MATHS MELA

Textbook of Mathematics for Grade 5

Part - I

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NCERT
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NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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Textbook of Mathematics for Grade 5

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Foreword

The Foundational Stage in school education, as envisaged by the National Education Policy (NEP) 2020, serves as the cornerstone for the holistic development of children. It enables them not only to imbibe the invaluable samskaras rooted in our country's ethos and constitutional framework, but also to acquire basic literacy and numeracy. This foundation equips them to transition seamlessly into the more challenging Preparatory Stage.

The Preparatory Stage acts as a bridge between the Foundational and the Middle Stages, spanning three years from Grade 3 to Grade 5. The education provided during this stage builds upon the pedagogical approaches of the Foundational Stage. While the play-way, discovery, and activity-based learning methods continue, children are also introduced to textbooks and more formal classroom settings. This introduction aims not to overwhelm but to establish a foundation across curricular areas, promoting holistic learning and self-exploration through reading, writing, speaking, drawing, singing, and playing. This comprehensive approach encompasses physical education, art education, environmental education, languages, mathematics, basic science, and social science. This comprehensive approach ensures children are well-prepared both at the cognitive, sensitive, physical, and *pranic* (emotional) levels to effortlessly transition to the Middle Stage.

The textbook, *Maths Mela* for Grade 5 Mathematics is meticulously designed to align with these objectives. It adheres to the recommendations of the National Education Policy 2020 and the National Curriculum Framework for School Education 2023. The textbook emphasises conceptual understanding, critical thinking, creativity, values, and dispositions essential for this developmental stage. It incorporates cross-cutting themes such as inclusion, multilingualism, gender equality, and cultural rootedness integrating appropriate ICT and school-based assessments. The engaging content and activities are designed to captivate students and encourage peer group learning, thus enriching the educational experience for students as well as teachers.

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It is crucial to remember the pedagogical focus of the textbook emphasising understanding, critical thinking, reasoning, and decision making. Children's innate curiosity at this stage should be nurtured by addressing their questions and designing activities based on core learning principles. While the play-way method continues, the nature of toys and games used for teaching evolves to enhance engagement rather than mere attraction.

While this textbook is valuable, children should also explore additional resources on the subject. School libraries should facilitate this extended learning, and parents and teachers should support their endeavours.

An effective learning environment motivates students, keeping them engaged and fostering curiosity and wonder vital for learning.

With confidence, I recommend this textbook to all students and teachers at the Preparatory Stage. I extend my gratitude to everyone involved in its development, hopeful that it will meet expectations. As NCERT remains committed to systemic reforms and improving publication quality, we welcome feedback to refine the textbook content.

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DINESH PRASAD SAKLANI
Director
National Council of Educational
Research and Training

New Delhi
23 June 2025

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About the Book

The textbook *Maths Mela* for Grade 5, has been developed based on the recent documents—National Education Policy (NEP) 2020 and National Curriculum Framework for School Education (NCF-SE) 2023. They aim to ensure that all children achieve basic numerical skills and abilities to think mathematically and logically, solve problems, develop intuitions regarding quantities and reasoning, and feel a sense of joy, wonder, and curiosity. The Preparatory Stage specifically focuses on the development of conceptual ideas about numbers, shapes, and spatial relationships, measurement and data handling, procedural skills and fluency, and computational thinking.

In light of this, the book for Grade 5 is designed to support learners in consolidating their learnings in the Foundational Stage and making progress towards dealing with more abstract ideas. The chapters of the book cover the foundational ideas of Mathematics: whole numbers and operations, fractions, shapes and spatial relationships, measurement (length, weight, capacity, time), and data handling. Chapters are woven around certain themes so as to engage children with the ideas and their applications. Ideas will keep recurring throughout the book, building deeper engagement and complexity to suit the interest and curiosity of the growing child.

