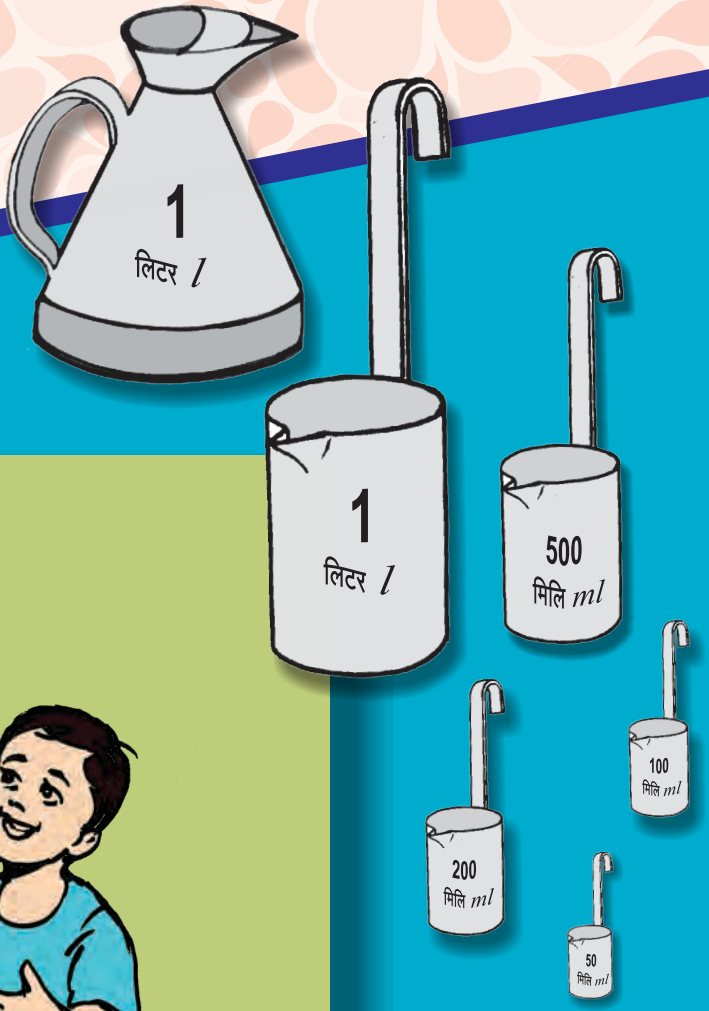
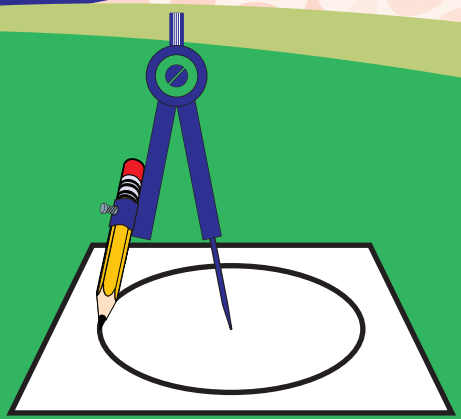
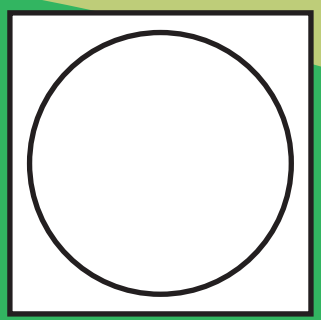
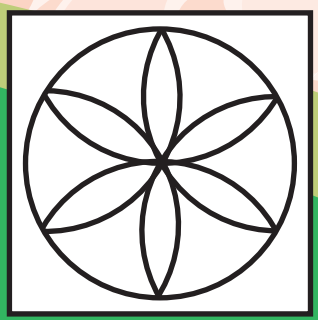
MATHEMATICS

STANDARD FOUR









The Constitution of India

Chapter IV A

Fundamental Duties

ARTICLE 51A

Fundamental Duties- It shall be the duty of every citizen of India–

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities, to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

(k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

Education Department's Sanction Number :
Pra-Shi-Sa/2014-15/2101/Manjuri/D-505/754, Date 4/2/2014

MATHEMATICS

STANDARD FOUR

The digital textbook can be obtained through DIKSHA App on a smartphone by using the Q. R. Code given on title page of the textbook and useful audio-visual teaching-learning material of the relevant lesson will be available through the Q. R. Code given in each lesson of this textbook.

MAHARASHTRA STATE BUREAU OF TEXTBOOK PRODUCTION
AND CURRICULUM RESEARCH, PUNE.

First Edition : 2014
Seventh Reprint : 2021

Cover and Illustrations :
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Typesetting :
DTP Section (Languages) Textbook Bureau, Pune.

Paper : 70 GSM Cream wove

Printer : UNITED MULTICOLOUR PRINTERS PVT. LTD., PUNE

Print Order No. : N/PB/2021-22/50,000

Publisher :
Vivek Uttam Gosavi, Controller
Maharashtra State Textbook Bureau,
Prabhadevi, Mumbai - 400 025.

The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

Preface

The 'Primary Education Curriculum - 2012' was prepared in the State of Maharashtra following the 'Right of Children to Free and Compulsory Education Act, 2009' and the 'National Curriculum Framework 2005'. The Textbook Bureau has launched a new series of Mathematics textbooks based on this syllabus approved by the State Government for Stds I to VIII from the academic year 2013-2014. We are happy to place this textbook of Standard Four in this series in your hands.

Our approach while designing this textbook was that the entire teaching-learning process should be child-centred, emphasis should be given on active learning and constructivism and at the end of Primary Education the students should have attained the desired competencies and that the process of education should become enjoyable and interesting.

Children have a natural liking for pictures and constantly try to 'do' things on their own. Considering these factors, we have tried to make this book pictorial and activity-oriented. As far as possible, expressive illustrations have been used which will lead to a clearer understanding of mathematical concepts.

Graded exercises have been included in order to ensure revision and reinforcement of mathematical concepts and to facilitate self-learning. It is expected that the children will solve the questions in the exercises on their own. We have tried to provide a variety of exercises to make it interesting for the students.

The language of presentation that the teacher is expected to use has been provided in the form of dialogues in the textbook. Some properties and rules that students need to use again and again while studying mathematics have been given under the heading 'Remember' in the boxes at the bottom of some pages. The instructions and the activities aim at making teaching more activity-oriented.

This book was scrutinized by teachers, educationists and experts in the field of mathematics at all levels and from all parts of the State to make it as flawless and useful as possible. Letters from teachers and parents as also reviews in newspapers have been taken into account while preparing this textbook. The Bureau is grateful to all of them for their co-operation. Their comments and suggestions have been duly considered by the Mathematics Subject Committee while finalising the book.

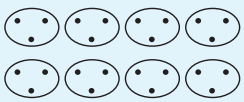
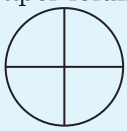
The Mathematics Subject Committee of the Bureau, the Panel, Shri. V. D. Godbole (Invitee) and the artists have taken great pains to prepare this book. The Bureau is thankful to all of them.

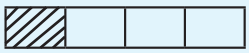
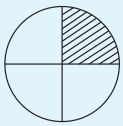
We hope that this book will receive a warm welcome from students, teachers and parents.

(C. R. Borkar)
Director
Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.

Pune
Date : February 3, 2014
Magh 14, 1935

English Mathematics- Standard Four-Learning Outcomes

Suggested Pedagogical Processes	Learning Outcomes
The learners may be provided opportunities in pairs/groups/ individually and encouraged to — • classify the numbers as even or odd according to their properties. • explore and write multiplication facts through various ways like skip counting, extending patterns, etc. For example, for developing multiplication table of 3, children could use either skip counting or repetitive addition or pattern as shown below: 1 2 3 4 5 6 7 8 9 10 11 12 - - - - - - - - - • expand the two-digit number and multiply, for example, 23 multiplied by 6 could be solved as follows: • $23 \times 6 = (20 + 3) \times 6 = 20 \times 6 + 3 \times 6$ $= 120 + 18 = 138$ • solve and create daily life problems/situations using multiplication like, if a pen costs Rs. 35, what will be the cost of 7 pens? • discuss and evolve standard algorithm for multiplication. • make groups for division, for example, 24÷3 means, for example, to find how many groups of 3 can be there in 24 or how many 3's make 24?  • create contextual questions based on mathematical statements. • for example, the statement 25 – 10 =15 may trigger different questions from different students. A student may create: "I had 25 apples. Ten were eaten. How many apples are still left?" • create contextual problem through group activity such as dividing the class in two groups where one group solves the problem given by the other group by using different operations and the vice-versa. • to discuss and correlate fractional numbers like half $\frac{1}{2}$ one-fourth $\frac{1}{4}$ three-fourths $\frac{3}{4}$ with daily life • represent the fractional numbers through activities related to pictures/paper folding • For example – shade half $\frac{1}{2}$ the picture 	**The learner —** 04.71.01 applies operations on numbers in daily life. 04.71.02 classifies the numbers as even or odd. 04.71.03 multiplies 2 and 3-digit numbers. 04.71.04 divides a number by another number using different methods like – pictorially (by drawing dots), equal grouping or repeated subtraction and by using inter-relationship between division and multiplication. 04.71.05 creates and solves simple real life situations/ problems including coins, notes, length, mass and capacity by using the four operations. 04.71.06 works with fractions. - identifies half, one-fourth, three-fourths of a whole in a given picture by paper folding and also in a collection of objects. - represents the fractions as half $\frac{1}{2}$, one-fourth $\frac{1}{4}$ and three-fourths $\frac{3}{4}$ by using numbers/ numerals - shows the equivalence of a fraction $\frac{1}{2}$ and $\frac{2}{4}$ with other fractions. 04.71.07 acquires understanding about shapes around her/him. 04.71.08 identifies the centre, radius and diameter of the circle. 04.71.09 finds out shapes that can be used for tiling. 04.71.10 makes cube/cuboids using the given nets. 04.71.11 draws top view, front view and side view of simple objects. 04.71.12 explores the area and perimeter of simple geometrical shapes (triangle, rectangle, square) in terms of given shape as a unit. For example, the number of books that can completely fill the top of a table.

Suggested Pedagogical Processes	Learning Outcomes
• Shaded part of which of the following pictures do not represent one fourth ($\frac{1}{4}$) (i)  (ii)  • draw circles with various lengths of radius, compasses and explores various designs with the shape. • discuss observation on tiling (of different shapes) which they see in their homes/ on footpaths / floors of various buildings • make their own tiles and verify whether the tiles they created tessellate or not • look at various objects in the classroom from different viewpoints and make a deep drawing of the view. For example, a glass may look differently from the front. Questions like, 'But how it would look like from the top?' Or 'how it would look like from below?' may be raised • convert rupees into *paisa*, for example, how may 50 *paisa* coins you will get in exchange of 20 rupees? • make bills so that the students while making bills will use the four operations of addition/ subtraction/ multiplication/ division • estimate the length of an object/ distance first and then verify them by actually measuring them. For example, estimating the length of their bed or distance between the school gate and the classroom and verifying it by measuring them • make a balance and weigh things with standard weights. In case standard weights are not available, packages with standard weights may be used like packets of $\frac{1}{2}$ kg *dal*, 200 gm pack of salt, 100 gm pack of biscuits • innovate use of weights like using two 250 gm packets instead of 500gm packet (or by using stones of equivalent weights, etc.) • make their own measuring vessel to measure capacities of other vessels. For example, a bottle may have capacity for 200 ml and can be used as a measurement unit to know the amount of water in a jug or in a container • observe and study the calendar and come up with the number of weeks in a month/ in a year. Let children explore the pattern in the number of days in each month and how days are associated with dates in a month, etc. • utilise their experiences inside/outside the class having exposure to telling time/ reading clock in hours and minutes, alongwith peers • discover the time lapsed in an event by counting forward or using subtraction/ addition • explore patterns/designs in their environment/ surroundings (using shapes and numbers) and make such patterns and extend them • collect information and draw meaningful results/ inferences in their daily life. Using these experiences, the children may be involved in activities focusing on data handling	04.71.13 converts metre into centimetre and centimetre into metre. 04.71.14 estimates the length of an object/distance between two locations, weight of various objects, volume of liquid, etc., and verifies them by actual measurement. 04.71.15 solves problem involving daily life situations related to length, distance, weight, volume and time involving four basic arithmetic operations. 04.71.16 reads clock time in hour and minutes and expresses the time in a.m. and p.m. 04.71.17 relates to 24 hr clock with respect to 12 hr clock. 04.71.18 calculates time intervals / duration of familiar daily life events by using forward or backward counting / addition and subtraction. 04.71.19 identifies the pattern in multiplication and division. (up to multiple of 9) 04.71.20 represents the collected information in tables and bar graphs and draws inferences from these.

Contents

Part One

Part Two

English Mathematics- Standard Four

❖ To the Teacher ❖

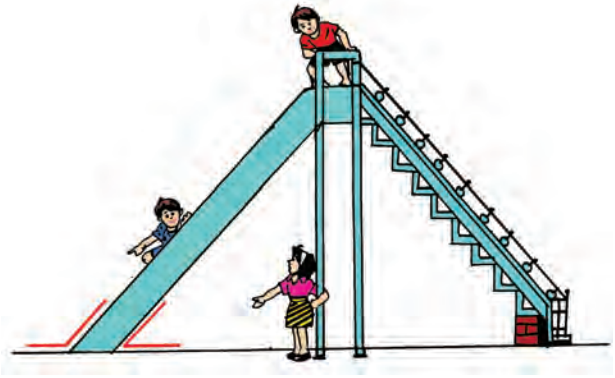
At this stage, the textbook is a very important tool of the teaching-learning process. This textbook has been designed to help teachers base their teaching of mathematics on their own and their pupils' varied experiences and surroundings. We urge you to make full use of the following special features of this textbook.

- The games, demonstrations, practical work and activities included for explaining mathematical ideas and concepts.
- Encouraging students to learn on their own, making use of the knowledge they already have. For this purpose, we can use learning aids such as number cards, picture cards, beads and strings.
- Give learning experiences based on the content of one page every day.
- Tell the students to talk to others in the group to get help if necessary.
- As the children carry out an activity, move amongst the groups to observe what they are doing. Give guidance if necessary.
- From time to time, ask thought-provoking questions based on previous lessons and encourage the children to find the answers on their own.
- Encourage children to ask questions about their difficulties. In fact, help them develop the habit of asking questions.

Part One

1. Geometrical Figures

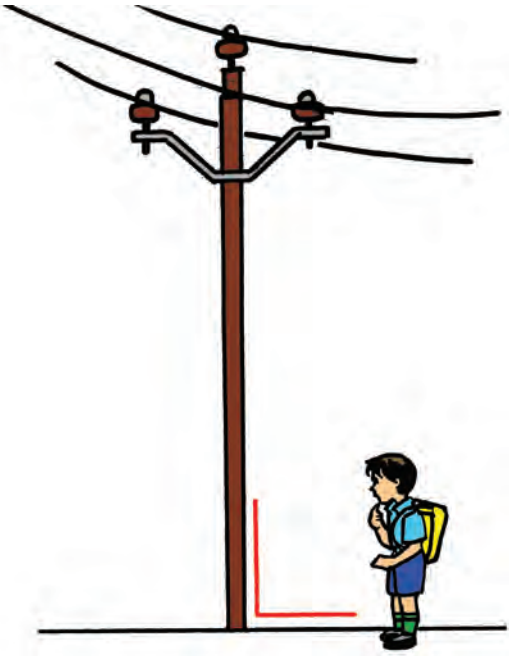
Angles



We see angles between the ground and the slide.

The ladder makes an angle with the ground.

We see angles between the tree trunk and its branches.

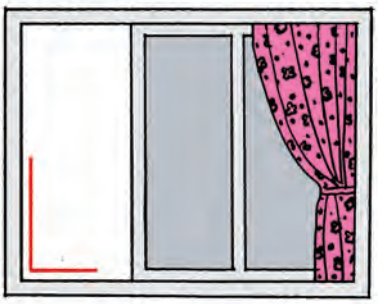


There is an angle between the electric pole and the ground.

In our surroundings, wherever we see two lines meeting, there is an angle.

- **Collect some pictures in which you can see angles. Mark those angles using a pencil.**
- **Look at the angles that can be made at your elbow.**

Right angle, acute angle, obtuse angle



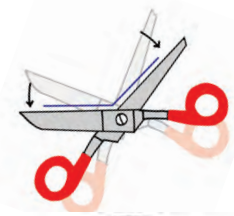
We see a right angle between two adjoining sides of a window.

Two adjacent sides of a book make a right angle.

In a clock, at 3 o'clock and 9 o'clock, the minute hand and the hour hand are at right angles to each other.

In the picture alongside, there is a **right angle** between the two blades of the scissors.

As we reduce the distance between the tips of the blades, little by little, the angle between the blades grows smaller than a right angle.
An angle which is smaller than a right angle is called an **acute angle**.

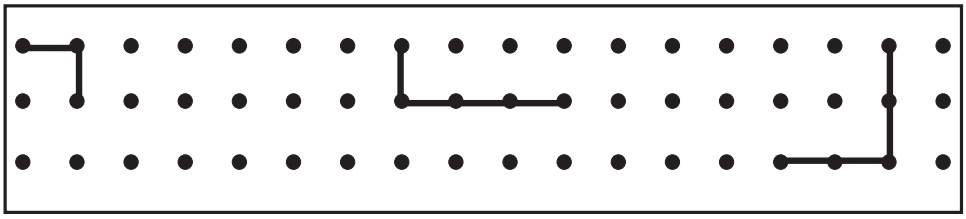


But, as we increase the distance between the tips of the blades the angle between the blades grows bigger than a right angle.
An angle that is bigger than a right angle is called an **obtuse angle**.

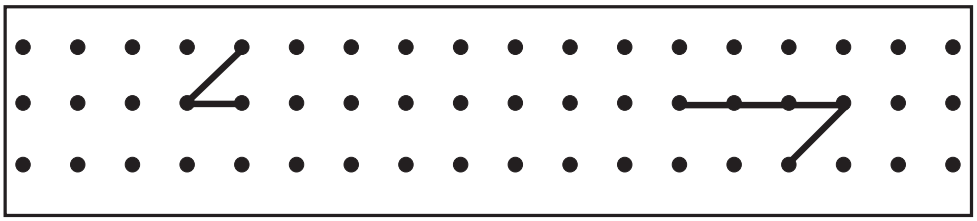
A right angle | **An acute angle** | **An obtuse angle**

◆ **Observe the figures below and write 'right angle', 'acute angle' or 'obtuse angle' in the box below each figure.**

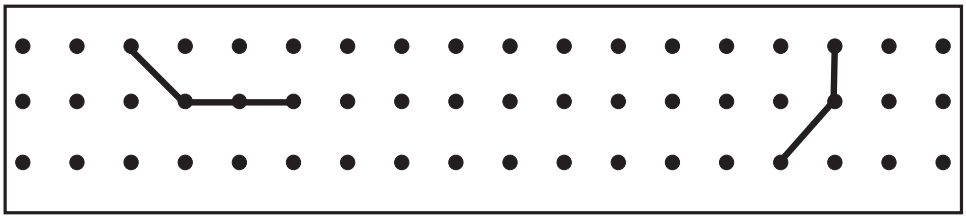
◆ **Make right angles by joining the dots in the box below.**



◆ **Make acute angles by joining the dots.**



◆ **Make obtuse angles by joining the dots.**



◆ **Make a right angle, acute angle and obtuse angle at your elbow. Show these angles to your friends and check theirs.**

◆ **Check! Is this true?**

- ❖ The angle an electric pole makes with the ground is a right angle.
- ❖ The slide makes one acute angle and one obtuse angle with the ground.
- ❖ The ladder makes one acute angle and one obtuse angle with the wall.
- ❖ The angle between the thorns of the *babul* tree is an obtuse angle.
- ❖ Leaving the thumb, the angles between any two adjoining fingers is an acute angle.

Activity : Observe in which places in your surroundings you find angles.
Make right angles, acute angles and obtuse angles by folding paper.

Circle

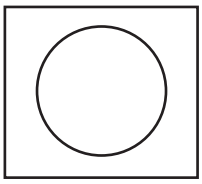
A bangle

A bicycle wheel

A cart-wheel

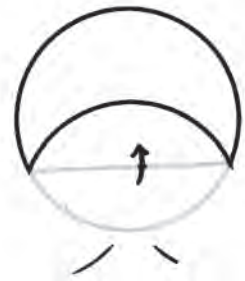
All the above objects are circular.

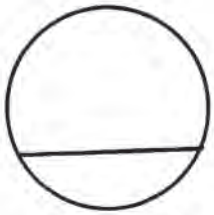
Circle : Centre, radius, diameter, chord



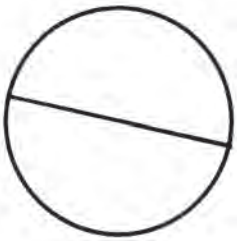
Take a small steel bowl. Place it upside down on a piece of paper and trace its outline. Remove the bowl. The figure you get on the piece of paper is a circle.

Draw two or three circles like this one and cut out the circular paper shapes.



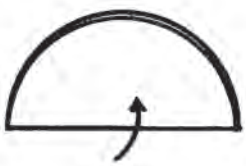


Take one of these shapes and fold it as shown in the picture. Trace the line of the fold with a pencil. This line is called a **chord** of the circle.



Now fold another circular shape to divide it into two halves. Trace the line of the fold with a pencil. This line is called a **diameter** of the circle.

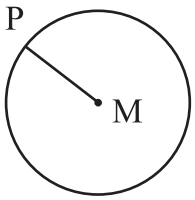
The diameter, too, is a chord of the circle.



Now fold the shape again so that we get a quarter part of the shape.

Unfold the paper shape. Now, you see the circular shape again. Trace the lines of the folds.

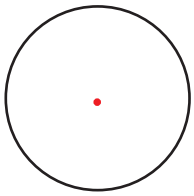
The point at which these lines meet each other is the **centre** of the circle.



Name the centre of the circle, M. Take any point P on the circle. Draw the line MP with your ruler. MP is a **radius** of the circle.

