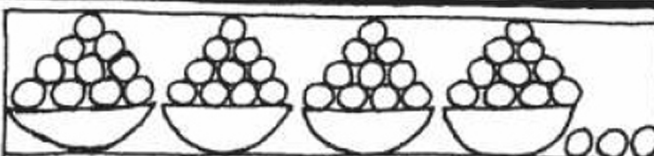
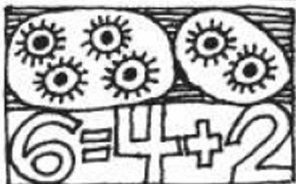
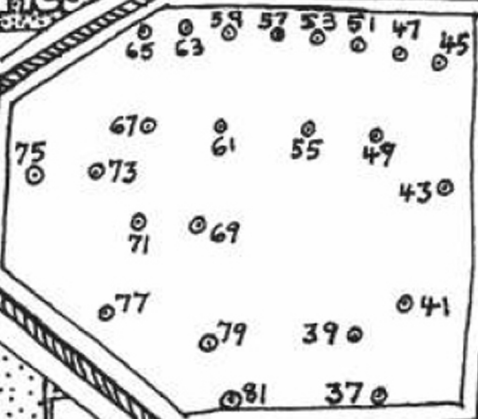
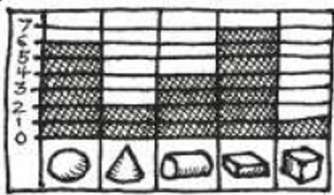


GAMES AND ACTIVITIES

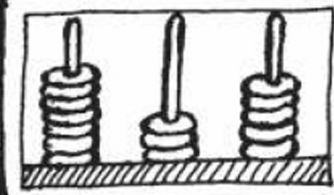
TEACHERS' GUIDE



4 tens and 3 ones



M	T	W	T	F	S	S
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



SCHOOL

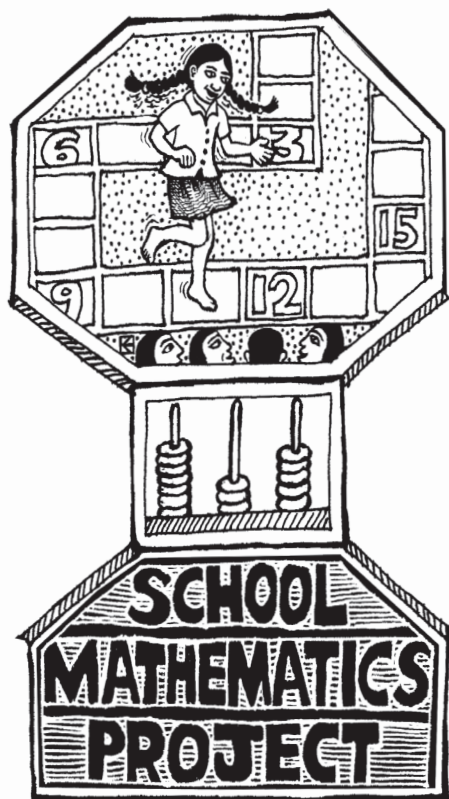


MATHEMATICS PROJECT



GAMES AND ACTIVITIES TEACHERS' GUIDE

Edited by
Amitabha Mukherjee and Vijaya Varma



Eklavya

Games and Activities: Teachers' Guide

School Mathematics Project

Centre for Science Education and Communication, Delhi University (2001)

Edited by: Amitabha Mukherjee and Vijaya Varma

Illustration/ Design: Karen Haydock



School Mathematics Project, July 2017

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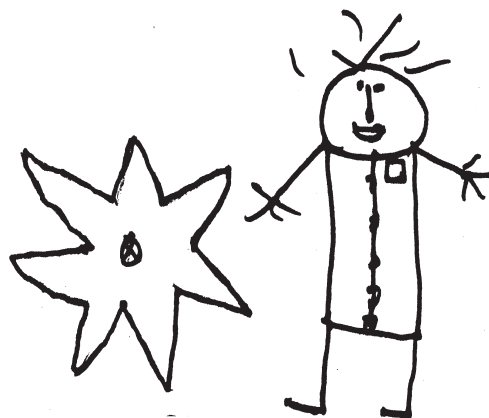
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Preface

This is a reprint of an experimental edition of *Games and Activities for Class II: Teachers' Guide* prepared for the School Mathematics Project (SMP) in 2001 with the help of teachers from participating schools. It explains and gives ideas on both how to use the worksheets in the accompanying book, *Games and Activities for Class II: Worksheets*, and also gives ideas for additional activities. As part of the same project, another book was written for Class I. But the games, activities and worksheets in both these books can be used for any age, depending on the needs of the students.

About SMP

The School Mathematics Project (SMP) was aimed at addressing the fear of mathematics in children. It was based at the Centre for Science Education and Communication, University of Delhi. From 1995, it ran as a teaching programme in 5 schools in Delhi. In 2000, the first batch of children completed Class V. The project laid emphasis on activities with concrete objects in the early stages. Algorithms were introduced later. Wherever possible, multiple ways of performing the same mathematical task were introduced. Children were encouraged to work in groups, and to talk about how they solved the problems in mathematics in the classroom. The following points encapsulate the 'SMP Approach':

On Children

- Children are not blank slates when they enter school. They come equipped with a certain awareness of number and operations ('initial mathematics') that is independent of formal instruction. Disregard of this leads to the growth of fear of mathematics.
- The classroom process should not be viewed as a one-way transfer of 'knowledge' from the teacher to the taught. The emphasis should be on elucidation rather than on instruction.
- Children are individuals with their own pace and often their own strategies of learning. The curriculum should provide room for them to remain different from each other. One method, one activity, one technique can not provide for all children. There is a natural pace at which each child picks up new concepts and skills in mathematics. Riding roughshod over them in an attempt to maintain a pace of learning dictated solely by an externally imposed pre-determined curriculum is a major factor in the development of fear of mathematics.

On Mathematics

- Mathematics is more than numbers, operations and algorithms. It encompasses shape and space, patterns, structures, data handling and measurement.
- Mathematics is inherently beautiful and a potential source of joy – but only if the teacher feels this herself can she communicate it to children.
- Aptitude comes naturally when there is a meaningful context for mathematics.

On Teachers and Teaching

- If the teacher is not convinced of the need for change, no curricular change will work. Teacher training is not just a matter of training teachers in new concepts and techniques, but of changing their attitude to mathematics and to teaching, especially in their relationship with children. This can not be done by imposition and may be possible only through involvement and association.

- Ultimately the teacher has to transact the curriculum in the classroom. It is neither possible nor desirable to spell out exactly how everything should be done. It is nevertheless necessary to provide the teacher all possible support.
- Symbolic notation is a powerful tool for computation as well as a means of recording the results of computation. However, familiarity with the symbol for something does not imply facility with what the symbol stands for.

The worksheets, naturally, do not capture everything that was done in the classroom. We suggest, therefore, that teachers who wish to use these in their classrooms adapt the worksheets to suit their specific needs.

Please note that the number at the top right corner of each page of the *Teachers' Guide* indicates the corresponding worksheet number, which runs from WS 1 to WS 63 (a few activities do not have worksheets).

Each worksheet carries a legend at the bottom right hand corner of the page. The legend starts off by specifying the type of worksheet, eg, whether it has to do with money, time, etc. Each type of worksheet has a unique number. The final element of the legend identifies the number of the worksheet. Use these numbers to find the page of the *Teachers' Guide* which corresponds to a particular worksheet.

Amitabha Mukherjee
Vijaya Varma
for the SMP Group

Please send any feedback and suggestions for modification to Karen Haydock (who illustrated and designed this book) at haydock@gmail.com.

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MONEY.....	1
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MONEY: LET'S GO SHOPPING!

Objective: Practise of addition and subtraction using money

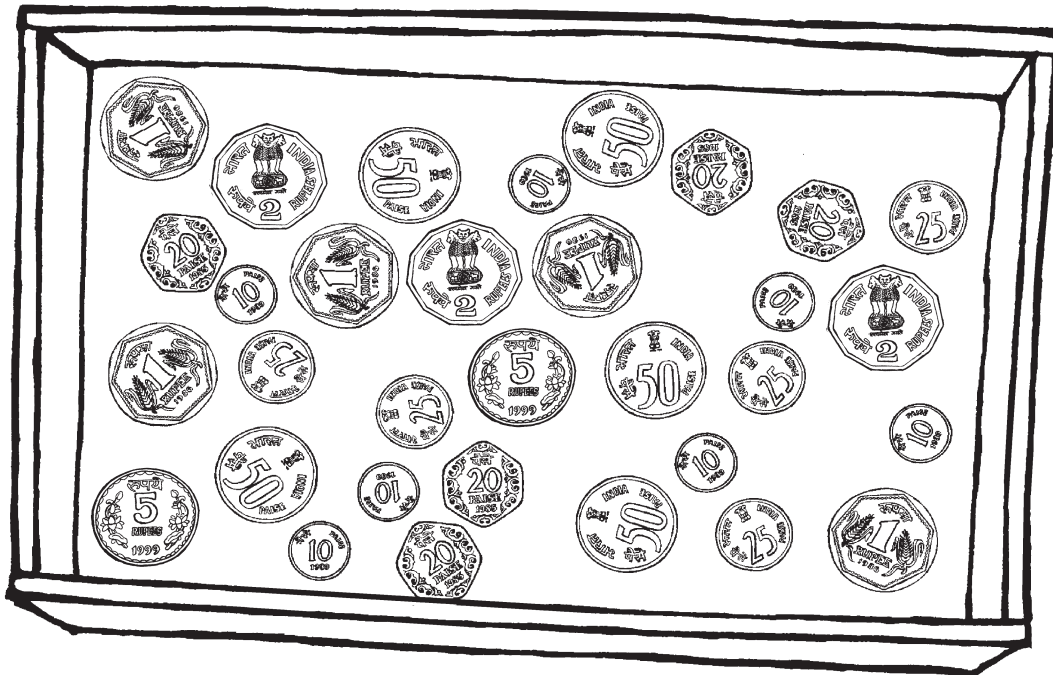


Suppose you are given Rs 200 each day for shopping. On each day, buy any three items and fill in the table.

DAY	ITEM NAME	AMOUNT	AMOUNT LEFT FROM Rs 200
1	1		
	2		
	3		
			TOTAL =
2	1		
	2		
	3		
			TOTAL =
3	1		
	2		
	3		
			TOTAL =

MONEY 2: A TRAY OF OLD COINS

Objective: Practise of multiplication and conversions from paise to Rupees



How many coins of each kind are there? How much are they worth?

<input type="text"/>	x	5 p coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	10 p coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	20 p coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	25 p coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	50 p coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	Re 1 coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	Rs 2 coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise
<input type="text"/>	x	Rs 5 coin	=	<input type="text"/>	Rupees	<input type="text"/>	paise

Extension: Students play a game in which the class is divided into two or three teams and each team in turn asks a question from the next team. Questions can be like: “If you have four coins of two Rupees each, how much money do you have?” or at a later stage: “If you have four coins of two Rupees each and two coins of one Rupee each, how much money do you have?” Students have to answer the question within a given time, otherwise the question is passed on to the next team. The team that gives a correct answer gets a point. The team with the maximum number of points at the end of the game wins.

MONEY 3: HOW MANY COINS MAKE 1 RUPEE?

Objective: Practise of addition with money

Nature: Activity

Materials: Coins of various denominations cut out of paper or cardboard

Participation: Individual

Description: Each student is given ten 5 p, 10 p, 25 p and 50 p coins.

Then they are asked questions like:

How many 50 p coins = Re 1?

How many 25 p coins = Re 1?

How many 10 p coins = Re 1?

Students are expected to show the number of coins in reply.

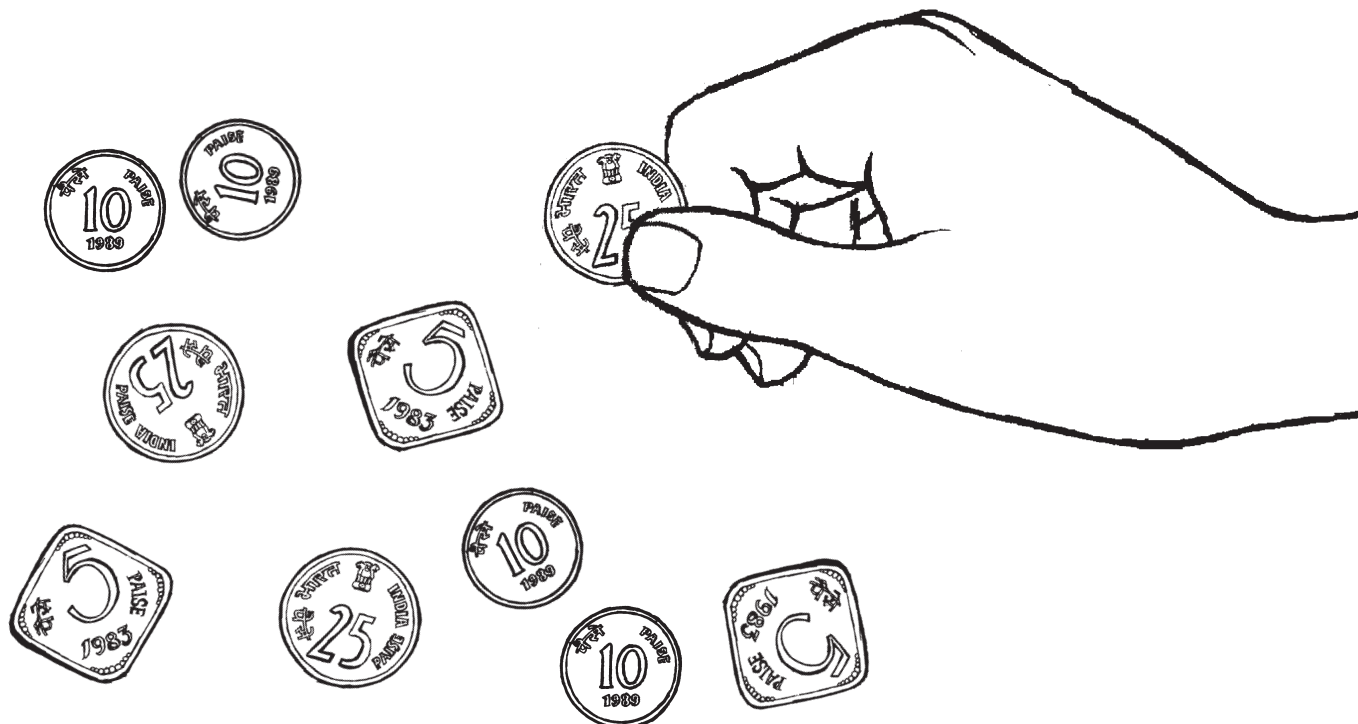
Extension:

1. Students can also be asked to find combinations of coins making 65 p, 70 p, 80 p, 95 p, etc

(without using a 50 p coin). For example,

$$65 \text{ p} = 25 \text{ p} + 25 \text{ p} + 10 \text{ p} + 5 \text{ p}$$

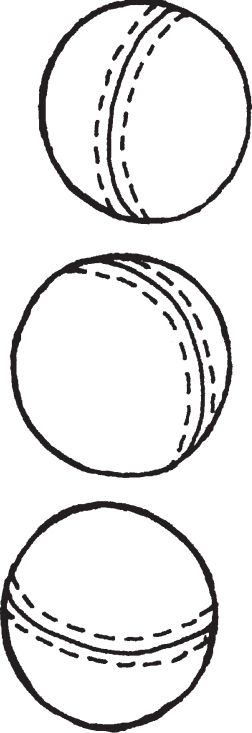
2. Students can also be asked to decide on their own the totals they wish to make up.



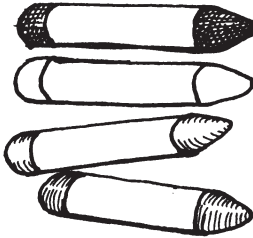
MONEY 4: HOW MANY CAN YOU BUY?

Objective: Practise of division using money

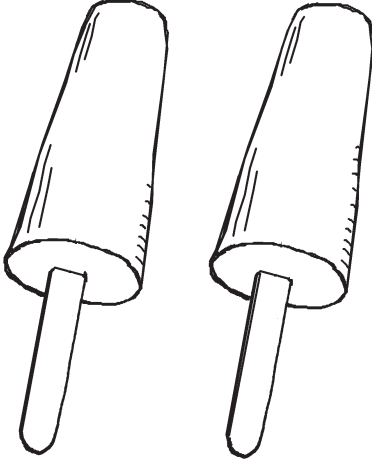
Circle the number of things in each box that you can buy with 10 Rupees.



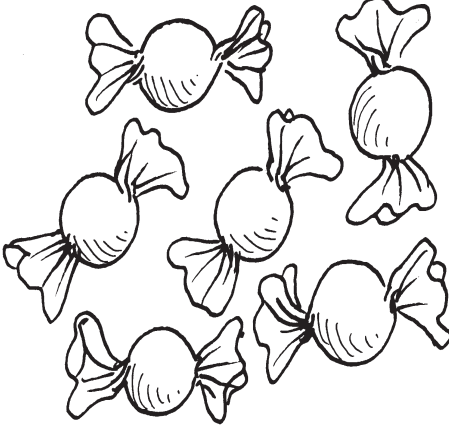
Balls
Rs 5 each



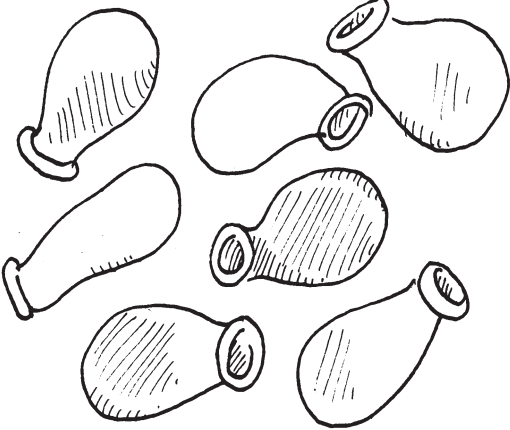
Crayons
2 for Rs 5




Kulfi
Rs 10 each



Toffees 2 for Rs 5



Balloons 3 for Rs 5



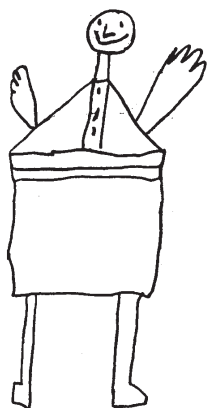
Crackers Rs 2 each

MONEY 5: PRICES OF THINGS

Objective: Familiarity with money

Visit a shop and note down the prices of any 10 things you might like to buy.

	NAME OF THING	PRICE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



MONEY 6: WHO BOUGHT WHAT?

Objective: Practise of addition and subtraction with money

Gita, Farha, Shilpa and Shruti each bought 1 jumper and 1 pair of shorts.

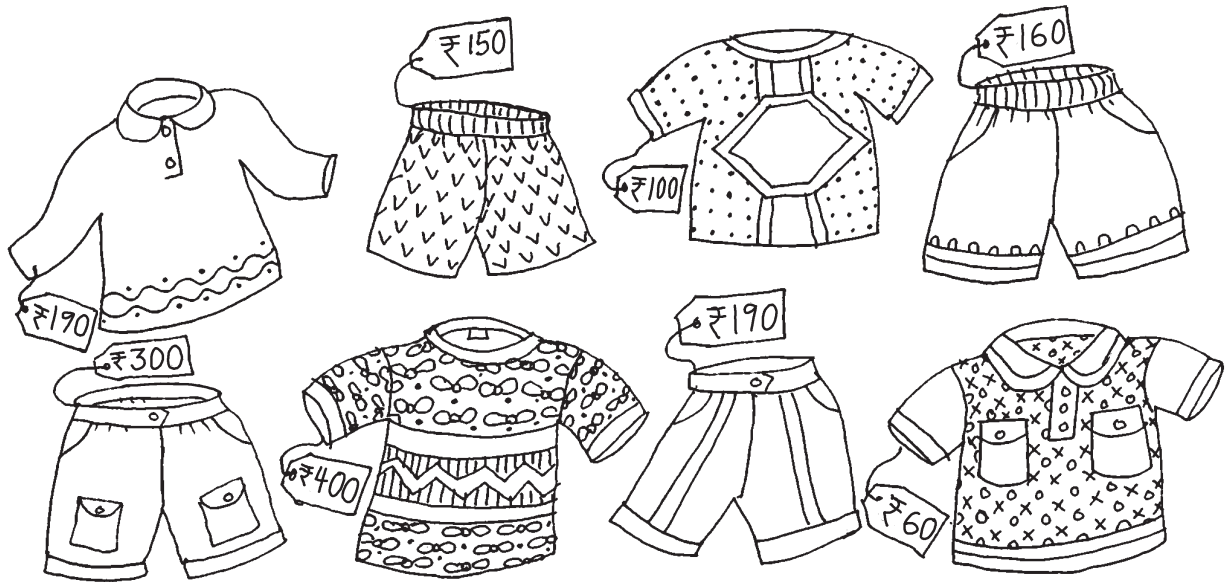
Gita spent Rs 380.

Farha spent Rs 400.

Shilpa spent Rs 560.

Shruti spent Rs 210.

Work out which jumper and which pair of shorts each girl bought.