We firmly believe that young learners are capable of reasoning, thinking, and problem-solving in different ways. Therefore, the book provides several occasions for identifying and noticing ideas and relationships across ideas, giving examples and counter-examples to statements, creating objects using mathematical ideas, measuring and quantifying, estimating, and solving problems. There are also opportunities to hone one's arithmetic skills through bare exercises, games, and puzzles. At some places in the chapters, such opportunities have been provided under the section 'Let us Play'. Another important purpose behind games and puzzles is to provide learners a stress-free and joyful learning. Most of these need not be assessed. Some tasks are aimed towards 'computational thinking' where learners are expected to observe and articulate patterns and find exhaustive solutions and solutions under different constraints.

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We also believe that learners should develop a liking for Mathematics. The chapters of this textbook provide several enjoyable activities, tasks, games, and puzzles that build on children's intuitions and tap into their experiences in the world around them. These have been given under the section 'Let Us Do' at many places in the chapters. These are sometimes used for making an entry to the concept and at other times provide opportunities to consolidate the ideas. The narrative in the chapters is supported through vivid illustrations, which are also integral to the tasks. We hope that this will allow learners to read pictures and use them for developing important mathematical ideas. Mathematical vocabulary and ways of communicating about mathematics have been emphsised throughout the chapters. We continue to provide instructions and explanation with as little use of language as possible.

Mathematics is an integrated body of knowledge, with a connected and coherent set of ideas. It can be built logically on commonly shared assumptions. Mathematical thinking and reasoning are an important part of learning mathematics. The book attempts to move away from rote memorisation of rules and procedures which kill learners' curiosity and burden them. It rather pushes learners to explore and discover important mathematical ideas. The sections named 'Let Us Think', 'Let Us Explore', and 'Let Us Discuss', included at various places, aim at keeping learners curious to reason out their thinking. These will give them reasons and insights that can be used to remember ideas and apply ideas flexibly and creatively, making further learning easier. It is important to engage with these processes of Mathematics so that learners can go beyond routine mathematical problems confidently and without fear and anxiety. We hope that the carefully chosen learning activities will help them make sense of the ideas, develop capacities to solve problems, experience wonder and joy in the process, and be curious about the world of mathematics. In addition to all of these, with growing capacities of children we have introduced a section called "Let Us Solve". This is aimed to help children hone their skills of using procedures, solving routine problems, and word problems.

We believe that the time available for children to work on problems and share their solutions and ideas will be crucial to achieve the objectives of NEP 2020 and NCF-SE 2023. The book carries several suggestions for appropriate activities and experiences (in class and in and around the home) to develop mathematical ideas.

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Teachers' and parents' support in changing conditions of learning for our children will be very important to achieve the dreams of a better and more confident nation.

The book also advises on the making of simple inexpensive concrete materials for learners to work with, and to develop and communicate their thinking. A few perforated sheets for some of the tasks in the chapters are provided at the end of the book. There are some more ideas in the 'Note for the Teachers' for activities and materials. The chapters also show a gradual movement from the use of materials to the use of pictures and making schematic diagrams to make sense of the situation and identify better strategy. The book tries to build models for the ideas using materials and pictures so that learners can use them to develop independent thinking. We would sincerely urge teachers and parents to use the sequence of ideas suggested in the book for teaching and gradually arrive at more formal rules and procedures. When children develop a better understanding, they will be in a better position to appreciate the rules and procedures. Similar care is also to be taken by parents and elder siblings who may help their wards in learning through this book. 'Note for the Teachers' may help teachers and parents in appropriately enhancing the child's learning.

Several activities and tasks in the book also require that children talk and discuss their ideas. Learning will significantly improve in a classroom that welcomes and respects learners' ideas. They will see different ways of thinking and using ideas, and alternative solutions leading to better and independent solutions over a period of time. They will get opportunities to scrutinise each other's solutions and develop fluency with mathematical language, symbols, and procedures. These will also serve as good assessments of learning for the teacher and also provide feedback to them. The exercises given in the book are also examples of how learners can be assessed.