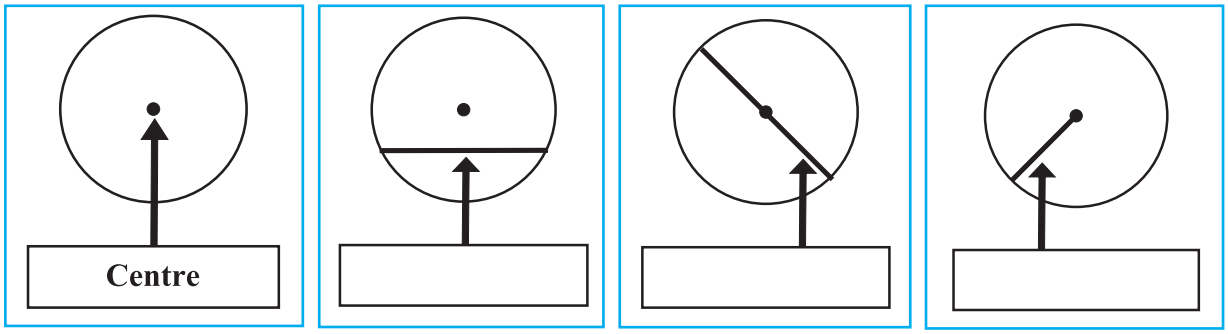
Drawing a circle using a compass

Take a piece of paper. Choose any point near the middle of the paper. Take a suitable distance between the steel tip of the compass and the tip of the pencil. Place the steel tip on the chosen point. Hold it in place and turn the pencil tip around it to trace a circle.



Mark with a red pencil, the point at which you held the steel tip. Now cut out this circle. Fold it twice as before to obtain two diameters of the circle. Observe that these two diameters meet at the red point. It means that the red point is the centre of the circle.

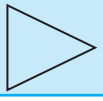
Look at each circle. Is the line shown by the arrow a chord, a diameter or a radius of the circle? Write it in the box below.



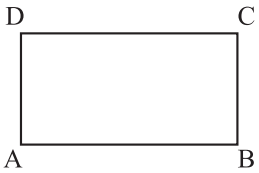
Activity : Draw different circles using things like the lid of a jar, a saucer, a bangle and coins.
Find out from your teacher how a circular playing field is marked on the ground.

Geometrical figures : Vertex and side

◆ **Observe the figures and complete the table below.**

Figure			
Name of figure			
Number of sides	Four	.....	.....
Number of corners	Four	.....	.....

Rectangle



A rectangle has four edges, that is, four sides. The point where two sides meet is called a **vertex**.
In the figure alongside, A, B, C and D are the vertices.

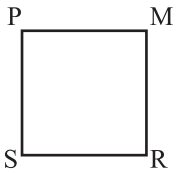
Here the sides AB, BC, CD, AD are the sides of the rectangle.

The opposite sides of the rectangle are of equal length. All the angles of a rectangle are right angles. A rectangle is also called a right-angled quadrilateral.

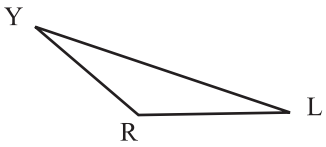
Square

A square has four vertices and four sides.
In the figure alongside, P, M, R and S are the vertices of the square.

All the sides of a square are of equal length
and all its angles are right angles.

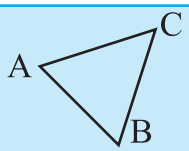
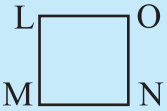


Triangle



A triangle has three vertices and three sides. Y, R and L are the vertices of this triangle. YR, RL and YL are the three sides of the triangle. A triangle has three angles.

◆ **Look at the figures and complete the table below.**

Figure			
Names of sides	Side AB	Side PQ	Side LM
	-------	-------	-------
	-------	-------	-------
		-------	-------
Names of vertices	A, ..., ...	P, ..., ..., ...	L, ..., ..., ...

2. Number Work

Three-digit numbers : Revision

◆ Solve the following examples.

1. Using any of these number cards make ten three-digit numbers and read them. (Remember that you cannot have zero in the hundreds place.)

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

2. Write the following numbers in words.
   (1) 325 (2) 549 (3) 667 (4) 782 (5) 890 (6) 401

3. Write the following numbers in figures.
   (1) Hundred and two
   (2) Three hundred and twenty
   (3) Five hundred and sixty-seven
   (4) Four hundred and forty-five
   (5) Nine hundred and ninety-nine
   (6) Seven hundred and fifty-six

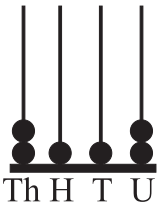
4. Write the next three numbers.
   (1) 399, ☐, ☐, ☐
   (2) 200, ☐, ☐, ☐
   (3) 597, ☐, ☐, ☐

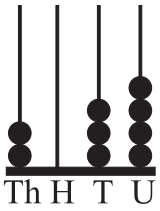
5. Write the three previous numbers.
   (1) ☐, ☐, ☐, 600
   (2) ☐, ☐, ☐, 369
   (3) ☐, ☐, ☐, 299

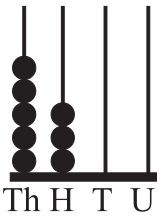
Four-digit numbers

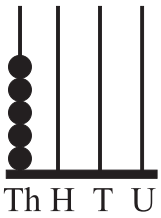
Symbols	Numbers	Read as
	1000	One thousand
	4000	Four thousand
	2012	Two thousand and twelve
	2203	Two thousand two hundred and three
	1010	One thousand and ten
	1001	One thousand and one
	2314	Two thousand three hundred and fourteen

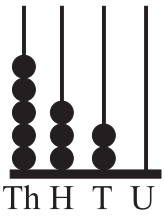
◆ **Look at the symbols. Write the number and read it.**

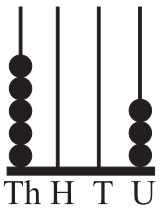
(1) 

(2) 

(3) 

(4) 

(5) 

(6) 

Numbers in words and figures

1. Four thousand and twenty-eight : 4028

Write 4 in the thousands place. Now, we must write the digits in the hundreds, tens and units places, too. The given number has no hundreds. So, we write a zero in the hundreds place. Twenty-eight has 2 tens and 8 units. So we write 2 in the tens place and 8 in the units place.

2. Five thousand three hundred and nine : 5309

In this number, there is 5 in the thousands place and 3 in the hundreds place. There are no tens, so we write 0 in the tens place. We write 9 in the units place.

When writing a four-digit number in figures, we first write the digit in the thousands place. Then, we write the proper digit from 0 to 9 in the hundreds, tens and units places in that order.

Exercise

1. Write the given numbers in figures.

Number in words	Th	H	T	U
(1) Four thousand and five				
(2) Five thousand and seventeen				
(3) Seven thousand three hundred and thirteen				
(4) Eight thousand				
(5) Nine thousand nine hundred and ninety-nine				

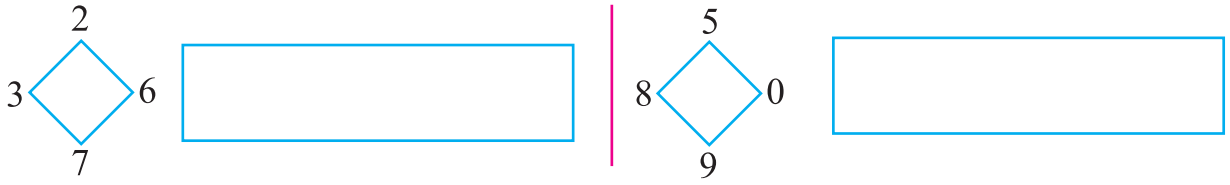
2. Read the numbers.

1001	2002	4004	5051	3067	7038	9000
1010	2020	4040	5105	3607	7308	9009
1100	2200	4400	5150	3670	7083	9090
			5501	3076	7830	9900

3. Read the given numbers. Write them in words.

1235	2341	3507	4115	5045	6787	7890	8888	9007

4. Using each digit only once, write five four-digit numbers and read them.



5. On a number slate, write different four-digit numbers by changing, one at a time, digits in different places. Read each number.

Th	H	T	U
3	0	2	5

Th	H	T	U
1	4	2	6

Introducing five-digit numbers

Reshma : Which is the biggest four-digit number?

Sachin : Nine thousand, nine hundred and ninety-nine!

Nargis : Which is the next number?

Tai : Let's work that out. When we add 1 to a number, we get the next number. You remember that, don't you? Now, we'll do the addition 9999 + 1 in vertical arrangement.

TTh	Th	H	T	U
	1	1	1	
	9	9	9	9
+				1
1	0	0	0	0

9 units and 1 unit make 10 units. That gives 1 ten to carry over. Write that in the tens place.

9T + 1T make 10 tens. That gives 1 hundred to carry over. Write that in the hundreds place.

9H + 1H make 10 hundreds. 10 hundreds is 1 thousand. Write that 1 thousand in the thousands place.

We get 9 + 1 = 10 in the thousands place. So, this number is ten thousand. We make a new ten thousands place for it on the left of the thousands place. We call it the 'TTh' place.

Reading and writing five-digit numbers

◆ **Look at the five-digit number below.**

TTh	Th	H	T	U
1	3	5	7	8

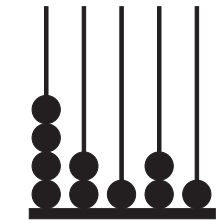
This number can be read as one ten thousand, three thousand, five hundred and seventy-eight.
But to make it easier we read it as thirteen thousand, five hundred and seventy-eight.
That is, we read the digits in the ten thousands and thousands places together.

◆ **Read the following numbers and write them in words.**

20,000 = Twenty thousand 68,000 = ... 79,000 = ...
80,000 = ... 54,000 = ... 99,000 = ...

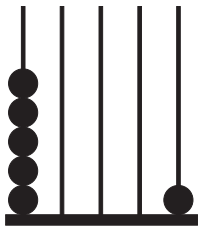
◆ **Look at the symbols and read the number they make.**

(1)



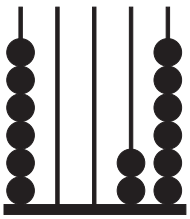
42,121 = Forty-two thousand, one hundred and twenty-one

(2)



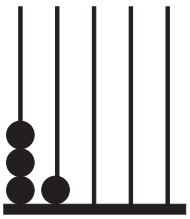
50,001 = Fifty thousand and one

(3)



60,026 = ...

(4)



31,000 = ...

Numbers in words and figures

1. Sixty-two thousand thirty seven : 62,037

62Th = 60 Th + 2 Th. It means that here we have 6 ten thousands and two thousands. This number has no hundreds. So we write 0 in the hundreds place.

2. Seventy thousand two hundred and six : 70,206

70 thousand is 7 ten thousands. There are no more thousands in this number. There are no tens, either. So we write 0 in the thousands and tens places.

3. Thirty thousand and one : 30,001

Here, 30 thousand is 3 ten thousands. Besides these, there are no thousands or hundreds or tens in this number. So we write 0 in all those places.

Exercise

1. Read the numbers, write them in figures.
   (1) Forty thousand
   (2) Fifty thousand fifty
   (3) Twelve thousand, three hundred and thirteen
   (4) Forty-five thousand and three
   (5) Twenty-three thousand, one hundred and five
   (6) Sixty-eight thousand and five

2. Read the numbers, write them in words.
   (1) 52,045 (2) 23,409 (3) 45,600
   (4) 41,000 (5) 99,999 (6) 95,768

3.

TTh	Th	H	T	U
2	3	4	1	1

On the number slate alongside, write five numbers by changing the digits in the units, tens, hundreds, thousands and ten thousands places, one at a time. Read the numbers.

4. Using each of the digits 9, 5, 6, 1, 8 only once, write six five-digit numbers.
5. Write the biggest number that can be made using the digits 1, 5, 6, 4, 7 .
6. Write two numbers by writing the digits 4, 3, 9, 8, 7 in the ascending and descending order.
7. Keeping 7 in the units place, use all the digits 6, 0, 7, 5, 4 to make five numbers. Write the numbers.
8. Write five numbers, keeping the smallest of 4, 9, 3, 5, 1 in the units place.

The expanded form of a number

Hamid : Could we write the number 5,324 as an addition or in the expanded form?

Tai : We have learnt to write the expanded form of a three-digit number. Let's write the expanded form of a four- or five-digit number in the same way.

Sharad : 5,324 means 5 thousands, three hundreds, 2 tens and 4 units.

Mary : It means that the expanded form of 5,324 is 5000 + 300 + 20 + 4.

Tai : Now, write the expanded form of the five-digit number 23,375.

Sharad : 23,375 means 2 TTh, 3 Th, 3 H, 7 T and 5 U. The expanded form is 23,375 = 20,000 + 3000 + 300 + 70 + 5.

Exercise

1. Write the following numbers in the expanded form.
   (1) 7,545 (2) 4,050 (3) 65,100 (4) 8,000 (5) 12,745
   (6) 78,999 (7) 9,392 (8) 50,105 (9) 70,495 (10) 82,727

2. Write the numbers from their expanded form.

(1) 3,000 + 200 + 50 + 7 = 3257 (2) 10,000 + 5,000 + 1 = ☐

(3) 4000 + 500 + 10 + 3 = ☐ (4) 20,000 + 300 + 40 + 5 = ☐

(5) 7,000 + 80 + 3 = ☐ (6) 90,000 + 90 + 2 = ☐

3. Some digits and their places in the number are given below. Write down the numbers they make.

For example, 5 TTh, 2Th, 3H, 2T, 1U = 52,321 ; 9H, 8TTh, 5U = 80905

(1) 7 U, 2 T, 5 TTh, 9 Th (2) 3 H, 4 Th, 5 T, 1 TTh

(3) 5 T, 8 Th, 7 TTh (4) 5 Th, 7 TTh, 3 H, 2 T, 4 U

Place value

Tai : Let's play a game. I'll say a number. You give the expanded form of that number. The number is : 55,555.

Dhruv : 50,000 + 5000 + 500 + 50 + 5

Priyanka : That's funny ! There's 5 in every place in the number. But its value is different in each place.

Tai : The place of a digit determines the value of the digit.
Tell me the place value of each of the digits in the number 37842.

Dhruv : Let me tell. 3TTh is 3 ten thousands which is 30,000, 7 Th is 7000, 8H is 800, 4T is 40, 2U is 2.

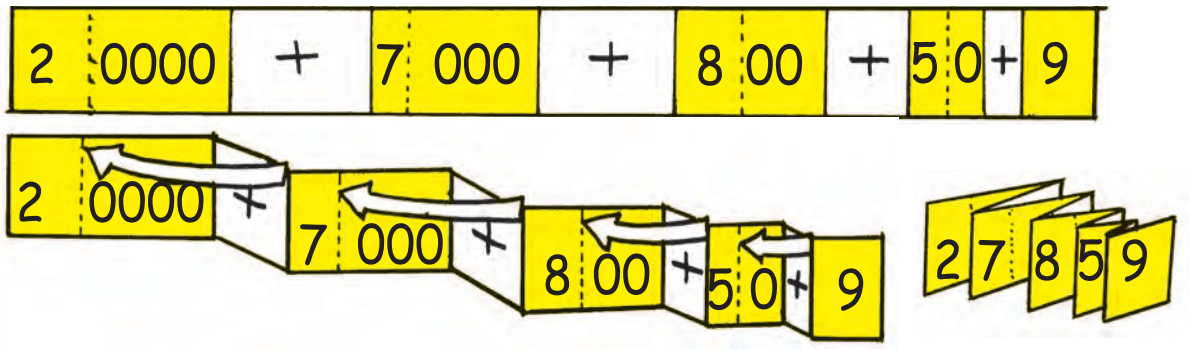
Exercise

Write the place value of the underlined digit in the following numbers.

(1) 1,9<u>9</u>9 (2) <u>2</u>,345 (3) 2,00<u>0</u> (4) 4,<u>8</u>35

(5) 3,74<u>9</u> (6) 2<u>7</u>,859 (7) 67,<u>7</u>77 (8) <u>5</u>6,708 (9) 3<u>0</u>,050

The expanded form of a number on a folding strip



✍ **Remember :** When reading a number, the digits are read in the descending order of their place value. So we start with the digit of the greatest place value.

The different breakups of a number

Tai : We write the number 'one hundred and twenty-five' as 125, in figures. That is, 125 is a sign or symbol used for the number 'one hundred and twenty-five'. But we can break up this number in different ways.

Gouri : Different ways? How?

Tai : Now, Gouri, suppose you have to give your friend 125 rupees and all you have is a whole lot of one-rupee coins. How will you do it?

Gouri : I'll give her 125 one-rupee coins.

Tai : So, the number 125 means 125 units.

Sudhir, suppose you have several 10-rupee notes and some 1-rupee coins. You have to give ₹125. How will you do it?

Sudhir : I will give 12 ten-rupee notes and 5 one-rupee coins. So, according to the notes and coins I give, 125 means 12 tens and 5 units.

Tai : That's right. Ajit, suppose you have 100-rupee notes, 10-rupee notes and 1-rupee coins. You, too, have to give ₹125. How will you do it?

Ajit : I shall give one 100-rupee note, two 10-rupee notes and five 1-rupee coins. Here, 125 means 1 hundred, 2 tens and 5 units.

Tai : So, the number 125 can have three different breakups.
125 = one hundred and twenty-five units
125 = twelve tens, five units
125 = one hundred, two tens, five units

Now can you tell the different breakups of the number 4083?

Sudhir : One of the breakups is 'four thousands and eighty-three units.'

Ajit : Another breakup is '408 tens and 3 units.'

Mallika : Still another breakup is 'forty hundreds, eight tens and three units.'

Gouri : And yet another way is 'four thousands, zero hundreds, eight tens and three units.'

Tai : Thus we can have several different breakups of the same number.

Exercise

Work out and write different breakups of the numbers given below.

(1) 679 (2) 863 (3) 6745 (4) 9856 (5) 1027

The numbers just before and after a given number

Mary : Nandu, can you tell the number just after 120?
Nandu : 121.
Mary : Now tell the number just after1999.
Nandu : I can't tell.
Tai : Remember, the number just after any number is greater by 1 and the number just before it is smaller by 1.
Nandu : Yes. So, if I add 1 to 1999 I will get the next number 1999 + 1 = 2000. Also, the number just before 1999 is 1998.

Exercise

Write the number just after and the number just before the given number.

Number	The number just before	The number just after	Number	The number just before	The number just after
2999			1000		
3800			3459		
7798			5009		

Comparing numbers

Tai : What do you remember about comparing numbers ?
Nandu : Any three-digit number is bigger than any two-digit number.
Priya : And if both numbers have three digits, then the one with the bigger hundreds digit is the bigger number.
Tai : So now, how will we compare numbers having up to four digits ?
Priya : Any three-digit number will be smaller than any four-digit number !
Nandu : If both numbers have four digits, the number with the bigger thousands digit will be the bigger number. If the thousands digits are equal, we'll compare the hundreds digits. If those are also equal, look at the tens digits to determine the smaller and bigger number. For example, 4567 > 4325.

Exercise

Complete the following table.

Numbers	Smaller	Bigger	Numbers	Smaller	Bigger
2123, 1968			9999, 999		
2342, 2432			6070, 8079		
9542, 9549			5978, 7539		

Ascending and descending order

Cupboards of several different companies are on sale in a shop. The price of one is ₹4,750 while that of another is ₹6,200 and of a third, ₹3,980.

The price of the costliest cupboard : ₹6200

The price of the cheapest cupboard : ₹3980

The prices in ascending order : 3980 < 4750 < 6200

The prices in descending order : 6200 > 4750 > 3980

Write the numbers 2980, 3000, 5125 in ascending and descending order.

Ascending order : 2980 < 3000 < 5125 Descending order : 5125 > 3000 > 2980

Exercise

Write the numbers in ascending and descending order.

(1) 2345, 2349, 2347 (2) 6000, 5070, 3007 (3) 5007, 2007, 3007

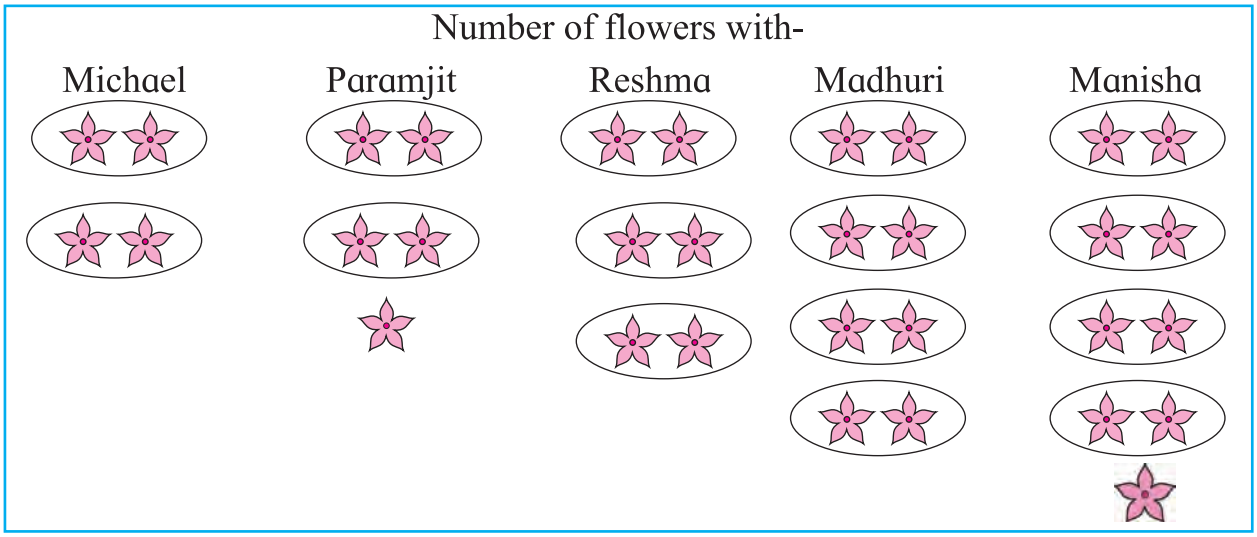
(4) 1009, 1900, 1090 (5) 4180, 6180, 7180 (6) 2917, 3456, 1357

Even and odd numbers

Tai : Michael, you take 4 flowers, Paramjit 5, Reshma 6, Madhuri 8 and Manisha 9. Now, put the flowers in twos. Make the pairs and also tell how many are left over.

Michael : I made two pairs from my four flowers and I have no flowers left.

Paramjit: I also made two pairs with my five flowers but I have one flower left.



Tai : Now, let's see. Who had no flowers left? We shall put all your numbers into one group. Who had one flower left? We put yours into another group.

Numbers from which no flower was left over 4, 6, 8

Numbers from which one flower was left over 5, 9

Tai : Look carefully at the numbers in the two groups. What difference do you notice in them?

Reshma : If we divide 4, 6, 8 by 2, there is no remainder. But, when we divide 5 or 9 by 2, the remainder is 1.

Tai : The numbers which leave no remainder when we divide them by 2 are called even numbers. 4, 6 and 8 are even numbers.
Numbers that leave a remainder of 1 when divided by two are called odd numbers. 5 and 9 are odd numbers.

◆ **Take as many objects (stones, beads, etc.) as each of the following given numbers in turn. By putting the objects in twos, decide whether the number is even or odd.**
12, 11, 10, 23, 27, 34, 25, 36, 39, 41, 45, 52, 16, 17, 19, 28

- Write down the digits in the units place of the even numbers.
- Write down the digits in the units place of the odd numbers.