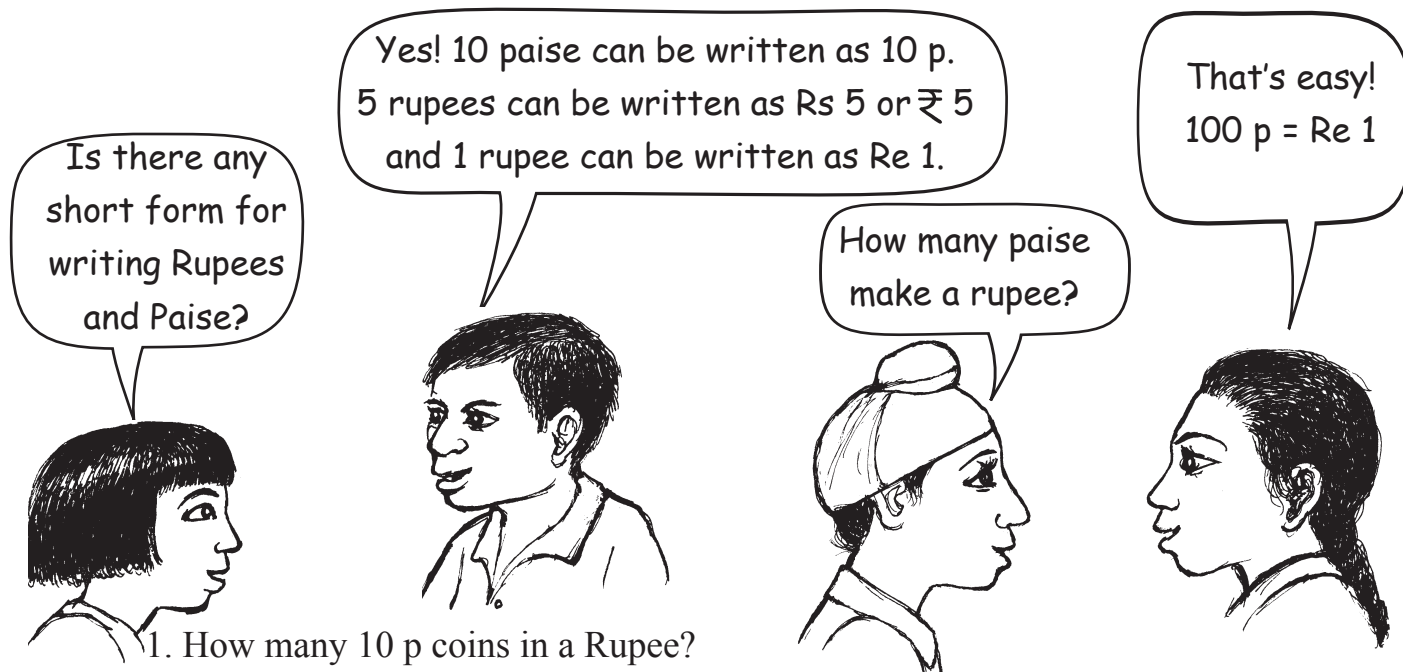


Write how much they spent in the table below.

Name of Girl	Cost of Jumper	Cost of Shorts	Total Cost
Gita			Rs 380
Farha			Rs 400
Shilpa			Rs 560
Shruti			Rs 210

MONEY 7: HOW MANY COINS IN A RUPEE?

Objective: Knowledge of various combinations of coins that make 10 Rupees



1. How many 10 p coins in a Rupee?

$$\textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10} + \textcircled{10}$$

$$\boxed{10} \times 10 \text{ p} = \boxed{\quad} \text{ p}$$

2. How many 20 p coins in a Rupee? (Draw and write.)

$$\boxed{\quad} \times 20 \text{ p} = \boxed{\quad} \text{ p}$$

3. How many 25 p coins in a Rupee?

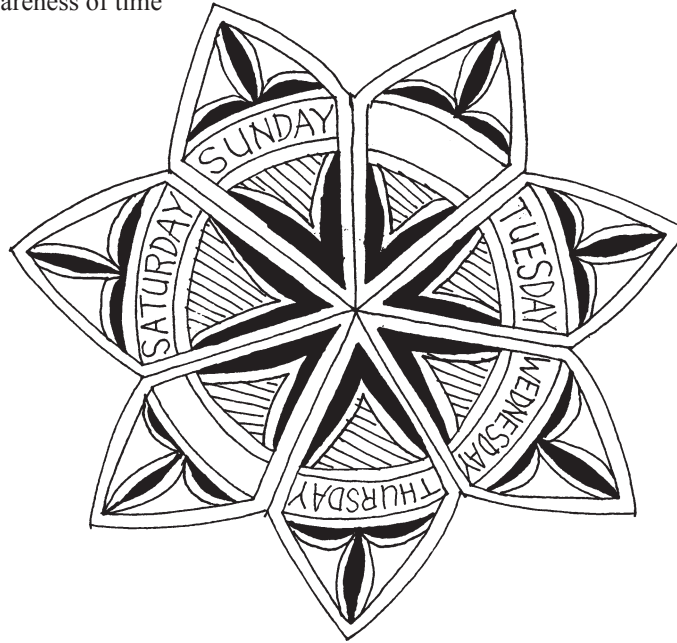
$$\boxed{\quad} \times 25 \text{ p} = \boxed{\quad} \text{ p}$$

4. How many 50 p coins in a Rupee?

$$\boxed{\quad} \times 50 \text{ p} = \boxed{\quad} \text{ p}$$

TIME 1: DAYS OF THE WEEK

Objective: Awareness of time



1. Fill in the missing days of the week in the above picture.
2. Which day of the week is it today? (tick one)

a. Monday	e. Friday
b. Tuesday	f. Saturday
c. Wednesday	g. Sunday
d. Thursday	
3. Which day of the week is always a holiday? _____
4. Which day comes after Wednesday? _____
5. Which day comes before Saturday? _____
6. The day before Thursday is _____.
7. There are _____ days in two weeks.
8. There are _____ days in three weeks.
9. My favourite day of the week is _____.

Extension: Instead of the questions being asked in a worksheet, teachers can ask questions orally and then students can be encouraged to ask each other similar questions based on time.

TIME 2: MAKE A CALENDAR

Objective: Familiarity with a calendar

Suppose this month has 31 days. Complete the calendar.

MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3			
7						
	15					
					26	

1. What is the second Saturday? _____
2. What is the first Wednesday? _____
3. What is the last Friday in the month? _____
4. What is the second Monday? _____
5. What is the third Friday? _____
6. Is the 21st a Sunday? _____
7. Is the 18th a Friday? _____
8. Is the 12th a Tuesday? _____



TIME 3: 2018 CALENDAR

Objective: Awareness of time

January							February							March							April						
Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7				1	2	3	4				1	2	3	4							1
8	9	10	11	12	13	14	5	6	7	8	9	10	11	5	6	7	8	9	10	11	2	3	4	5	6	7	8
15	16	17	18	19	20	21	12	13	14	15	16	17	18	12	13	14	15	16	17	18	9	10	11	12	13	14	15
22	23	24	25	26	27	28	19	20	21	22	23	24	25	19	20	21	22	23	24	25	16	17	18	19	20	21	22
29	30	31					26	27	28					26	27	28	29	30	31		23	24	25	26	27	28	29
																					30						

May							June							July							August						
Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1	2	3	4	5	6					1	2	3							1			1	2	3	4	5
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
28	29	30	31				25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30	31		
														30	31												

September							October							November							December						
Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
					1	2	1	2	3	4	5	6	7				1	2	3	4						1	2
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
																					31						

1. Is 23rd April a Monday or a Sunday in 2018? _____
2. On which day of the week does Gandhi Jayanti (October 2) fall in 2018? _____
3. My birthday is in the month of _____.
4. February has 28 days except in a leap year when it has 29 days.
Is 2018 a leap year? _____
5. My summer holidays are in the months of _____.
6. On which day of the week does Independence Day (August 15) fall? _____
7. The fifth month of the year is _____.
8. The tenth month of the year is _____.
9. August is the _____ month of the year.
10. A month has _____ weeks.
11. These months have 31 days: _____.

Extension: Instead of questions being asked in a worksheet, students can be encouraged to ask such questions among themselves. Teachers can give some examples to start this activity.

TIME 4: HOW LONG IS ONE MINUTE?

Objective: Estimation of time intervals

Nature: Game

Materials: Stop clock (or any clock with a second hand)

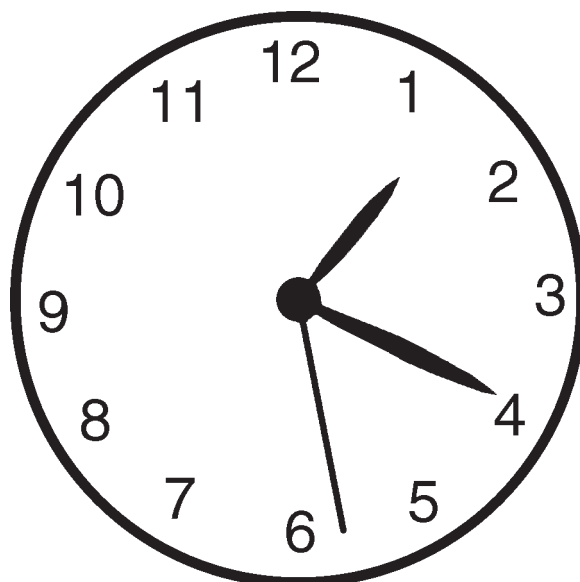
Participation: Groups of two or three

Description: Students are given an idea of how long a minute is with the help of a stop clock. This should be repeated two or three times. Then they are asked for examples of things they can do in a minute. They should then carry out these activities and the teacher should measure the time they actually take. This should be repeated a few times with students being allowed to alter their estimates so that they develop a feeling for how long a minute is.

For example, here are some responses some students gave:

1. One group of two students claimed that they can draw 20 laddoos on the blackboard in one minute. The first group took 25 sec and the next 27 sec.
2. We can make a paper fan within a minute.
3. We can sharpen three pencils in a minute.
4. We can take out everything from a bag and fill the bag again.
5. We can run around the school once.

Extension: This activity can be repeated with different time intervals like 2 or 5 minutes.



TIME 5: HOW MANY TIMES?

Objective: Estimation of time

Nature: Activity

Participation: Whole class

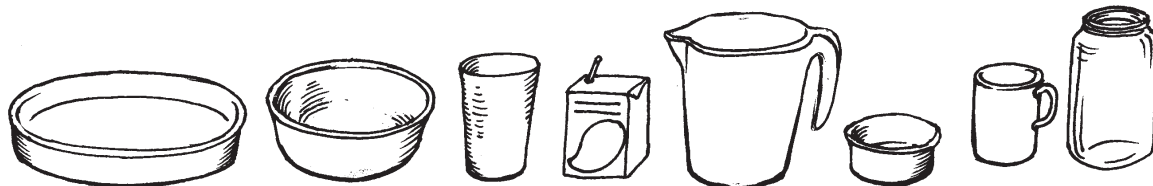
Description: The teacher asks students how many times they can do a particular task in a minute, for example, how many times they can jump, clap, shake hands, blink their eyes in a minute.

Extension: They can also be asked to guess how much time it takes to fill a bucket, how much time they take to brush their teeth, to put their shoes on, to wear their clothes, to pack their bags, to fill air in a balloon, etc. A record can be kept of the guesses and the actual number of times the children can carry out the task in one minute.



VOLUME 1: VOLUME

Objective: Introduction of standard units to measure volume



Take six to eight containers of different sizes and shapes.
Label each one with a different number.

1. Guess

Look at your containers and guess the answers to these questions:

Which one will hold the most water?

Which one will hold the least water?

Arrange the containers in order from the one that will hold the most to the one that will hold the least. Write the numbers here:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

2. Test

Now use water to find out:

Which one really held the most water?

Which one really held the least water?

Arrange the containers in order from the one that really held the most to the one that held the least. Write the numbers here:

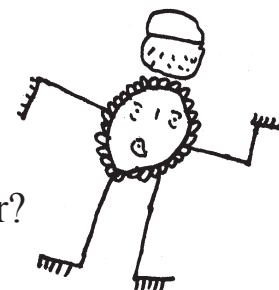
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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3. Think

Is the tallest container the one that holds the most?

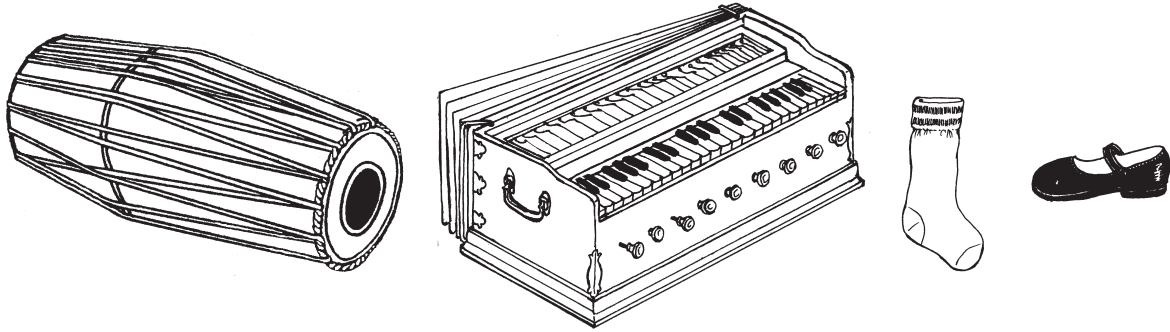
Is the shortest container the one that holds the least?

Can you find a tall container that holds less than a shorter container?



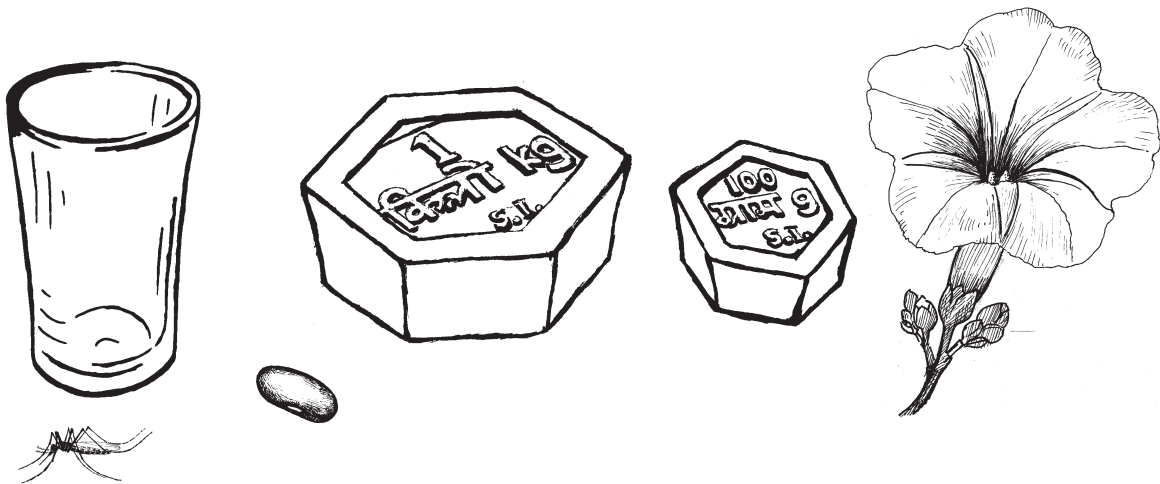
WEIGHT 1: LIGHTER AND HEAVIER

Objective: Introduction of standard units to measure weights



Which is heavier:

- (1) the harmonium or the dholak?
- (2) the shoe or the sock?
- (3) the dholak or the shoe?



Which is lighter?

- (4) the bean or the 1 kg weight?
- (5) the empty glass or the bean?
- (6) the 1 kg weight or the 100 g weight?
- (7) the bean or the mosquito?
- (8) the empty glass or the 1 kg weight?
- (9) the flower or the bean?
- (10) the flower or the 100 g weight?

PUZZLE 1: EVEN OR ODD?

Objective: Testing the concept of even and odd numbers

Nature: Activity

Participation: Whole class

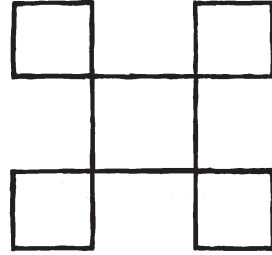
Description: The teacher asks each student to write their full name in block letters and then count the number of letters in their name. They should then write down the total number of letters and whether they have an even or odd number of letters in their name.



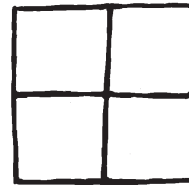
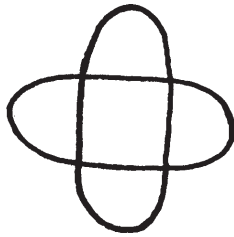
PUZZLE 2: CAN YOU DRAW IT?

Objective: Playing with shapes

1. Can you draw this **without** lifting your pencil?



2. How about these?



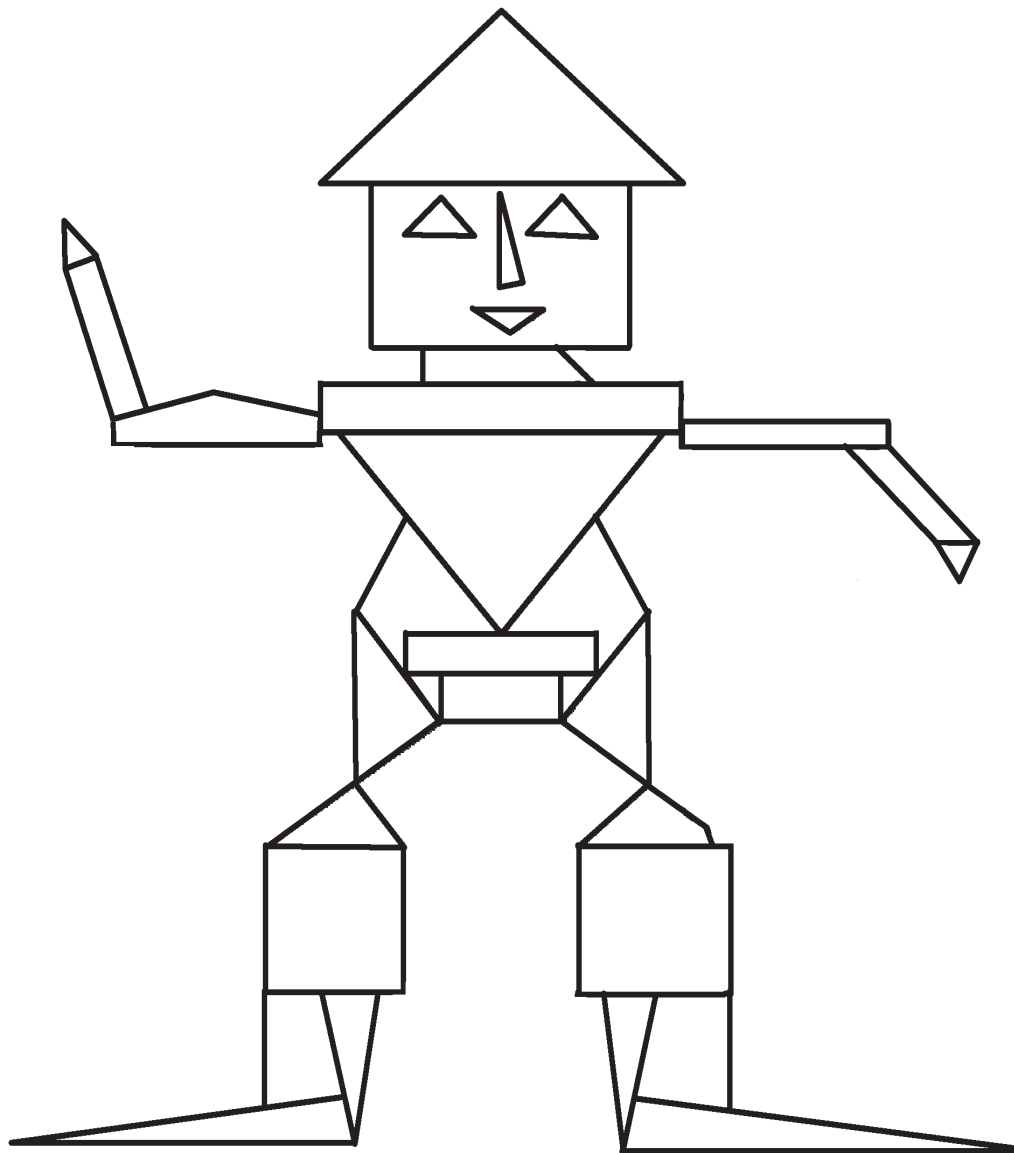
3. Draw any other figures you like without lifting your pencil even once.

Extension: Here are some more examples of figures you can draw on the board and ask the students whether they can be drawn without lifting their pencils:



SHAPE 1: SHAPES

Objective: Identification of basic shapes



Find out how many triangles and rectangles the robot is made of.

Colour the triangles red.

Colour the rectangles blue.

Number of triangles

=

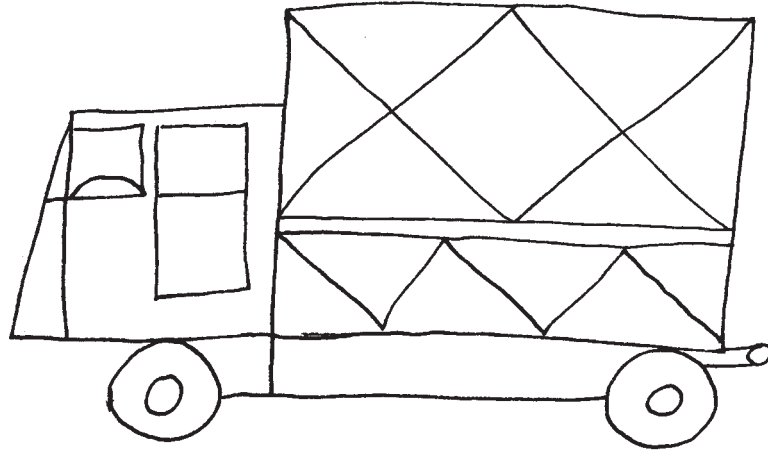
Number of rectangles

=

Extension: Students can then be asked to draw their own figures using triangles and rectangles and then count the number of each.