Assessment should be done in multiple forms—using materials and pictures, problem situations and bare problems, activities, creating objects, and sharing and explaining solutions. The book provides enough opportunities for adaptive assessment, assessment for learning, and assessment as learning while the child is engaged in different activities. Teachers can note down their observations while the learners discuss their ideas, replying to the questions asked, and explaining the reasoning for their answer. Such records can be included in the learner's portfolio.

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Chapters have more paper and pen tasks in Grade 5 (questions, word problems, and projects) that a child can complete in the classroom or at home. Such tasks provide opportunities to practice writing and present their thinking on paper.

In the times to come, we will provide more resources to the teachers and learners in the form of videos, worksheets for practice, and links to online resources.

We hope that the book will be enjoyable to all and will lead to better teaching-learning conditions.

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THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a [1]**[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 [2][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.**

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1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)

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Constitution of India

Part IV A (Article 51 A)

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 wildlife, 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.

Note: The Article 51A containing Fundamental Duties was inserted by the Constitution (42nd Amendment) Act, 1976 S.11 (with effect from 3 January 1977).

*(k) was inserted by the Constitution (86th Amendment) Act, 2002 S.4 (with effect from 1 April 2010).

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CONSTITUTION OF INDIA

Part III (Articles 12 – 35)
(Subject to certain conditions, some exceptions
and reasonable restrictions)
guarantees these

Fundamental Rights

Right to Equality

- before law and equal protection of laws;
- irrespective of religion, race, caste, sex or place of birth;
- of opportunity in public employment;
- by abolition of untouchability and titles.

Right to Freedom

- of expression, assembly, association, movement, residence and profession;
- of certain protections in respect of conviction for offences;
- of protection of life and personal liberty;
- of free and compulsory education for children between the age of six and fourteen years;
- of protection against arrest and detention in certain cases.

Right against Exploitation

- for prohibition of traffic in human beings and forced labour;
- for prohibition of employment of children in hazardous jobs.

Right to Freedom of Religion

- freedom of conscience and free profession, practice and propagation of religion;
- freedom to manage religious affairs;
- freedom as to payment of taxes for promotion of any particular religion;
- freedom as to attendance at religious instruction or religious worship in certain educational institutions.

Cultural and Educational Rights

- for protection of interests of minorities;
- for minorities to establish and administer educational institutions;
- saving of certain Laws 31A–31D.

Right to Constitutional Remedies

- by issuance of directions or orders or writs by the Supreme Court and High Courts for enforcement of these Fundamental Rights.

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Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.



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Chapter 1 We the Travellers—I

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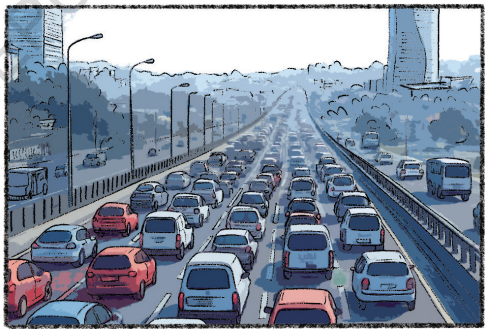


When was the last time you went on a long trip? Where did you go? How did you travel? What was the duration of your trip? How much distance did you cover? Ask the elders who went with you to help you answer these questions.





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Human beings have always been interested in travelling. About a hundred years ago, there were far fewer vehicles than today. There were animal-drawn carts, cars, and trains. Long before this, thousands of years ago, people travelled long distances on foot or used animals to travel from one place to another. They also built boats and ships to travel across lakes, rivers, and seas. Boats were probably the first form of transport invented by humans, much before bullock carts! Do you know how many vehicles are currently there in your state?

Reading and writing large numbers

How do you write numbers to show several thousand objects?