◆ **Digits in the units place of even and odd numbers**
Digits in the units place of even numbers : 0, 2, 4, 6 or 8.
Digits in the units place of odd numbers : 1, 3, 5, 7 or 9.

◆ **See the digits in the units place and say whether the number is even or odd.**
35, 67, 32, 30, 43, 34, 51, 56, 88, 79

International numerals

Suresh : Hey, Vijaya, have you noticed? All the numbers printed on our currency notes are in English.

Vijaya : Yes, that's true! What did you think they would be?

Suresh : Well, I thought, in Maharashtra, they would be in Marathi. Come let's ask Tai about this. Tai, why are all the numbers printed on our currency notes in English and not in Marathi?

Vijaya : And mostly all the numbers on our vehicles, too?

Tai : Very good! Excellent observation! Now tell me, have any of you travelled outside Maharashtra?

Vijaya : Yes, Tai, we have been to Karnataka.

Tai : Could you read the names of shops on their sign boards?

Vijaya : No, I couldn't.

Tai : That's because they write letters using a different script.
Their numerals are also different from ours.

Suresh : How do they write them?

Tai : In Marathi we write १, २, ३, ...१०. This is how they write : ० ७ ३ ४ ५ ६ २ ८ ९ ००. So, if we had १, २, ३ on our currency notes, how would they read them?

Vijaya : And if the numerals were like theirs, we wouldn't be able to read them!

Tai : That's right. It means that the numbers on currency notes should be such that everyone in India can read them. And, not only Indians, but visitors from other countries should also be able to read them.

Suresh : Yes, I agree. Because, if I had to go to another country, I would like to be able to read the numbers on their notes.

Tai : Well said! That's why all the countries of the world have agreed that numbers that tell the values of currency notes or their serial numbers should all be printed in English. So also other numbers such as the serial numbers of train tickets or bus and airline tickets.

Vijaya : Now I understand! That must be the reason why all over our country too, bus and rickshaw numbers are written in English.

Tai : When numbers are written using English numerals, everyone in the world can understand them. That is why these numerals are now called 'international numerals'. You are already familiar with them.

Devanagari numerals	०	१	२	३	४	५	६	७	८	९
International numerals	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Devanagari numerals	४९७	२३५	४३७	५६८	६७२	७९९	८००	९१२
International numerals	**497**	**235**	**437**	**568**	**672**	**799**	**800**	**912**

Reading numbers and writing them in words

4536 is read as, 'Four thousand, five hundred and thirty-six'.
27,105 is read as, 'Twenty-seven thousand, one hundred and five'.
64,089 is read as, 'Sixty-four thousand and eighty-nine'.

Exercise

1. Read the numbers given below and write them in words.
   (1) 20,504 (2) 97,487 (3) 30,008 (4) 4,879 (5) 6,405 (6) 893
2. Where have you seen international numerals being used ?
3. Find prices of things written in Devanagari numerals and read them.

3. Addition

Revision

◆ **Solve the following sums.**

(1) 342 + 123 = ____

(2) 345 + 324 = ____

(3) 170 + 626 = ____

(4) 294 + 105 = ____

(5) 609 + 200 = ____

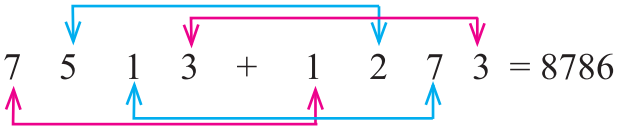
◆ **Study the sums given below.**

Th	H	T	U
4	3	0	1
+ 3	2	9	0
7	5	9	1

TTh	Th	H	T	U
7	3	2	1	5
+		3	5	2
7	3	5	6	7

While adding three-digit numbers, we add units to units, tens to tens and hundreds to hundreds. In the same way, while adding numbers with four or five digits, thousands are added to thousands and ten thousands to ten thousands.

◆ **Study the horizontal arrangement of the sum given below.**



First we add units to units. Then we add tens to tens, hundreds to hundreds and thousands to thousands.

Exercise

1. Arrange vertically and add.
   (1) 2301 + 4056 (2) 4017 + 2081 (3) 2017 + 17060
   (4) 4777 + 2001 (5) 941 + 99058 (6) 12336 + 50021
   (7) 77777 + 2001 (8) 999 + 4000

2. Add in horizontal arrangement.
   (1) 7006 + 2193 (2) 411 + 588 (3) 279 + 97410
   (4) 53046 + 2001 (5) 7013 + 91405 (6) 9298 + 80301

3. Match the equal numbers in the three columns.

Fourteen thousand plus three hundred	509 + 100	99702
Two thousand plus ninety	14000 + 300	609
Five hundred and nine + one hundred	99000 + 702	2090
Ninety-nine thousand + seven hundred and two	2000 + 90	14300

Addition : with carrying over

◆ **Tanvi has 637 beads.**

Saanvi has 574 beads.

How many beads do the two girls have altogether ?

Adding 7 single beads to 4, we get a string of 10 and 1 bead is left over.

3 strings of ten added to 7 strings is equal to 10 strings. Adding 1 new string makes a total of 11 strings of ten beads each.

Joining 10 out of 11 strings makes 1 purse of 100 and 1 string is left over.

Together the two girls have 11 purses of 100 beads. One new purse added to the 11 purses makes a total of 12 purses. Of these, 10 purses of 100 beads each, taken together make one wallet of 1000.

Let us make one wallet of 1000. 2 purses of 100 are left over.

The beads of both girls together 

make a total of 1211 beads.

Let us write the addition of 637 + 574 as shown alongside.

Th	H	T	U
1	1	1	
	6	3	7
+	5	7	4
1	12	11	11

◆ **Solve the sums given.**

Th	H	T	U
	5	4	8
+	9	5	7

Th	H	T	U
	6	5	0
+	8	7	9

Th	H	T	U
	4	8	9
+	5	1	1

Addition of four-digit numbers

Exercise

Add.

(1) 5642 + 4179

Th	H	T	U
5	6	4	2
+ 4	1	7	9

(2) 4984 + 775

Th	H	T	U
4	9	8	4
+	7	7	5

(3) 7850 + 29

Th	H	T	U
7	8	5	0
+		2	9

(4) 5689 + 135 + 87

Th	H	T	U
+			
+			

(5) 7 + 4895 + 137

Th	H	T	U
+			
+			

(6) 239 + 5310 + 30

Th	H	T	U
+			
+			

◆ **Add : 6785 + 7453**

Th	H	T	U
6	7	8	5
+ 7	4	5	3

TTh	Th	H	T	U
	1	1		
	6	7	8	5
+	7	4	5	3
1	4	2	3	8

First, we arrange the numbers vertically.

Add units to units. 5 + 3 = 8

Add tens to tens. 8T + 5T = 13T

13T means 1H and 3T.

Carry over the 1 H. 3 T remain.

Now, 7 H + 4 H = 11 H.

11H + 1H carried over = 12H.

12H means 1Th and 2H. Carry over 1Th. 2H remain.

Now, 6Th + 7Th = 13Th

13Th + 1Th carried over = 14Th.

Now, only one digit is written in each place.

Since 14Th means 1TTh and 4Th, we make a new place for the ten thousand. The new place will be marked 'TTh'.

The sum of the two numbers is 14238.

Exercise

1. Add the following.

(1) 7859 + 8546

TTh	Th	H	T	U
+				

(2) 8888 + 4576

TTh	Th	H	T	U
+				

2. Arrange vertically and add.

(1) 8509 + 3658 (2) 9076 + 4953 (3) 6841 + 7515

(4) 5709 + 7811 (5) 6854 + 3963 (6) 2847 + 9563

◆ **Add : 24558 + 37**

Amit, Rupesh and Sumit arranged the numbers vertically as shown below. Whose answer is correct ?

Amit

TTh	Th	H	T	U
+ 2	4	5	5	8
3	7			
6	1	5	5	8

Rupesh

TTh	Th	H	T	U
2	4	5	5	8
+			3	7
2	4	5	9	5

Sumit

TTh	Th	H	T	U
2	4	5	5	8
+ 3	7			
2	8	2	5	8

Rupesh's answer is correct. Amit and Sumit did not write the number 37 in the right place. 37 is a two-digit number. It has 3 tens and 7 units. There are no digits in the hundreds, thousands and ten thousands places. While adding numbers, we write units under units and tens under tens. Amit and Sumit's arrangements were wrong, therefore, their answers are also wrong.

Exercise

Add the following.

(1) 1719 + 4925 (2) 1157 + 900 (3) 2709 + 35

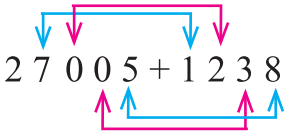
(4) 3752 + 485 (5) 8076 + 565 (6) 57004 + 3816

(7) 88709 + 165 (8) 27095 + 4807 (9) 51098 + 19803

(10) 300 + 150 + 70 + 35 (11) 49000 + 4200 + 620 + 54

(12) 4000 + 1600 + 800 + 80 + 320 + 32

◆ **Add the following numbers in the horizontal arrangement. Keep in your mind the number to be carried over.**



Exercise

Add horizontally.

(1) 4512 + 2395 (2) 92009 + 429 (3) 50325 + 152

Ayesha : We have understood how to add two numbers. However, I have a question.

Tai : What is it?

Ayesha : While adding numbers, why do we add first units, then tens, then hundreds? Why can't we add first hundreds, then tens and so on?

Tai : You can do it that way as well. I will show you both ways. Watch carefully. You will find the answer to your question.

Method 1

	H	T	U
	2	9	9
+	1	8	7
+	1	2	6
	4	19	22
	4+1	9+2	2
	5	11	2
	5+1	1	2
	6	1	2

Here, hundreds were added first, then tens and then units. Numbers were carried over twice to the hundreds from the tens place.

Method 2

	2	2	
	2	9	9
+	1	8	7
+	1	2	6
	6	21	22
	6	1	2

Here, numbers are added in the order of units, tens and then hundreds. A number in the tens place had to be carried over only once.

Ayesha : Now I understand. It is easier to start from the extreme right adding first units, then tens and hundreds, rather than from the extreme left starting with hundreds.

Remember : When adding numbers, it is more convenient to start by adding first units, then tens, hundreds and so on thus going on to digits of higher and higher place value.

4. Subtraction

Revision

(1) There are 452 teak trees and 321 neem trees in a forest. How many more neem trees must be planted in order to have the same number of neem trees as teak trees?

$$\begin{array}{r} 452 \\ -\ 321 \\ \hline 131 \end{array}$$

In order to find the answer, we have to count ahead from 321 to 452.
In other words, we have to subtract 321 from 452.
131 more neem trees have to be planted.

(2) Ajay has collected 207 seeds while Vijay has collected 165 seeds. How many more seeds does Ajay have than Vijay ?

We can find the answer by doing the following subtraction: 207 – 165.

T	H	U
1	10	
~~2~~	~~0~~	7
– 1	6	5
0	4	2

Let us subtract 5 units from 7 units. 2 remain.

We cannot subtract 6 tens from 0 tens. However, we have 2 hundreds of which we can borrow 1.

1 hundred remains in the hundreds place.

1 hundred is equal to 10 tens. Write them in the tens place. Subtracting 6 tens from 10 tens, 4 tens remain.

Now, subtract 1 hundred from 1 hundred, 0 remain.

The answer is 42.

Ajay has 42 more seeds than Vijay.

Exercise

1. Arrange vertically and subtract.

   (1) 586 – 425 (2) 465 –179 (3) 542 – 351

   (4) 754 – 287 (5) 500 – 365 (6) 502 – 307

2. If 400 – 100 = 300, solve 477 – 177. Write three subtraction problems with the answer 200.
3. Rajani buys a uniform worth ₹372 and a school bag worth ₹250. How much more does she spend on the uniform than on the bag ?
4. The answer to an addition is 915. One of the numbers is 427. Which is the other number ?
5. The answer to an addition is 915. Choose any number smaller than 800 as one of the numbers. Find the other number.
6. Using the numbers 534 and 252, write a subtraction word problem and solve it.

Subtraction of four-digit numbers without borrowing

◆ **There are 4526 men and 3214 women in a village. How many more men than women does the village have?**

Th	H	T	U
4	5	2	6
– 3	2	1	4
1	3	1	2

We shall subtract four-digit numbers using the same method that we used to subtract three-digit numbers.

There are 1312 more men than women.

◆ **Subtract horizontally.**

Th H T U **Th H T U**

6 7 8 9 – 5 4 3 2 = 1357

Even horizontally, units are subtracted from units, tens from tens, hundreds from hundreds and thousands from thousands.

Exercise

1. Subtract the following.

(1)

5	6	0	0
– 2	3	0	0

(2)

5	7	9	5
–	1	8	0

(3)

2	5	8	9
– 1	3	5	4

2. Arrange horizontally and subtract.

   (1) 5555 – 2222 (2) 8740 – 3520

   (3) 9586 – 432 (4) 3256 – 24

3. If 5000 – 2000 = 3000, then 5888 – 2888 = ?

4. Write three subtraction problems with the answer 2000.

5. Using the words ‘literate’ and ‘illiterate’ and the numbers 4765 and 2142, write a subtraction problem and solve it.

6. Whose subtraction is correct? Why?

Manda

5	6	8	7
–	2	5	
5	4	3	7

Nanda

5	6	8	7
– 2	5		
3	1	8	7

Kunda

5	6	8	7
–		2	5
5	6	6	2

Subtraction by borrowing

(1) Let us solve : 9072 – 7548.

Th	H	T	U
8	10	6	12
~~9~~	~~0~~	~~7~~	~~2~~
– 7	5	4	8
1	5	2	4

First we write the numbers vertically. We cannot subtract 8 units from 2 units. Therefore, we untie 1 ten from 7 tens. 6 tens remain in the tens place. 10 units from 1 ten plus 2 units make 12 units. 12 – 8 = 4 units.

6T – 4T = 2T. 2 tens remain in the tens place.

We cannot subtract 5 hundreds from 0 hundreds. Therefore, we untie 1 thousand from 9 thousands. 8 remain in the thousands place. 1 thousand equals 10 hundreds. 10 hundreds plus 0 hundreds make 10 hundreds.

10H – 5H = 5H.

8Th – 7Th = 1Th. The answer is 1524.

(2) Solve : 5000 – 967

Th	H	T	U
	9	9	
4	~~10~~	~~10~~	10
~~5~~	~~0~~	~~0~~	~~0~~
–	9	6	7
4	0	3	3

Here, we cannot subtract 7 units from 0 units. We must untie 1 ten. However, there are no numbers in the tens and hundreds places. Therefore, we will untie 1 thousand from the 5 thousands and obtain 10 hundreds. Then we untie 1 hundred from 10 and we obtain 10 tens. There are 9 hundreds left in the hundreds place. Of the 10 tens, we untie 1 ten. We get 10 units and 9 tens will remain in the tens place.

We write the units in the units column. 10 U – 7 U = 3 U; 9 T – 6 T = 3 T; 9 H – 9 H = 0 H; there is nothing to subtract from 4 thousands. The answer is 4033.

Exercise

1. Subtract.

(1)

Th	H	T	U
4	2	1	5
– 2	6	4	9

(2)

Th	H	T	U
7	1	2	3
– 5	7	8	4

(3)

Th	H	T	U
3	0	1	4
– 2	5	2	7

(4)

Th	H	T	U
6	3	2	5
–	7	5	8

2. Arrange vertically and subtract.

(1) 3245 – 1127 (2) 6007 – 2345 (3) 6037 – 4043

(4) 4752 – 2384 (5) 4004 – 3156 (6) 8042 – 3129

(7) 6524 – 2656 (8) 5305 – 2169 (9) 6052 – 2763

(10) 8235 – 4192 (11) 4000 – 3999 (12) 8020 – 5432

Subtraction of five-digit numbers without borrowing

◆ **In a village, ₹ 86,574 are collected through contributions for water conservation works. ₹ 74, 254 are spent. The remaining amount is to be used for ground water recharging. How much money remains for this work ?**

TTh	Th	H	T	U
8	6	5	7	4
– 7	4	2	5	4
1	2	3	2	0

Arrange the numbers in order, putting units under units, tens under tens, and so on.

Units are subtracted from units, tens from tens, hundreds from hundreds, thousands from thousands and ten thousands from ten thousands.

₹ 12,320 are available for ground water recharging.

Exercise

1. Subtract.

(1)

TTh	Th	H	T	U
1	7	4	3	2
– 1	4	3	2	1

(2)

TTh	Th	H	T	U
3	4	5	6	7
– 1	3	2	5	6

(3)

TTh	Th	H	T	U
5	9	3	2	5
– 3	7	1	2	4

(4)

TTh	Th	H	T	U
3	8	9	7	6
– 2	7	4	0	5

2. Arrange vertically and subtract.

(1) 13908 – 2705 (2) 23457 – 346

(3) 85679 – 74056 (4) 69876 – 54321

Subtraction of five-digit numbers by borrowing

◆ **Study the following example.**

TTh	Th	H	T	U
	14	9	9	
3	~~4~~	~~10~~	~~10~~	15
~~4~~	~~5~~	~~0~~	~~0~~	~~5~~
− 3	7	8	5	7
0	7	1	4	8

We cannot subtract 7 units from 5 units. Therefore, we need to untie 1 ten. Since there is nothing in the tens and hundreds places, we take 1 thousand from 5 thousands and obtain 10 hundreds. We borrow 1 hundred from 10 hundreds and get 10 tens. Borrowing 1 ten from 10 tens gives us 10 units. These 10 units, in addition to 5 units already there, brings the total to 15 units. We subtract 7 units from 15 units and complete the subtraction of the other digits in the proper order.

Exercise

Subtract.

(1)

TTh	Th	H	T	U
4	2	7	1	5
− 2	1	6	1	8

(2)

TTh	Th	H	T	U
5	6	8	2	4
− 3	2	4	6	5

(3)

TTh	Th	H	T	U
7	8	2	3	5
− 4	3	7	5	9

(4)

TTh	Th	H	T	U
3	4	4	2	9
− 1	5	2	1	9

(5)

TTh	Th	H	T	U
5	0	7	0	9
− 3	2	8	1	5

(6)

TTh	Th	H	T	U
6	7	0	0	0
− 3	8	7	6	5

(7)

TTh	Th	H	T	U
5	0	0	0	0
− 3	5	0	0	0

(8)

TTh	Th	H	T	U
8	4	5	4	0
− 2	4	8	9	9

(9)

TTh	Th	H	T	U
7	0	0	0	0
− 1	9	0	7	5

Addition and subtraction : Oral

Tai : Medha, Kunal, Johnathan, come here. Let's play a different game today. One of you will tell two numbers. The other two will add and subtract them. But, you must not use a pencil or a notebook.

Medha : Does that mean we have to solve them mentally or orally?

Tai : Yes. Johnathan, you may begin.

Johnathan : 28 and 53.

Kunal : The sum is 81. Because 28 and 3 equal 31. Then we add 50 to 31. This means we add 5 times 10 to 31. So, 41, 51, 61, 71, 81.

Medha : I solved it differently. I added 2 tens from 28 and 5 tens from 53. That gave 7 tens. The remaining 8 units and 3 units equal 11. This is added to 7 tens or 70. So, 70 + 10 + 1 = 81.

Johnathan : I used still another method. The nearest ten to 28 is 30. I added those, 10 at a time, to 53. 63, 73, 83. Since 30 is 2 more than 28, I subtracted 2. The answer is 81.

Tai : Excellent! Now let us try to subtract those two numbers.

Medha : I thought in reverse. I went backwards from 53 to 28. How many numbers do I need to go back, to reach 28? That would be the answer. I subtracted 3 from 53, leaving 50. Then I subtracted 2 tens, leaving 30. Then I subtracted 2 and was left with 28. This means I subtracted 3, 10, 10, 2; that is 25 altogether. Therefore, 53 – 28 = 25.

Kunal : Subtracting 28 from 53 means counting forward from 28 to 53. 2 added to 28 equals 30. 20 added to 30 equals 50. 3 more added to 50 equals 53. This means that we added 2, 20 and 3, that is 25, to 28, to get 53. Therefore, 53 – 28 = 25.

Tai : Excellent! All your methods of mental and oral addition and subtraction are absolutely correct. Do continue to add and subtract using your own methods. It will be very useful in the future.

Exercise

Add and subtract the following pairs of numbers orally, using your own methods. If your friend's method is different, try to understand it.

(1) 90, 50 (2) 35, 65 (3) 47, 23 (4) 16, 74 (5) 70, 38

5. Multiplication : Part 1

Revision

Eight dozen bananas were bought to give to the children.

Mahendra : One dozen bananas is 12 bananas. How many are 8 dozen?

Kamal : To find out, we must multiply 12 by 8. This multiplication can be done using the lattice method. So, let's use this method.

$12 = 10 + 2$

×	10	2
8	80	16

$$\begin{array}{r} 80 \\ +\ 16 \\ \hline 96 \end{array}$$

Eight dozen bananas means 96 bananas.

Kamal : Now answer this. Students are standing in 15 rows for a drill. There are 37 students in each row. How many students are there altogether?

Mahendra : I will tell you. To answer this, I will have to multiply 37 by 15.

×	30	7
10	300	70
5	150	35

$37 = 30 + 7$; $15 = 10 + 5$

$300 + 150 + 70 + 35 = 555$

There are 555 children in all on the field.

Exercise

Multiply the following.

(1) 53 × 8 (2) 25 × 9 (3) 86 × 5 (4) 75 × 11 (5) 41 × 14 (6) 68 × 12

Multiplying a three-digit number

Multiplying whole hundreds by a one-digit number

4 × 100, is also 4 × 1H = 4H = 400; Also, 6 × 100 = 600; 2 × 400 = 800.

◆ **₹ 300 were to be collected from each student for a picnic. 4 students paid on the first day. What was the total amount collected on that day?**

Kamal : To solve this, we will have to take 300, 4 times.

Mahendra : 300 is 3 hundreds. 4 times 3 hundreds, 3H × 4 = 12H, that is 1200.

Kamal : ₹ 1200 were collected on the first day.

✍ **Remember :** While multiplying whole hundreds by another number, multiply the hundreds digit by the other number and write two zeroes in front of the product.

◆ **If 40 students pay ₹ 300 each, what is the total amount of fees collected ?**

Tony : 40 times 300 = 3H × 40 = 120H = 12000. While multiplying 300 by 40, we can multiply the 3 by 4 to get 12; then we can place the 2 zeroes from 300 and one zero from 40 in front of the product 12.

Exercise

Carry out the following multiplications.