SHAPE 2: PICTURES AND SHAPES

Objective: Practising recognition of shapes



1. Count the number of triangles, rectangles and circles in the truck.

Number of triangles =

Number of rectangles =

Number of circles =


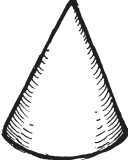
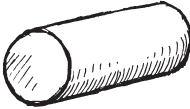
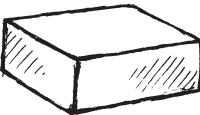
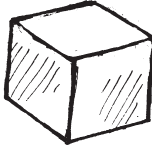
2. Draw your own pictures using these shapes.

SHAPE 3: WHAT SHAPE IS IT?

Objective: Practising recognition of shapes and their classification

Look at each object in the picture and decide which shape it is. For each object, shade a box in the graph below. For example, there is only one object that is like a sphere, so we have shaded only the bottom box in the column marked 'sphere'.

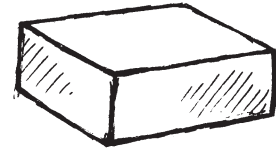


Number of Objects	8					
	7					
	6					
	5					
	4					
	3					
	2					
	1					
	0					
	Sphere 	Cone 	Cylinder 	Cuboid 	Cube 	

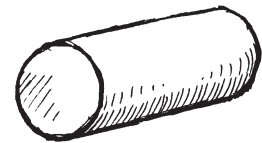
SHAPE 4: SHAPES OF OBJECTS

Objective: Practising recognition of three-dimensional objects

Name at least five objects that are cuboidal in shape.



Name at least five objects that are cylindrical in shape.



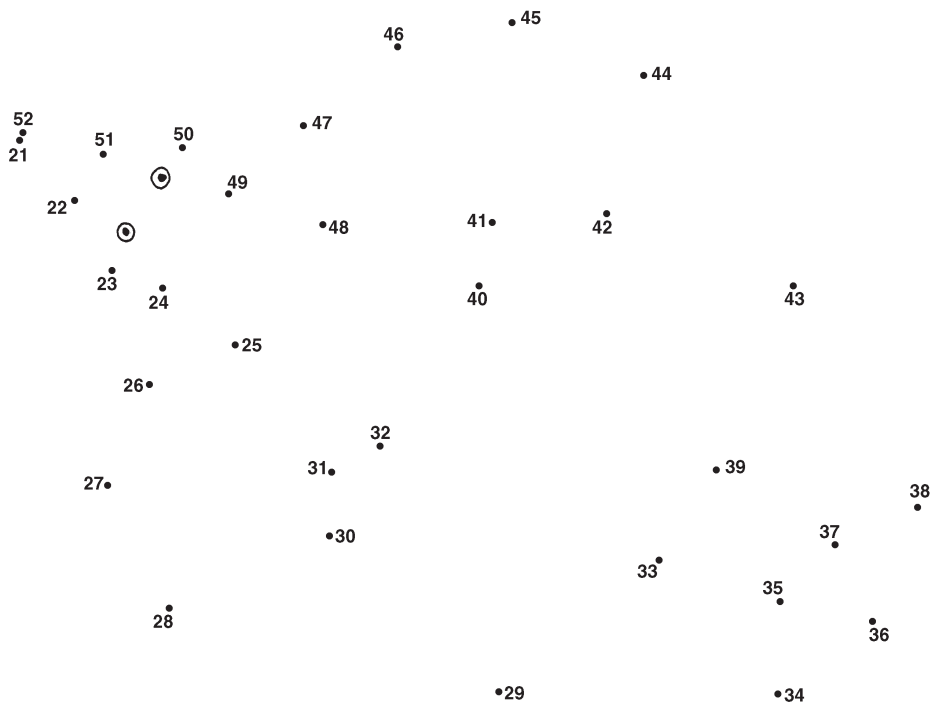
Extension:

1. Students can also be asked to name objects which are spherical or conical.
2. Students, in pairs, can play a game in which they ask each other the names of objects of a particular shape. When the student who is asked the question has answered, the roles are reversed. The game continues for as long as the students want.
3. A variant is to ask students to draw pictures of objects instead of just naming them.
4. A similar exercise can be done to help children distinguish between a cube and a cuboid.

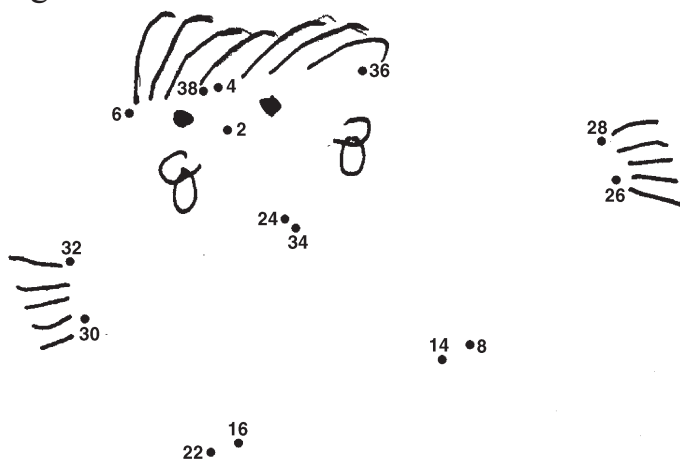
NUMBER 1: THE NUMBER GAME

Objective: Practise of number sequences

This animal can do something you can't do. What animal is it?
To find out, draw straight lines to join the dots from 21 to 52.



Now draw straight lines connecting all the dots with even numbers.
Join up in order, from 2 to 38.



What have you drawn?

Extension: Make exercises where students:

1. Join dots where only even numbers are joined.
2. Join dots where only odd numbers are joined.
3. Join dots where numbers increase by 3.
4. Join dots where numbers are multiples of 5.
5. Join dots where numbers are multiples of 10.

NUMBER 2: COLOUR THE BOXES IN THE GRID

Objective: Practise of sequence of numbers

Box 4 has been shaded.

Now you colour these boxes:

12, 35, 49, 53, 69, 71, 84, 93



Extension: This can be turned into a game for two players. One student calls out 5 numbers which have to be represented on the table. Then the other student calls out 5 numbers. Then they check the numbers represented. Whoever has made fewer mistakes wins.

NUMBER 3: JOIN THE NUMBERS

Objective: Practise of order of numbers

Join the numbers in increasing order.

334
201

321

301

231

325

Now make your own JOIN THE NUMBERS on the back and give it to a friend to do.

Extension: Numbers that are multiples of 5 or 10 can be used.

NUMBER 4: WHICH ONE IS IT?

Objective: Practise with ordinal numbers

1 2 3 4 5 6 7 8 9

Fill in the blanks with ordinal numbers:

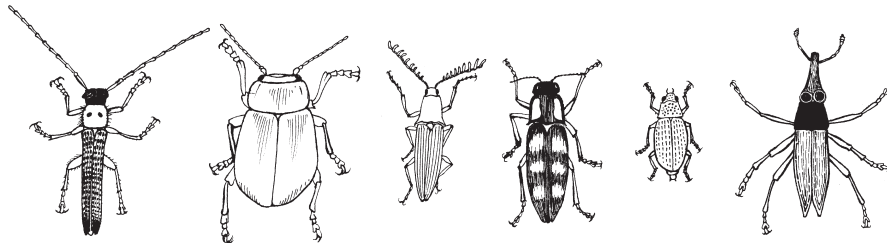
9 is the ninth number.

4 is the _____ number.

7 is the _____ number.

3 is the _____ number.

1 is the _____ number.



The first beetle has two black spots on its thorax.

The _____ beetle is smallest.

The _____ beetle is biggest.

The _____ beetle has the longest antennae.

The _____ beetle has a black thorax.

The _____ beetle has six white spots on its abdomen.

Extension: The teacher carries a box with some stones in it. She goes to a student and says, for example, “Give three stones to the fifth student on your right.” The student has to carry out the instructions.

NUMBER 5: WRITE MY NAME

Objective: Practise of number names

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

Circle the following numbers in the above chart and write their number names.

The first one is already done for you.

Number	Number Name
48	<i>forty eight</i>
32	
78	
18	
33	
40	
27	
54	
19	



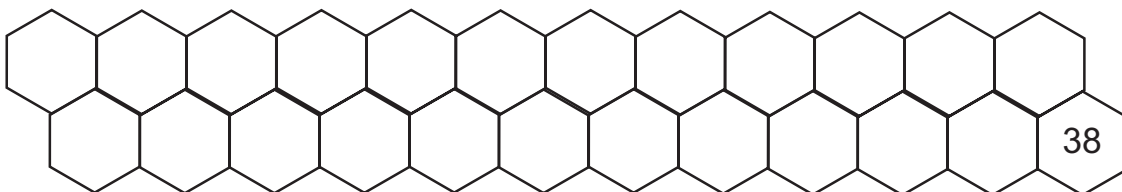
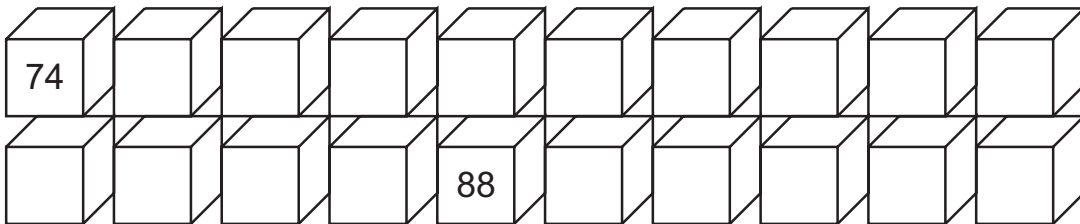
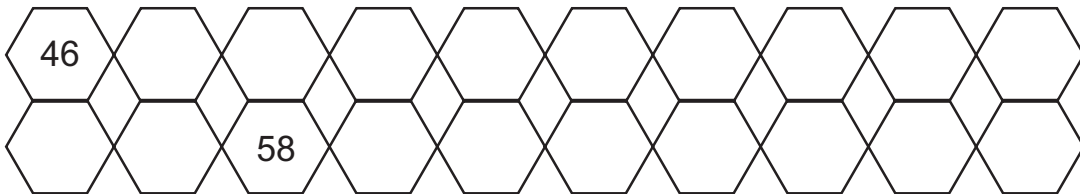
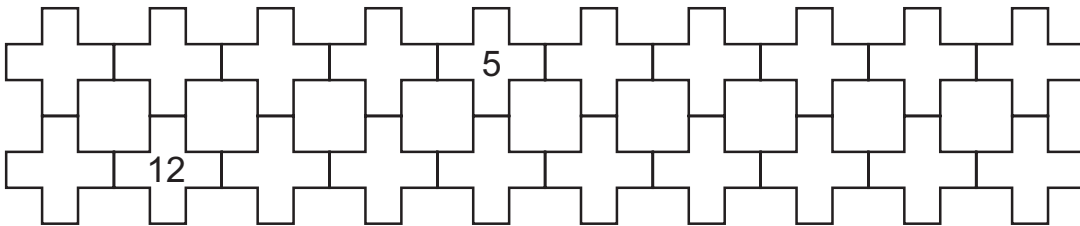
Extension:

1. The teacher can point to the circled numerals and ask students to call out the names.
2. The teacher calls out a number and students are required to encircle the appropriate numerals on the chart.

NUMBER 6: NUMBERS IN SERIES

Objective: Practise of order of numerals

Fill in numbers to complete each sequence.



Extension: Students are given cards on which numbers are already written and they are asked to arrange them in increasing or decreasing order.

NUMBER 7: THE ODD ONE OUT

Objective: Practise with numbers and pattern recognition

1. Read out loud the numbers in each row.

107	139	106	101	108
148	141	143	130	144
110	126	130	155	150
124	136	149	116	107
100	300	700	4000	800

2. Circle the odd one out in each row.

3. Colour the smallest number in each row red.

4. Colour the largest number in each row blue.

NUMBER 8: CHART YOUR NUMBERS

Objective: Practise of place value and number names

Complete the table for the numbers shown.

Number	Abacus	Place Value		
		Hundreds	Tens	Ones
51				
510				
105				
150				
15				

- Extension:**
1. This can be turned into a game for two students. One student chooses the number and the other makes the entries. They then reverse their roles.
 2. Students can also play the game alone, choosing their own numbers.

NUMBER 9: WHAT IS ITS VALUE?

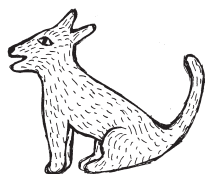
Objective: Practise of addition

Suppose letters have the following values:

A = 1	G = 7	M = 3	S = 9	Y = 5
B = 2	H = 8	N = 4	T = 10	Z = 6
C = 3	I = 9	O = 5	U = 1	
D = 4	J = 10	P = 6	V = 2	
E = 5	K = 1	Q = 7	W = 3	
F = 6	L = 2	R = 8	X = 4	



Farida has some toys. Find out their values.



$$\text{DOG} = 4 + 5 + 7 = \boxed{}$$



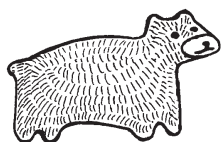
$$\text{CAT} = \boxed{} + \boxed{} + \boxed{} = \boxed{}$$



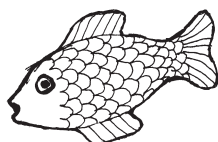
$$\text{CAR} = \boxed{} + \boxed{} + \boxed{} = \boxed{}$$



$$\text{BUS} = \boxed{} + \boxed{} + \boxed{} = \boxed{}$$



$$\text{BEAR} = \boxed{} + \boxed{} + \boxed{} + \boxed{} = \boxed{}$$



$$\text{FISH} = \boxed{} + \boxed{} + \boxed{} + \boxed{} = \boxed{}$$

- Extension:**
1. Students can be asked to write some words of their own and find out their values.
 2. The letters can be assigned values from 1 to 26 in alphabetical order and students can be asked to work out the values of various words of their choice.

NUMBER 10: ADDITION WITH CARRY OVER

- Objective:** 1. Understanding addition with carry over
2. Familiarisation with words like: loan, borrow, exchange, deposit, etc

Nature: Activity

Materials: Fake notes (3 sets of hundreds, tens and ones)

Participation: In pairs

Description: Consider, for example, the addition:

HTO

$$\begin{array}{r} 324 \\ +88 \\ \hline \end{array}$$



One child plays and the other acts as a banker. The first child picks up 4 one-rupee notes, then 8 more one-rupee notes and adds them together. There will be now 12 one-rupee notes. Instead of handling 12 one-rupee notes she asks the banker to exchange 10 ones for 1 ten-rupee note. Now the child has 1 ten and 2 one-rupee notes. The 2 ones come down in the one's place and the 1 ten is carried over to the ten's place.

HTO

$$\begin{array}{r} 1 \\ 324 \\ +88 \\ \hline 2 \end{array}$$

In the same way the child adds 1 ten, 2 ten and 8 ten-rupee notes. She has 11 ten-rupee notes. Now she exchanges 10 tens for 1 hundred-rupee note from the banker. Now she has 1 hundred and 1 ten-rupee note.

HTO

$$\begin{array}{r} 11 \\ 324 \\ +88 \\ \hline 12 \end{array}$$

The 1 ten comes down in the ten's place and the 1 hundred is carried over to the hundred's place. After adding 1 hundred and 3 hundreds, she gets 4 hundreds.

HTO

$$\begin{array}{r} 11 \\ 324 \\ +88 \\ \hline 412 \end{array}$$

Similarly, children can solve other problems made by themselves or by their friends.

NUMBER 11: SKIP COUNTING!

Objective: Practise with skip counting

Count in twos: (Circle every second number.)

1 (2) 3 (4) 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in threes: (Circle every third number.)

1 2 (3) 4 5 (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in fours: (Circle every fourth number.)

1 2 3 (4) 5 6 7 (8) 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in fives: (Circle every fifth number.)

1 2 3 4 (5) 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in sixes: (Circle every _____ number.)

1 2 3 4 5 (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in sevens: (Circle every _____ number.)

1 2 3 4 5 6 (7) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in eights: (Circle every _____ number.)

1 2 3 4 5 6 7 (8) 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in nines: (Circle every _____ number.)

1 2 3 4 5 6 7 8 (9) 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in tens: (Circle every _____ number.)

1 2 3 4 5 6 7 8 9 (10) 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Count in tens, starting from 27:

(27) 28 29 30 31 32 33 34 35 36 (37) 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58

Count in threes, starting from 22:

(22) 23 24 (25) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53

Count in sixes, starting from 27:

(27) 28 29 30 31 32 (33) 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58

Count in _____, starting from _____:

29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

NUMBER 12: ARRANGE THE NUMBERS

Objective: Practise ordering numbers



Put the numbers in increasing order:

(a) 143, 256, 98, 320, 194, 279

(b) 421, 356, 168, 200, 450, 349

(c) 288, 153, 67, 192, 431, 120

Put the numbers in decreasing order:

(d) 241, 183, 432, 376, 94, 203

(e) 350, 488, 99, 145, 264, 333

(f) 444, 434, 498, 343, 243, 93

NUMBER 13: COMPARE US

Objective: Comparison of numbers

Write the correct symbol $>$, $<$, or $=$ in each box:

$153 \quad \square \quad 148$

$423 \quad \square \quad 490$

$460 \quad \square \quad 380$

$157 \quad \square \quad 183$

$500 \quad \square \quad 468$

$297 \quad \square \quad 490$

$224 \quad \square \quad 268$

$483 \quad \square \quad 593$

$444 \quad \square \quad 471$

$237 \quad \square \quad 333$

$300 \quad \square \quad 299$

$332 \quad \square \quad 345$

$198 \quad \square \quad 176$

$205 \quad \square \quad 250$

$327 \quad \square \quad 398$

$276 \quad \square \quad 420$

$245 \quad \square \quad 445$

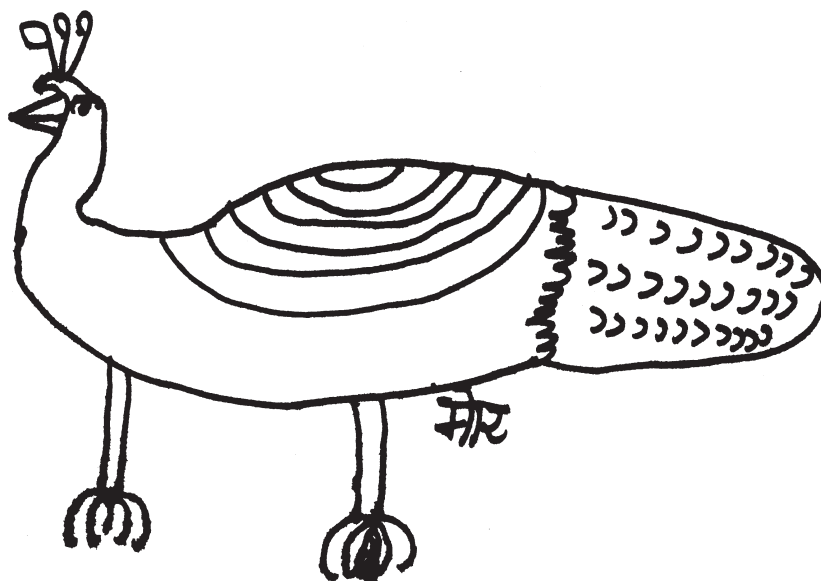
$364 \quad \square \quad (346 + 8)$

$417 \quad \square \quad 421$

$160 \quad \square \quad (105 + 55)$

$410 \quad \square \quad 310$

$500 \quad \square \quad (499 + 1)$



NUMBER 14: ARE YOU EVEN OR ODD?

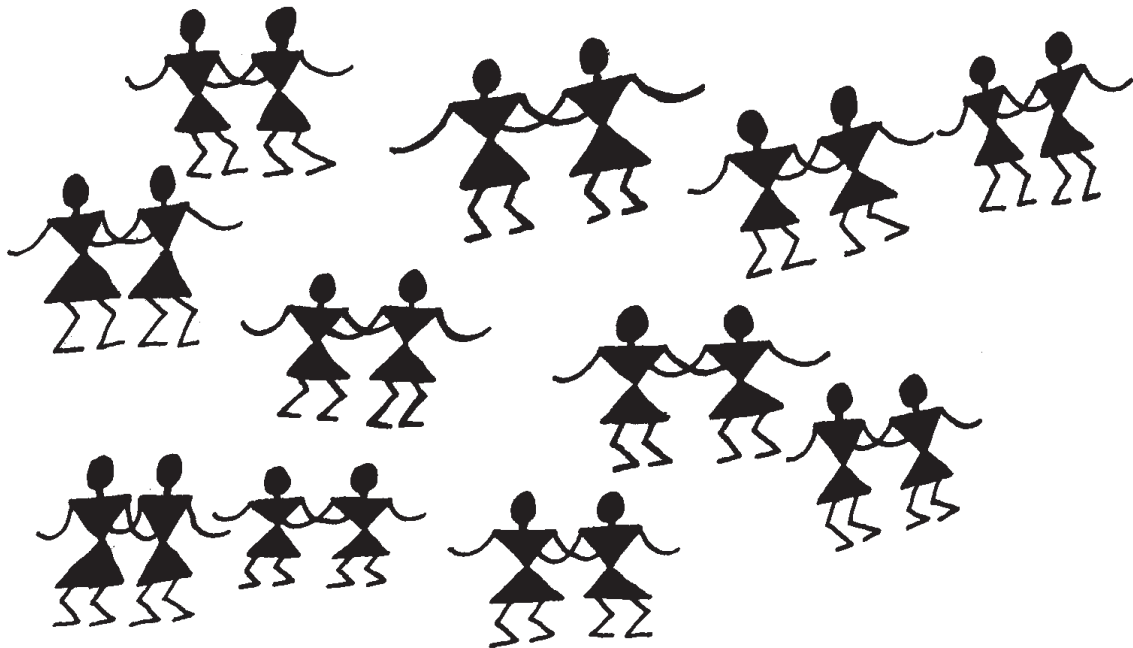
Objective: Practise of odd and even numbers

Nature: Activity

Participation: Individual as well as whole class

Description: The teacher asks each student to find a partner. The teacher then explains that if there is any student left without a partner then the total number of students in the class is odd and if nobody is left out then the total number of students is even. Then the total number of students in the class is counted.