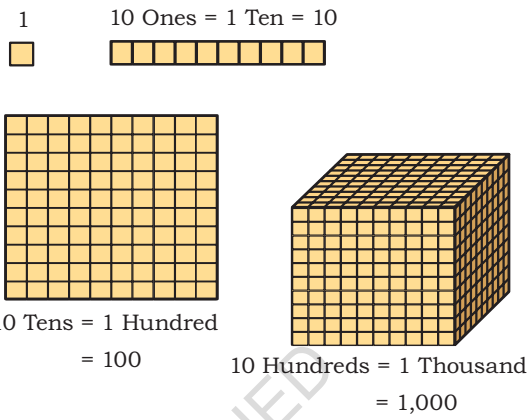
Let us start with 1,000. What numbers do we get when we keep adding a thousand?

1,000	2,000							9,000

What number do we get when we add a thousand to 9,000? We get **ten thousand**. How do we write this number?

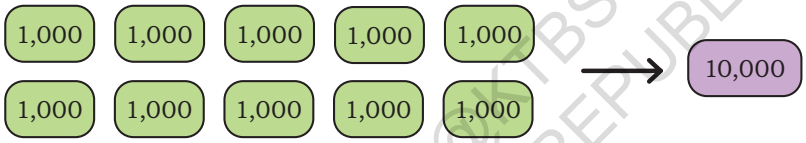
Look at the table below and notice the pattern of writing numbers. In the place value chart, we have added another column, **TTh**. It stands for ten thousand.

×10	×10	×10	×10	
TTh	**Th**	**H**	**T**	**O**
				1
			1	0
		1	0	0
	1	0	0	0
1	0	0	0	0



In the same way, 10 Thousands = Ten Thousand = 10,000

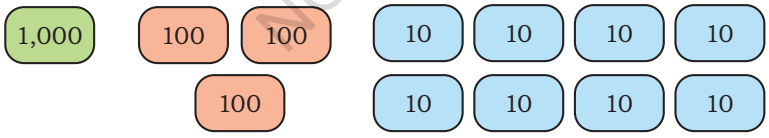
We use a comma to help us read large numbers easily



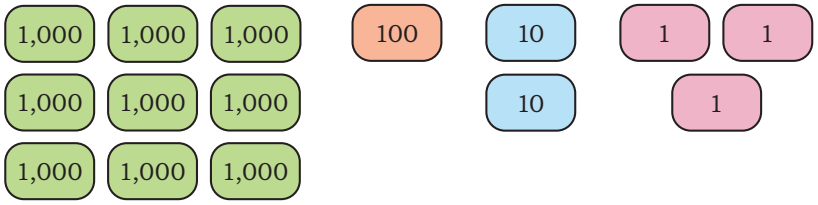
Do you remember how we read and write numbers in the Indian place value system? We use the same ten digits 0–9 in different places to write larger numbers.

For example,

1,380 = 1 Thousand + 3 Hundreds + 8 Tens + 0 Ones.



9,123 = 9 Thousands + 1 Hundred + 2 Tens + 3 Ones.

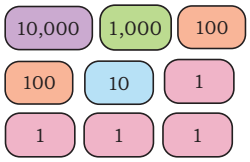
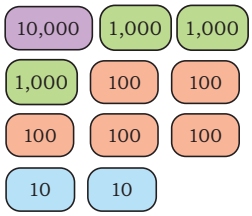
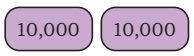
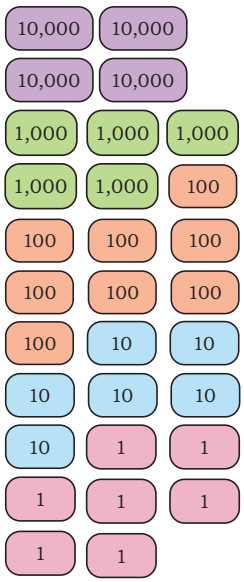


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Let us see how we write numbers beyond 10,000 and how we name them. We write them in the same way as numbers below 9,999. You can use the tokens given in the end of the book.