(1) 4H × 5 = 2000

(2) 20 × 3H = ☐

(3) 40 × 500 = ☐

(4) 800 × 60 = ☐

(5) 35 × 200 = ☐

(6) ☐ × 70 = 7000

(7) 7 H × 2 = ☐

(8) 20 × 300 = ☐

(9) 600 × 30 = ☐

(10) 900 × 20 = ☐

(11) 600 × 42 = ☐

(12) 15 × ☐ = 30000

Multiplying any three-digit number by a one-digit number

◆ **One set of textbooks costs ₹245. What is the cost of 8 such sets?**

Since the cost of 8 sets of textbooks will be eight times the cost of one set, we will multiply 245 by 8. Remember that 245 = 200 + 40 + 5.

×	200	40	5
8	1600	320	40

$$\begin{array}{r} 1600 \\ +\ 320 \\ +\ 40 \\ \hline 1960 \end{array}$$

Therefore, the cost of 8 sets is ₹1960.

Exercise

1. Multiply.

(1) 124 × 3 (2) 367 × 5 (3) 408 × 9

(4) 627 × 8 (5) 840 × 4 (6) 716 × 7

2. The cost of 1 chair is ₹650. What is the cost of 4 such chairs?

3. One small sack of rice costs ₹825. How much do 5 such sacks cost ?

Multiplying a three-digit number by a two-digit number

◆ **While planting rice, 28 rows have been planted with 244 seedlings in each row. How many seedlings have been planted ?**

There are 244 seedlings in each row. So, there must be 28 times as many seedlings in 28 rows.

We will multiply 244 by 28.

$244 = 200 + 40 + 4$

$28 = 20 + 8$

×	200	40	4
20	4000	800	80
8	1600	320	32

	4000
+	1600
+	800
+	320
+	80
+	32
	6832

6832 seedlings have been planted.

◆ **Multiply : 709 × 76**

$709 = 700 + 0 + 9$

$76 = 70 + 6$

×	700	0	9
70	49000	0	630
6	4200	0	54

	49000
+	4200
+	630
+	54
	53884

Hence, 709 × 76 = 53884

Exercise

1. Multiply.
   (1) 819 × 12 (2) 545 × 38 (3) 953 × 38
   (4) 610 × 45 (5) 407 × 55 (6) 781 × 90
2. The concessional rate of one English dictionary is ₹175. If 31 students in a class give their teacher that amount for the dictionary, how much money has the teacher collected?
3. A van carries 205 crates of mangoes. If each crate contains 48 mangoes, how many mangoes are there in the van?

6. Division : Part 1

Revision

(1) If 20 chocolates are divided equally between 5 children, how many does each child get ?

Let us carry out 20 ÷ 5.

$$5\overline{)\,20}\quad 4$$

$$-\ 20 \rightarrow 5 \times 4$$

$$00$$

Each child gets 4 chocolates.

(2) If 21 flowers are divided equally between 7 children, how many flowers does each child get ?

Let us carry out 21 ÷ 7.

$$7\overline{)\,21}\quad \square$$

$$-\ \square$$

$$\square$$

Each child gets ☐ flowers.

(3) Let us arrange 15 ÷ 5 in the form of dots. As 5 is the divisor, let us put 5 dots in one row and find out how many rows are needed for 15 dots.

• • • • • First row
• • • • • Second row
• • • • • Third row

Three rows are formed, therefore, 15 ÷ 5 = 3.

In the same way, solve the following problems by using dots.

(1) 8 ÷ 2	(2) 16 ÷ 4	(3) 18 ÷ 6	(4) 24 ÷ 8

The inter-relationship between division and multiplication

Shobha : Come, Rohit, let's put these rings on the stands! Let's put an equal number of rings on each stand!

Rohit : We have 12 rings in the box.

Shobha : There are three stands.

Rohit : Let us put the rings one by one on each stand.

Shobha : If 12 rings are distributed equally on three stands, how many rings should there be on each stand? Let us count.

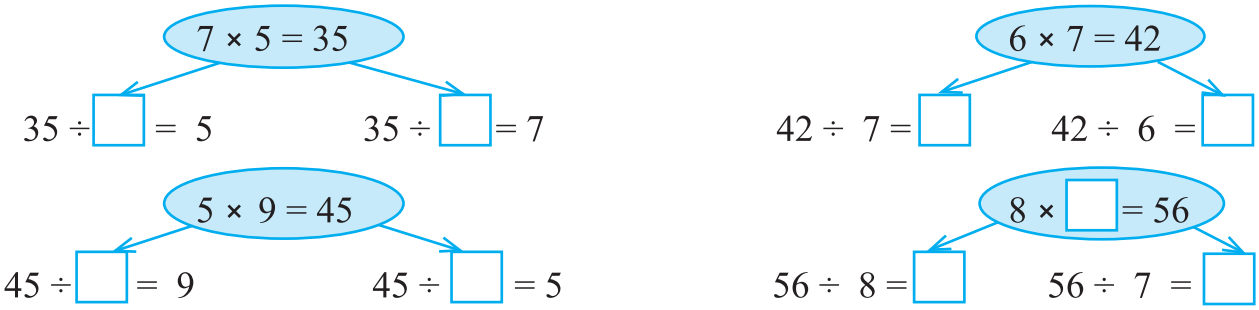
Rohit : You are asking us to divide. $12 \div 3 = 4$. Each stand will have 4 rings. Now tell me, if each stand has four rings, how many stands do we need for 12 rings?

Shobha : This is division again! $12 \div 4 = 3$. We need 3 stands.

Tai : Why is that so? Because, you see, $3 \times 4 = 12$ and $4 \times 3 = 12$, so, $12 \div 3 = 4$ and $12 \div 4 = 3$.

Rohit : This means that we can get two divisions from one multiplication. For example, from $8 \times 4 = 32$, we get $32 \div 8 = 4$ and $32 \div 4 = 8$. Is that right?

Tai : Excellent! You are absolutely right. Keep that in mind while solving the following problems.



Dividing a two-digit number by a single-digit number

◆ **Four farmers together bought 84 sacks of manure and wondered how to divide them equally among themselves.**

● **One farmer suggested the following method.**

Step 1
Each farmer gets 10 sacks.
10 | 10 | 10 | 10 = 40
4 × 10 = 40 sacks given.
84 – 40 = 44 remain.

Step 2
From the remaining 44 sacks, each farmer gets 10 sacks more.
10 | 10 | 10 | 10 = 40
40 sacks are given.
44 – 40 = 4 remain.

Step 3
Of the remaining 4 sacks, each farmer is given 1 sack.
1 | 1 | 1 | 1 = 4
4 sacks are given.
4 – 4 = 0 remain.

Therefore, each farmer gets a share of 10 + 10 + 1 = 21 sacks.

● Another farmer suggested another method :

Step 1
Each farmer is given 20 sacks.
20 | 20 | 20 | 20 = 80
4 × 20 = 80 sacks given.
84 – 80 = 4 sacks remain.

Step 2
Of the remaining 4 sacks,
each farmer is given 1 sack.
1 | 1 | 1 | 1 = 4
4 × 1 = 4 sacks given.
4 – 4 = 0 remain.

Therefore, each farmer gets a share of 20 + 1 = 21 sacks

◆ **Equal shares can also be made by carrying out a division as follows :**

```
4)84
```

The dividend is 84, or 8T and 4U. The divisor is 4.

```
  2
4)84
 −8↓
 04
```

Let us first distribute the tens. Let us see if 8T can be divided by 4. Let us say the 4 times table. Four twos are eight. So, we can directly distribute 2T each. Let us subtract those. Each gets 2T, so, let us write 2 above the line in the tens place of the quotient. We subtract 8T from 8T. 0T remain.

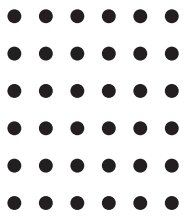
```
  21
4)84
 −8↓
 04
 − 4
 00
```

Next, let us distribute the 4 units. 4 times 1 is 4, so we subtract 4 times 1 from 4. Each gets 1U. Let us write 1 above the line in the units place of the quotient.

After subtracting 4 units, 0 remain. The quotient is 21.

◆ **The teacher gave Rohit, Shobha and Madhavi 36 little bindis to stick on a piece of paper. She asked them to put an equal number of bindis in each row and then to count how many rows were formed.**

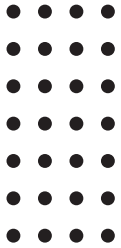
Rohit's work



$$\begin{array}{r} 6 \\ 6\overline{)36} \\ -\,36 \\ \hline 00 \end{array} \rightarrow 6 \times 6$$

Rohit said, "I stuck 6 bindis in one row so I got 6 rows. It means that $36 \div 6 = 6$."

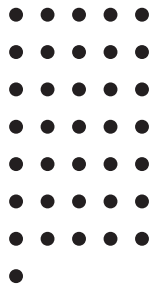
Shobha's work



$$\begin{array}{r} 9 \\ 4\overline{)36} \\ -\,36 \\ \hline 00 \end{array} \rightarrow 4 \times 9$$

Shobha said, "I put 4 bindis in 1 row and 9 rows were formed. It means $36 \div 4 = 9$."

Madhavi's work



$$\begin{array}{r} 7 \\ 5\overline{)36} \\ -\,35 \\ \hline 01 \end{array} \rightarrow 5 \times 7$$

Madhavi said, "I put 5 bindis in 1 row, so 7 full rows were formed and 1 bindi remained."

Now you try to form rows of 8 bindis each, using 36 bindis.

◆ **Grandfather bought a packet of sweets and asked Rasika, Rohan and Rashmi to share them equally.**

Rohan : Let me first count the sweets. 1, 2, …, 57, 58. There are 58 sweets.

Rasika : Grandfather, you told us to share the sweets equally. It means you are asking us to do a division.

Rashmi : Shall we distribute 1 sweet each at a time?

Rasika : No, that will take too long. Let us distribute 10 each first. 10 sweets each for 3 of us means that 30 sweets have been distributed. $58 - 30 = 28$ sweets left.

Rohan : Of these 28, let us distribute 9 sweets each to the three of us. 9 threes 27. $28 - 27 = 1$ sweet left over.

Rashmi : That means $10 + 9 = 19$ sweets each. But there's still one sweet left over!

Rasika : Grandfather, why don't you take the remaining sweet? Then, we will not fight over it.

Grandfather : Correct! You have carried out the division well. However, to divide big numbers quickly, we use the arrangement given below.

$3\overline{)58}$

$$\begin{array}{r} 1 \\ 3\overline{)58} \\ -3\downarrow \\ \hline 28 \end{array}$$

$$\begin{array}{r} 19 \\ 3\overline{)58} \\ -3\downarrow \\ \hline 28 \\ -27 \\ \hline 01 \end{array}$$

58 is the dividend and 3 is the divisor.

To divide 5T between 3, say the 3 times table. 3 ones are 3. 3 twos are six, 6 > 5, which means we can divide by 3 once. Each gets 1T. 3T are subtracted from 5T and 2T remain.

Let us convert them into units for division. 20 units from 2T and the 8 units already there, that gives us 28 units for distribution. 3 nines are 27, 3 tens are 30 and 30 > 28. Therefore, while dividing 28 units between three, each gets 9 units at the most. Let us subtract 27 units from 28 units. 1 unit remains. The quotient is 19.

Rohan : Grandpa, you have given us an easy method. It makes division quicker.

Exercise

Carry out the divisions. Write down the divisor, dividend, quotient and remainder.

(1) $5\overline{)75}$ (2) $4\overline{)52}$ (3) $3\overline{)44}$ (4) $8\overline{)92}$ (5) $6\overline{)85}$ (6) $7\overline{)92}$

✍ **Remember :** While dividing, the divisor is subtracted from the dividend the greatest possible number of times. That is why the remainder is always smaller than the divisor.
This method is used while dividing a large number and when the table of the divisor up to 10 is not enough.

◆ Bunty has to give laddoos to four neighbours. There are 21 laddoos in the jar.

Bunty took four plates and put the laddoos one by one in each. He could put 5 laddoos in each plate and 1 was left over.
This means that while dividing 21 laddoos into four equal parts, we get 5 laddoos in each part and 1 laddoo remains.

This division can be shown by arranging the numbers vertically as follows.

$$4\overline{)21}$$

The dividend 21 has 2T and 1U.

2T cannot be divided into four parts in that form.

$$\begin{array}{r} 0 \\ 4\overline{)21} \\ -\,0\downarrow \\ \hline 21 \end{array}$$

Therefore, let us give each person 0T. Write a 0 in the tens place in the quotient.

Now, 20 units from 2T and 1 unit already present make 21 units. Let us divide these 21 units by 4.

$$\begin{array}{r} 05 \\ 4\overline{)21} \\ -\,0\downarrow \\ \hline 21 \\ -\,20 \\ \hline 01 \end{array}$$

4 fives are 20, 4 sixes are 24, 24 > 21, so each gets 5 units at the most. Let us subtract 20 from 21.

21 – 20 = 1.

The remainder is 1 unit and the quotient is 5 units.

Exercise

Divide the following.

(1) 33 ÷ 5 (2) 41 ÷ 8 (3) 51 ÷ 7 (4) 80 ÷ 9

Dividing zero by a non-zero number

Bharat, Sarla and Julie stood near a guava tree. Bharat said, “I’ll put a bag around my neck and climb up to get the ripe guavas. Let us all share them.” He climbed up the tree and Sarla and Julie waited below.

Julie : If Bharat picks 6 guavas, we'll get 2 each.

Sarla : If he gets ten, we'll get 3 each, and there will be one left. Let's give him that one.

(Bharat climbed down from the tree. He looked disappointed.)

Julie : How many guavas did you pick ?

Bharat : There wasn't a single guava ripe enough to eat. My bag is empty.

Sarla : Since you picked 0 guavas, we will get 0 guavas each. That's alright. At least we learned that 0 divided by 3 is 0!

Julie : If we had to divide zero guavas between 7 or 8 people, we would still have zero guavas each.

When zero is divided by any other number, that is,
by any non-zero number, the quotient is always zero.

◆ **If there are zero laddoos on a plate, no matter how many children there are, each child will get zero laddoos.**

$$\begin{array}{r} 0 \\ 9\overline{)\,0} \\ -\,0 \\ \hline 0 \end{array} \qquad \begin{array}{r} 0 \\ 7\overline{)\,0} \\ -\,0 \\ \hline 0 \end{array}$$

◆ **Divide 80 ÷ 4.**

$$\begin{array}{r} 20 \\ 4\overline{)\,80} \\ -\,8\downarrow \\ \hline 00 \\ -\,0 \\ \hline 00 \end{array}$$

First let us divide the tens equally between 4. Each gets 2T.
0T remain.

0 units are to be divided among 4 people. 0 divided by any other number is 0. Therefore, let us write 0 in the units place in the quotient. The quotient is 20. If the 0 is not written in the units place of the quotient, instead of 20, it will be read as 2 which would be wrong.

This shows that when 80 objects are equally divided among 4 people, each person gets 20 objects.

Exercise

Divide the following.

(1) 50 ÷ 5 (2) 90 ÷ 9 (3) 60 ÷ 3 (4) 40 ÷ 2

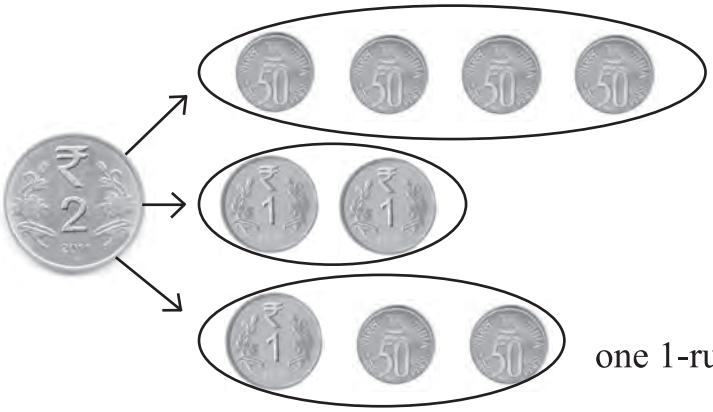
7. Coins and Notes

Exchanging big coins and notes for smaller ones

◆ **The change for 1 rupee is**

two coins of 50 paise

◆ **The change for 2 rupees is**



four 50 paise coins

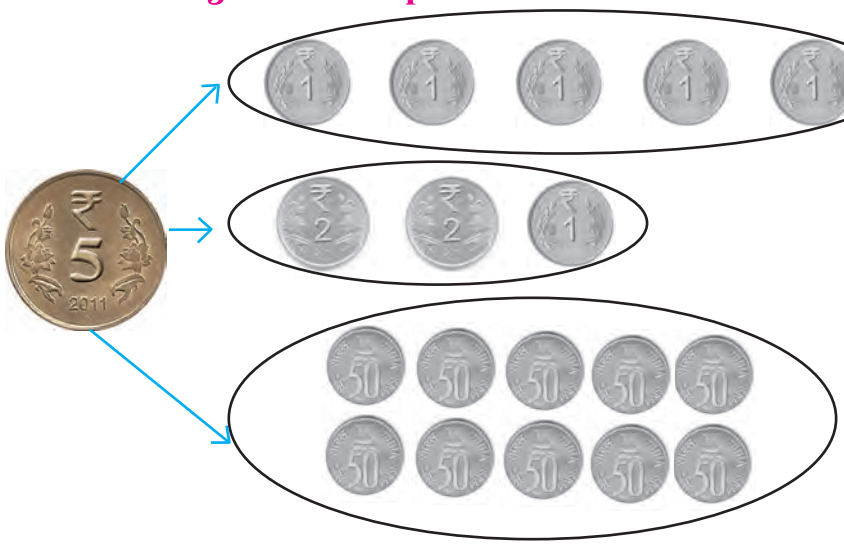
or

two 1-rupee coins

or

one 1-rupee coin and two 50 paise coins.

◆ **The change for a 5-rupee coin is**



☐ one-rupee coins

or

☐ 2-rupee coins

and ☐ 1-rupee coin

or

☐ 50 paise coins

◆ **The change for a 10-rupee coin is**

☐ 50 paise coins

☐ 1-rupee coins

☐ 2-rupee coins

☐ 2-rupee coins and ☐ 1-rupee coins

☐ 5-rupee coins

Mother : Nandu, go to the shop and get change for this 500-rupee note.

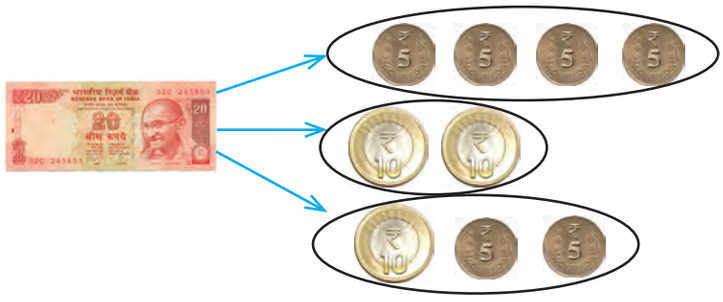
The change brought by Nandu

◆ 

₹ 20 + ₹ 20 + ₹ 10

₹ 10 + ₹ 10 + ₹ 10 + ₹ 10 + ₹ 10

The change for a 50-rupee note is two 20-rupee notes and one 10-rupee note or five 10-rupee notes. Describe other ways of getting change for the note.

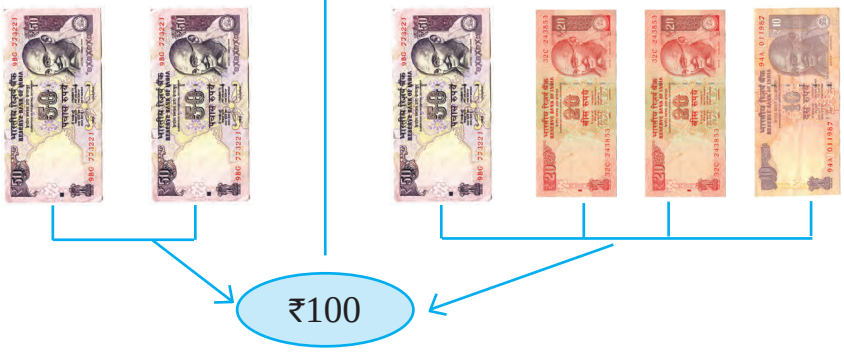
◆ 

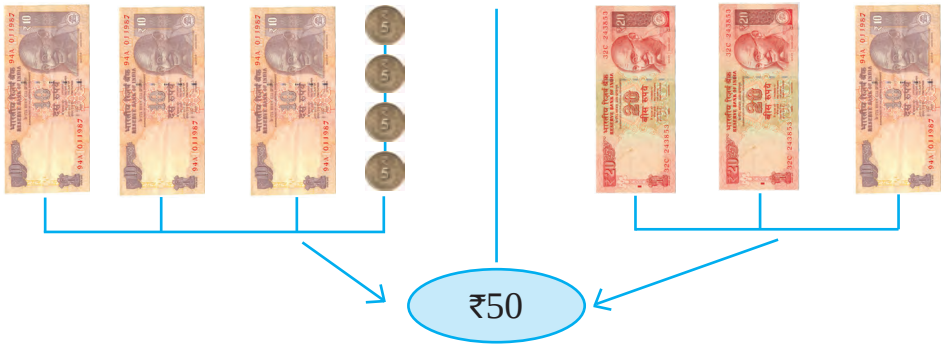
The change for a 20-rupee note is four 5-rupee coins or two 10-rupee coins or one 10-rupee coin and two 5-rupee coins. Describe other ways of getting change for the note.

◆ **The change for a 2000-rupee note is**

- ☐ 20-rupee notes
- ☐ 50-rupee notes
- ☐ 100-rupee notes
- ☐ 500-rupee notes

Small notes and coins can also be exchanged for a single bigger note or coin.





Exercise

1. Write the correct number in the square.

(1)
- ☐ 5-rupee notes
- ☐ 10-rupee notes
- ☐ 2-rupee coins and ☐ 10-rupee coins

→ one ₹50 note

(2)
- ☐ 5-rupee notes
- ☐ 10-rupee notes and ☐ 20-rupee notes
- ☐ 20-rupee notes
- ☐ 50-rupee notes

→ one ₹100 note

(3) ☐ 10-rupee notes
☐ 20-rupee notes
☐ 50-rupee notes
☐ 100-rupee notes
☐ 500-rupee notes

→ one ₹2000 note

2. Ajay has 9 notes. The total value of those notes is ₹500. Which notes does Ajay have and how many of each?
3. Swati has some 100-rupee notes, 50-rupee notes and 20-rupee notes. If the total value of the notes is ₹500, how many notes of each denomination does Swati have?
4. Nandu has 6 notes. The total value of the notes is ₹1000. Which notes does Nandu have and how many of each?
5. Salma has 11 notes. If the total value of the notes is ₹1000, which notes does Salma have and how many of each?