Then the teacher asks students to find out whether the number wearing glasses, having curly hair, being left-handed, etc, is even or odd.



Extension: Teacher can encourage students to check whether a number is even or odd by making pairs.

NUMBER 15: PLACE VALUE

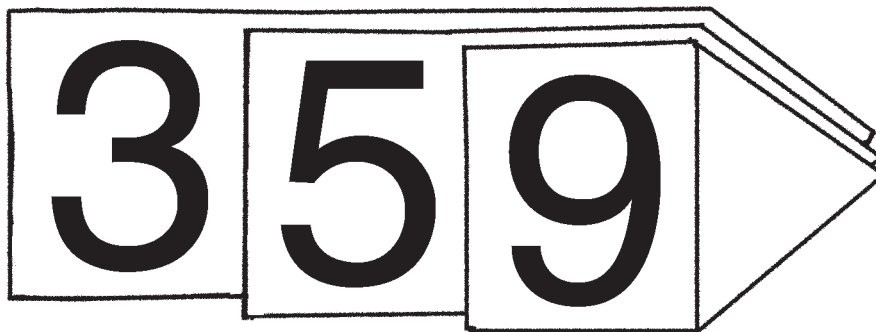
Objective: Practise of place value

Nature: Activity

Materials: Place value sheets

Participation: Individual

Description: The teacher gives students the place value cards. Then the teacher calls out a number and students have to display it using the place value cards. For example, if the teacher calls out the number 359, the students pick out the cards for 300, 50 and 9. They then lay these cards on each other to form 359.

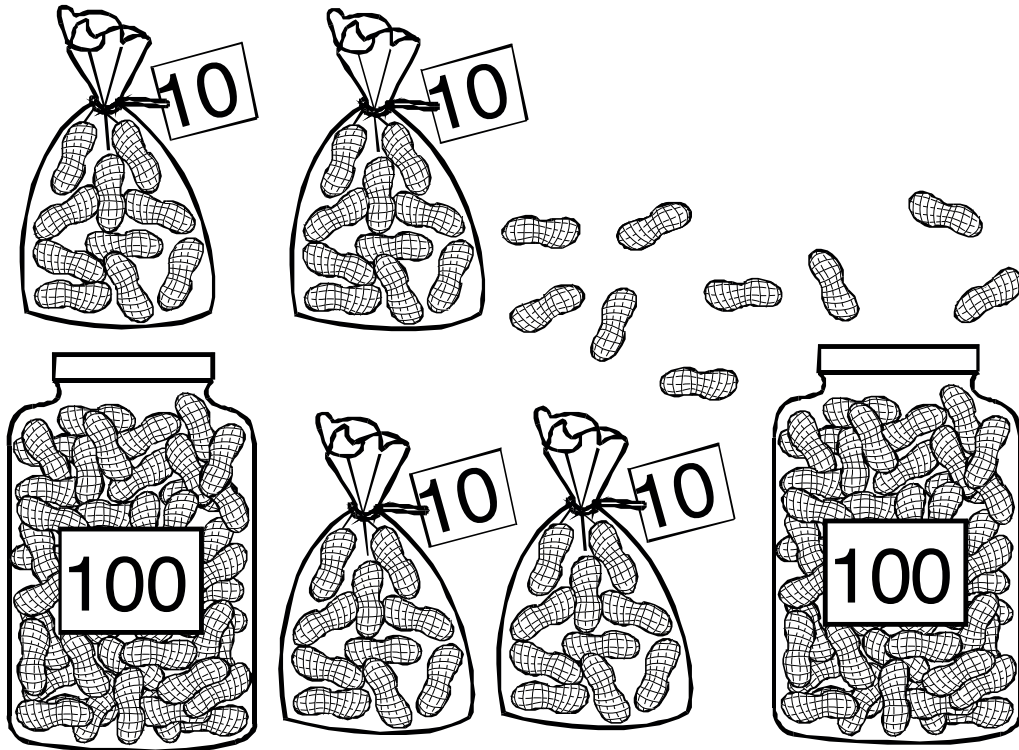


Extension: Students can also play this as a game with each other.

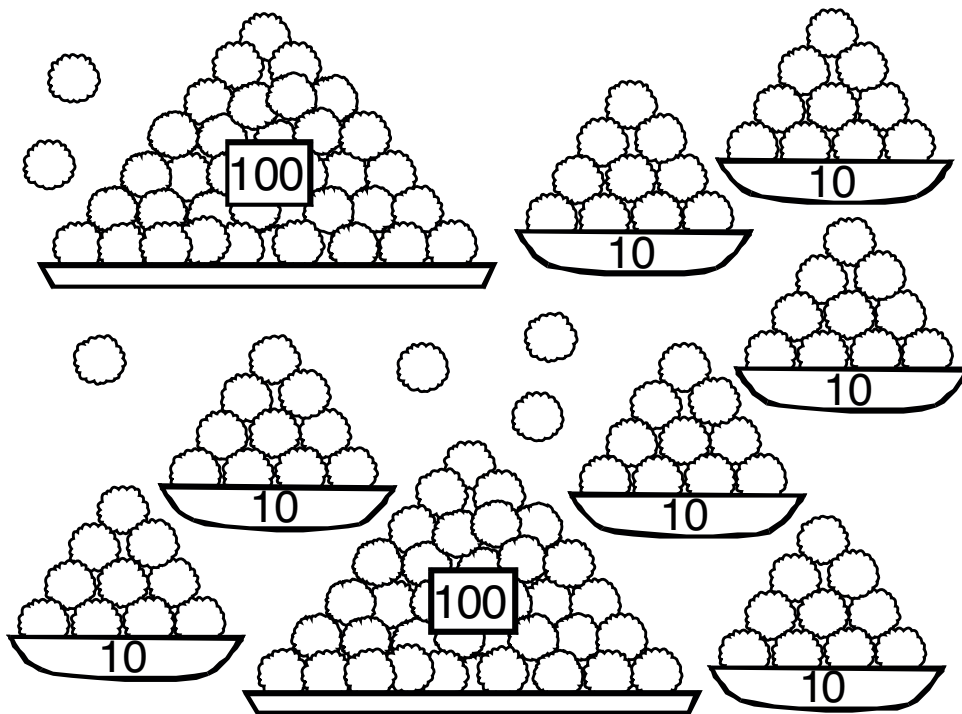
NUMBER 16: HOW MANY?

Objective: Practise of multiplication

How many peanuts are there?



How many laddus are there?



NUMBER 17: MAKE NUMBERS WITH NUMBER CARDS

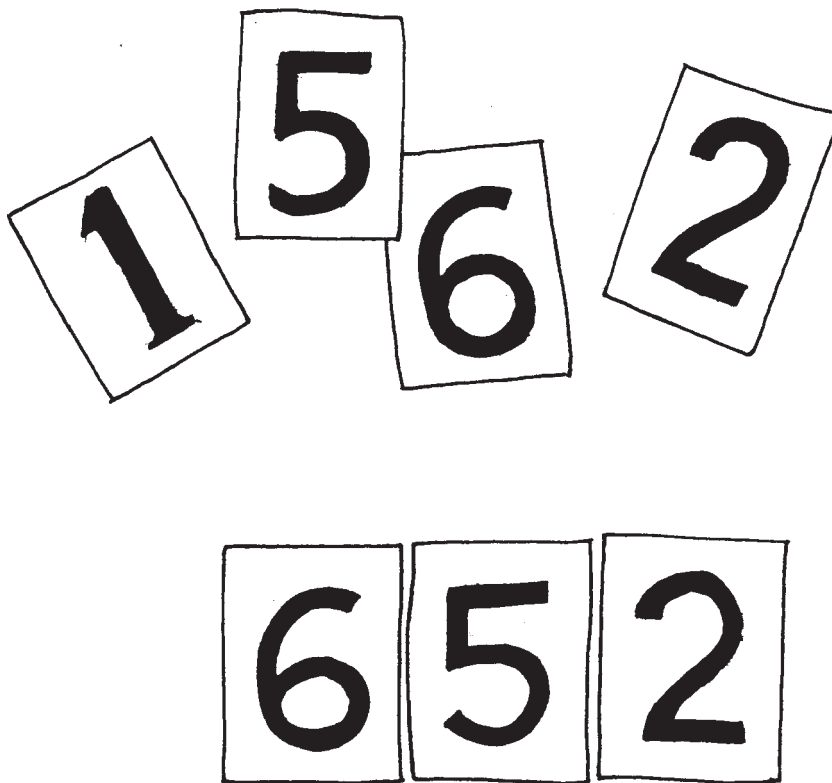
Objective: Practise of place value

Nature: Activity

Materials: Number cards for integers from 0 to 9

Participation: Individual

Description: Students are asked to pick up four cards from the pack of number cards. Then they are asked to arrange three of them to form the largest three-digit number possible. Similarly they are asked to arrange three of the cards to form the smallest three-digit number possible. Then they have to pick three cards and form a number as close to 400 as possible. The teacher should explain that a zero can not be used as the leading digit.



Extension:

1. They can be asked to repeat the activities with all four cards taken together.
2. The activity can be repeated with students being allowed to use zero cards in the leading places so that the smallest numbers need not be three or four-digit numbers.

NUMBER 18: EXPAND THE NUMBER

Objective: Practise of place value

Write each number in expanded form. The first one is done for you.

$$937 = \underline{9 \text{ hundreds}} + \underline{3 \text{ tens}} + \underline{7 \text{ ones}}$$

(a) $781 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(b) $146 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(c) $356 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(d) $164 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(e) $362 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

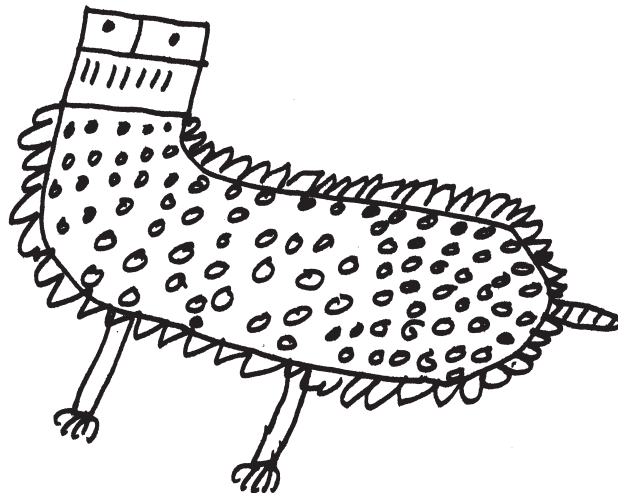
(f) $930 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(g) $276 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(h) $571 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

(i) $403 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

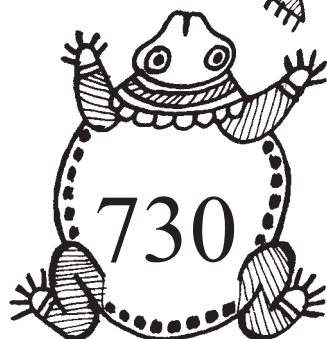
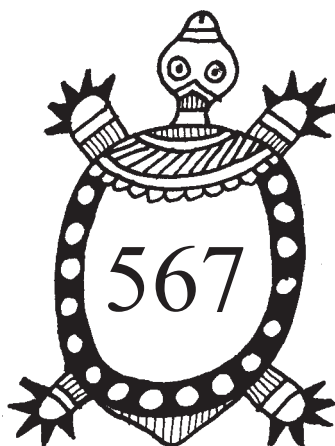
(j) $82 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$



NUMBER 19: DO YOU REMEMBER OUR NAMES

Objective: Practise of number-name correspondence

These large numbers have forgotten their names.
Can you write the number names?



ADDSUB 1: ADDITION SUMS

Objective: Practise of addition

Add the matchsticks. Make a ring around new sets of 10 matchsticks.

T	O
47	
25	

T	O

T	O

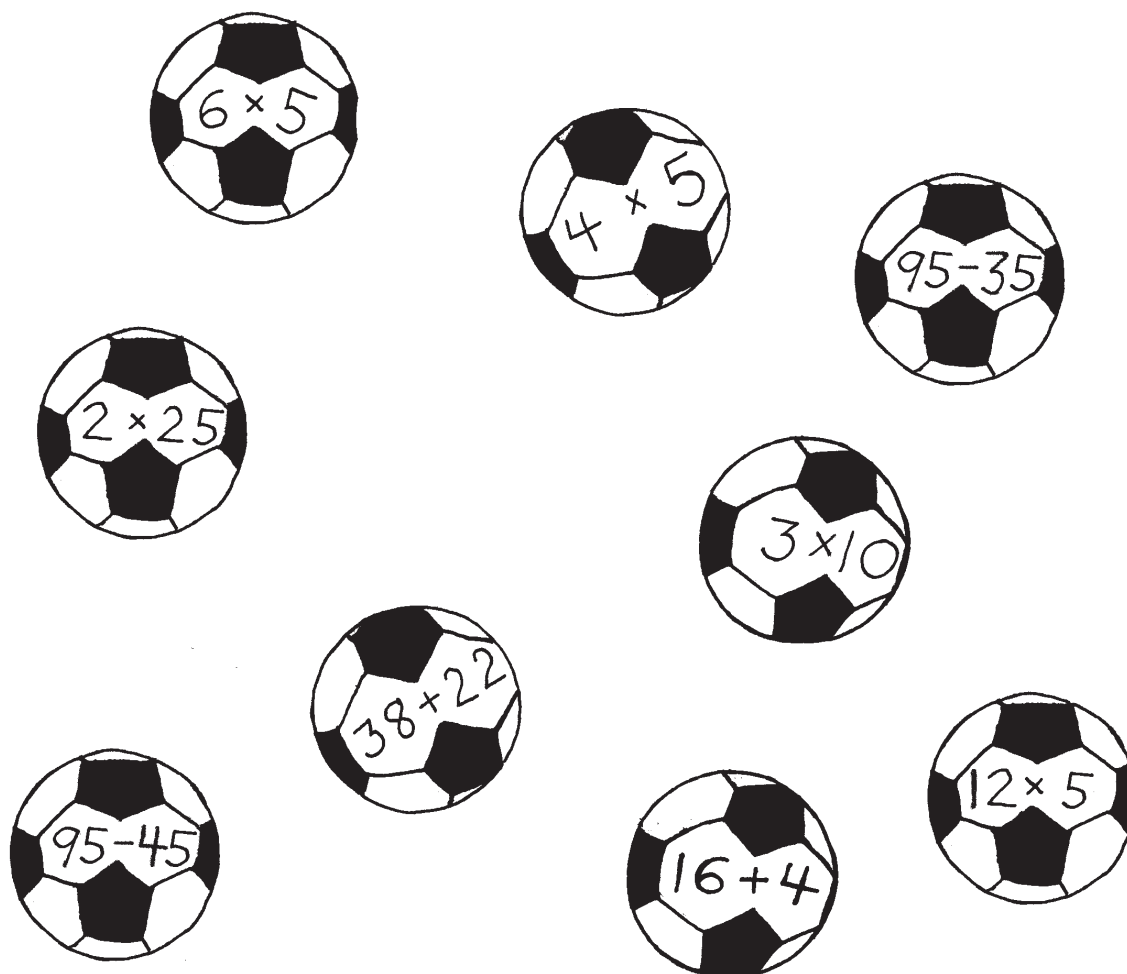
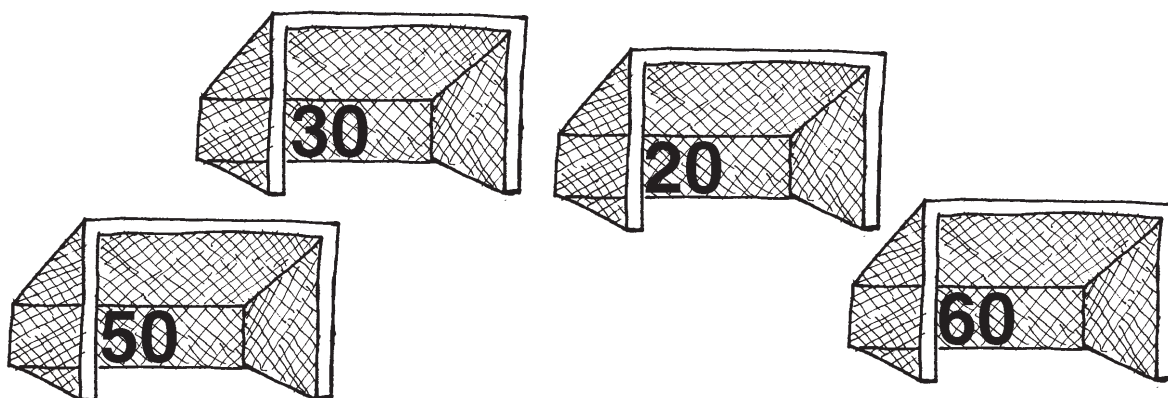
T	O

Extension: Students can be asked to make similar problems and solve them or give them to their friends to solve.

ADDSUB 2: WHERE WILL THE BALLS GO?

Objective: Practise of addition, subtraction, and multiplication

Draw lines to match the balls and the goals.



Extension: Students can be asked to make similar problems and solve them or give them to their friends to solve.

ADDSUB 3: COLOUR THE PICTURE

Objective: Practise of addition

Solve the sums to find which colours to use.

KEY:

26	RED
27	BLUE
28	YELLOW
29	ORANGE

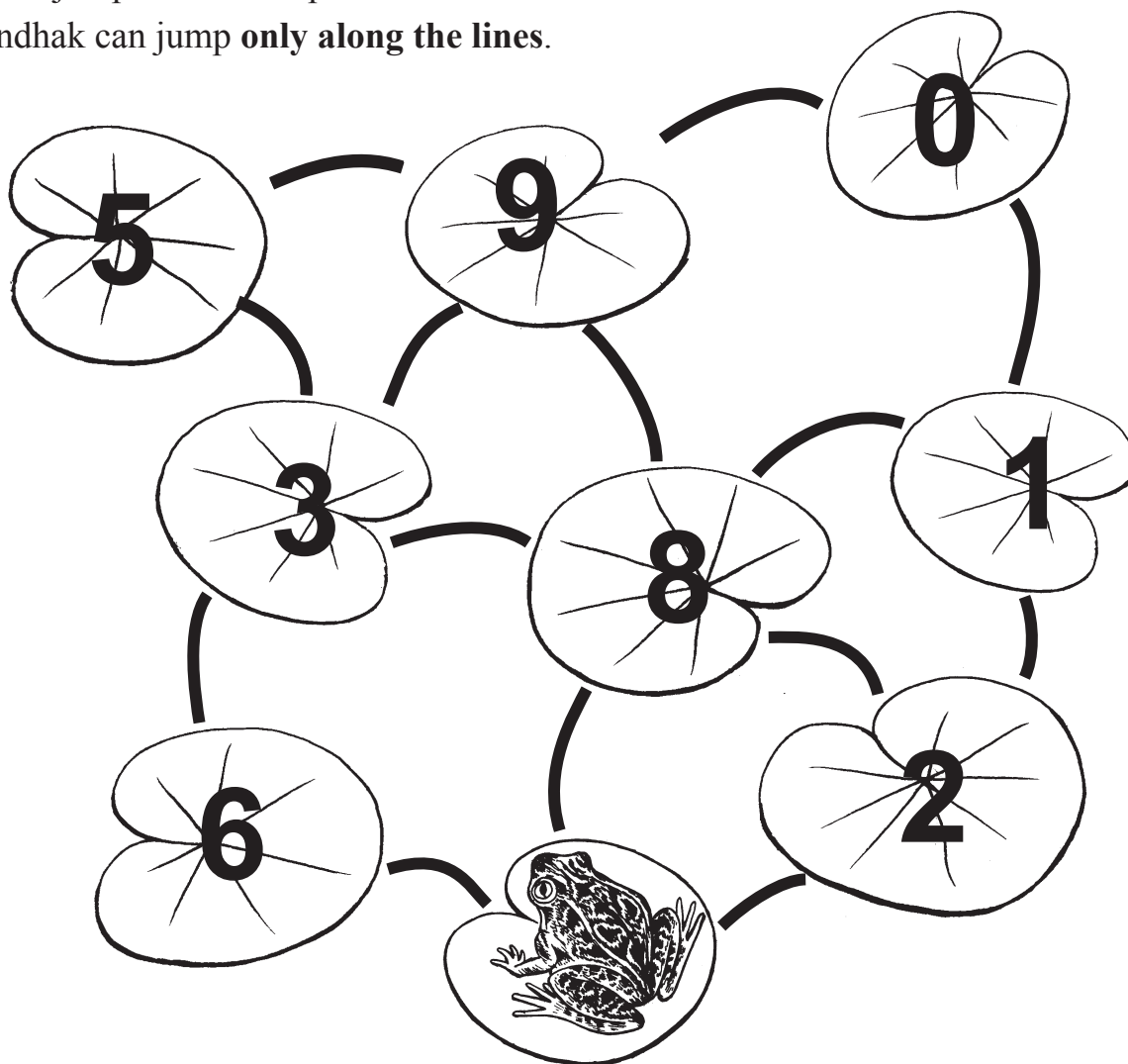
Extension: Students can be asked to make similar worksheets either for themselves or to give to their friends to solve. The shapes drawn by students will probably be simpler, and if they want they can also select their own colour code.