Token(s)	Number	TTh	Th	H	T	O	Number Name
10,000 1	10,001	1	0	0	0	1	Ten thousand one
10,000 1 1	10,002	1	0	0	0	2	Ten thousand two
10,000 10	10,010	1	0	0	1	0	Ten thousand ten
10,000 10 10 1 1 1 1	10,024	1	0	0	2	4	Ten thousand twenty-four
10,000 10 10 10 1 1 1							Ten thousand thirty-three
10,000 100 100 100 100 10 10 10 10 10 1 1 1 1 1 1 1	10,458						Ten thousand four hundred fifty-eight

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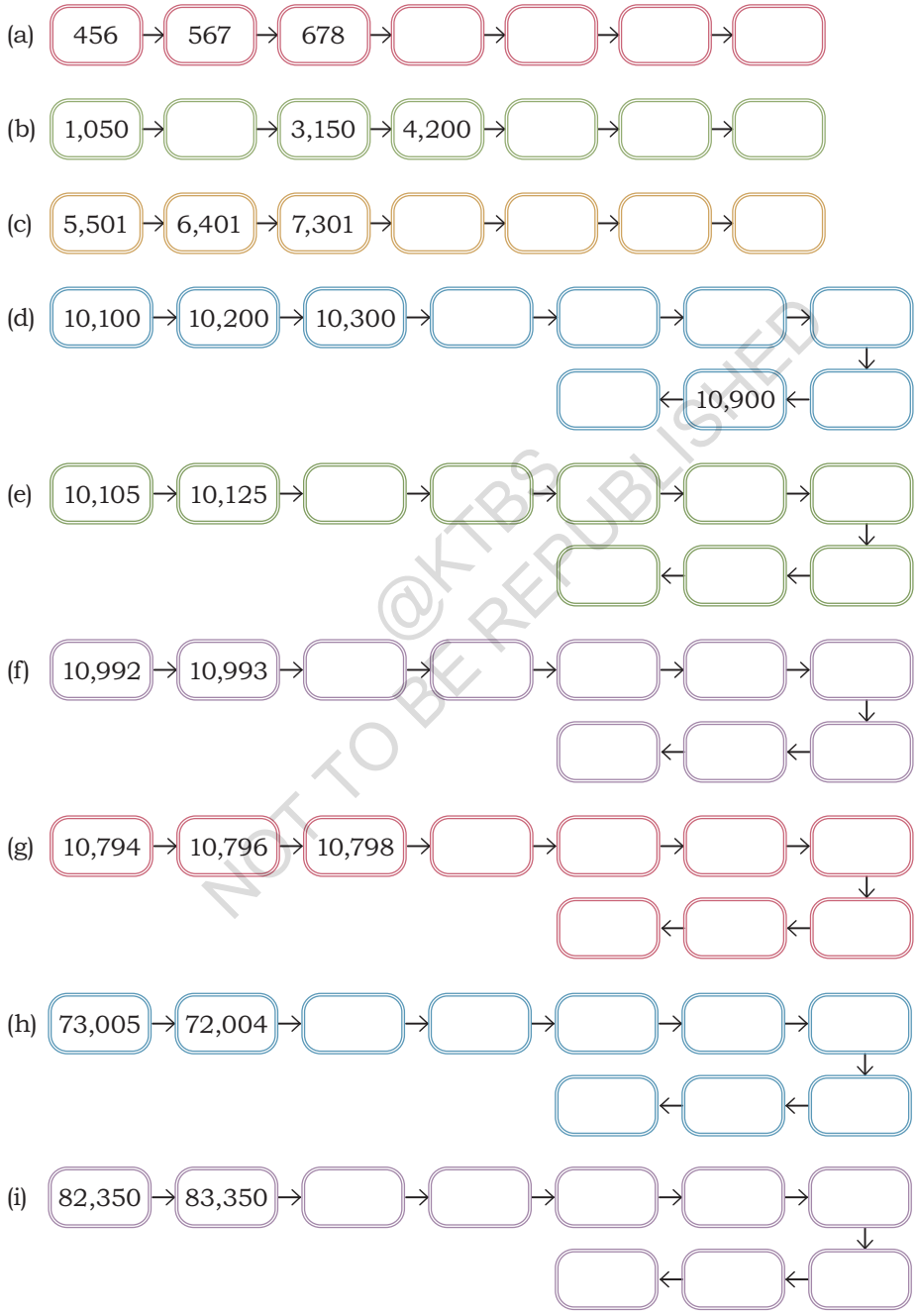
Token(s)	Number	TTh	Th	H	T	O	Number Name
		1	1	2	1	4	
	13,520						Thirteen thousand five hundred twenty
	20,000						Twenty thousand
	45,867						Forty-five thousand eight hundred sixty-seven