◆ 

→ 10 notes of 10 rupees

→ 2 notes of 50 rupees

The value of one 100-rupee note is 10 times the value of a 10-rupee note or twice the value of a 50-rupee note.

◆ 

→ ₹100 + ₹100 + ₹100 + ₹100 + ₹100

→ 10 notes of 50 rupees

The value of a 500-rupee note is five times the value of a 100-rupee note or 10 times the value of a 50-rupee note.

◆ 

→ 4 notes of 500-rupees

→ 20 notes of 100-rupees

The value of a 2000-rupee note is ☐ times that of a 500-rupee note.

The value of a 2000-rupee note is ☐ times that of a 100-rupee note.

8. Measuring Time

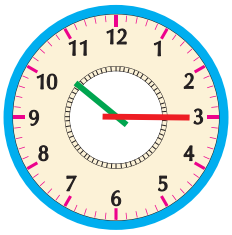
Telling the time : Revision

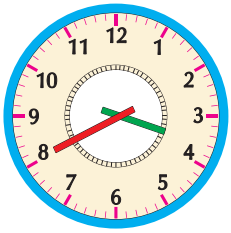
What is the time?

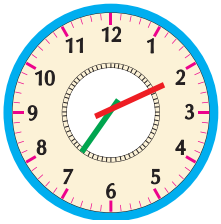
The hour hand is between 1 and 2
and the minute hand is at 6.
It means that the time is 30 minutes past 1.

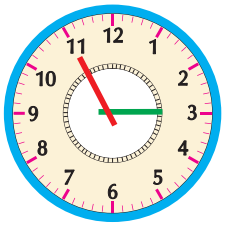
◆ **Write the time shown by the clocks below in hours and minutes.**

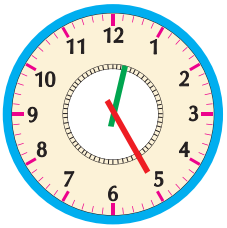
45 minutes past 1



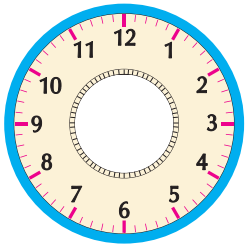




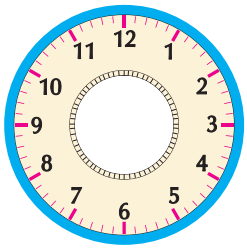




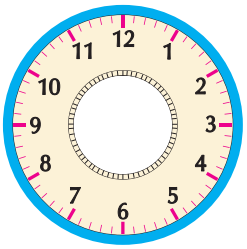
◆ **Read the time given in the boxes below and draw the position of the clock hands.**



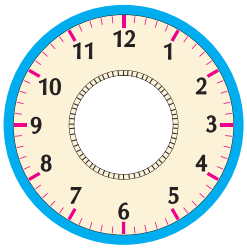
10 minutes past 5



15 minutes past 12



35 minutes past 8

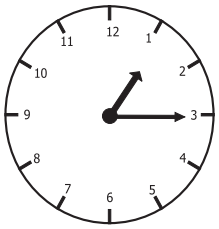


25 minutes past 4

◆ **Make a model of a clock. Arrange an exhibition of the models of clocks.**

Using the terms ‘a quarter past’, ‘half past’ and ‘a quarter to’

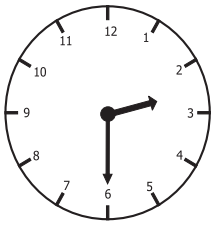
1 hour = 60 minutes
Half an hour = 30 minutes
A quarter of an hour = 15 minutes
Three quarters of an hour = 45 minutes
After 12 o’clock, we start measuring time again from 1.



The hour hand is between 1 and 2 and the minute hand is on 3. It is 15 minutes past 1. One hour and a quarter hour has passed.
It is a quarter past 1.

The hour hand is between 2 and 3 and the minute hand is on 3. It is 15 minutes past 2. Two hours and a quarter have passed.
It is a quarter past 2.

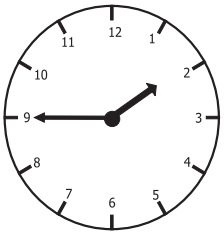
In the same way, we also say ‘quarter past 3’, ‘quarter past 4’, …,‘quarter past 12.’



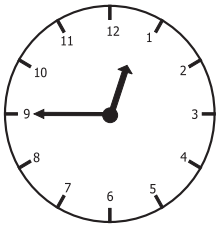
It is thirty minutes past 2. When two hours and a half hour have passed, we say it is half past 2.
Thirty minutes past 1 is the same as half past 1.

It is 30 minutes past 3 in the clock.
3 full hours and one half hour have passed.
It is half past 3.

In the same way, we can say ‘half past 4’, ‘half past 5’, …, ‘half past 12.’



It is 45 minutes past 1.
A quarter of an hour less than 2 can also be read as ‘a quarter to 2’.



It is 45 minutes past 12.
This can also be read as ‘a quarter to 1’.

In the same way, we also say, ‘a quarter to 3’, ‘a quarter to 4’, …, ‘a quarter to 12’.

Exercise

Fill in the blanks.

(1) Quarter past 3 = 15 minutes past 3

(2) 15 minutes past 4 = ... 4.

(3) Quarter past 5 = ☐ minutes past ☐

(4) 45 minutes past 6 = ... 7.

(5) Quarter to 10 = ☐ minutes past ☐

(6) 30 minutes past 9 = ... 9.

The Calendar : Revision

8	August 2014	Calendar		Shravan-Bhadrapad Shaka 1936	
Sun	31	3	10	Shrikrishna Janmashtami 17	24
Mon		4	11	Gopalkala 18 Parvardin	25
Tue		5	12	19	26
Wed		6	Sankashta Chaturthi 13	20	27
Thu		7	14	21	28
Fri	1	8	Independence Day 15	22	Ganesh Chaturthi 29
Sat	2	August Krantidin 9	16	23	30

◆ **Study this page of a calendar and answer the questions.**

(1) How many days does August have?

(2) This year, on which day of the week is Independence Day?

(3) How many Mondays does this month have?

(4) Which dates fall on Thursdays?

(5) In August, which days occur five times?

(6) How many days pass before the same day of the week is repeated?

Measuring a period of time

(1) Surekha went to her uncle's village in May. She went swimming every day from the 9th to the 25th of May. How many days did Surekha go swimming?

To find it out, let us count the days from the 9th to the 25th.

9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Surekha went swimming for 17 days.

(2) John's school vacation started on the 5th of May and school started again on the 12th of June. How many days' vacation did John have?

The vacation started on the 5th of May. May has 31 days.

After the 4th of May up to the 31st, there are 31 – 4 = 27 days.

School started on the 12th of June. It means that the vacation continued from the 1st of June to the 11th of June, for 11 days.

The period of the vacation was of 27 + 11 = 38 days.

Exercise

Solve the following problems.

(1) In a certain year, the Ganesh festival started on the 9th of September and ended on the 18th of September. For how many days was the festival celebrated?

(2) Seema reached her hometown for Deepawali on the 12th of November and stayed there till the 1st of December. How many days did she spend there?

(3) A school trip was from the 5th of December to the 10th of December. How many days was it?

(4) Shyamrao had milk delivered to his home from the 5th of November to the 5th of December. How many days was milk delivered?

The Leap Year

2	February 2012	Calendar		Magh - Phalgun Shaka 1933	
Sun		Eid-e-Meelad 5	12	Chhatrapati Shivaji Maharaj Jayanti 19	26
Mon		6	13	Mahashivratri 20	27
Tue		7	14	21	28
Wed	1	8	15	22	29
Thu	2	9	16	23	
Fri	3	Sankashta Chaturthi 10	17	24	
Sat	4	11	18	25	

Suhas : Rajesh, we both have birthdays this month.

Rajesh : Yes, but my birthdate comes only once every four years.

Suhas : How is that possible?

Rajesh : My birthday is on the 29th of February. And, this date only comes once every four years!

Tai : What are you discussing?

Suhas : Tai, Rajesh says that the 29th of February only comes once in four years. How is that possible?

Tai : He's right. Usually, if the number denoting a year is divisible by four, then that year has 29 days in February. That year is called a leap year.

Suhas : It means that 2008 and 2012 were leap years and 2016 and 2020 will be leap years as well, correct?

2	February 2014	Calendar		Magh Shaka 1935	
Sun		2	9	16	23
Mon		3	10	17	24
Tue		4	11	Angarak Sankashta Chaturthi 18	25
Wed		5	12	Chhatrapati Shivaji Maharaj Jayanti 19	26
Thu		6	13	20	Mahashivratri 27
Fri		7	14	21	28
Sat	1	8	15	22	

Tai : Correct! But century years like 1900 and 2000 follow a slightly different rule. A century year is a leap year only if the number denoting it is divisible by 400.

Rajesh : That means 2000 was a leap year.

Suhas : And, 2100 is not divisible by 400, so it cannot be a leap year, right?

Tai : Yes, 2100 and 2200 will not be leap years. However, 2400 will be a leap year.

Rajesh : So, then, leap years have one day more than other years!

Tai : Yes. A leap year has 366 days. Other years have 365 days.

9. Word Problems: Addition and Subtraction

Addition

◆ **Aunt Uma bought 5 kilograms of toordal for ₹ 345 and 20 kilograms of rice for ₹ 789. How much money did Aunt Uma spend?**

		Method
What information is given?	The cost of toordal and rice is given.	Cost of dal ₹ 345 Cost of rice ₹ 789
What is asked?	Total cost.	
What method should be used?	Addition	$\begin{array}{r} 345 \\ +\ 789 \\ \hline 1134 \end{array}$
Aunt Uma spent ₹ 1134 in all.		

◆ **The cost of a refrigerator is ₹ 13,750 and the cost of a cupboard is ₹ 8,999. How much must we pay the shopkeeper to buy them both ?**

$$\begin{array}{rrl} & 1\,1\,1 & \\ & 1\,3\,7\,5\,0 & \text{Cost of the refrigerator} \\ + & 8\,9\,9\,9 & \text{Cost of the cupboard} \\ \hline & 2\,2\,7\,4\,9 & \text{Amount to be paid to the shopkeeper.} \end{array}$$

The shopkeeper must be paid ₹ 22, 749.

Exercise

(1) Baburao planted 143 sweet lime trees and 156 chikoo trees in his orchard. How many trees did he plant in all ?

(2) Priyanka bought books worth ₹ 245 and notebooks worth ₹ 178. How much did she spend altogether ?

(3) There are 1,230 story-books and 150 poetry books in a library. How many books are there in the library altogether ?

(4) If 1,310 children, 1,505 women and 790 men came to watch the circus, how many people came to watch the circus altogether ?

(5) Ajay deposited ₹ 18,000 in one bank and ₹ 15,000 in another. What is the total amount of money be deposited in the banks ?

Subtraction

◆ **There are 1,473 Marathi books and 586 Hindi books in a school library. Which language has more books than the other and how many more are there ?**

		Method
What information is given?	Marathi books 1, 473 Hindi books 586	
Which language has more books?	Marathi	
What is asked?	How many more books in which language ?	
What method should be used?	Subtraction	

	13	16	
0	~~3~~	~~6~~	13
~~1~~	~~4~~	~~7~~	~~3~~
–	5	8	6
0	8	8	7

There are 887 more Marathi books than Hindi books.

◆ **The sum of two numbers is 31,426.**
One of the numbers is 17,548.
What is the other number ?

The other number is 13,878

2	10	13	11	
	~~0~~	~~3~~	~~1~~	16
– ~~3~~	~~1~~	~~4~~	~~2~~	~~6~~
1	7	5	4	8
1	3	8	7	8

Exercise

(1) Abdul had 720 beads. He sold 648 of them. How many beads does he have left?

(2) Joseph bought tables worth ₹6,350 and chairs worth ₹3,800. How much more did the tables cost than the chairs ?

(3) Ragahvrao bought seeds worth ₹3,587 and fertilizers worth ₹4,655. How much more than the seeds did the fertilizers cost?

(4) The reading of the electricity meter in Nisha's house was 03452 on the 1st of June. On the 1st of July, it was 03531. How many units of electricity were used in June?

(5) In a census taken in 2001, the population of a village was 62,947. The census of the year 2011 listed the population as 74,405. How much did the population increase in the meantime?

Addition and subtraction: Mixed problems

◆ **There are 42,306 trees in a forest. Of these 23,479 are teak trees and 16,675 are subabhul trees. How many other trees are there in the forest?**

		Method
What is asked?	The number of other trees	
What information is given?	Total trees : 42,306 Teak trees : 23,479 Subabhul trees : 16,675	
What will you do first?	Add teak and subabhul trees.	$\begin{array}{r} 2\ 3\ 4\ 7\ 9 \\ +\ 1\ 6\ 6\ 7\ 5 \\ \hline 4\ 0\ 1\ 5\ 4 \end{array}$
What will you do next?	Subtract this sum from the total number of trees	$\begin{array}{r} \ \ \ \ 2\ 10\ \ \\ 4\ 2\ \not{3}\ \not{0}\ 6 \\ -\ 4\ 0\ 1\ 5\ 4 \\ \hline 0\ 2\ 1\ 5\ 2 \end{array}$
There are 2,152 other trees in the forest.		

Exercise

(1) Rohan spent ₹ 27,658 for purchasing computers and ₹ 16,478 on a printer and scanner. Packing and transporting the goods cost extra. Rohan spent a total of ₹ 47,000. How much did he spend on packing and transport?

(2) In a nursery, there were 32,140 saplings. 12,789 were mango saplings and 10,423 were teak saplings. How many other saplings were there?

(3) The seating capacity of a playground is 20,750. If there were 8,500 women and 11,200 men present for a function, how many seats remained vacant?

(4) Rambhau had ₹ 15,000. He bought fodder worth ₹ 8,570 and other animal feed worth ₹ 4,950. How much money did he have left?

(5) Lalitaben donated ₹ 75,000 to a hospital. ₹ 47,500 were used for equipment and ₹ 18,240 were used for medicines. How much money still remains?

Making problems based on the given information and solving them

◆ **Make an addition problem based on the given information and solve it.**

Given information : Number of men 1,450; number of women 1,270

Example : There are 1,450 men and 1,270 women working in a company. How many people work in the company in all?

	1 4 5 0	Men
+	1 2 7 0	Women
	2 7 2 0	Total

In all, 2,720 people work in the company.

◆ **Make a subtraction problem based on the given information and solve it.**

Given information : Cost of one motorcycle : ₹ 47,580

Cost of another motorcycle : ₹ 50,240

Example: 'A' company's motorcycle costs ₹ 47,580 and 'B' company's motorcycle costs ₹ 50,240. Which company's motorcycle is more expensive and by how much?

	5 0 2 4 0	Rupees
−	4 7 5 8 0	Rupees
	0 2 6 6 0	Rupees

'B' company's motorcycle costs ₹ 2660 more.

Exercise

Based on the given information, make one addition and one subtraction problem each and solve the problems.

(1) Cost of one company's washing machine : ₹ 19,999; cost of another company's washing machine : ₹ 21,550.

(2) ₹ 3,900 worth of fodder and ₹ 2,570 worth of other animal feed.

(3) The population of one town, 76,560; the population of another town, 57,940.

(4) The flight ticket from Mumbai to Tokyo, ₹ 35,840; the flight ticket from Tokyo to Los Angeles, ₹ 38,760.

(5) Cost of a new motorcycle, ₹ 46,530; cost of an old motorcycle, ₹ 8,500.

(6) 17,500 maths books; 13,250 science books.

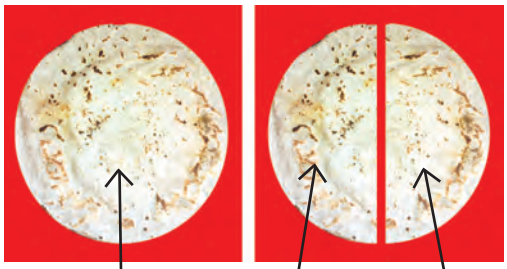
(7) The bus from Kolhapur to Mumbai passes through Pune. The distance from Pune to Mumbai is 192 kilometres. The distance from Pune to Kolhapur is 235 kilometres.

(8) The capacity of one water tank is 38,500 litres; the capacity of another water tank is 22,750 litres.

10. Fractions

The meaning of fractions. Reading and writing fractions :

◆ Half



Whole bhakari | Half bhakari | Half bhakari

One bhakari has to be divided equally between two people. When it is divided into two equal parts, each of the parts is one half of the whole bhakari.

When any object is divided into two equal parts, then each of the parts is one half of that object. One half of the whole is shown by the fraction $\frac{1}{2}$.

◆ Quarters

Whole bhakari | Quarter bhakari

One bhakari has to be divided equally between four people. When it is divided into four equal parts, and one part is given to each person, each share is a quarter of the whole bhakari.

When any object is divided into four equal parts, each of those parts is a quarter of the whole.

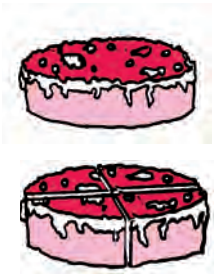
One quarter is shown by the fraction $\frac{1}{4}$.

Numbers such as $\frac{1}{2}$, $\frac{1}{4}$ are called fractions. In a fraction, the number written above the line is the numerator and the number written below the line is the denominator. In the fraction $\frac{1}{2}$, the numerator is 1 and the denominator is 2.

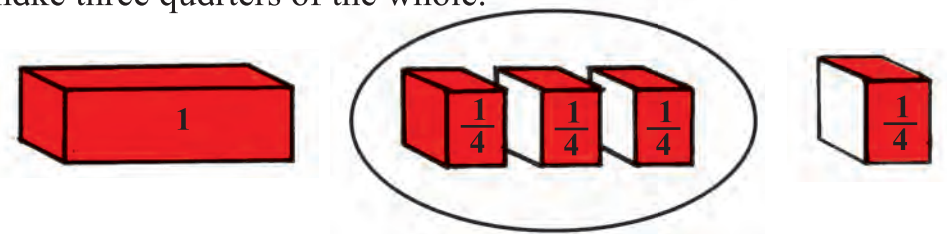
$\frac{1}{2}$ is read as 'one half' or 'one upon two.'

$\frac{1}{4}$ is read as 'one fourth' or 'one quarter' or 'one upon four'.

◆ Three quarters



Three children bought a cake and asked their grandfather to divide it equally among the four of them including himself. Grandfather divided the cake into four equal pieces. Each piece is one quarter of the cake. Grandfather gave Raju, Rani and Pinky one quarter each and kept the last quarter for himself. Grandfather gave his two granddaughters, quarter + quarter, that is, half of the cake. He gave his three grandchildren quarter + quarter + quarter, three quarters of the cake. One half and one quarter also make three quarters of the whole.



When an object is divided into 4 equal parts, 3 of its parts taken together are called three quarters. This is shown by the fraction $\frac{3}{4}$.

$\frac{3}{4}$ is read as 'three fourths' or 'three upon four.'

Some more fractions

Here, a circular disc is divided into 5 equal parts and 3 of its parts are coloured. The coloured part of the disc is shown as $\frac{3}{5}$.

$\frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ together make $\frac{3}{5}$. That is, $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$

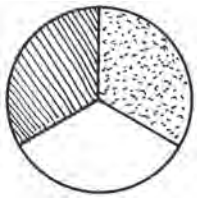
When an object is divided into 5 equal parts and three of them are taken, that part is shown as $\frac{3}{5}$. Here, the denominator 5 shows how many equal parts are made of the whole, and the numerator 3 shows how many of those are taken.

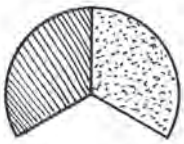
This strip has been divided into 7 equal parts and 2 parts are coloured, which means $\frac{2}{7}$ of the strip is coloured. Here, the number 7 gives the total number of equal parts made, and 2 gives the number of parts taken. In the fraction $\frac{2}{7}$, 2 is the numerator and 7 is the denominator.

You can work out the meanings of fractions such as $\frac{8}{11}$ or $\frac{7}{13}$ just like the fractions $\frac{3}{4}$, $\frac{3}{5}$ and $\frac{2}{7}$.

Different meanings of fractions

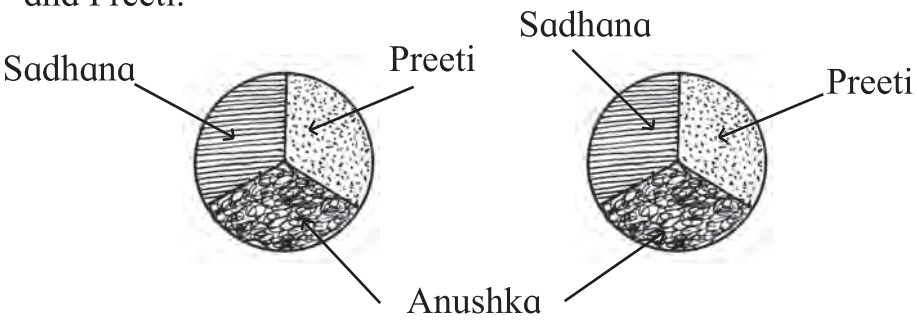
Amita was given two parts out of three equal parts of a bhakari.



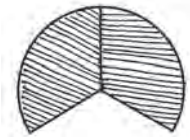


This means Amita was given $\frac{2}{3}$ of one bhakari.

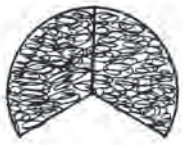
Two bhakaris of the same size as Amita's have to be divided equally between three girls, Sadhana, Anushka and Preeti.



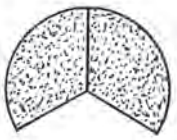
The two bhakaris were divided into three equal parts each. One part of each bhakari was given to Sadhana, Anushka and Preeti.



Sadhana's share : $\frac{1}{3} + \frac{1}{3}$



Anushka's share : $\frac{1}{3} + \frac{1}{3}$



Preeti's share : $\frac{1}{3} + \frac{1}{3}$

Each girl was given a $\frac{1}{3}$ part twice.

That is, each got $\frac{1}{3} + \frac{1}{3}$.

However, Amita's share and that of each of the other three girls is the same.

Hence, we can see that $\frac{2}{3} = \frac{1}{3} + \frac{1}{3}$

Note that when two bhakaris are divided between three girls, each girl gets $\frac{2}{3}$ bhakaris.

It means that $\frac{2}{3}$ can be explained in three different ways.

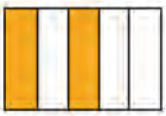
- 2 parts out of 3 equal parts of an object.
- $\frac{1}{3}$ twice; which means $\frac{1}{3} + \frac{1}{3}$; which also means $2 \times \frac{1}{3}$; or two times $\frac{1}{3}$.
- Equal division of two objects between three people.