ADDSUB 4: MENDHAK

Objective: Practise of addition

Mendhak jumps from one lotus leaf to another.
As she jumps she adds up the numbers on the leaves.

Mendhak can jump **only along the lines**.



This is a path Mendhak can follow to get 18:

$$8 + 1 + 9 = 18$$

(1) What path can Mendhak follow to get 20?

$$\square + \square + \square = 20$$

(2) What path can Mendhak follow to get 14?

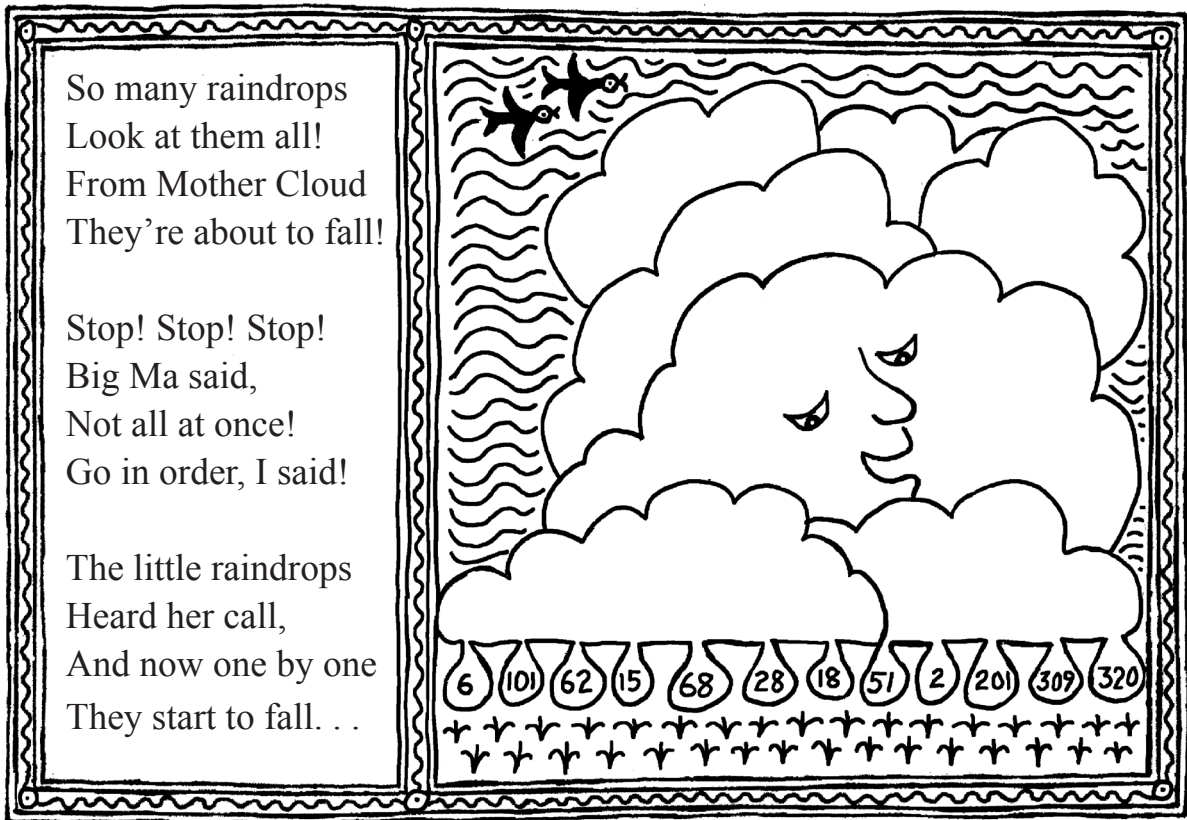
$$\square + \square + \square = 14$$

(3) What path can Mendhak follow to get 12?

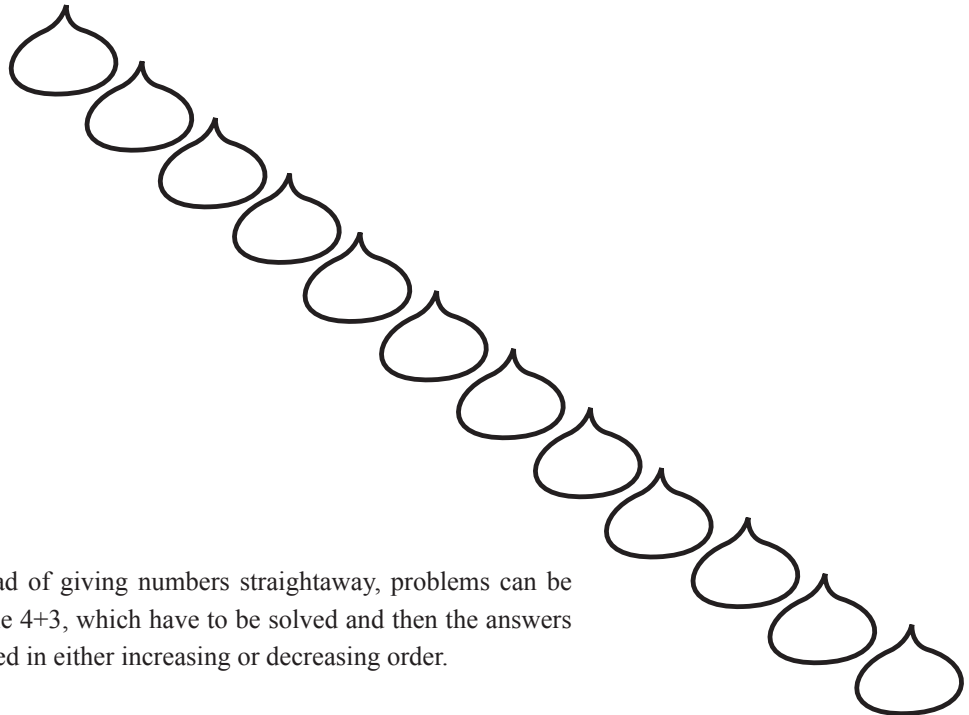
$$\square + \square + \square = 12$$

ADDSUB 5: LITTLE RAINDROPS

Objective: Practise of arranging numbers in order



Arrange the numbers in the raindrops in increasing order.



Extension: Instead of giving numbers straightaway, problems can be given, for example $4+3$, which have to be solved and then the answers have to be arranged in either increasing or decreasing order.

ADDSUB 6: I WILL EAT NUMBERS

Objective: Practise of numbers in sequence

Write the missing numbers.



ADDSUB 7: SOLVE PROBLEMS ON MY BACK

Objective: Practise of addition, subtraction and numbers in sequence

Solve the following problems:



Extension: Students can draw different snakes with problems and give them to their friends to solve.

ADDSUB 8: SUBTRACTION WITH BORROWING

Objective: 1. Understanding subtraction with borrowing
2. To facilitate introduction of subtraction in written form

Nature: Activity

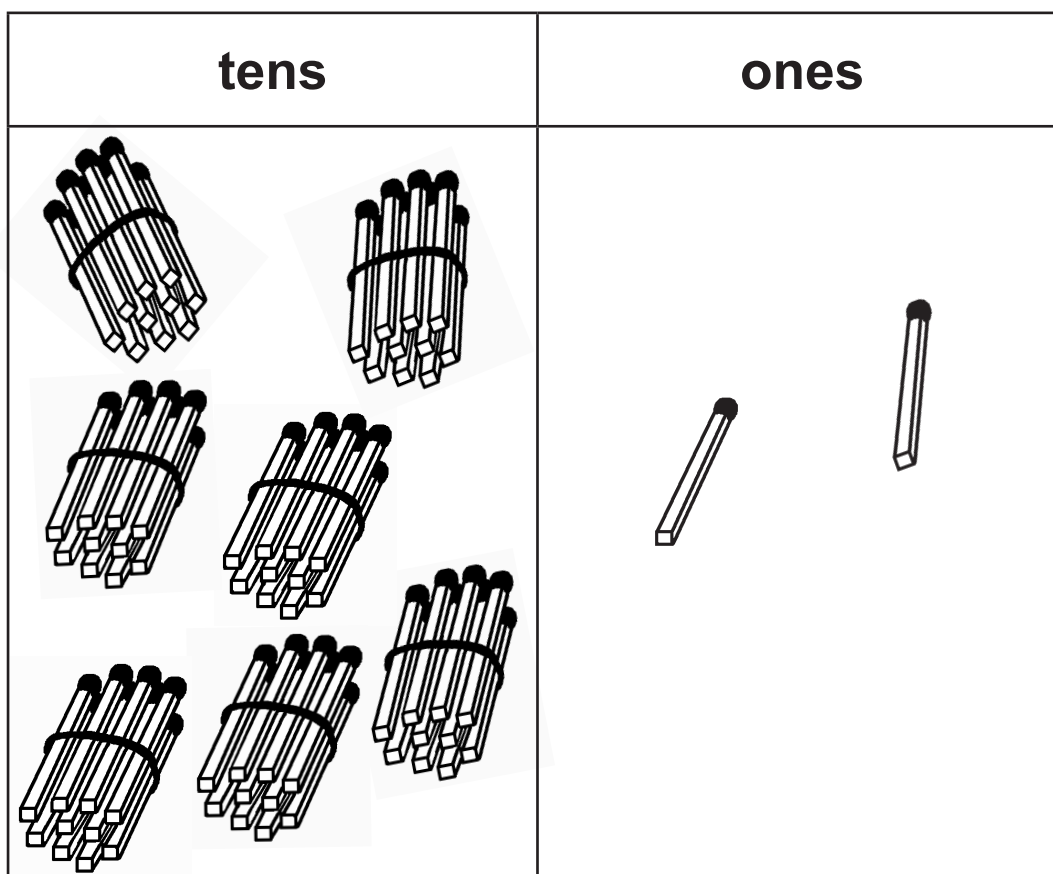
Materials: Bundles made of 10 matchsticks each, as well as individual matchsticks and the frames on paper

Participation: Individual

Description: Each student should draw a large ‘tens and ones frame’ on a piece of paper (as shown below). The teacher asks students to represent a number like 72 on the given frame with matchstick bundles and matchsticks. After making sure students can subtract matchsticks without borrowing (e.g. subtract 21 from 72), the teacher then asks how, for example, 36 can be subtracted from 72. The students should figure out that this can be done only by opening up one of the bundles of 10.

Then students are given similar subtraction problems to do using matchsticks.

Extension: Students can be encouraged to make up subtraction problems that they either do themselves or give to their friends to do. After solving a problem, the student has to explain how it was done to his/her friends.



ADDSUB 9: COMPUTE LIKE A COMPUTER

Objective: Practise of addition and subtraction

Do the following sums in your mind:

$$(3 + 6) - 5 = \square$$

$$(3 + \square) + 5 = 16$$

$$(11 + 5) - 3 = \square$$

$$(12 - \square) + 2 = 9$$

$$(5 + 9) - 3 = \square$$

$$(13 - \square) + 3 = 11$$

$$(7 - 2) + 6 = \square$$

$$(7 - \square) - 4 = 2$$

$$(16 - 4) + 4 = \square$$

$$(5 + 3) + \square = 13$$

$$(6 - 1) + 6 = \square$$

$$(10 + 5) + \square = 20$$

$$(13 - 2) - 7 = \square$$

$$(8 + 3) + \square = 17$$

$$(20 - 4) - 3 = \square$$

$$(\square + 7) + 8 = 18$$

$$(\square + 6) + 5 = 13$$

$$(11 + 2) - 3 = \square$$

$$(\square + 3) + 11 = 20$$

$$(13 - 6) + \square = 14$$

$$(\square + 4) + 3 = 14$$

$$(17 + 3) - 5 = \square$$

$$(6 + \square) + 3 = 11$$

Extension: Teachers can give students a time limit. For example, teachers can say, "How many of these sums can you do in 5 minutes?" (Choose a short time, so that perhaps no student can finish all the sums.)



ADDSUB 10: MAKE SUMS

Objective: Practise of addition and subtraction

Draw rings to show how to make different sums. Write the sums.



$$7 + 5 = 12$$



$$\square + \square = 12$$



$$\square + \square = 12$$



$$\square + \square = 12$$



$$\square + \square = 15$$



$$\square + \square = 15$$



$$\square + \square = 15$$



$$\square + \square = 15$$



$$\square + \square = 15$$

Now choose whatever sums you want. Draw and write them on the back.

ADDSUB 11: MAGIC SQUARES

Objective: Practise of addition

The four numbers across each row add up to 34.

The four numbers down each column add up to 34.

For example, $1 + 8 + 13 + 12 = 34$

and, $1 + \square + 4 + 15 = 34$.

Can you fill in the missing numbers?

1	8	13	12
	11		7
4		16	
15			6

Another Magic Square

This time the four numbers across each row add up to 65.

The four numbers down each column add up to 65.

12	13		1
	3		15
7		11	
	16	5	

Comment: This activity is meant to be an extra challenge for the students. Let them help each other, without admonishment if they can not solve the magic squares.

ADDSUB 12: HOW MANY WAYS CAN YOU GET 8?

Objective: Practise of addition; observing addition facts and number patterns

Materials: Plastic cubes (Bottle caps or pebbles or large seeds can also be used)

Description: Students are given eight cubes each and are asked to split them into three groups in different ways and to record on paper what they do as an addition sum. For example if they arrange the cubes like this:



then they should write:

$$8 = 2 + 1 + 5$$

Then they are asked to find the total number of different ways in which 8 can be split into three parts.

So they might write:

$$8 = 1 + 1 + 6$$

$$8 = 1 + 2 + 5$$

$$8 = 1 + 3 + 4$$

$$8 = 2 + 2 + 4$$

$$8 = 2 + 3 + 3$$

Extension:

1. They can be asked to try the same activity with different numbers of cubes.
2. Students can also be asked to find the number of ways of splitting a number in which two of the three parts are the same, for example, $4 + 2 + 2 = 8$.
3. Students can also be asked to split a given number in, say two or four groups.

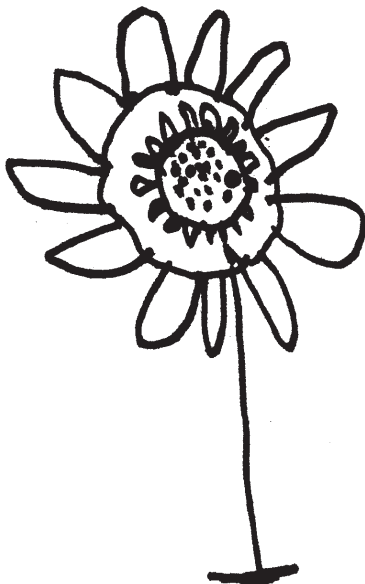
ADDSUB 13: SQUARE SUMS

Objective: Practise of addition and subtraction

Fill in the blanks:

40	-	30	=	
-		-		+
	+	10	=	30
=		=		=
20	+		=	

33		26	=	59
+				+
	-		=	41
=		=		=
	+	15	=	



	+	4	=	
+		+		+
41	+		=	
=		=		=
56			=	72

ADDSUB 14: WHAT IS THE QUESTION?

Objective: Practise of addition, subtraction and multiplication

Using the operations +, - and \times , find five ways to get each **answer**.

For example, if the **answer** is **40**, you can write

$$\boxed{45} \ominus \boxed{5} = 40$$

50

(1) $\boxed{} \ominus \boxed{} = 50$

(2) $\boxed{} \ominus \boxed{} = 50$

(3) $\boxed{} \ominus \boxed{} = 50$

(4) $\boxed{} \ominus \boxed{} = 50$

(5) $\boxed{} \ominus \boxed{} = 50$

48

(1) $\boxed{} \ominus \boxed{} = 48$

(2) $\boxed{} \ominus \boxed{} = 48$

(3) $\boxed{} \ominus \boxed{} = 48$

(4) $\boxed{} \ominus \boxed{} = 48$

(5) $\boxed{} \ominus \boxed{} = 48$

72

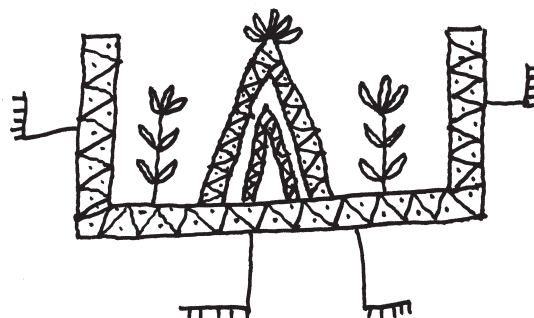
(1) $\boxed{} \ominus \boxed{} = 72$

(2) $\boxed{} \ominus \boxed{} = 72$

(3) $\boxed{} \ominus \boxed{} = 72$

(4) $\boxed{} \ominus \boxed{} = 72$

(5) $\boxed{} \ominus \boxed{} = 72$



ADDSUB 15: MAKE A HUNDRED

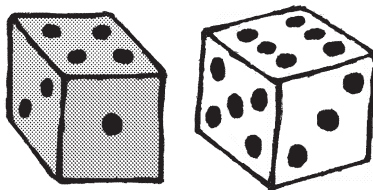
Objective: Practise of addition, subtraction, estimation, and place value

Nature: Game

Materials: Two dice of different colours (one for tens, the other for ones) for each group

Participation: Small groups or pairs make up each team

Description: The players should first be told which colour is the tens die and which is the ones die. Teams take turns to throw both the dice. On each turn each team will get one value for the tens and another value for the ones. For example, if the tens die shows 4 and the ones die shows 6, it will be counted as 46. They should write down the number they get. After each team has taken four turns they will each have four two-digit numbers. The task of each team is to figure out how to add or subtract these four numbers to get as close to 100 as possible. The team whose total is closest to 100 wins.



46

MULTDIV 1: TABLE OF TWO

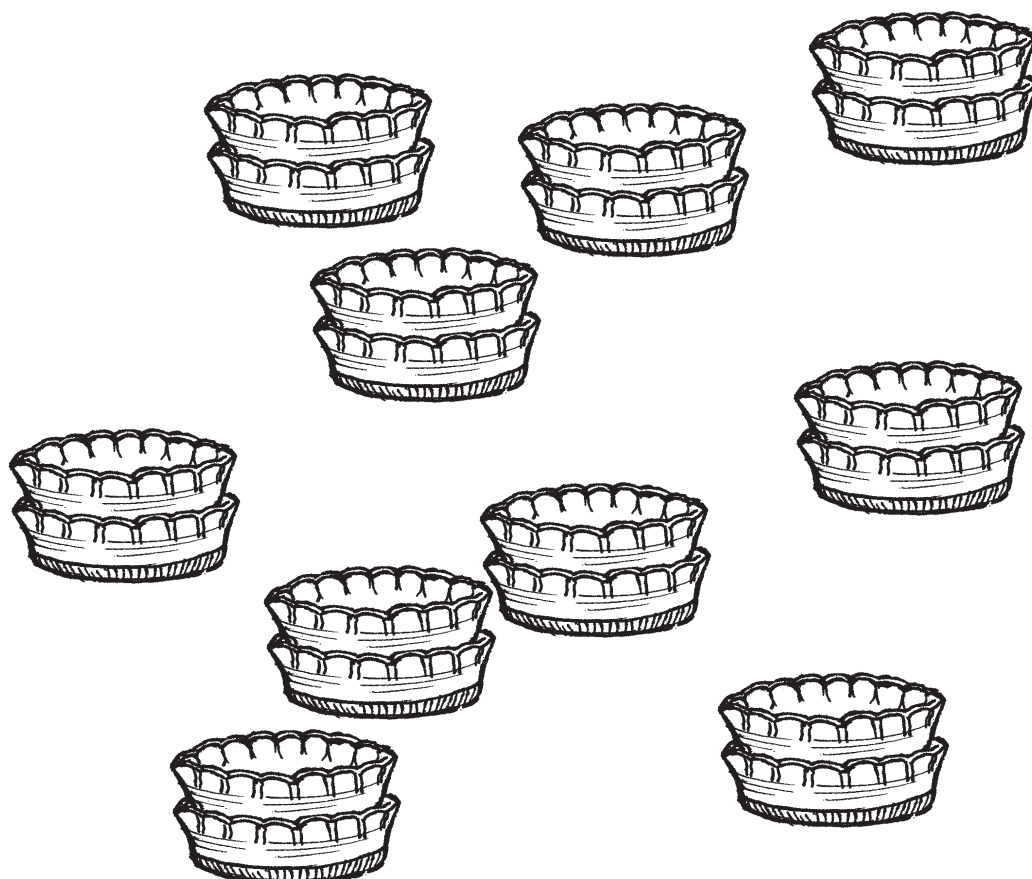
Objective: Introduction of the table of two.