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Let Us Do

1. Fill in the blanks by continuing the pattern in each of the following sequences. Discuss the patterns in class.



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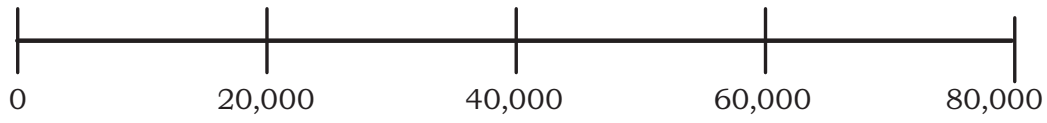
2. Fill in the blanks appropriately. Use commas as required.

Number	Number Name
8,045	Eight thousand forty-five
7,209	
10,599	
	Ten thousand seven hundred forty-three
20,869	Twenty thousand eight hundred sixty-nine
13,579	
	Ten thousand ten
	Fifty-six thousand four hundred ninety-one
45,045	
39,593	
50,005	
26,050	
81,200	
	Ninety thousand nine
	Twenty-three thousand two hundred thirty
	Thirty-six thousand one

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3. Arrange the numbers below in increasing order. You can use the number line below, if required.

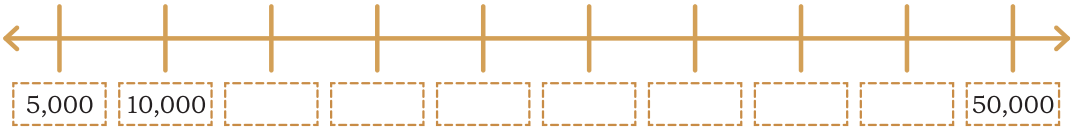
40,347 | 34,407 | 40,473 | 34,740 | 73,404 | 74,430 | 47,340 | 18,926



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4. A student said 9,990 is greater than 49,014 because 9 is greater than 4. Is the student correct? Why or why not?

Use the number line below to find the position of the numbers. Fill in the blanks.



TTh	Th	H	T	O
	9	9	9	0
4	9	0	1	4

You can use this place value chart to compare the numbers.

5. Digit swap

   (a) In the number 1,478, interchanging the digits 7 and 4 gives 1,748. Now, interchange any two digits in the number 1,478 to make a number that is larger than 5,500

   (b) Interchange two digits of 10,593 to make a number

   i) Between 11,000 and 15,000.

   ii) More than 35,000.

   (c) Interchange two digits of 48,247 to make a number

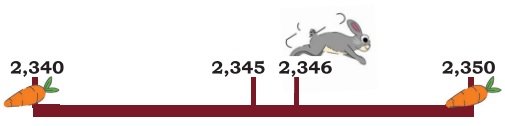
   i) As small as possible.

   ii) As big as possible.

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Nearest Tens (10s), Hundreds (100s), and Thousands (1,000s)

A rabbit is hungry. Its location is given in the pictures below. Its food has been kept at two places. Help the rabbit to reach its food.