Exercise

1. Complete the following table.

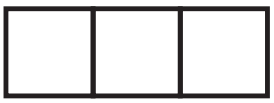
Fractions	Addition	Multiplication	How many times
$\frac{4}{5}$	$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	$\frac{1}{5} \times 4$	4 times $\frac{1}{5}$
$\frac{3}{4}$			
$\frac{3}{7}$			
$\frac{5}{6}$			

2. Write the shaded and unshaded parts of the shapes below as fractions and in words.

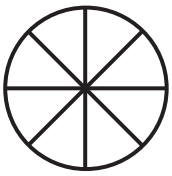
Shape	Shaded fraction	Read as	Unshaded fraction	Read as
	$\frac{3}{8}$	Three upon eight	$\frac{5}{8}$	Five upon eight
				
				
				
				

✍ **Remember :** In the first shape given above, the shaded part is $\frac{3}{8}$ and the unshaded part is $\frac{5}{8}$. Both together form $\frac{8}{8}$ or the whole shape. The same thing can also be seen in the other shapes.

3. Write the given fraction in the blue box and colour an equal part in the given shape.

(1) 

Two thirds ☐

(2) 

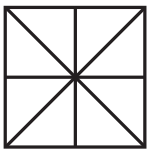
Four upon eight ☐

(3) 

Five sixths ☐

(4) 

Two upon seven ☐

(5) 

Seven upon eight ☐

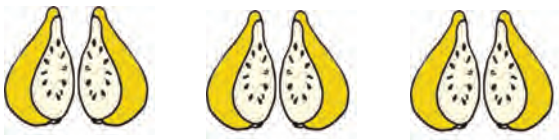
4. Write the numerator and denominator of each of the following fractions.

$\frac{3}{7}$, $\frac{8}{11}$, $\frac{4}{5}$, $\frac{7}{13}$, $\frac{2}{9}$, $\frac{5}{8}$

Mixed fractions

◆ **3 guavas have to be shared equally between 2 people. We can do this in two ways.**

Method 1



Divide each guava equally into two. Give each person 1 part, that is, $\frac{1}{2}$, of each guava.

In this way, each person gets three halves.

Therefore, each person will have $\frac{1}{2} \times 3 = \frac{3}{2}$ guavas.

Method 2

First, give each person 1 whole guava. Then divide the remaining guava into two equal parts. Give each person one part of the third guava, that is, $\frac{1}{2}$ guava.

Each person gets 1 whole and $\frac{1}{2}$ guava.

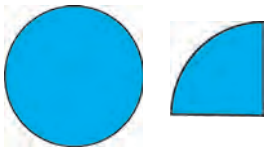
Each has $1 + \frac{1}{2}$ guava.

$1 + \frac{1}{2}$ is written as $1\frac{1}{2}$.

This shows that $\frac{3}{2} = 1\frac{1}{2}$.

A fraction like $1\frac{1}{2}$ is called a mixed fraction.

One and a quarter, two and a quarter, three and a quarter

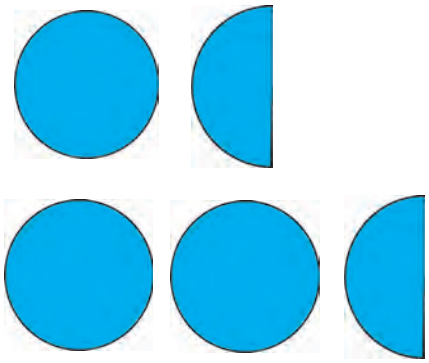


One whole and one quarter makes $1 + \frac{1}{4}$. This is written in short as $1\frac{1}{4}$ and is read as 'one and a quarter'.

Three wholes and one quarter make $3 + \frac{1}{4}$. This is written in short as $3\frac{1}{4}$ and read as 'three and a quarter'.

In the same way, $2\frac{1}{4}$ is read as 'two and a quarter' and $4\frac{1}{4}$ is read as 'four and a quarter'.

One and a half, two and a half, three and a half



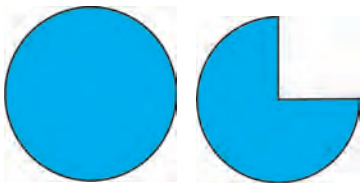
One whole and one half make $1\frac{1}{2}$.

$1\frac{1}{2}$ is read as 'one and a half'.

Two wholes and one half is written as $2\frac{1}{2}$ and read as 'two and a half'.

In the same way, $3\frac{1}{2}$ is read as 'three and a half' and $4\frac{1}{2}$ is read as 'four and a half'.

One and three quarters, two and three quarters, three and three quarters,...



One whole and three quarters is written as $1\frac{3}{4}$ and read as 'one and three quarters'.

In the same way, $2\frac{3}{4}$ is read as 'two and three quarters' and $4\frac{3}{4}$ is read as 'four and three quarters'.

Exercise

1. Read the following fractions and write them in words.

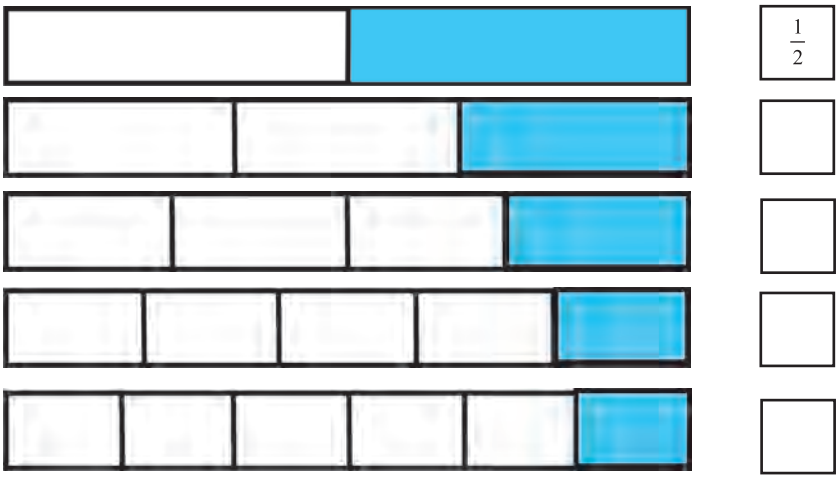
   $2\frac{3}{4}$, $3\frac{1}{4}$, $11\frac{1}{2}$, $5\frac{3}{4}$, $9\frac{1}{2}$, $8\frac{1}{4}$

2. Read each of the following and write the fractions.

   - Four and three quarters
   - Ten and a half
   - Fourteen and three quarters
   - Seven and one quarter
   - Eighteen and a half
   - Nine and one quarter
   - Seven and a half

Comparing fractions

In the picture given below, each of the strips of equal length has some shaded part. Write the fraction shown by the shaded part of each strip in the box next to it.



Now look at the pictures and the fractions written in the boxes and answer the following questions.

(1) Which is the smaller fraction, $\frac{1}{2}$ or $\frac{1}{3}$?

(2) Which is the smaller fraction, $\frac{1}{5}$ or $\frac{1}{6}$?

(3) Which is the bigger fraction, $\frac{1}{3}$ or $\frac{1}{5}$?

(4) Write $<$ or $>$ in the boxes given below.

$\frac{1}{3} \square \frac{1}{2}$; $\frac{1}{3} \square \frac{1}{4}$; $\frac{1}{5} \square \frac{1}{3}$; $\frac{1}{2} \square \frac{1}{3} \square \frac{1}{4} \square \frac{1}{5} \square \frac{1}{6}$

(5) As the denominator of the fractions with numerator 1 keeps increasing, what happens to the value of the fraction?

(6) Which is the smaller fraction, $\frac{1}{6}$ or $\frac{1}{9}$? Why ?

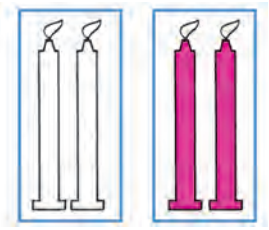
(7) Fill in the boxes below with the proper sign from $=$, $<$ or $>$.

$\frac{1}{8} \square \frac{1}{10}$, $\frac{1}{5} \square \frac{1}{3}$, $\frac{1}{4} \square \frac{1}{2}$, $\frac{1}{3} \square \frac{1}{3}$

$\frac{1}{15} \square \frac{1}{20}$, $\frac{1}{20} \square \frac{1}{15}$, $\frac{1}{200} \square \frac{1}{100}$

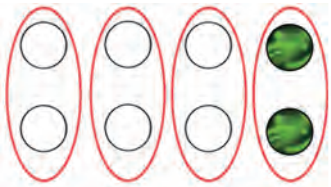
(8) You have a fruit. Using that fruit, how will you explain to your friend that $\frac{1}{4} < \frac{1}{2}$?

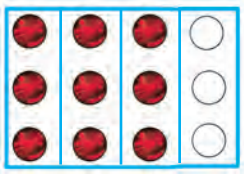
Fractions related to sets



- In this picture, there is a set of four candles. It has been divided into two equal parts and 1 part has been coloured. That is $\frac{1}{2}$ a part has been coloured. $\frac{1}{2}$ of 4 is 2.

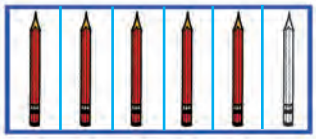
- This is a set of 8 marbles. It has been divided into 4 equal parts. One of the parts is coloured. That is, a $\frac{1}{4}$ part has been coloured. This means $\frac{1}{4}$ of 8 is 2.





- This is a set of 12 balls which has been divided into 4 equal parts. Three parts are coloured. It means that a $\frac{3}{4}$ part is coloured. $\frac{3}{4}$ of 12 is 9.

- This is a set of 6 pencils which has been divided into 6 equal parts. Each part has only one pencil. 5 parts are shaded showing that $\frac{5}{6}$ of 6 is 5.



Exercise

Circle a portion of the set equal to the given fraction.

Fraction	Set
$\frac{1}{2}$	
$\frac{2}{3}$	
$\frac{3}{4}$	
$\frac{2}{4}$	
$\frac{1}{5}$	
$\frac{3}{5}$	

11. Measurement

Length

The length I have measured is more than 5 centimetres but less than 6 centimetres. How do I measure this length?

Here, take this ruler. There are smaller markings between two adjacent centimetre markings. You will find them useful.

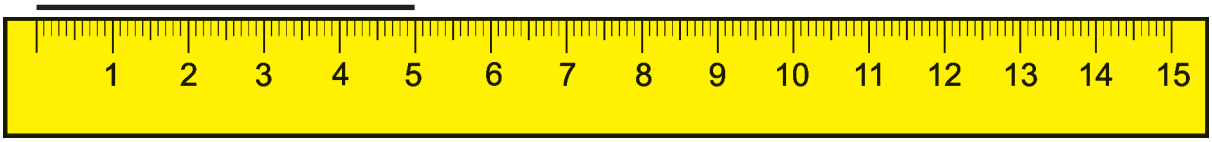
The length I have measured is 5 centimetres and 3 small parts.

Tai : One centimetre is divided into 10 equal parts. Each part is called a millimetre.

Sudha: It means that the length I have measured is 5 centimetres and 3 millimetres.

1 centimetre = 10 millimetres.

Centimetre is written in short as 'cm'.
Millimetre is written in short as 'mm'.



The length of this line is 5 cm. That is, 5 × 10 = 50 mm.

When a ruler is held along a line with its first marking at one end of the line, then the number at the other end of the line shows the length of the line.

How many mm is 7 cm?

7 × 10 = 70. So, 7cm = 70 mm.

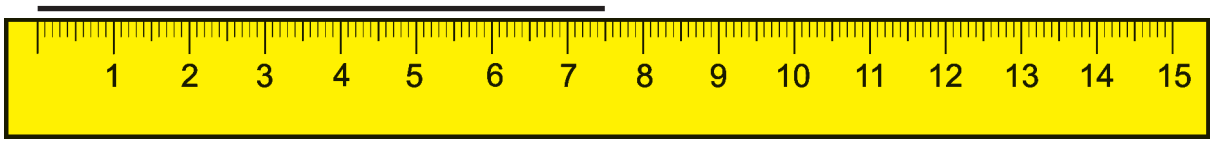
Exercise

Measure the length of the lines shown below and convert into millimetres.

(1) ——————— ☐ cm ☐ × 10 = ☐ mm

(2) ——————————— ☐ cm ☐ × ☐ = ☐ mm

Measuring the length of a line in centimetres and millimetres



The length of the line shown above is 7 centimetres and 5 millimetres.

◆ **Measure the length of each line below and write how many centimetres and millimetres.**

(1) ——————— ☐ cm ☐ mm

(2) ——————————— ☐ cm ☐ mm

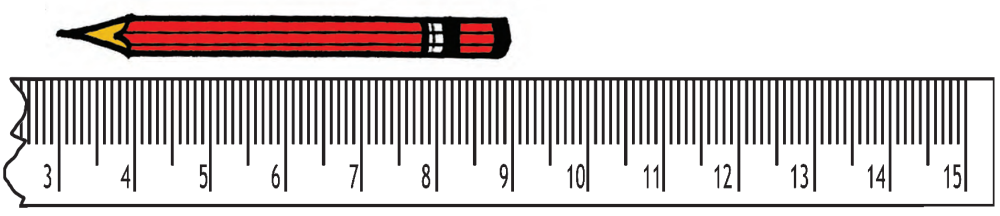
◆ **Measure and write.**

Length of a book	Thickness of an eraser	Length of a pencil	Length of the edge of a notebook	Length of a table

Vivek : I have an old ruler which shows centimetres and millimetres. But, the first end is broken. Will I be able to use it to measure centimetres?

Tai : Oh, yes! Your ruler has a 3 centimetre mark and every centimetre mark after that. So you can start at 3 and measure the length from there. Can you do that?

Vivek : Yes. The length of this pencil is from 3 centimetres to 9 centimetres.



Meera : If it is from 3 cm to 9 cm, you must subtract 3 from 9. The pencil is 6 centimetres long.

◆ **Try this.**

- Guess the length of the pencil you have. Measure it with a ruler and see if your guess was right.
- Draw two dots on a piece of paper and measure the distance between them.

Guessing the distance between two places

Tai : We measured the length of the table with a ruler and the distance between two gateposts with a measuring tape. Now let us see how to measure a longer distance.

Dilip : Shall we measure the distance between the school gate and our classroom?

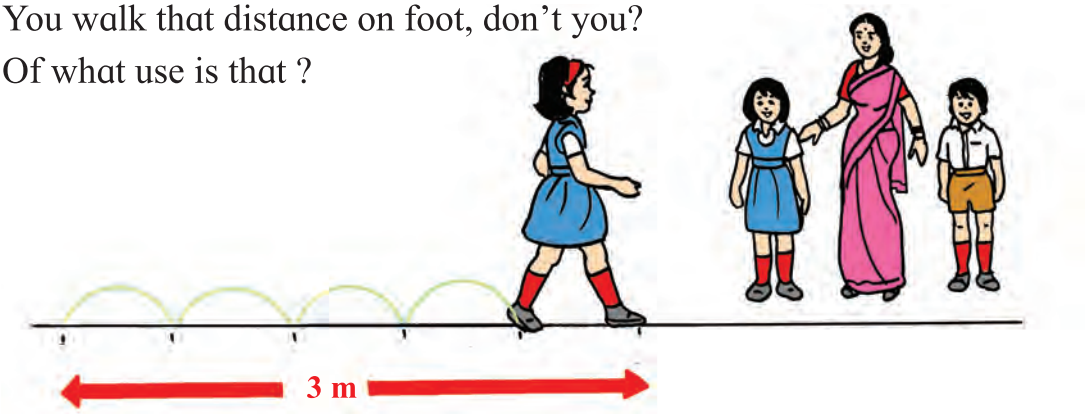
Meera : It will be a little difficult to measure with the tape.

Tai : We can measure the length of the path that you walk from the gate to the classroom.

Dilip : Where will we find such a long tape?

Tai : You walk that distance on foot, don't you?

Dilip : Of what use is that ?



Tai : Come, Meera. Walk 5 steps along this line. Now, Dilip, you measure the distance with the tape.

Dilip : The distance is 3 metres.

Tai : Meera, now walk from the school gate to the classroom. Tell us how many steps you take.

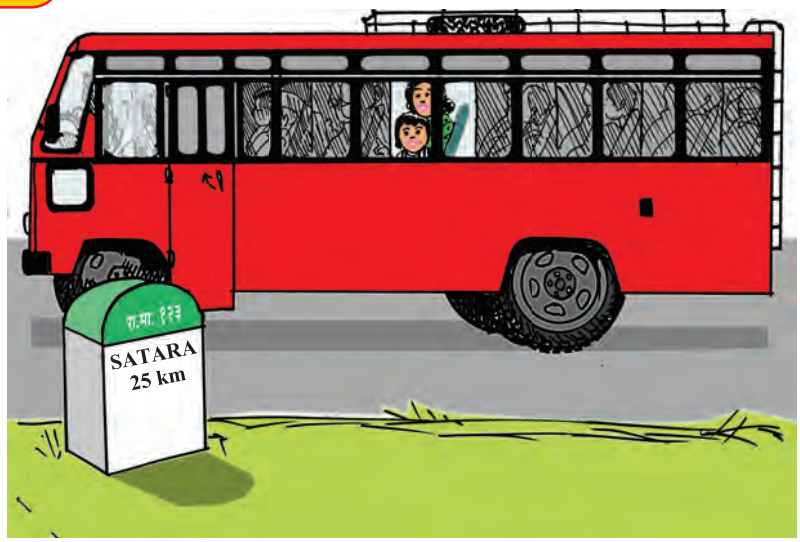
Meera : I took 95 steps till the classroom.

Tai : When we divide 95 by 5, the answer is 19. This means that 95 steps have 19 stages of 5 steps each. One stage of 5 steps is equal to 3 metres. Therefore, 19 stages make $19 \times 3 = 57$ metres.

Vivek : That means the distance from the gate to the classroom is about 57 metres.

Tai : You can use this method to measure the distance between your house and other places that you walk to, such as a friend's house, a shop or a garden nearby.

Introducing 'kilometre'



Varsha : I saw a signboard a while ago. It said, 'Tunnel 500 metres ahead'. I understood that. Now, this stone says 'Satara 25 km'. What does it mean?

Mother : The '25 km' on the stone means that Satara is at a distance of 25 kilometres from the point marked by the stone.

Varsha : But, what does kilometre mean?

Mother : 'Kilo' means thousand. 1 kilometre is equal to 1000 metres.

Varsha : It means that Satara is at a distance of 25000 metres, is that right?

Mother : Yes. 25 kilometres is equal to 25 thousand metres. Kilometre is written in short as 'km'. It is inconvenient to measure long distances in metres. So, they are measured in stages of one thousand metres, that is, in kilometres.
Did you notice, if the units for measuring distance are bigger, the number showing the measurement becomes shorter?

Varsha : Yes, Mother!

1 kilometre = 1000 metres

2 kilometres = 2000 metres

6 kilometres = 6000 metres

10 kilometres = 10000 metres

13 kilometres = 13000 metres

Exercise

The timetable below lists the places between Wardha and Nagpur and their distances in kilometres. Study it and answer the following questions.

Wardha	Varud	Selu Road	Tuljapur	Sindhi	Gumgaon	Ajani	Nagpur
0	7	14	24	32	60	76	79

- From which place have the distances of all the other places been measured?
- How far is Tuljapur from Wardha?
- What is the distance between Sindhi and Nagpur?
- What is the distance between Selu Road and Ajani?

Half, quarter and three-quarters of a kilometre and a metre

+	50	cm	50 cm taken twice is 100 cm,
	50	cm	that is 1 metre.
	100	cm	

Half of 1 metre is 50 centimetres.

Half of a metre is 50 centimetres.

+	25	cm	25 cm taken twice is 50 cm.
	25	cm	Half of 50 cm is 25 cm.
	50	cm	

Half of half is one quarter metre.

One quarter of 1 metre is 25 cm.

+	50	cm	half a metre.
	25	cm	one quarter of a metre.
	75	cm	three quarters of a metre.

One half and one quarter makes three quarters.

Three quarters of a metre is 75 cm.

1000 m = 1 km

500 m + 500 m = 1000 m

Half of 1000 is 500

Therefore, 500m = half a km

250 m = a quarter km

750 m = three quarters of a km

Exercise

Match the following.

• Half a metre	25 cm
• Three quarter kilometres	500 m
• Quarter metre	75 cm
• Quarter kilometre	50 cm
• Half a kilometre	250 m
• Three quarter metres	750 m

Match the following.

• 3 metres	40 millimetres
• 3 kilometres	200 centimetres
• 2 metres	300 centimetres
• 4 centimetres	20 millimetres
• 4 kilometres	3000 metres
• 2 centimetres	4000 metres

Activity : Each one jumps as far as they can. Then measure and write down the length of each one's jump.

Conversion of units

✣ **Convert 5 km into metres.**

1 km = 1000 m

Therefore, 5 km = 1000 × 5 metres

= 5000 metres

Similarly, 5 km 40 m = 5040 m.

✣ **Convert 2 metres into centimetres.**

1 metre = 100 cm

2 metres = 100 × 2 cm

= 200 cm

Similarly, 2 metres 12 cm = 212 cm.

✣ **Convert 6 centimetres into millimetres**

1 centimetre = 10 millimetres

6 centimetres = 10 × 6 millimetres

= 60 millimetres

Similarly, 6 cm 5 mm = 65 mm

✣ **Convert one and a half metres into centimetres.**

$1\frac{1}{2}$ metre = 1 m + $\frac{1}{2}$ m

= 100 cm + 50 cm

= 150 cm

✣ 712 centimetres consist of 700 centimetres and 12 centimetres.
712 centimetres are equal to 7 metres and 12 centimetres.

✣ 5465 metres consist of 5000 metres and 465 metres.
Hence, 5465 metres are equal to 5 kilometres and 465 metres.

Exercise

1. Convert.

(1) 7 metres into centimetres.

(2) 8 kilometres into metres.

(3) 9 centimetres into millimetres.

(4) $5\frac{1}{2}$ metres into centimetres.

(5) 11 kilometres into metres.

(6) 4 centimetres into millimetres.

(7) 8 metres into centimetres.

(8) 7 kilometres into metres.

2. Match the following.

• 2 km	50	mm
• 5 cm	800	cm
• 8 m	2000	m
• 11 cm	900	cm
• 9 m	12000	m
• 12 km	110	mm

3. Fill in the blanks.

- 530 centimetres = ☐ m ☐ centimetres
- 1240 metres = ☐ km ☐ metres
- 845 centimetres = ☐ m ☐ centimetres
- 1250 centimetres = ☐ m ☐ centimetres
- 2275 metres = ☐ km ☐ metres
- 4090 metres = ☐ km ☐ metres

Mass (Weight)

Rahul : The short form for 'kilogram' is kg, right? Also, how much is twenty grams?