Nature: Activity

Materials: Bottle caps; copy and pencil for recording

Participation: Individual

Description: Students have to arrange 20 bottle caps (if bottle caps are not available, pebbles can also be used) in pairs by keeping one over the other and then they have to count the number of pairs. Then they have to pick up a pair and say 1 set of 2 is 2. Then they have to pick up another pair and say 2 sets of 2 are 4 and so on. By repeated practise the table of two is learnt. Then they have to write it using the multiplication sign, eg, $1 \times 2 = 2$, $2 \times 2 = 4$, $3 \times 2 = 6$, etc.



Extension: Students can be asked to make tables of 3, 5 etc, in the same way.

MULTDIV 2: TABLE OF THREE

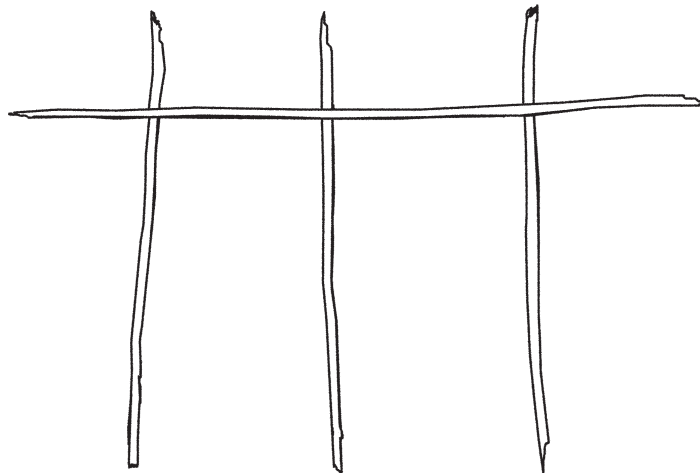
Objective: Introduction of table of three and observing multiplication as repeated addition

Nature: Activity

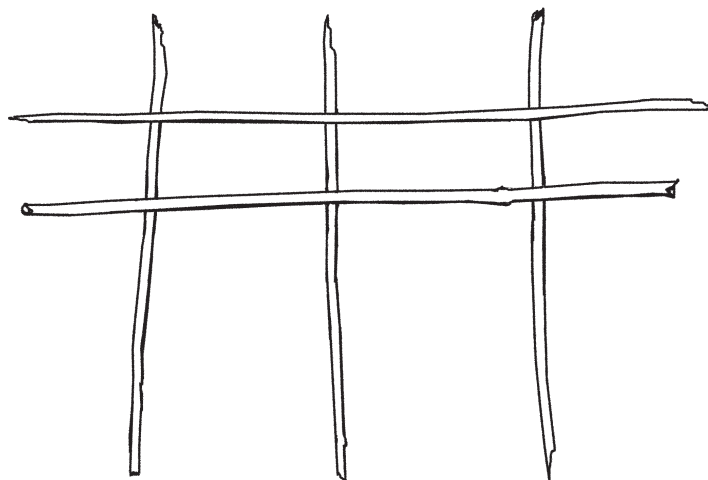
Materials: Broomsticks; copy, pencil for recording

Participation: Individual

Description: Students are asked to place three sticks vertically. Then they have to put sticks horizontally one by one and each time count the number of crossings and record them in the form $3 \times 1 = 3$, $3 \times 2 = 6$, ...etc.



$$3 \times 1 = 3$$



$$3 \times 2 = 6$$

Extension: Students can be asked to make tables of 2, 4, 5, etc, in the same way.

MULTDIV 3: TABLE OF FOUR

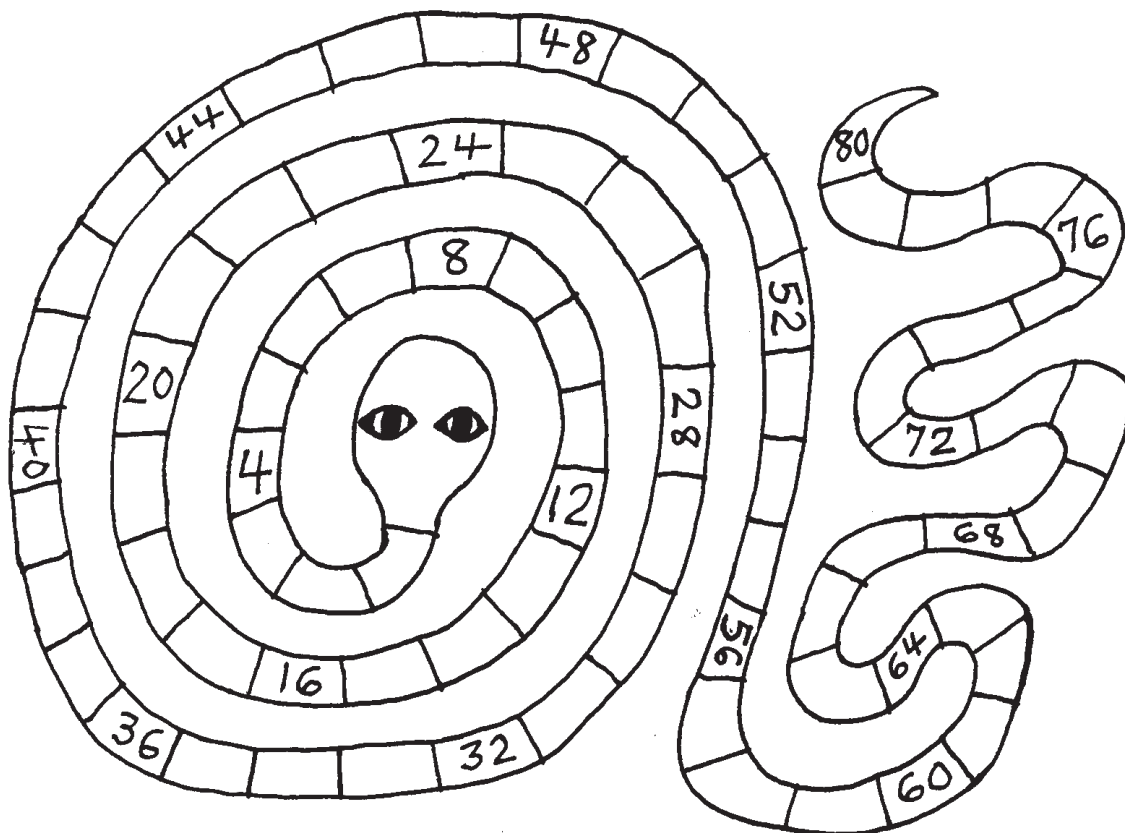
Objective: Introduction of table of four

Nature: Activity

Materials: Copy, pencil

Participation: Individual

Description: Students are asked to draw a snake with segments in its body. They should fill every fourth segment with its number, for example, in the fourth segment they should write 4, leave the next three segments blank and fill the fourth segment with 8, then the next fourth segment with 12, etc. Then they should record it in the form of $1 \times 4 = 4$, $2 \times 4 = 8$, etc.



Extension: Students can be asked to make tables of 5, etc.

MULTDIV 4: TABLE OF FIVE

Objective: Introduction of table of five

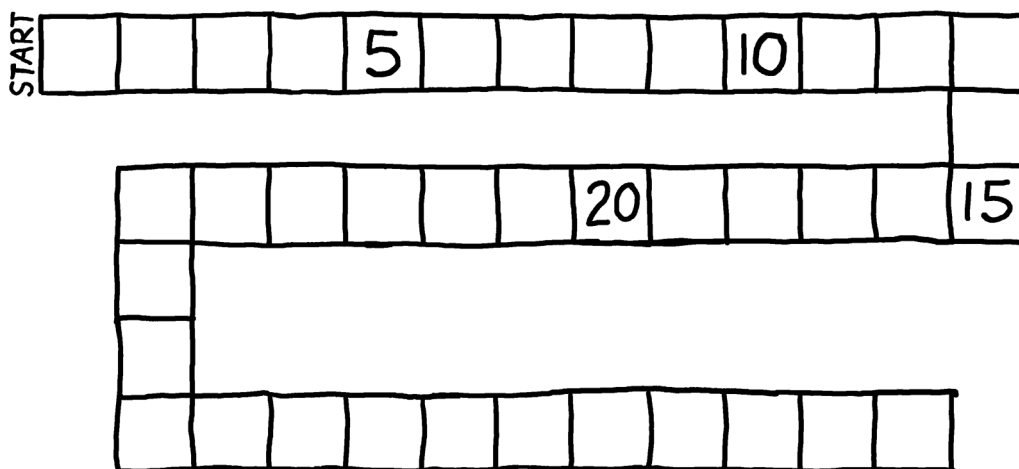
Nature: Game

Materials: Chalk and stapu

Participation: Whole class

Description: The classroom floor has squares marked on it in chalk (without any numbers). Furniture is arranged along the sides and children are asked to sit in their places.

The first child is asked to stand at the starting point and throw the stapu on the fifth square. If she succeeds she then skips to the fifth square, counting out loud, “1, 2, 3, 4, 5” as she skips on each square. She writes 5 on the fifth square. Standing on the 5th square, she then tries to throw the stapu on the tenth square, (this time counting, “6, 7, 8, 9, 10” and writing 10 if she succeeds), and so on. In case she fails, the next child takes a turn, going to the place from where the last player had failed. The game continues like this. At the end, the children look at the numbers written on the floor. The teacher points out that they have generated the table of 5 while playing *panch ka stapu*. The children are asked to read out the table and also write it in their notebooks in any way they like.



Extension:

1. Each time a new player comes he can be asked to start at the beginning and skip to the place where he will throw the stapu, counting out the squares as he goes, pausing on the multiples of 5 and clapping.
2. At the end of the game, a student can be asked to skip through all the squares while the entire class calls out the multiples of 5 as the child hops on that square.
3. Similarly the game can be played for the tables of 3, 4, 6, 7, etc.

MULTDIV 5: FIRE ON THE MOUNTAIN – RUN, RUN, RUN

Objective: Introduction to the concept of division

Nature: Game

Materials: None

Participation: All children in the class

Description: All the children are asked to make a big circle holding hands, and they are asked to count how many children there are in all. The teacher starts singing, “Fire on the mountain, run, run, run” and then calls out a number, say 2. The children are now supposed to form groups of 2. The children who are left out leave the game. Children are asked to count how many groups have been formed in all. The game continues with different numbers being called out by the teacher till no children are left.



Extension:

1. After the game has been played once, the teacher can then begin another game, starting with a certain number of children instead of the whole class. Again the teacher calls out a number and then the groups are formed with that many students in each group. The teacher tells them that the number of students who are left out is called the remainder. The teacher also tells them how this can be written in mathematical form. For example, if the total number of students is 30 and teacher calls out a number, say 5, then the number of groups formed is 6. This can be written as

$$30 \div 5 = 6$$

Similarly if the teacher calls out number 4 then the number of groups formed is 7 and 2 students are left out. This can be written as

$$30 \div 4 = 7 + 2/4$$

The teacher continues to call out various numbers and students form groups, and count the number of groups formed as well as number of students left out. Then they write it in mathematical form.

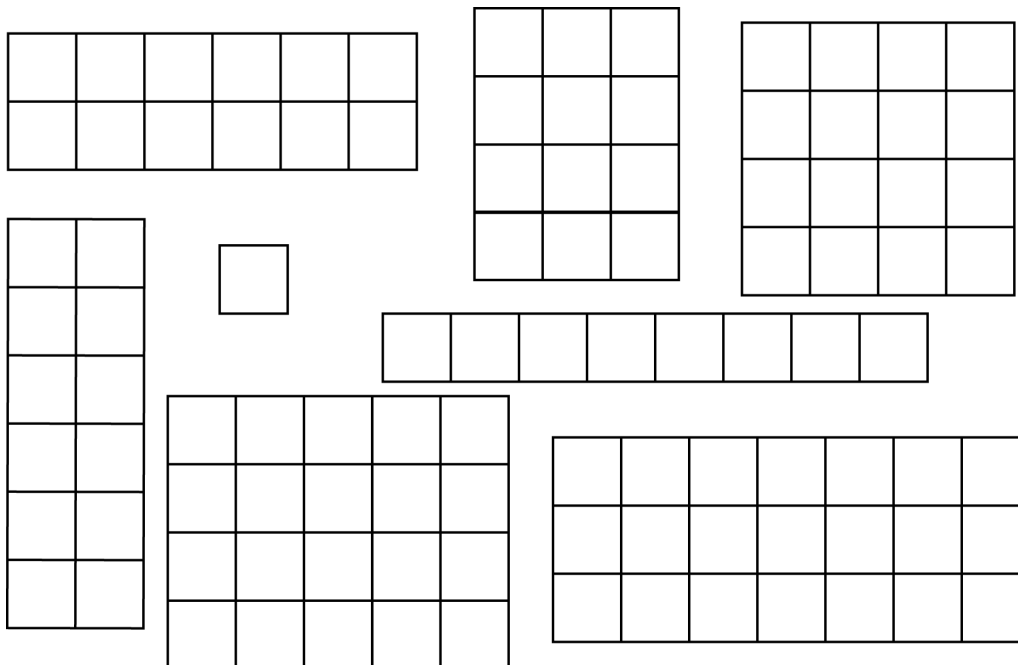
2. After students become comfortable in representing the operation in mathematical form, teacher asks them to use stones or counters instead of playing themselves. When students are able to perform the division operation on the counters and write them correctly, then the teacher can ask them to find which number between say 1 and 15 has the maximum number of divisors, or which numbers can not be divided without remainders, etc.

MULTDIV 6: MULTIPLICATION PICTURES

Objective: Understanding multiplication

Find the picture of each multiplication, colour it according to the given code, and fill in the blanks.

Rows		Columns		Total boxes	Colour
1	x	1	=	<input type="text"/>	Black
1	x	8	=	<input type="text"/>	Brown
4	x	5	=	<input type="text"/>	Red
3	x	7	=	<input type="text"/>	Yellow
2	x	6	=	<input type="text"/>	Green
4	x	4	=	<input type="text"/>	Blue
6	x	2	=	<input type="text"/>	Green
4	x	3	=	<input type="text"/>	Green



Extension: Students are given multiplication statements and are asked to make the corresponding grids.

MULTDIV 7: MAKING MULTIPLICATION PICTURES

Objective: Understanding multiplication

Nature: Game

Materials: Number cards (with smaller or larger numbers, as appropriate)

Participation: Individual or pairs

Description: Each child or pair of children comes to the front of the class and picks the top card from a pile of number cards. The teacher writes this number on the board as a product of two unknown numbers. The child then draws a grid of this number of boxes and fills in the numbers in the equation.

For example, if the child picks the number 6, the teacher writes:

$$6 = \square \times \square$$

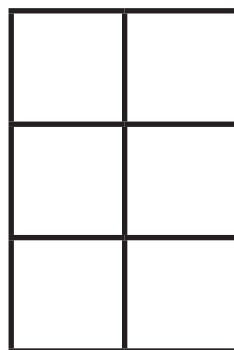
The child might draw:



The child then fills in the equation to get:

$$6 = \boxed{3} \times \boxed{2}$$

Or the child might draw and write:

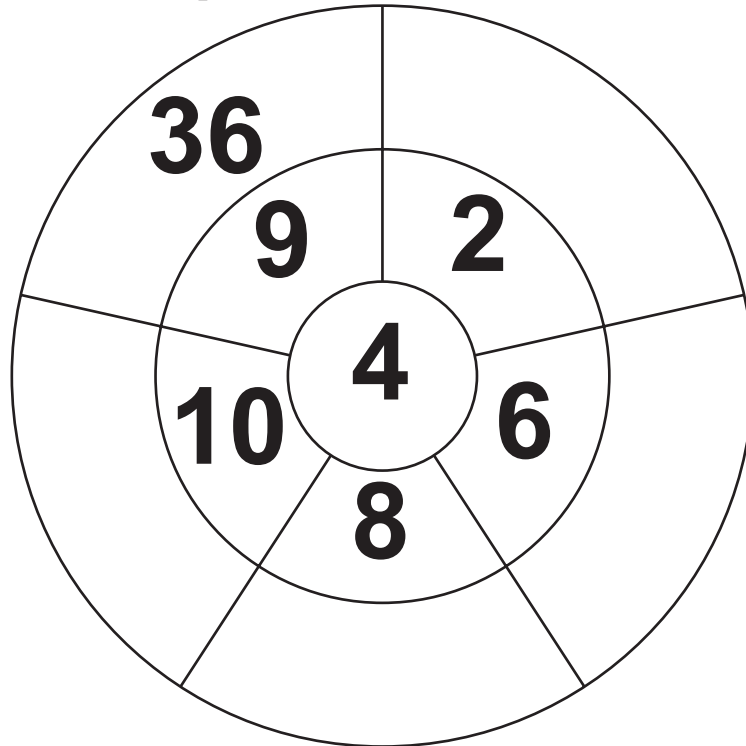


$$6 = \boxed{2} \times \boxed{3}$$

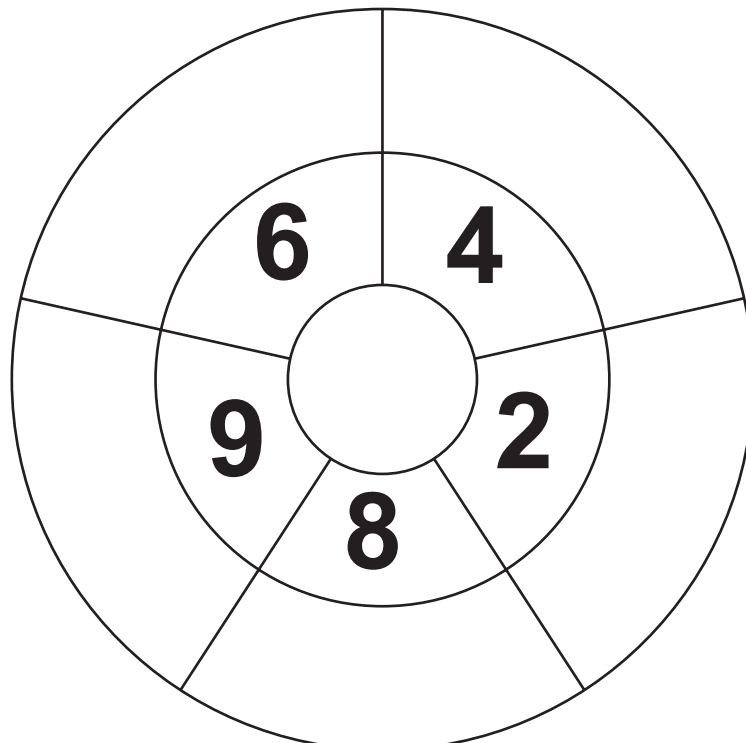
MULTDIV 8: MULTIPLICATION WHEELS

Objective: Practise of multiplication

Multiply the number in the centre with each of the other numbers and write the answers in the blank spaces.



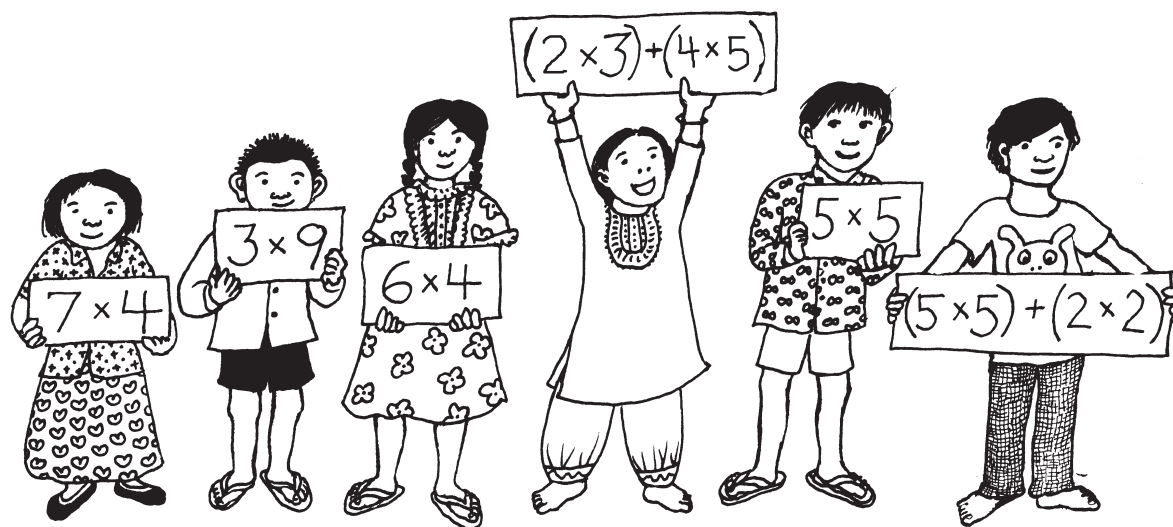
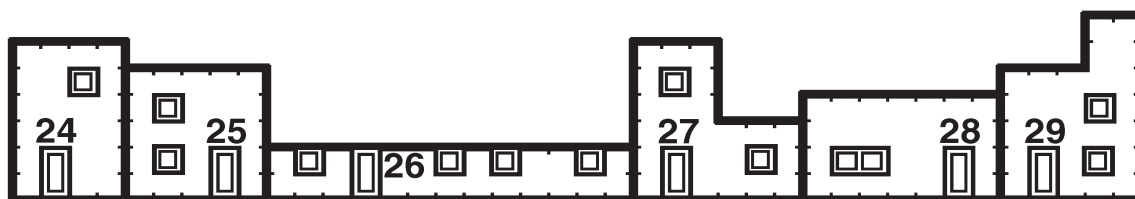
First choose any number for the centre, then repeat the same process.



MULTDIV 9: WHERE DO WE LIVE?

Objective: Practise of multiplication, addition and subtraction

Solve the problems and draw lines to show where each child lives.



Extension: Students can be given the same worksheets with lines joining the children to their houses. The house numbers are still given but one of the numbers written in each child's sign is missing. Students have to find the missing numbers.

