. Problem Situation	7-b. Multioperational Problem the use of all rational Example: Planning a vac
7-c. Scientific Notation with Large Numbers	7-c. Review place value in pr for introducing exponent 1000 is 10^3 23,000 = 2.3×10^4 4567 = 4.567×10^3
7-d. Prime Factoring of Large Numbers	7-d. Construct factor tree See next page for

ACTIVITY/PROCEDURE

7-a. Using the number line

1. Plot the set of natural #'s.
2. Add zero to complete the set of whole numbers.
3. Extend the number line to include the set of integers
4. Extend this procedure to include the set of all rational numbers.

7-b. Multioperational Problems involving the use of all rational numbers.

Example: Planning a vacation trip.

7-c. Review place value in preparation for introducing exponents.

1000 is 10^3

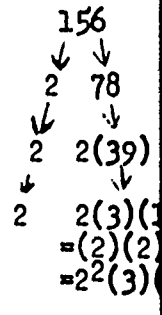
$23{,}000 = 2.3 \times 10^4$

$4567 = 4.567 \times 10^3$

7-d. Construct factor tree

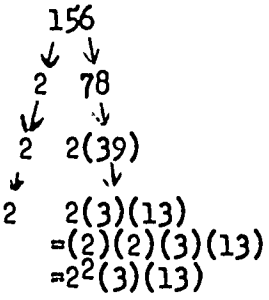
See next page for factor tree.

GRADE 7

CONCEPTS AND SKILLS	ACTIVITY/PROCE
7-d. cont'd	7-d. Example 156 
7-e. Ratio and Proportion	7-e. a. Relate equivalent fr using Ration and Pro b. Apply the use of Rat to practical problem c. 1 gal. of gas cost 3 gal. cost? 1/35 = 3/x ?
7-f. Percent	7-f. Extension of percent to number and fractional p Practical Application Interest Rate - sale ca
7-g. Measurement	7-g. Use of all previous meas the measurement of angle angles of geometric figu

ACTIVITY/PROCEDURE

7-d. Example 156



7-e. a. Relate equivalent fractions to using Ration and Proportion
b. Apply the use of Ratio and Proportion to practical problem situation.
c. 1 gal. of gas cost 35¢ what does 3 gal. cost?

$1/35 = 3/x$?

7-f. Extension of percent to include whole number and fractional percent.

Practical Application

Interest Rate - sale catalog

7-g. Use of all previous measurement plus the measurement of angles. Measure angles of geometric figures leading

CONCEPTS AND SKILLS	ACTIVITY/PROCED
7-g. cont'd	7-g. to generalization of sum in the geometric figures triangle, quadrilateral.
7-h. Graphing	7-h. Continue graphing relev from science, social st all kinds of graphs so Make use of graphs for and/or predictions.
7-i. Other Number Bases	7-i. 2^4 2^3 2^2 2^1 2^0 1 0 1 1 + 1 1 0 1 1 1 0 0 0 $1(2^3)$ $1(2^4)$
7-j. Geometry	7-j. Simple Geometric Constru straight edge, compass,

ACTIVITY/PROCEDURE

7-g. to generalization of sum of angles in the geometric figures; e.g. triangle, quadrilateral.

7-h. Continue graphing relevant information from science, social studies, etc. using all kinds of graphs so far presented.

Make use of graphs for comparisons and/or predictions.

7-i.

	2^4	2^3	2^2	2^1	2^0	
		1	0	1	1	→ 11
+	1	1	0	1		→ 13
	1	1	0	0	0	24

Check Base ten

$1(2^3) = 8$

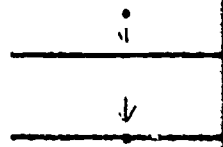
$1(2^4) = +16$

24

Therefore the answer is correct in base 2.

7-j. Simple Geometric Construction using straight edge, compass, protractor.

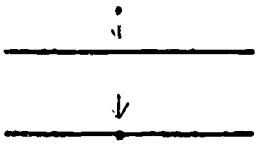
GRADE 7

CONCEPTS AND SKILLS	ACTIVITY/PROCED
7-j. cont'd	7-j. 1. Perpendicular bisecto of a square) 2. Angle bisector 3. Construct a regular h 4. Equilateral triangle 5. Perpendicular from a not on a line to the 6. Perpendicular to a gi of a given line. Example: 
7-k. Area	7-k. Practical applications parallelograms, circles, scalene triangles. Surfa cones, cylinder, polyhed
7-l. Volume: Introduce Pyramids, Cones, etc.	7-l. Experimentation leading of formulas.

ACTIVITY/PROCEDURE

7-j. 1. Perpendicular bisector (construction of a square)
2. Angle bisector
3. Construct a regular hexagon
4. Equilateral triangle
5. Perpendicular from a given point not on a line to the line.
6. Perpendicular to a given point of a given line.

Example:



7-k. Practical applications for all parallelograms, circles, right and scalene triangles. Surface Areas of: cones, cylinder, polyhedron.

7-l. Experimentation leading to development of formulas.

TEACHER'S NOTES

GRADE 8

8-a. If a student has mastered the previous skills and concepts through Level 7-1 and a por that school year remains, 8-a is for exploration:

Solution sets, inequalities, variables, plotting simple functions, statistics, probability, mathematics in Career Education, real number properties.

These suggested topics are in no way intended to limit a teacher's initiative or creat in presenting topics that teachers feel appropriate and necessary in extending a stude mathematical education.

NOTE: It is strongly recommended that no student progresses to Level 8-b or 8-c at an time during the course of a given school year.

NOTE: No student should be placed in either 8-b or 8-c until he has successfully prog through the previous grade levels. These levels, 8-b and 8-c, are to be full y courses of study under daily supervision of a mathematics teacher. FOR EIGHT G STUDENTS ONLY.

8-b. Pre Algebra	Requirements: Mastery of previous levels Need of more efficient work Need of more mental maturit
8-c. Algebra I NOTE: Those students upon successful completion will receive a high school algebra credit.	Requirements: Mastery of previous levels conceptual understanding of Excellent work habits. Mental maturity.

kills and concepts through Level 7-1 and a portion of
loration:

, variables, plotting simple functions,
thematics in Career Education, real number

tended to limit a teacher's initiative or creativity
appropriate and necessary in extending a student's

no student progresses to Level 8-b or 8-c at any
n school year.

ither 8-b or 8-c until he has successfully progressed
s. These levels, 8-b and 8-c, are to be full year
ervision of a mathematics teacher. FOR EIGHT GRADE

	Requirements: Mastery of previous levels through 7-1. Need of more efficient work habits. Need of more mental maturity.
	Requirements: Mastery of previous levels through 7-1 and conceptual understanding of said levels. Excellent work habits. Mental maturity.