Mother: Yes, 'kg' is short for 'kilogram'. Gram is a unit for measuring weights much smaller than a kilogram. We buy items such as sugar, pulses and rice in kilograms. However, since cardamom, cloves, masalas and other such items are bought in small quantities, they are measured in grams.

Rahul : How many grams of *pohe* will the shopkeeper give us when we ask for half a kilogram?

Mother: 1 kilogram is 1000 grams. Now tell me, how many grams will half a kilogram be?

Rahul : 500 grams.

Mother: How is that?

Rahul : 500 + 500 = 1000. So, half of 1000 is 500.
Therefore, half a kilogram = 500 grams.
But, Mom, how will the shopkeeper give 500 grams of *pohe*?

Mother: The shopkeeper has different weights.

Rahul : That means the shopkeeper will use the 500 grams weight to give the *pohe* and the 200 gram and 50 gram weights to give the tea.

Mother: Correct! How did you work this out?

Rahul : 250 + 250 = 500. Half of 500 is 250. 500 grams is equal to half a kilogram. Half of half is one quarter. This means a quarter kilogram is equal to 250 grams.

Mother: Excellent!

Rahul : But how will he give 20 grams of cardamom?

Mother: The shopkeeper has weights of 10 grams and 20 grams, too. He also keeps 10 gram and 20 gram packets of cardamom ready. Since you are going to the shop, have a look at those weights.

Conversion of units

✣ **How many grams is 4 kilograms?**

1 kilogram = 1000 grams
4 kilograms = 1000 × 4
= 4000 grams
Therefore, 4 kilograms
= 4000 grams
4 kg 500 grams = 4500 grams
4 kg 250 grams = 4250 grams

✣ **How many grams is one and three quarter kilograms?**

One and three quarter kilograms means 1 kilogram and half a kilogram and a quarter kilogram.
1000 grams + 500 grams + 250 grams = 1750 grams.
Therefore, one and three quarter kilograms are 1750 grams.

Exercise

1. Answer the following questions.

(1) How many grams is 3 kilograms ?
(2) How many grams is one and a half kilograms ?
(3) How many grams is one and a quarter kilograms?
(4) How many grams is three and three quarter kilograms?
(5) Which weights will the shopkeeper use to measure three and a half kilograms of wheat?

2. Fill in the blanks.

(1) ☐ weights of 100 grams is 1000 grams.
(2) ☐ weights of 200 grams is 1000 grams.
(3) ☐ weights of 500 grams is 1000 grams.

◆ **Study the various packets of groceries bought from the market. Weigh each packet and compare its weight with the weight stated on the packet.**

Name of the object	Weight that you measured	Weight stated on the packet	Possible reason for difference, if any

◆ **Weigh the fruits and vegetables and write the weight in kilograms and grams.**

Vegetable	One bag of brinjals	One small basket of onions	A pumpkin	15 bitter gourds
Weight				

◆ **Try this out.**

- Take 3 identical 1-litre plastic bottles. Measure the weight of one while it is empty. Fill the bottles with different liquids : (1) drinking water (2) nimbupani with sugar (3) very salty water.

  Now, weigh each of the filled bottles.

  Can you now tell the weight of one litre of each liquid ?
  Which one is the heaviest ? Which one is the lightest ?

◆ **Find out.**

- The story of 'How they weighed the elephant'.
- Weights less than 50 grams used by the shopkeeper.

Volume and Capacity

Amit : Mom, have you divided 1 litre of milk equally among all the cups?

Mother : Yes!

Amit : How do I measure the milk in each cup?

Mother : A liquid less than 1 litre is measured in millilitres.

This is a bag of milk. It has '1 litre' written on it.

1 litre is 1000 millilitres

Amit : If 1000 millilitres of milk is divided equally between 10 cups, each cup will have 100 millilitres, is that right?

Mother : Right, millilitre is a very small unit used to measure the volume of liquids.

Amit : How small is that?

Mother : Look at this bottle of medicine. It comes with a measure. The measure has marks for 5 *ml* and 10 *ml*. 1 teaspoonful of a liquid is approximately 5 *ml*.

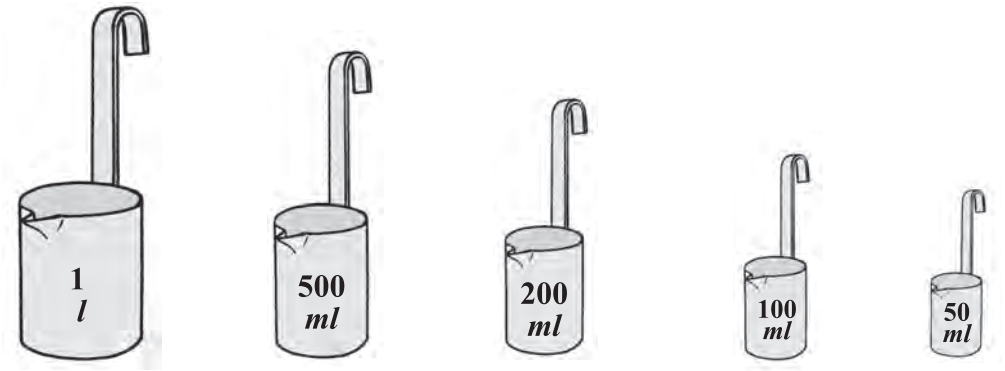
Amit : Mom, when I go to the dairy, I see several small measures kept there to pour milk. Are they used in the same way?

Mother : Yes! Two full 500-millilitre measures of milk add up to 1 litre of milk. This means that 500 millilitres is half of 1 litre. Therefore,

half a litre = 500 millilitres.

Amit : One quarter is half of half, so a quarter litre is 250 millilitres. A half and a quarter make three quarters.
Therefore, three quarters of a litre = 500 *ml* + 250 *ml* = 750 millilitres

Mother : Litre is written as '*l*' and milliliter is written as '*ml*'.



Exercise

1. Fill in the blanks.

   1 litre = 1000 millilitres

   2 litres = 2 × 1000 = 2000 millilitres

   4 litres = ☐ millilitres

   15 litres = ☐ millilitres

2. How many millilitres are there in three and three quarter litres?
3. How many millilitres are there in one and a half litre?
4. How many millilitres are there in one and a quarter litre?
5. Which measures will be used to pour three and a half litres of milk and how many times will they be used?
6. Write how many times the following measures will have to be used to fill a 1-litre measure.

Measure	200 *ml*	50 *ml*	100 *ml*	500 *ml*
How many times	5			

◆ **Try this out.**

- Measure how many millilitres there are in one cupful of water. Based on that, guess how many cups will make 1 litre of water.
- Take a measure that comes with a medicine bottle. Fill it drop by drop with a dropper and count how many drops make 5 *ml* of water.
- Use a 1-litre and a 100-*ml* measure, to fill different vessels with water and find out how many litres and millilitres of water the vessels can hold.

Measurement : Word problems

Tai : If a bus that leaves Sangamner at 45 minutes past 6 in the morning reaches Malegaon at 10 past 10 the same morning, how much time did the journey take?

Sanjay : From 45 minutes past 6 to 7 o'clock there are 15 minutes. The time between 7 am and 10 am is three hours. From 10 o'clock to 10 past 10, there are ten minutes. That means the total time taken for the journey is 15 minutes + 3 hours + 10 minutes or 3 hours and 25 minutes.

Tai : Roshni had half a litre of milk delivered every day during the month of June. If one litre of milk costs ₹40, how much was the total milk bill ?

Swati : June has 30 days. Half a litre every day means 30 times half a litre. Half of 30 is 15, so she took 15 litres of milk. Therefore, the total milk bill was ₹40 × 15 = ₹600.

Exercise

Solve the following problems.

(1) One round of the walking track in the park is 250 metres long. Ajit's grandfather walks that path 4 times every morning. How many kilometres does he walk every day?

(2) Sulabha bought four and a half metres of cloth. She divided it into five equal lengths and gave them to five friends. How much cloth did each friend get?

(3) If 1 litre of petrol costs ₹70, how much do two and a half litres of petrol cost?

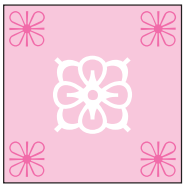
(4) Jenny bought a quarter kilogram of *barfi*, half a kilogram of *chivda*, a quarter kilogram of *shev* and three quarter kilograms of *jalebi* from a shop. What was the total weight of her purchases?

(5) Wasim's school started at a quarter past twelve in the afternoon and finished at half past five in the evening. If the break was for half an hour, how much time did the children spend in the classroom?

(6) Sharad went to his friend's place on a motorcycle. When he started, the reading was 19,235 kilometres. When he reached his friend's place, it was 19,301 kilometres. How many kilometres did Sharad travel?

12. Perimeter and Area

Perimeter



Sita : Salma, will you come to the market with me to buy lace?

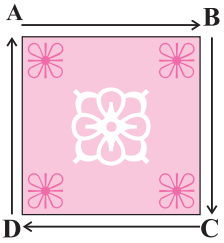
Salma : Why do you need lace?

Sita : I have a handkerchief. I want to trim it with lace.

Salma : How much lace do you need?

Sita : Oh yes! How much lace do I need?

Salma : Let us take a spool of thread. Hold one end of the thread at one corner of the handkerchief. Then, slowly unwind the thread along all four of its sides until you reach the first corner. Cut it there. You will know how much lace you need by the length of the thread you have cut off.



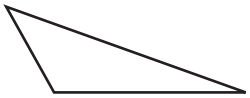
ABCD is a square handkerchief. The sum of the length of sides AB, BC, CD and DA is the length of lace needed. This length is called the perimeter of the handkerchief.

The perimeter of a square is the sum of the length of all four sides of the square.

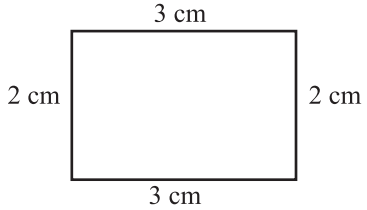
A fence of a single wire has to be put around a rectangular field. We have to find out the length of the wire needed. The sum of the lengths of all four sides of the rectangular field will tell us the length of wire needed.

The perimeter of a rectangle is the sum of the length of all four sides of the rectangle.

This is a triangle made of wire. To find out the length of the wire needed to make it, we will straighten out the wire and measure its length. This length will be the sum of the length of the three sides of the triangle.



The perimeter of a triangle is the sum of the length of all three sides of the triangle.

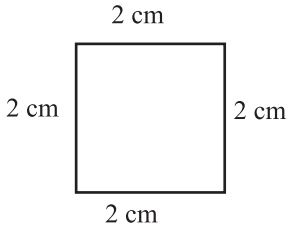


This figure shows a rectangle whose sides are 3cm, 2cm, 3cm and 2 cm. Let us find out its perimeter.

The perimeter of a rectangle is the sum of the length of all four of its sides.

$3 + 2 + 3 + 2 = 10$.

Therefore, the perimeter of this rectangle is 10 cm.

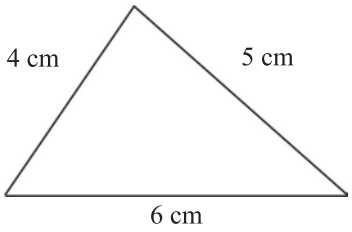


The figure alongside is a square and all of its sides are 2 cm long. Let us find the perimeter of the square.

The perimeter of a square is the sum of the length of its four sides.

$2 + 2 + 2 + 2 = 8$.

Therefore, the perimeter of the square = 8 cm.



The sides of the triangle here are 4 cm, 5 cm and 6 cm long. Let us find out the perimeter of the triangle.

The perimeter of a triangle is the sum of the length of all three of its sides.

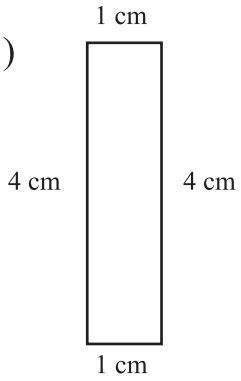
$4 + 5 + 6 = 15$.

Therefore, the perimeter of this triangle = 15 cm.

Exercise

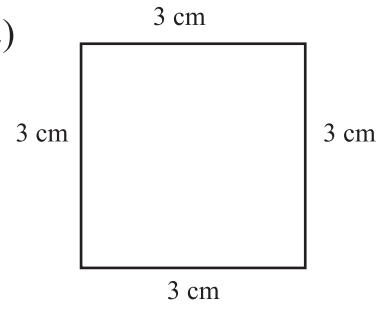
1. Find the perimeter of the figures given below.

(1)



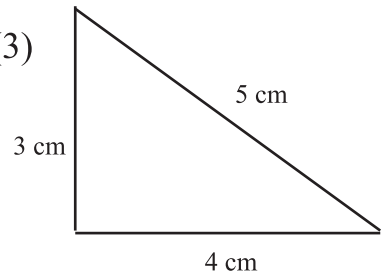
Perimeter = ☐ cm

(2)



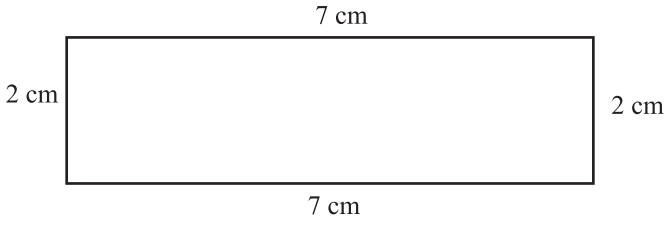
Perimeter = ☐ cm

(3)



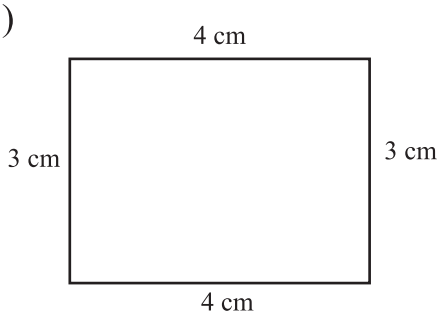
Perimeter = ☐ cm

(4)



Perimeter = ☐ cm

(5)



Perimeter = ☐ cm

2. The sides of a rectangular field are 150m, 120m, 150m and 120m. Find the perimeter of the field.

Area

Saina : I have more chikki than you.

Virat : I have more chikki than you.

Sumatai : Stop! Don't fight. Saina, why don't you count the number of chikki squares you have?

Saina : I have 16 squares of chikki.

Sumatai : Now, Virat, you count the number of chikki squares that you have.

Virat : I have 16 squares of chikki, too.

Sumatai : Now tell me, who has more chikki?

Saina : We were fighting over nothing, Tai. We both have the same amount of chikki.

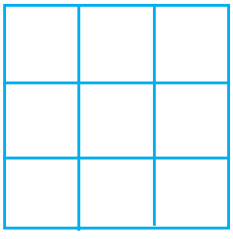
Sumatai : That's right. But, let me explain it to you properly. The thickness of the squares of chikki you both have is the same. So, let us measure their surfaces. There are 16 squares of equal measure on both your slabs. Therefore, you both got the same amount of chikki.

On any surface, the measure of the place occupied by a figure is the area of that figure.

The measure of a figure should be the same no matter who measures it. Hence, 'a square of side 1 cm' is used as the standard unit of measurement of area. The area of a figure is given in square centimetres (sq cm).

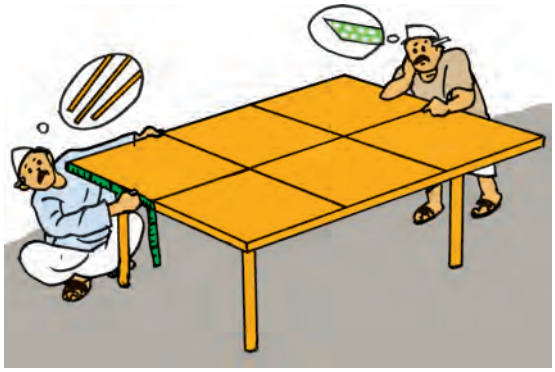
To find out the area of this rectangular piece of paper, let us count the number of squares with sides of 1 cm on the paper. There are 10 such squares on the paper. Therefore, the area of the paper is 10 sq cm.

To find out the area of the shape given alongside, let us count the number of squares with sides 1 cm, in it.



Area of the shape = number of squares = 9

Therefore, area of the shape = 9 sq cm.



A big rectangular table is 3 metres long and 2 metres wide. The surface of the table is to be laminated and a border tape has to be fitted along its sides. For this, we must find out how much laminate and what length of border tape is required. The laminate will occupy the top surface of the table. Therefore, to find out how much laminate is needed, we must find the area of the table top.

The border tape will be fitted along the sides of the surface. Hence, to find out the length of border tape needed, we find the perimeter of the table top.

Here, the size of the table is large. So, to find the area, let us use squares with sides of length 1 metre.

A square with side 1 metre has an area of 1 square metre.

Measurement of laminate = Area of the table top

= Number of squares occupying the table top

= 6

Therefore, the quantity of laminate needed is 6 square metres.

Length of border tape = Perimeter of the surface of the table

= Sum of the length of all four sides of the surface

= 2 + 3 + 2 + 3

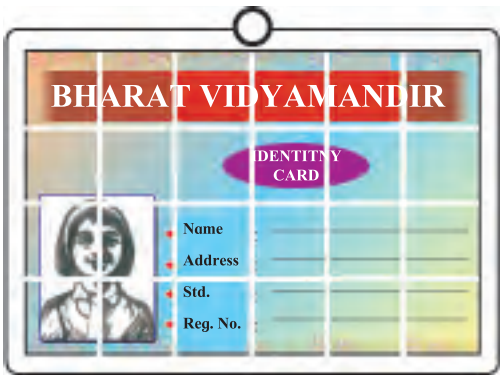
= 10

Therefore, the length of border tape needed is 10 metres.

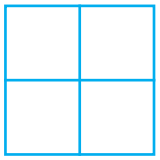
Exercise

Find the area of the following figures (all small squares are of 1 sq cm area).

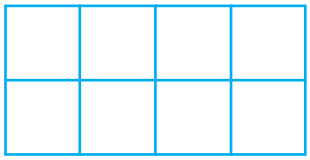
(1)



(2)

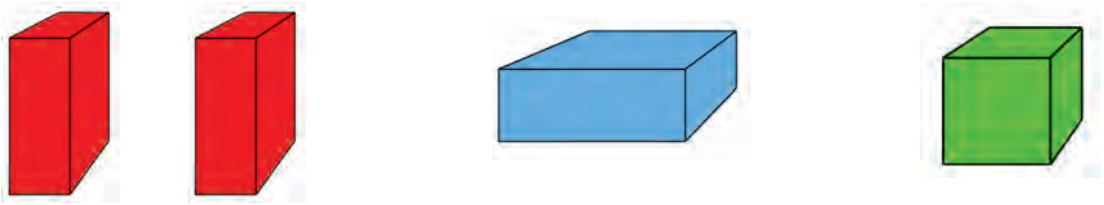


(3)



(4)

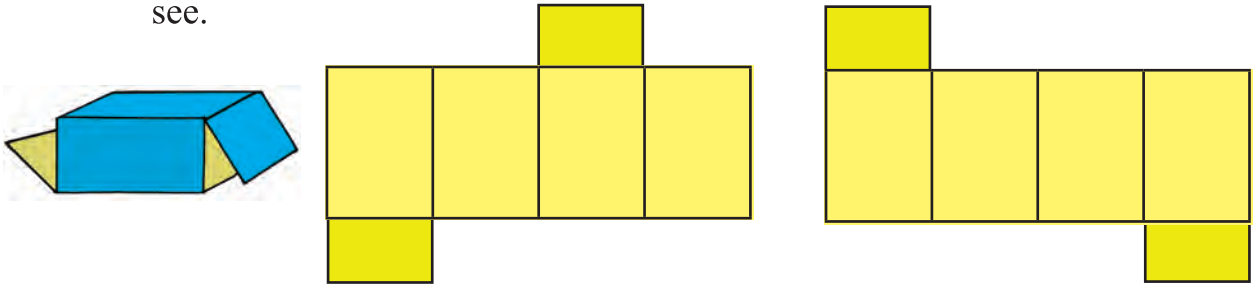
Constructing boxes (Packaging nets)



Nandu : Anand, look at these cardboard boxes. How do you think they are made?

Anand : Let us cut one of the boxes and lay it out flat. Then we will know how it is made.

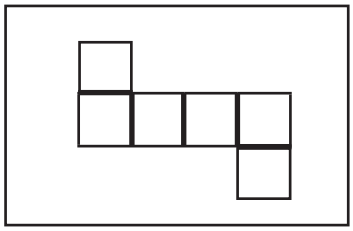
Aditi : If we cut along different lines, will we get a different kind of box ? Let us see.



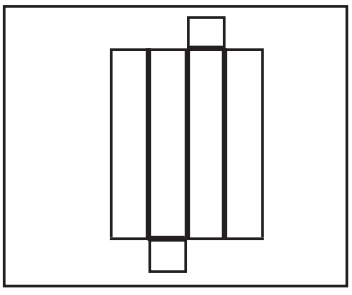
Anand : Let us open up this smaller box with a different shape.

◆ Try this out.

- Take a piece of thick rectangular paper. Draw six joined squares as shown in the picture.



- Take a rectangular piece of thick paper. Draw six joined rectangles as shown in the picture.



Cut out the remaining paper. Fold the squares and rectangles along the thick lines to make boxes.

- Collect boxes of different shapes used to store different things. Open them up and study their structure.

13. Multiplication : Part 2

Seven students of Std IV received a scholarship of ₹ 315 each. What was the total amount of the scholarship received by the students ?

We can find the total scholarship amount by multiplying 315 by 7. Let us multiply using the lattice method, keeping in mind that 315 = 300 + 10 + 5.

×	300	10	5
7	2100	70	35

	2100
+	70
+	35
	2205

The total scholarship amount received by the students is ₹ 2205.

Nandu : Tai, last year we learned a different method of multiplying two-digit numbers vertically. Can we use that method here?

Tai : Yes. Let us find 315 × 7 using that method.

Th	H	T	U
	1	3	
	3 ×	1	5 7
2 ←	(2)2	(1)0	(3)5

First, we multiply 5 units by 7 units. The product is 35 units. 35 units = 3 tens + 5 units.

Write these 3T in the carried over tens place.

Now, 1 T × 7 = 7 T. To this, we add the 3 carried over tens. The sum is 10 tens. 10 tens are equal to 1 H + 0 T. Write 0 in the tens place and 1H above the hundreds place.

3 H × 7 = 21 H and 1 H carried over makes 22 H.

22 H = 2 Th + 2 H. Put the 2 Th in the thousands place. Now the digits in the Th, H, T, U places are 2, 2, 0, 5 in that order. The answer is 2205.

Salma : We had to make a thousands place to write this multiplication.

Exercise

Multiply the following.