MULTDIV 10: MULTIPLY TO DECODE

Objective: Practise of multiplication

Multiply to find the code.

$\begin{array}{r} 43 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 87 \\ \times 6 \\ \hline \end{array}$
<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>

L O P C A

$\begin{array}{r} 65 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 35 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 82 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 94 \\ \times 8 \\ \hline \end{array}$
<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>

M I E N

Arrange your answers in increasing order in the upper boxes and use the code letters under each product to find out who will catch the thief.

				C				

Extension: Students can be asked to develop more such problems and solve them among themselves.

MULTIPLICATION SQUARES

Objective: Familiarisation with multiplication facts and observing compensation (ie, if one factor is increased then the other factor has to be reduced in the same ratio to give the same product)

This is a **Multiplication Table**:

1	2	3	4	5
2	4	6	8	10
3	6	9	12	15
4	8	12	16	20
5	10	15	20	25

Look at the shaded **square** of four numbers:

2	3
4	6

Multiply the diagonal numbers in the square and see what happens:

$$2 \times 6 = 12$$

$$4 \times 3 = 12$$

Find four other squares in the Multiplication Table. Write them below and multiply the diagonals. What do you find?

		x		=					x		=	
		x		=					x		=	
		x		=					x		=	
		x		=					x		=	

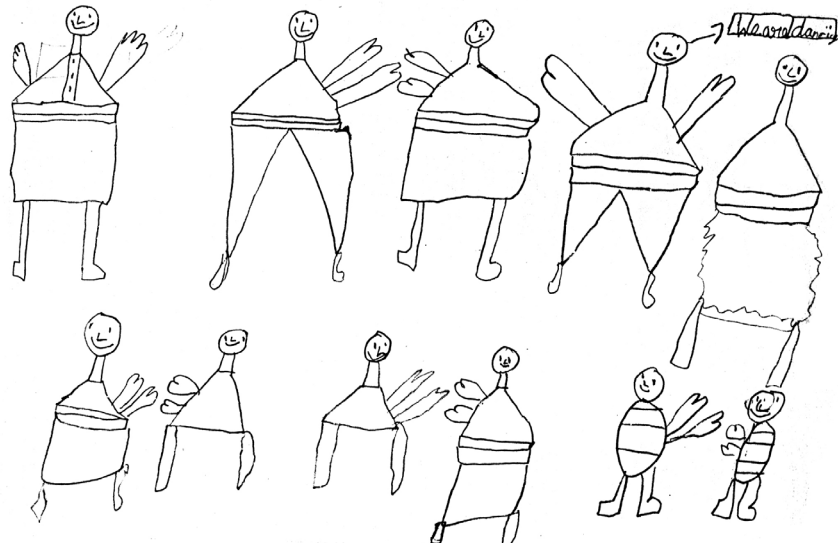
Extension (for higher classes): The students can be asked to make their own tables of numbers and find similar patterns in them.

MULTDIV 12: MULTIPLY AND MULTIPLY

- Objective:** 1. Practise of multiplication.
 2. Observing the factors involved in making a number when it is obtained by two successive multiplications

Multiply and then multiply again:

3	$\times 2$		$\times 8$	
2	$\times 3$		$\times 7$	
3	$\times 0$		$\times 7$	
5	$\times 10$		$\times 4$	
3	$\times 4$		$\times 6$	
3	$\times 6$		$\times 4$	

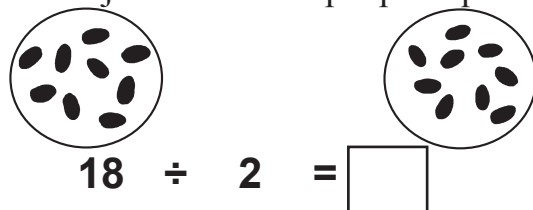


MULTDIV 13: DIVIDING JAMUN

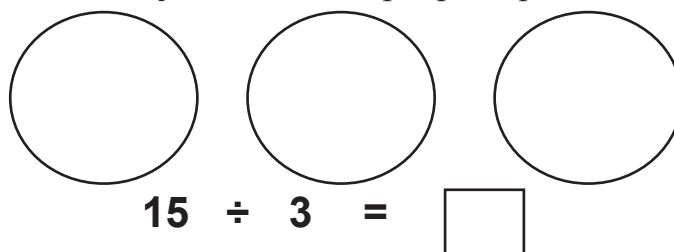
Objective: Observing the relationship between multiplication and division

How many does each person get?

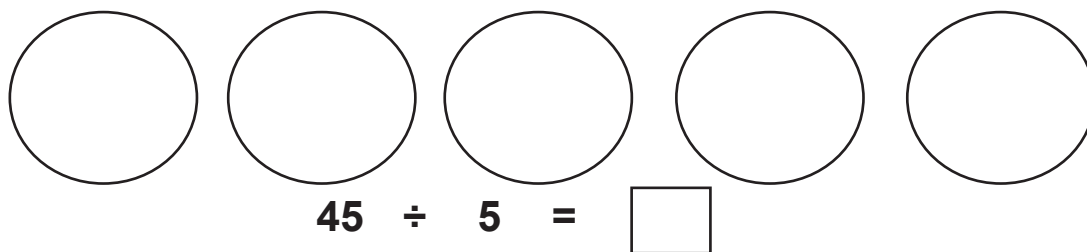
- (a) Suppose there are 18 jamun. Give 2 people equal numbers:



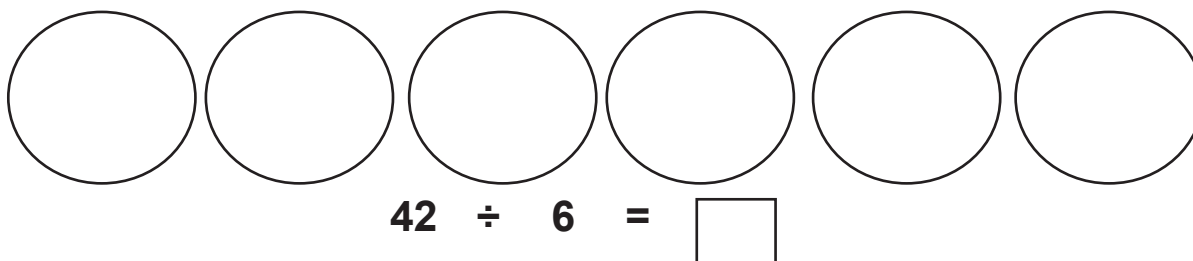
- (b) Suppose there are 15 jamun. Give 3 people equal numbers:



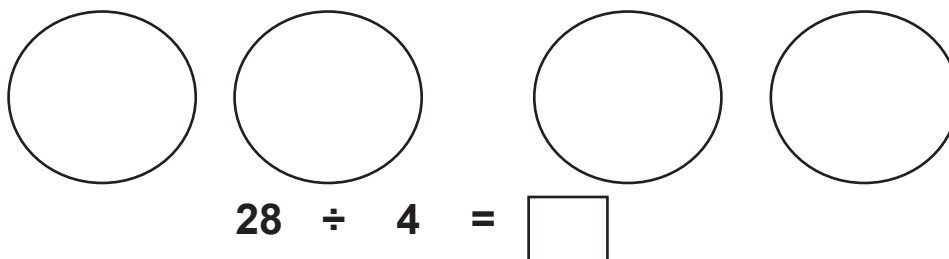
- (c) Suppose there are 45 jamun. Give 5 people equal numbers:



- (d) Suppose there are 42 jamun. Give 6 people equal numbers:



- (e) Suppose there are 28 jamun. Give 4 people equal numbers:



- (f) Now you make your own division problems on the back. Draw pictures and write the equations.

MULTDIV 14: THINKING ABOUT MULTIPLICATION AND DIVISION

Objective: Practise of multiplication and division

(a) Think of some numbers that can be divided by 2.

--	--	--	--

(b) Think of some numbers that can be divided by 3.

--	--	--	--

(c) Think of some numbers that can not be divided evenly by 3.

--	--	--	--

(d) Think of a one-digit number. Multiply it by 4.

$$\square \times 4 = \square$$

Can the product be divided by 2? Show your work.

(e) Think of some numbers that can be divided by both 2 and 4.

--	--	--	--	--

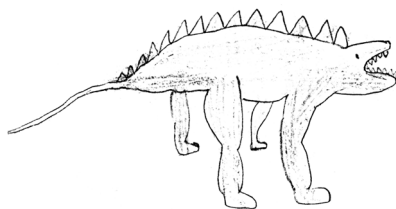


MULTDIV 15: COMPLETE THE MULTIPLICATION TABLE

Objective: Practise of multiplication

Fill in the missing products.

x	0	1	2	3	4	5	6	7	8	9	10
0			0								
1		1					6				
2											
3					12						
4											
5											
6				18							
7											
8							48				
9											
10											



Extension: Afterwards the tables can be given with increasing complexity by giving bigger numbers to be multiplied or by leaving larger numbers of blocks in the table blank to be filled by the students.

MULTDIV 16: MULTIPLY AND MATCH

Objective: Understanding the relationship between division and its representation

Join the multiplications to their answers:

8×2
 6×4
 7×10
 7×4
 9×4
 9×3

28
 18
 20
 16
 35
 70
 21
 24
 27
 45
 40
 30
 36

7×5
 6×3
 5×4
 9×5
 6×5
 7×3
 4×10

MULTDIV 17: EXTENSION OF *ULTA-PULTA*

Objective: Understanding multiplication

Nature: Activity

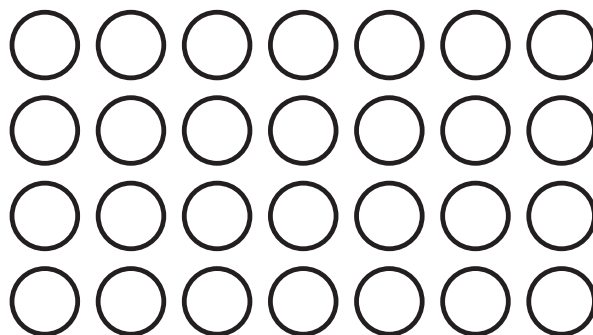
Materials: Small plastic disks (or bottle caps or stones)

Participation: Whole class

Description: After giving each student a pile of plastic discs, the teacher asks them to make a column of 4 discs, and checks to see that they are doing it as shown (vertically and equally spaced).



Then they are asked to make more columns of 4 discs, until they have a total of 7 columns. They should be carefully arranged in a grid, as shown below.



The teacher then asks the students to count the total number of discs to find out: “How much are 7 columns of 4?” (They should touch each disc as they count it.) Each student can write their answers in the form of the equation:

$$7 \times 4 = 28$$

Then students are asked to use the plastic discs to make other multiplication problems and solve them.

Extension: The teacher can ask a pair or a group of students to use the discs to figure out a multiplication problem (one for which they have not already memorised the answer), and then explain how they have done it to the class. They should be encouraged to figure out different ways for themselves.

MULTDIV 18: ORAL CONVERSATION

Objective: Practise of division

Nature: Oral exercise

Materials: None

Participation: Whole class

Description: The teacher asks students some questions like:

“How many chairs will it take to get 24 legs?”

“If there are 30 fingers then how many hands are there?”

“If there are 40 udders, how many cows are there?”

“How many weeks are there in 28 days?”

“24 months is equal to how many years?”

“How many 20-rupee notes does it take to get Rs 100?”

“How many people would it take to get 30 thumbs?”

“If you evenly distribute 36 sweets to 6 children, how many does each child get?”

“If you arrange 42 chairs in 7 equal rows, how many chairs will there be in each row?”

“12 axles is enough to make how many cars?”

“If it take 5 metres of cloth to make one suit, how many suits can you make from 16 metres?”

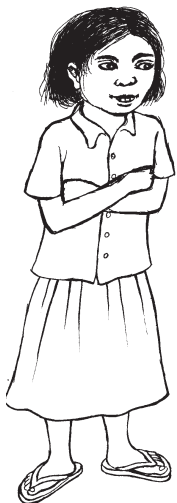
“If each person eats 3 rotis, 24 rotis is enough for how many people?”

“How many cockroaches would it take to get 42 cockroach legs?”

“If there are 18 samosas how many plates do you need if you put 2 on each plate?”

And so on.

Extension: Blackboard work can be done simultaneously. Written records can also be maintained.



MULTDIV 19: LET'S DIVIDE

Objective: 1. Practise of division by actually dividing a set into groups
2. Introducing the symbol of division

Nature: Activity

Materials: Pebbles, plastic discs or bottle caps

Participation: Whole class as well as individual

Description: Students are asked some division problems that they have to solve using pebbles. For example:

Given 10 pebbles,
divide them in groups of 5.

How many groups will you get?

Students can record each division problem in the following form (after the teacher explains that “ \div ” means “divided by”):

$$10 \div 5 = \square$$

Students can figure out the answers using pebbles, and then write the answers in the box. Rather than being told exactly what to do, students should be encouraged to invent their own ways of using the pebbles to find the answers. Problems should be given for which the students have not already memorised the answers, and thus need to use the pebbles. More difficult problems can be given to those students who already know the answers to simple problems.

The teacher can also introduce the concept of remainder, for example by giving 7 bottle caps to the students to be divided into two groups. Then students are asked to find out how many bottle caps go to each group and how many remain. Then they are asked to record their results as follows:

$$7 \div 2 = \square \text{ with } \square \text{ remaining}$$

MULTDIV 20: MULTIPLICATION AND DIVISION

Objective: Observing the relationship between multiplication and division

$$12 \div 4 = \square$$

Think! 4 times what number equals 12?

4 times 3 equals 12.

So $12 \div 4 = 3$.

(a) $3 \times \square = 12$

(b) $16 \div 4 = \square$

(c) $14 \div 2 = \square$

(d) $20 \div 4 = \square$

(e) $5 \times \square = 20$

(f) $64 \div 8 = \square$

(g) $30 \div 3 = \square$

(h) $45 \div 9 = \square$

(i) $25 \div 5 = \square$

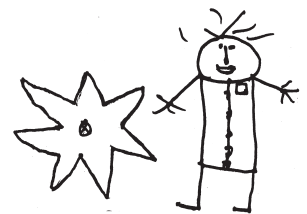
(j) $18 \div 6 = \square$

(k) $9 \times \square = 36$

(l) $18 \div 9 = \square$

(m) $24 \div 8 = \square$

(n) $32 \div 4 = \square$

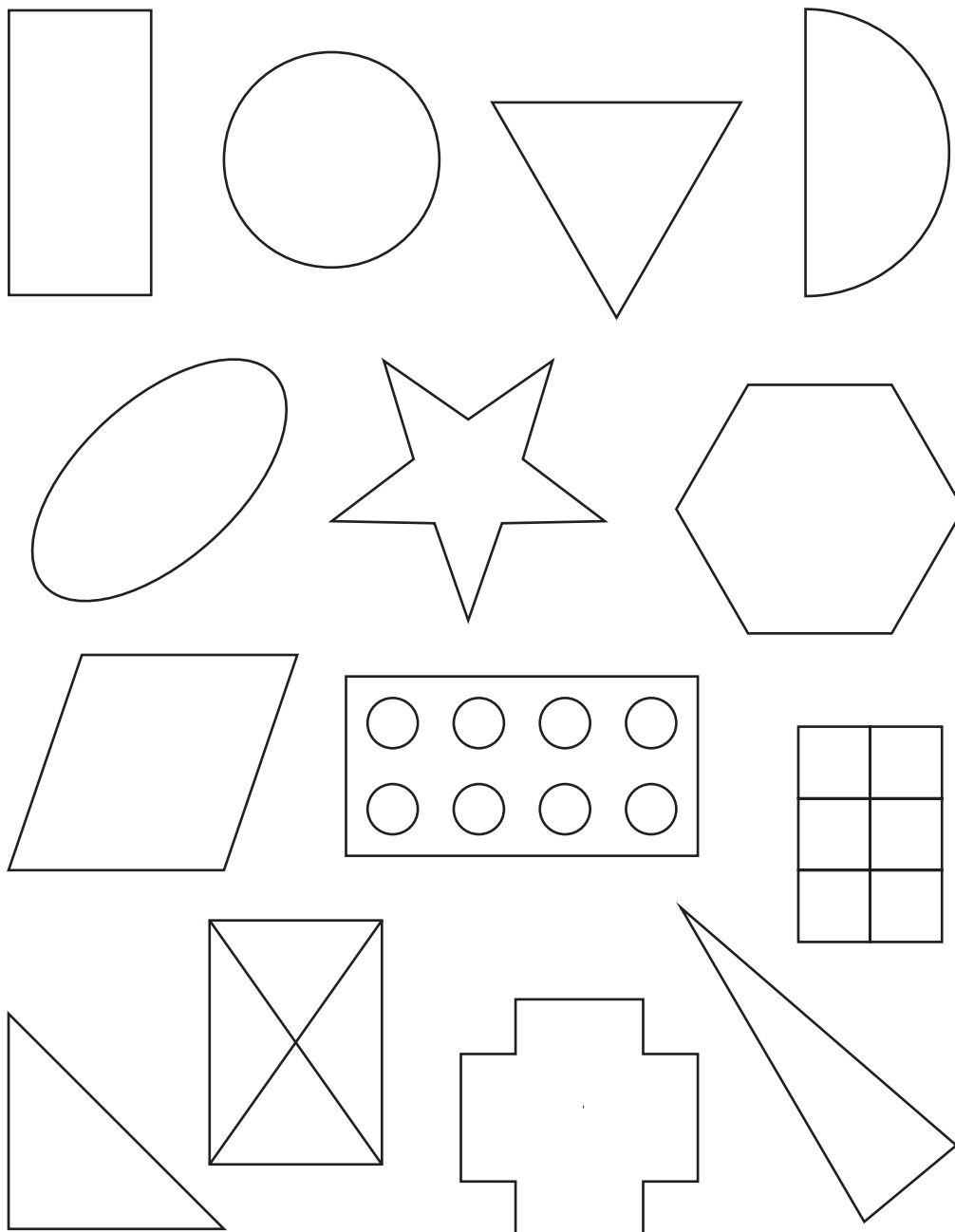


FRAC 1: DIVIDE IN HALF AND COLOUR HALF

Objective: Understanding the concept of a half (as part of a whole)


 $\frac{1}{2}$

Cut each shape in half. Colour one half.



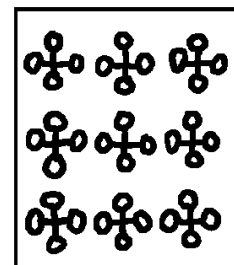
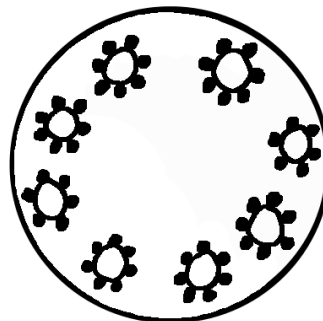
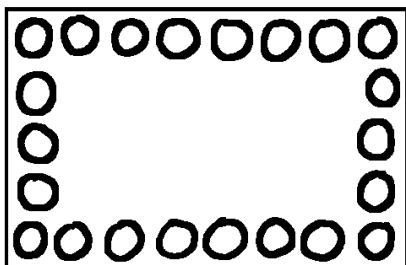
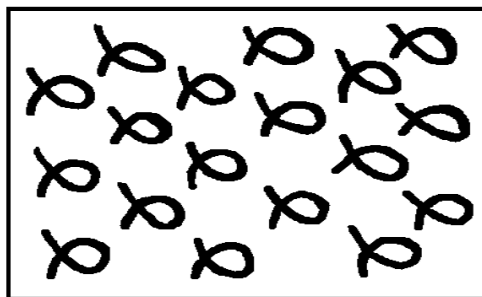
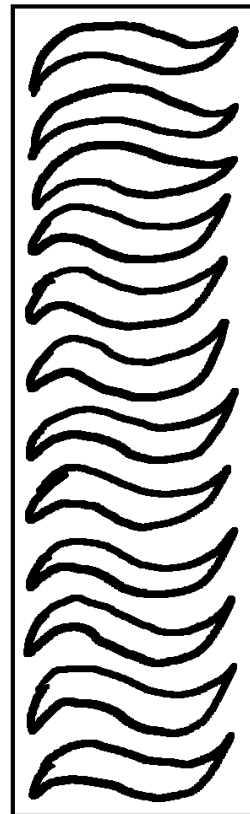
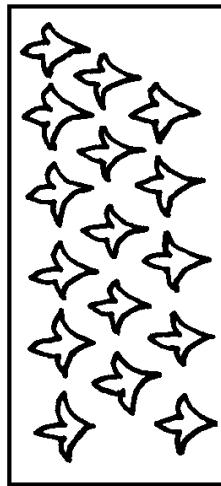
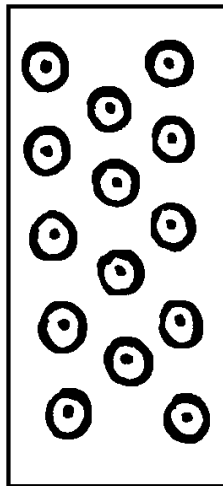
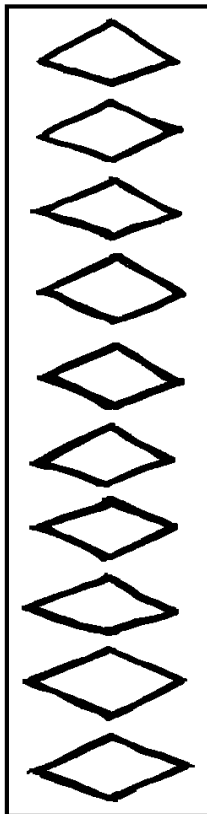
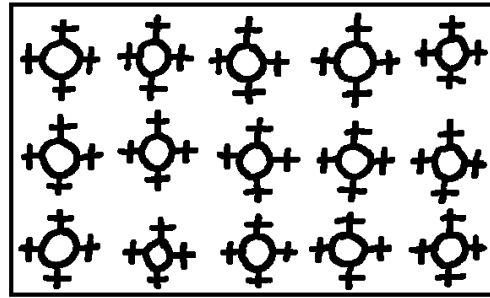
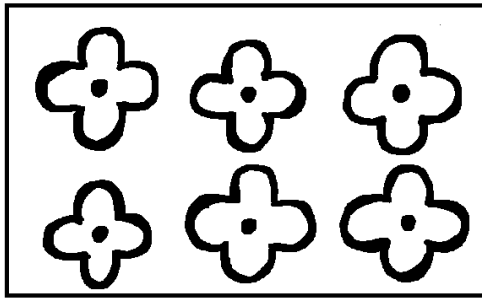
Extension (for higher classes): Students can be asked to draw their own shapes, cut them from paper and make two halves and then draw the resulting shapes on the paper.

They can even be asked to draw halves in different ways (either by cutting, folding or by just drawing).

FRAC 2: HALF OF THE THINGS

Objective: Understanding the concept of half (as the result of division of a set)

Colour half of the things in each set.



Extension: Students can be encouraged to tell different ways to show halves.

FRAC 3: COLOUR ONE QUARTER

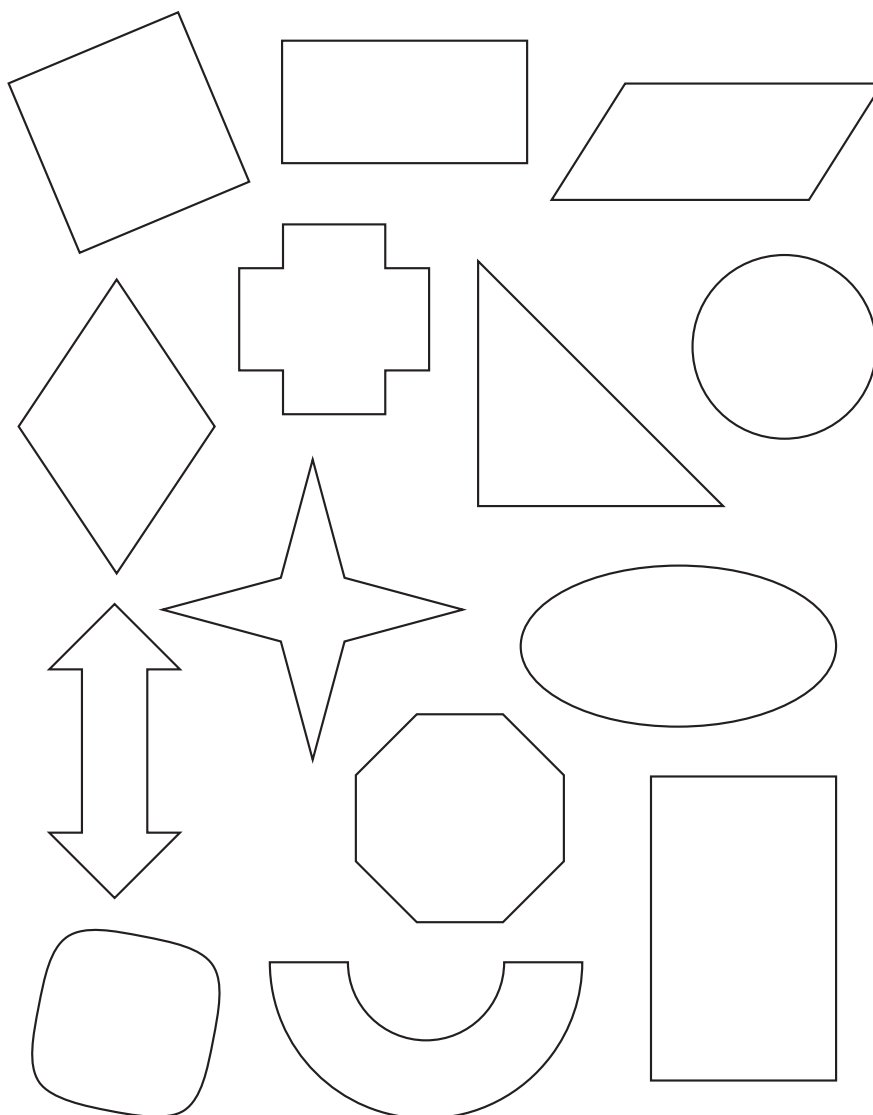
Objective: Understanding the concept of a quarter as a fraction of a whole



$$\frac{1}{4}$$

Divide each shape into four equal parts. Colour one part.

This one part out of four is called one-fourth or one quarter ($\frac{1}{4}$).



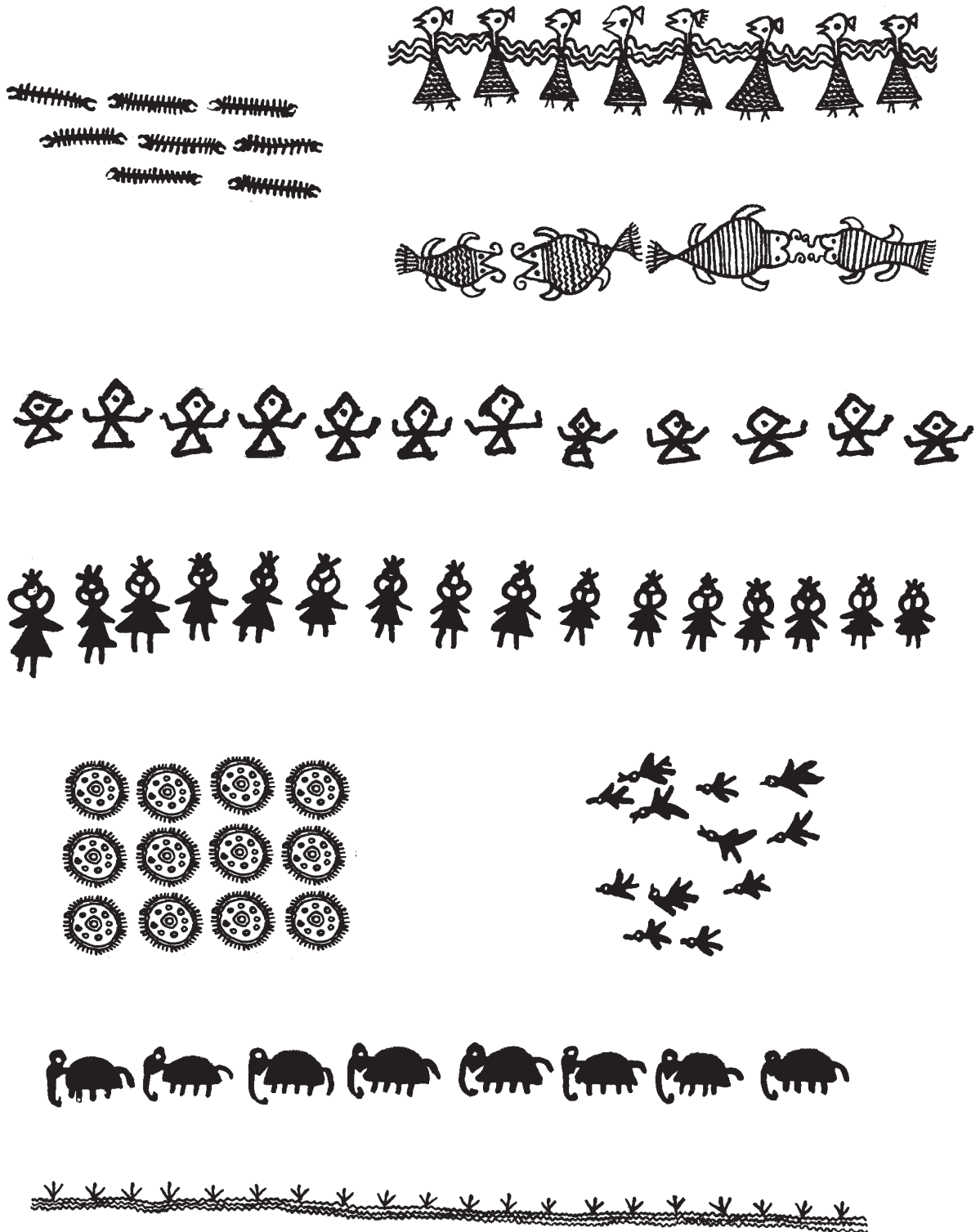
Extension:

1. Instead of dividing on the paper, students can be given the cut-outs of different shapes.
2. In higher classes they can also be asked to cut the paper into four equal parts. They can be asked to find out different ways to do it. They can also be asked to find the relation between $\frac{1}{2}$ and $\frac{1}{4}$.

FRAC 4: ONE QUARTER OF THE OBJECTS

Objective: Understanding the concept of a quarter of a set of objects

Ring one quarter of the things in each set.



Extension: Students can be encouraged to tell different ways to show halves.

FRAC 5: COLOURING FRACTIONS OF A WHOLE

Objective: Understanding the meaning of a fraction

Colour the bar to match the fraction.

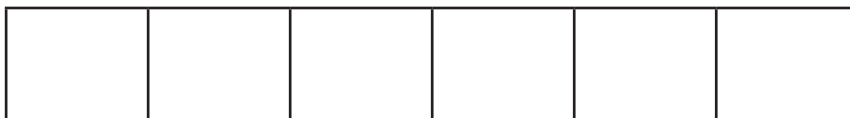
$2/4$



$5/5$



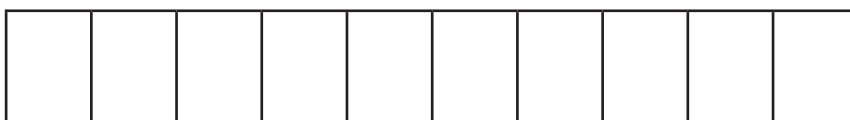
$4/6$



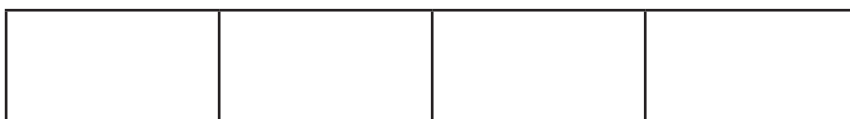
$1/2$



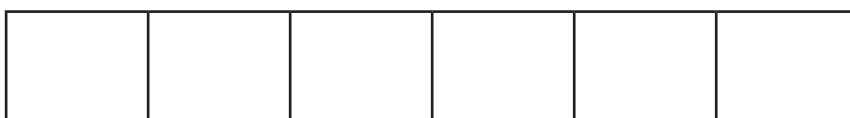
$7/10$



$3/4$



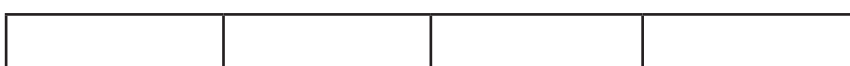
$3/6$



$9/13$



$1/4$



Are any of these fractions the same?

FRAC 6: DRAW THE OTHER HALF

Objective: Understanding the meaning of a half

Half of each shape is given. You draw the other half.

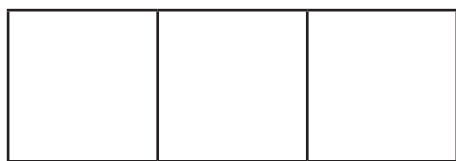
The grid contains three pairs of shapes, each pair representing the left half of a larger shape. The shapes are:

- Pair 1:** A vertical rectangle on the left, and a vertical line on the right. The rectangle is 2 units wide and 4 units high. The line is 4 units high.
- Pair 2:** A triangle pointing left on the left, and a vertical line on the right. The triangle has a base of 2 units and a height of 3 units. The line is 3 units high.
- Pair 3:** A complex polygon on the left, and a vertical line on the right. The polygon has a top horizontal edge of 2 units, a left vertical edge of 4 units, a bottom horizontal edge of 2 units, and a right vertical edge of 4 units. The line is 4 units high.

Extension: A student can draw half a shape on a square copy and ask a friend to draw the other half.

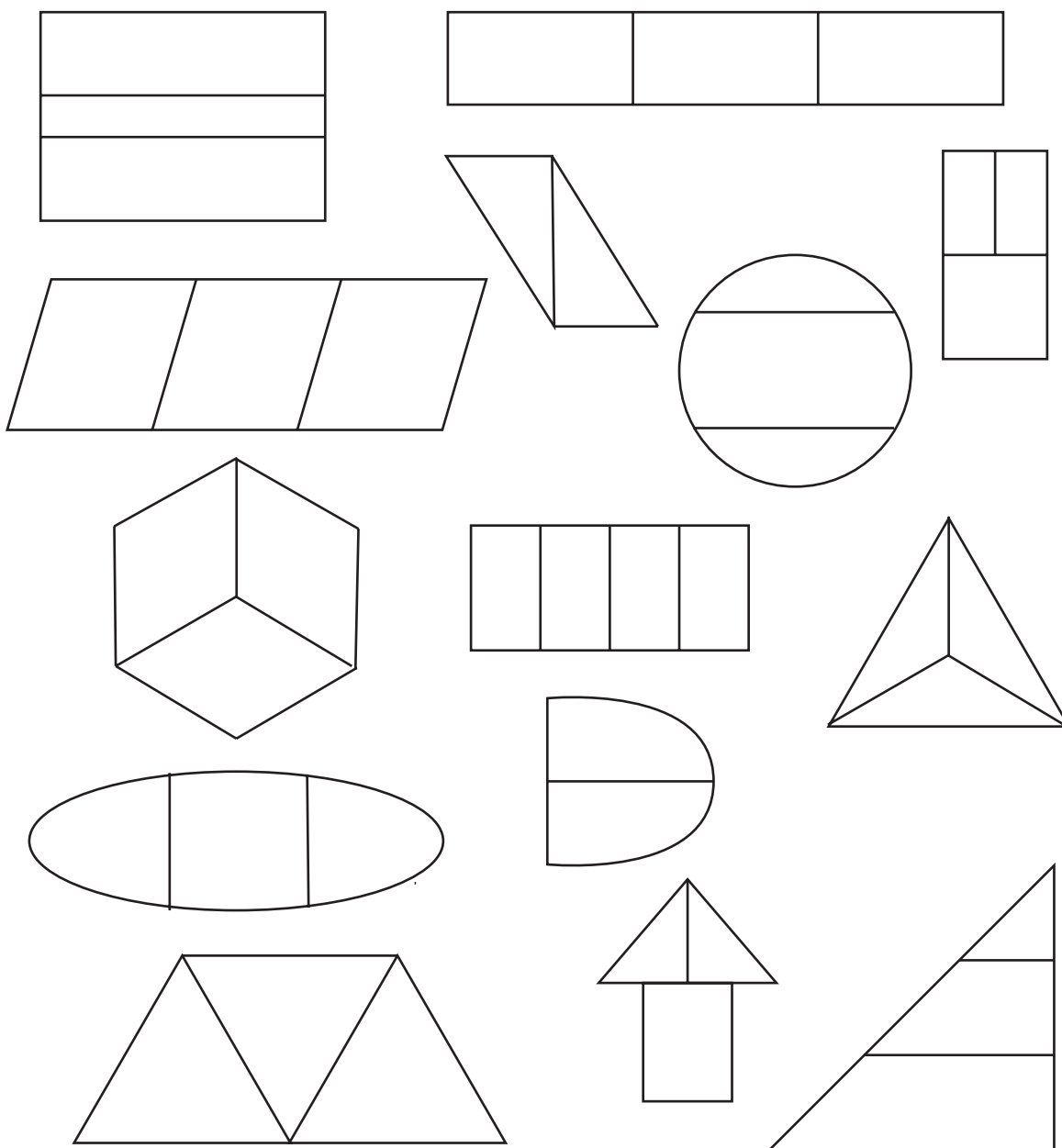
FRAC 7: THIRDS

Objective: Understanding thirds



3^{rds}

Ring the pictures that show thirds.



FRAC 8: ONE-FOURTH OR ONE HALF?

Objective: Understanding one-fourth and one half

Draw lines to show if the shaded parts are $\frac{1}{4}$ or $\frac{1}{2}$.

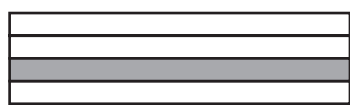
$\frac{1}{4}$

$\frac{1}{2}$

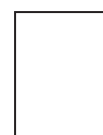
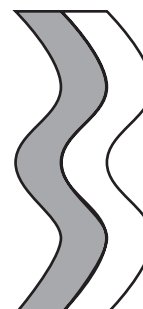
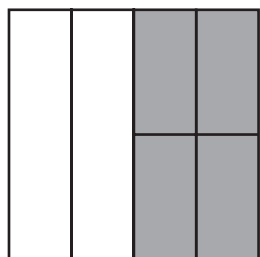
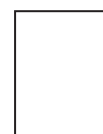
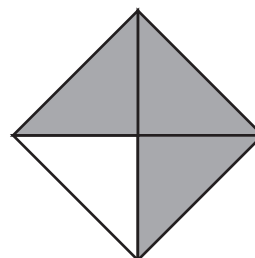
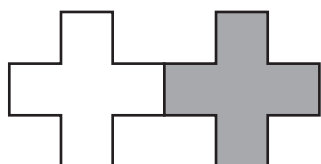
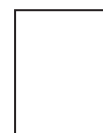
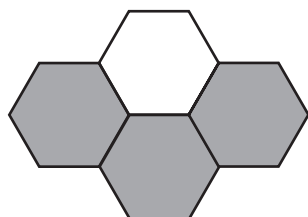
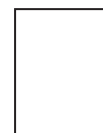
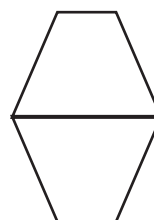
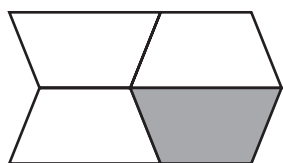
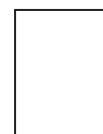
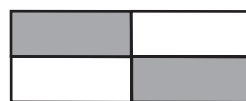
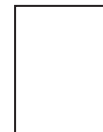
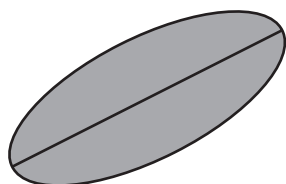
FRAC 9: WHAT FRACTION?

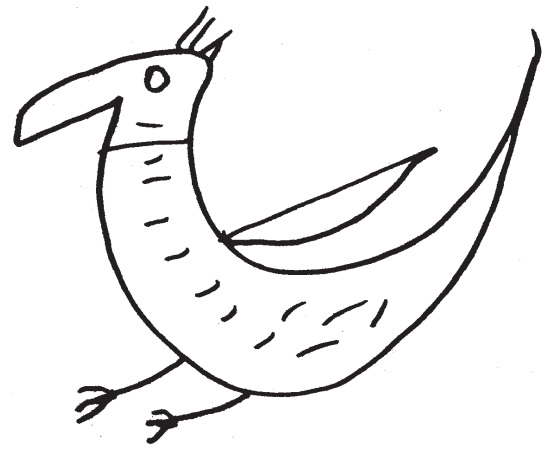
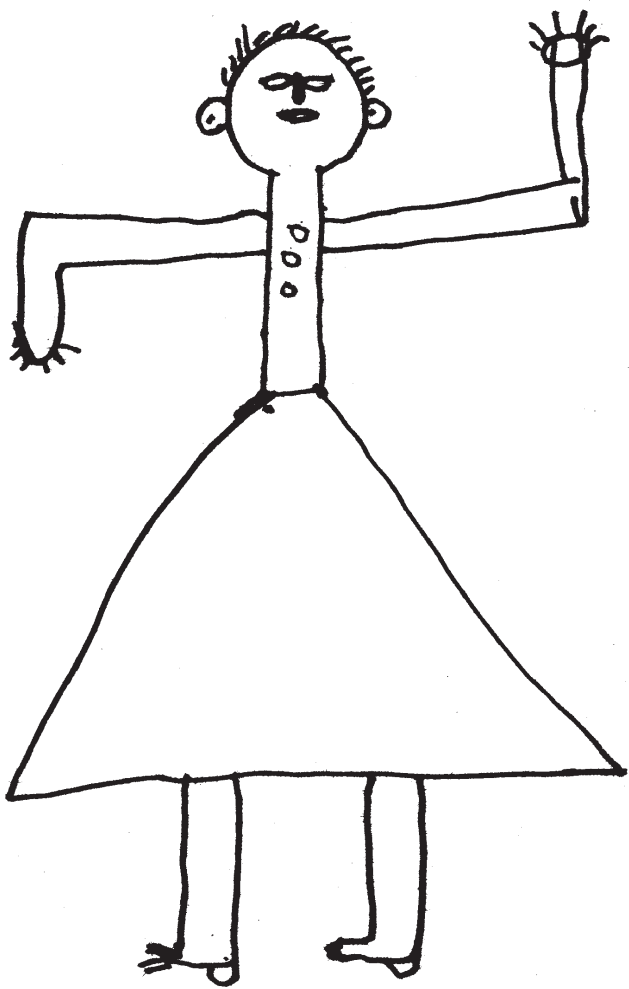
Objective: Understanding one-fourth and one-half

How much of each shape is shaded?



$\frac{1}{4}$







eklavya

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