(1)

Th	H	T	U
	7	4	3
	×		5

(2)

Th	H	T	U
	4	0	9
	×		4

(3)

Th	H	T	U
	3	5	4
	×		9

Amit : We can also multiply two two-digit numbers using this vertical method!

Tai : Yes, you can. Let me show you an example using both methods.

38 × 24

×	30	8
20	600	160
4	120	32

600
+ 160
+ 120
+ 32
912

H	T	U	
1			Carried over after multiplying by tens
	3		Carried over after multiplying by units
	× 3	8	
	2	4	
1	5	2	
+ 7	6	0	
9	1	2	

Sonu : I understood that 38 × 4 = 152. But, I didn't understand how we got the 0 when multiplying by 2 tens.

Tai : That's simple. Multiplying 8 units by 2 tens, we get 16 tens.
16 T = 1 H + 6 T. 6 tens stay in the tens place and 1 hundred is carried over to the next place. Multiplying any number with a ten, the product is always in whole tens. Therefore, we write a 0 in the units place.

Nandu : Tai, I have realized something after studying both methods. In the vertical arrangement, multiplying 38 by 4 units gives us 152; in the lattice method, multiplying 30 and 8 by 4 gives us 120 and 32. The sum of 120 and 32 is also 152!

Tai : Excellent! Did you find out anything else?

Sonu : In the lattice method, we carried out four small multiplications and added them. In the vertical method, we solved two slightly bigger multiplications and added the products. That took less time.

Exercise

1. Multiply.

(1)

Th	H	T	U
		3	7
		× 2	7

(2)

Th	H	T	U
		6	7
		× 9	2

(3)

Th	H	T	U
		6	0
		× 2	4

(4)

Th	H	T	U
		3	8
		× 2	5

(5)

Th	H	T	U
		6	7
		× 9	4

(6)

Th	H	T	U
		6	0
		× 3	4

2. Multiply.

(1) 223 × 3 (2) 127 × 8 (3) 85 × 17 (4) 31 × 26 (5) 26 × 31

3. Solve the problems given below.

(1) Find out the total cost of 3 shirts costing ₹495 each.

(2) Aminabai bought 6 crates of apples, each costing ₹325. How much did she pay altogether?

(3) In a mango grove, there are 45 rows, with 32 trees in each row. How many mango trees are there in the grove?

(4) If one book costs ₹80, how much do 25 such books cost?

(5) Seema bought 2 dresses for ₹695 each. How much did she pay in all ?

(6) If one sack of wheat weighs 53 kilograms, how much do 19 such sacks weigh ?

(7) A car travels a distance of 16 km on one litre of petrol. How many kilometres will it travel on 35 litres?

(8) If 365 trees can be planted on 1 hectare of an orchard, how many trees can be planted on 8 hectares?

Sonu : We can use the vertical arrangement to multiply three-digit numbers by two-digit numbers, can't we?

Tai : Of course, we can. In fact, we can use this method to multiply any number by any number no matter how many digits they have. Let me show you one example. Watch carefully and tell me whether or not you understand.

TTh	Th	H	T	U
		3	5	
		7 ×	0 4	9 6
+ 2	4 8	2 3	5 6	4 0
3	2	6	1	4

Carry over

Nandu : Tai, I understood the entire multiplication. The only new part is that we had to make a place for ten thousands.

Sonu : Just like the last example, when multiplying by 4 tens, we put a 0 in the units place.

Salma : Tai, I have a doubt.

Tai : It is good to have questions in your mind and to ask them. Go ahead.

Salma : Just like this, we can multiply three-digit or four-digit numbers by three-digit numbers. However, carrying over numbers will become more and more difficult.

Tai : Yes. The solution to this is to avoid writing the carried over numbers in the table. Instead, keep the number in your mind and forget it as soon as you have added it. Repeat this with the next number to be carried over. Once you make this a habit you need to write less and you can work faster.

◆ **Multiply 453 × 78.**

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

Exercise

1. Multiply.
   (1) 125 × 52 (2) 234 × 65 (3) 598 × 51
   (4) 375 × 40 (5) 650 × 28 (6) 447 × 59
2. Solve the problems given below.
   (1) There are 18 sacks of rice in a van. If each sack weighs 105 kg, what is the total weight of all the sacks ?
   (2) If the cost of 1 chair is ₹750, what is the cost of 24 such chairs?
   (3) Make a two-digit and three-digit number using the digits 5, 6, 7, 8 and 9 only once. Multiply one with the other.

14. Division : Part 2

❁ Word Problems.

◆ **Divide 56 notebooks equally among 7 students. How many will each get ?**

$$\begin{array}{r} 8 \\ 7\overline{)\,56} \\ \underline{-\,56} \\ 00 \end{array}$$

Each one gets 8.

Exercise

Solve the following problems.

1. If the total cost of three compass boxes is ₹90, what is the cost of one compass box ?

$3\overline{)\,90}$

2. If four kilograms of wheat cost ₹92, what is the cost of one kilogram of wheat ?

$4\overline{)\,92}$

3. If 31 litres of milk are poured into 4-litre vessels, how many such vessels will be completely filled and how much milk will there be in the partly filled vessel ?

$4\overline{)\,31}$

4. If 49 seedlings are to be planted in a garden in rows of 7 saplings each, how many such rows will be made ?

$7\overline{)\,49}$

5. If 40 children stand in 5 equal rows for a drill, how many children will there be in each row ?

$5\overline{)\,40}$

6. There are 87 beads. How many necklaces of 9 beads each can be made and how many beads will be left over?

$9\overline{)\,87}$

Dividing a three-digit number by a one-digit number

Madhu has three hundred-rupee notes, six ten-rupee notes and nine one-rupee coins totalling ₹369. How should she divide it equally between Neena, Beena and Nagesh ?

```
  123
3)369
 -3↓
 ---
  06
 - 6↓
 ---
  009
  - 9
  ---
    00
```

First let us divide the 3 notes of 100 rupees.
3 ÷ 3 = 1, or, 3 can be divided by 3 once. That means each person gets one note of 100 rupees.
6 ten-rupee notes have to be divided between three people.
6 ÷ 3 = 2, so each person will get 2 notes of 10 rupees or 20 rupees.
9 rupees have to be divided between three people.
9 ÷ 3 = 3. Each person will get 3 rupees.
Each person gets 100 rupees + 20 rupees + 3 rupees = 123 rupees.
This division is shown vertically alongside.
The quotient is 123, so each person will receive ₹123.

Exercise

Divide the following.

(1) $4\overline{)484}$ (2) $3\overline{)396}$ (3) $4\overline{)448}$ (4) $2\overline{)468}$

◆ **Now let us divide 4 notes of 100 rupees, 6 notes of 10 rupees and 5 coins of 1 rupee, totalling ₹465 between 5 people.**

```
  0
5)465
 -0
 ---
  4
```

In these 465 rupees, there are 4 notes of 100 rupees. 5 can only be taken zero times from 4. This means that no one can get a 100-rupee note. Let us put a 0 in the hundreds place of the quotient.

```
  09
5)465
 -0↓
 ---
  46
- 45
 ---
  01
```

We change 4 notes of 100 rupees for 10-rupee notes. Those 40 notes and the 6 notes we already have make a total of 46 ten-rupee notes. Let us divide them among 5 people. 5 can be subtracted from 46 a maximum of 9 times. 9 times 5 is 45. So, 46 – 45 = 1, and 1 note of 10 rupees remains.

```
  093
5)465
 -0↓
 ---
  46
- 45↓
 ---
  015
 - 15
 ---
   00
```

We change this 10-rupee note for ten 1-rupee coins and add the 5 coins that we already have, making a total of 15 one-rupee coins to divide among 5 people. Thrice 5 is 15. Therefore, we can subtract 5, 3 times.

15 – 15 = 0. The quotient is 93.

When ₹465 are divided among 5 people, each person gets ₹93.

```
   2
3) 629
 - 6↓
   02
```

```
   209
3) 629
 - 6↓
   02
 -  0
   029
 - 27
   002
```

◆ Find : 629 ÷ 3

Divide the hundreds, tens and units in that order by 3.

Twice 3 is 6, so 6 can be divided by 3. We write 2 in the hundreds place of the quotient. Now let's bring down 2 tens and divide.

3 can be taken zero times from 2. Therefore, let us write 0 in the tens place of the quotient. 2 – 0 = 2, so 2 tens remain.
20 units from 2 tens and the 9 units we already have make a total of 29 units to be divided by 3. 9 times 3 is 27.
29 – 27 = 2.

Therefore, the quotient is 209 and the remainder is 2.

Exercise

Divide.

(1) $4\overline{)494}$ (2) $2\overline{)815}$ (3) $3\overline{)242}$ (4) $5\overline{)455}$

(5) $6\overline{)578}$ (6) $8\overline{)945}$ (7) $7\overline{)647}$ (8) $4\overline{)908}$

```
   4
2) 800
 - 8
   00
```

```
   40
2) 800
 - 8
   00
 - 00
   000
```

```
   400
2) 800
 - 8
   00
 - 00
   000
 - 000
   000
```

◆ 800 ÷ 2 = How much?

The dividend is 800 and the divisor is 2.
Let us divide 8H by 2; four times 2 is 8, so we write 4 in the hundreds place of the quotient.
8 – 8 = 0. Zero hundreds remain.

Now let us divide zero tens by 2; zero divided by any number is zero. Let us write zero in the tens place of the quotient.

Similarly, zero units divided by 2 is 0. Therefore, let us write 0 in the units place of the quotient. The quotient is 400 and the remainder is zero.

If, while dividing 800 ÷ 2, we do not put zeroes in the tens and units places, the quotient could be written by mistake as 40, or even 4, instead of 400.

Remember: While dividing, in case a number is divided zero times, write the zero in the correct place in the quotient.

Exercise

Divide the following.

(1) 500 ÷ 5 (2) 900 ÷ 6 (3) 120 ÷ 4

Word Problems

◆ **If 148 marbles were distributed, giving 4 to each child, how many children were given marbles ?**

$$\begin{array}{r} 037 \\ 4\overline{)\,148} \\ -\,0\downarrow \\ \hline 14 \\ -\,12 \\ \hline 028 \\ -\,28 \\ \hline 00 \end{array}$$

Exercise

Solve the problems given below.

(1) If 126 peppermint sweets are divided equally between 9 children, how many sweets will each child get?

$9\overline{)\,126}$

(2) In a field, if 987 saplings are planted in 7 rows with an equal number of seedlings in each row, how many seedlings are planted in each row?

$7\overline{)\,987}$

(3) If a hostel has 132 students with 3 students in one room, in how many rooms are the students staying ?

$3\overline{)\,132}$

(4) How many bouquets can be made from 340 flowers, with 8 flowers in each bouquet? How many flowers will be left over ?

$8\overline{)\,340}$

(5) If we put 6 biscuits in one packet, how many packets can be made from 600 biscuits?

$6\overline{)\,600}$

15. Pictographs

Nasreen, Vishal, Viraj, Hema and other students went to the village fair. The fair had a variety of games. The students had a lot of fun. There were different types of shops at the fair, some selling toys, some food and some clothes. Naturally, there was a crowd of children near the toy shops and the food shops.

Paramjeet did not go to the fair. He asked Vishal, 'Which shops were there? How many?' Vishal showed him a table.

Types of shops	Number of shops
Food items	5
Toys	3
Clothes	2
Other	5

Nasreen made the table more attractive using pictures.

Types of shops	Number of shops
Food items	
Toys	
Clothes	
Other	

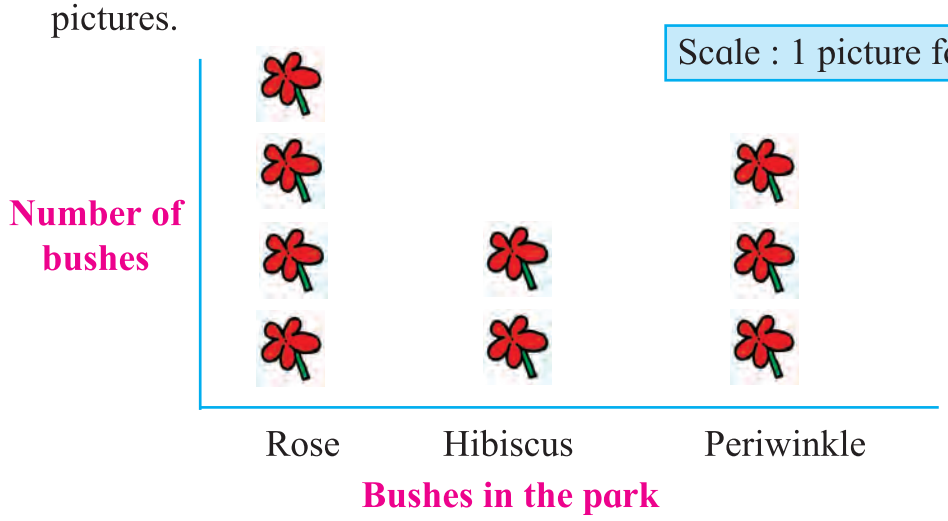
Vishal : What do these pictures mean?

Nasreen : One picture stands for one shop. There are three toy shops, so there are three pictures.

Hema : Suppose there are a lot of shops, will you draw as many pictures ?

Tai : No. It is not possible to draw so many pictures every time. We pack the mangoes from our orchard, 24 mangoes to a crate. When we count the total number of crates we come to know the number of mangoes we have packed. We can do this with the pictures.

Viraj : In the park in front of my house, there are 40 rose bushes, 20 hibiscus shrubs and 30 periwinkle shrubs. I will make a table to show this, using pictures.



Chairs were brought for a function in the school. Nasreen presented this information in the form of a pictorial chart. However, instead of arranging the pictures vertically, she arranged them horizontally. Let us see what this chart tells us.

Chart of chairs brought for the function

Type of chair	Number of chairs
Metal	
Plastic	
Wooden	

Scale : means 10 chairs

In the second row, 8 pictures like this are drawn. It means that there are $8 \times 10 = 80$ plastic chairs.

A total of 15 pictures like this are drawn, which means there are a total of $15 \times 10 = 150$ chairs.

Exercise

Study the tables and answer the questions given below.

(1) People in a town collected aid for the flood-affected. This is its pictorial representation.

Aid given	Number of families who helped
Medicine	
Food items	
Clothes	
Other	

Scale :  means 20 families

- How many families gave medicines as aid ?
- What form of help was given by the largest number of families?
- What form of aid was given by the least number of families ?

(2) This is a chart showing what kind of fuel is used in the kitchen in 160 houses in a village.

Fuel	Number of houses using the fuel
Gas	
Kerosene	
Wood	
Gobar gas	

Scale :  means 10 houses

- What kind of fuel is used in most houses?
- How many houses use gobar gas?
- How many houses use gas?

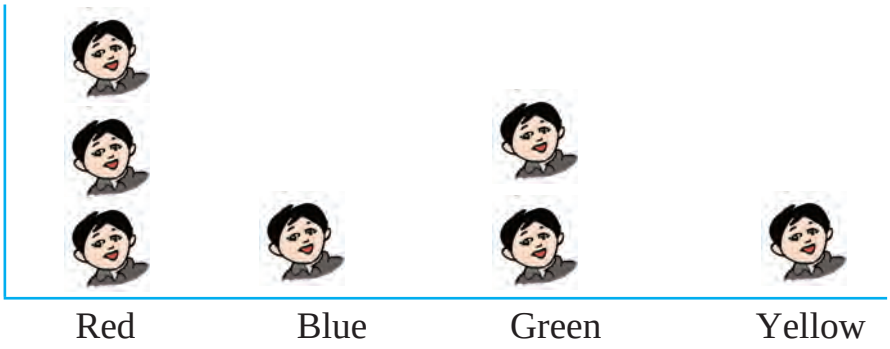
(3) A chart showing the crop grown by the farmers in a village.

Crop	Number of farmers
Jowar	
Pulses	
Vegetables	
Other	

Scale :  means 10 farmers

- How many farmers grow jowar?
- Which crop is grown by the least number of farmers?
- How many more farmers grow vegetables than pulses?

(4) A chart showing what colours were worn by children to school on the day when the school uniform was not compulsory.



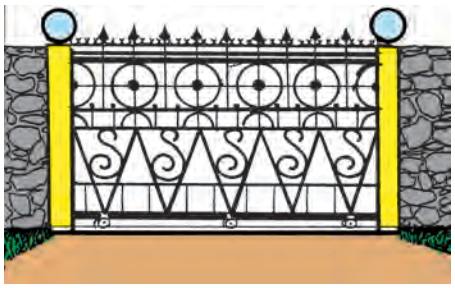
Scale :  means 5 children

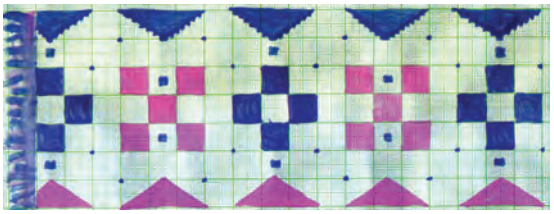
- How many children are there in the class?
- How many children wore yellow clothes?
- What colour did the greatest number of children wear? How many wore that colour ?

16. Patterns

Geometric patterns

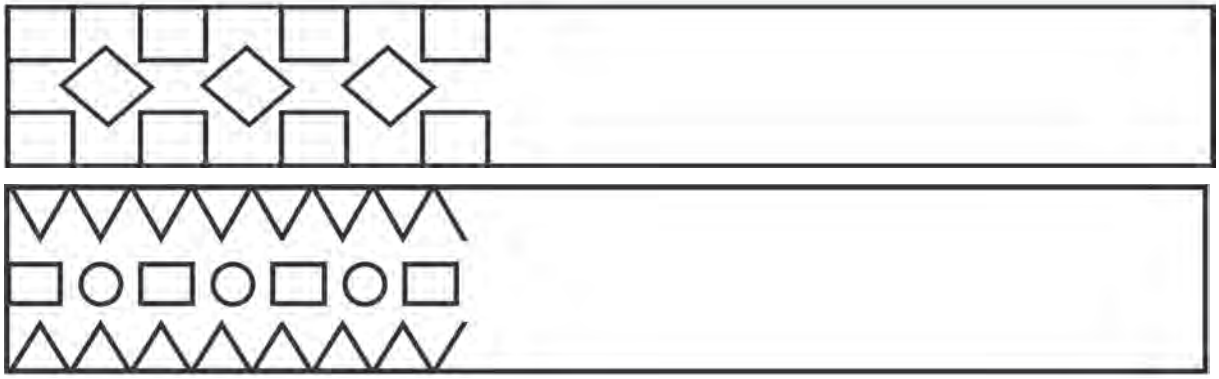
◆ **Study the designs shown below. Observe the patterns of geometric shapes.**





Exercise

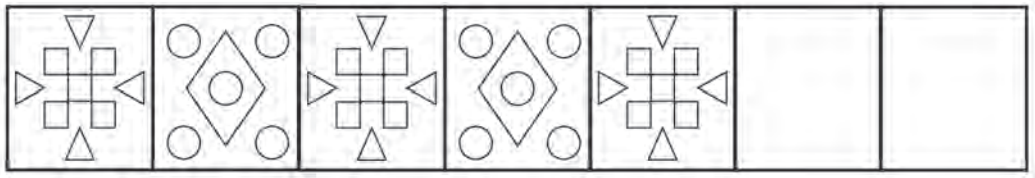
Complete the patterns given below.



◆ **Study the pattern below, made from freehand shapes.**

Exercise

1. Make a pattern by placing any geometric shapes one in front of the other.
2. Make a pattern using different freehand shapes.
3. Complete the pattern given below.



4. Identify the geometric shapes in the pattern above and, using them, create your own design.

Patterns in multiplication tables

9
18
27
36
45
54
63
72
81
90

Look at the 9 times table.
Note the sequence of numbers in the units places of the table.
What pattern do you see ?
Now note the sequence of numbers in the tens places of the table.
Find the pattern in it.

Exercise

1. Look at the 5 times table.
   5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75… Find the pattern in the digits in the units places of this table. Is there a pattern in the tens digits in this table?

2. Write the 10 times table.
   Look at the digits in the units place of this table. What is the pattern there?

3. Write the 2 times table till $2 \times 15 = 30$.
   Look at the digits in the units place from $2 \times 1 = 2$ up to $2 \times 15 = 30$.
   Find the pattern.

4. Complete the multiplications given below. Find a pattern in the products.

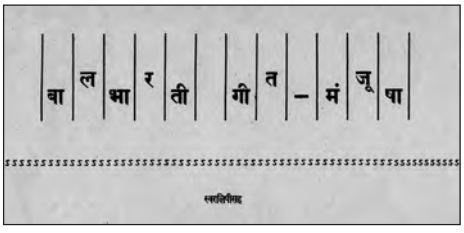
$6 \times 10 = 60$	$7 \times 10 = 70$
$6 \times 100 = 600$	$7 \times 100 = 700$
$6 \times 1000 =$	$7 \times 1000 =$
$6 \times 10{,}000 =$	$7 \times 10{,}000 =$

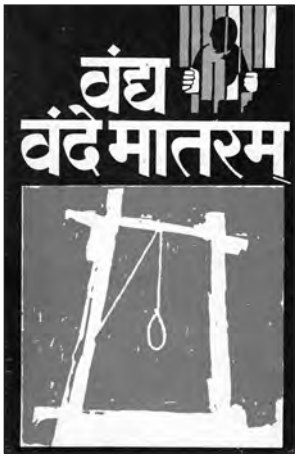
5. Multiply 37 by 3, 6, 9…, 27 in that order. Observe the patterns in the products.

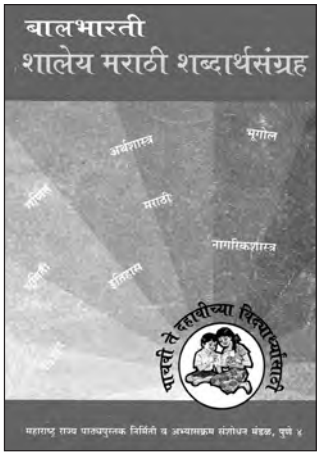
Activity : Create patterns using various geometric shapes.
Look at the designs on different fabrics and find the patterns. Make your own designs.
Dip a cross section of a bhindi in paint and use it as a stamp to make a design.

इयत्ता १ ली ते ८ वी साठीची पाठ्यपुस्तक मंडळाची वैशिष्ट्यपूर्ण पुस्तके

- मुलांसाठीच्या संस्कार कथा
- बालगीते
- उपयुक्त असा मराठी भाषा शब्दार्थ संग्रह
- सर्वांच्या संग्रही असावी अशी पुस्तके
- स्फूर्तीगीते
- गीतमंजुषा
- निवडक कवी, लेखक यांच्या कथांनी युक्त पुस्तके







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