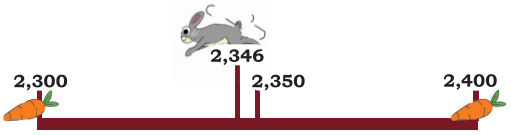
The rabbit is at 2,346. Its food has been kept at its neighbouring tens. On which tens should the rabbit go to get its food, with the least number of steps.

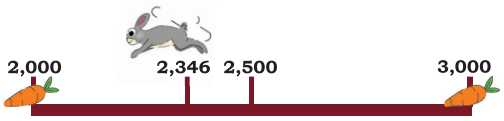
2,350 is the nearest ten of 2,346. It will need 4 jumps to reach 2,350.

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The rabbit is at 2,346. Its food has been kept at its neighbouring hundreds. Which of the two hundreds should the rabbit go to?

_____ is the nearest hundred of 2,346. It will need_____ jumps to reach _____.





The rabbit is at 2,346. Its food has been kept at its neighbouring thousands. Which number should the rabbit go to?

_____ is the nearest thousand of 2,346. It will need _____ jumps to reach _____.

Fill in the boxes appropriately.

Number	Nearest Tens	Nearest Hundreds	Nearest Thousands
3,176			
4,017			
5,789			
8,203			

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Let Us Think

1. Vijay rounded off a number to the nearest hundred. Suma rounded off the same number to the nearest thousand. Both got the same result. Circle the numbers they might have used.

7,126 7,835 7,030 6,999

Note for Teachers: Help the learners notice the placement of numbers in the neighbouring range of tens, hundreds, and thousands. Encourage them to use such images till they get comfortable identifying the nearest ten, hundred, and thousand.

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2. Think and write two numbers that have the same—

   (a) Nearest ten.
   (b) Nearest hundred.
   (c) Nearest thousand.

For example, 19 and 21 have the same nearest ten, that is, 20.

3. Think and write the numbers that have the same—

   (a) Nearest ten and nearest hundred.
   (b) Nearest hundred and nearest thousand.
   (c) Nearest ten, hundred and thousand.

Travelling, Now and Then

We learnt that people in the past travelled on foot, on animals, and used boats and sailing ships. The animals that have been used for travelling include bullocks, horses, donkeys, mules, and elephants. In hilly and snow-covered regions, yaks, dogs, and reindeers have been used, while camels have been used in deserts.

Now, people use bicycles, motorbikes, cars, buses, trains, ships, and aeroplanes to travel from one place to another. Submarines are used to go deep under water. Humans are also using spacecraft to travel to outer space.



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In an hour a person can generally travel—

(a) 3–5 km on foot.
(b) 10–15 km on horseback.
(c) 12–20 km by cycle.
(d) 40–60 km by motorbike.
(e) 40–160 km by train.
(f) 25–45 km by ship.
(g) 750–920 km by aircraft.
(h) minimum 28,000 km by spacecraft.

Let Us Do

1. A cyclist can cover 15 km in one hour. How much distance will she cover in 4 hours, if she maintains the same speed?

2. A school has 461 girls and 439 boys. How many vehicles are needed for all of them to go on a trip using the following modes of travel?

   The numbers in the bracket indicates the number of people that can travel in one vehicle.

   (a) Bicycle (2)
   (b) Autorickshaw (3)
   (c) Car (4)
   (d) Big car (6)
   (e) Tempo traveller (10)
   (f) Boat (20)
   (g) Minibus (25)
   (h) Aeroplane (180)

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Finding Large Numbers Around Us

We saw that the distance (in kilometre) covered by different means of transport in an hour can range from a 1-digit number to a 5-digit number. Can we find other contexts around us that contain numbers in this range? Let us consider the situation below.

A book has around 200 pages, and each page has about 50 words. The book therefore has about 10,000 words in all.

Find something in the textbook whose count is a 4-digit number.

Now, let us try this with our school.

(a) Our school has _____ classrooms.
(b) There are _____ students in my class.
(c) Our classroom has _____ books in total.

Usually, we measure distances in sea and air using nautical miles. For now, we will use 1 km = 1,000 m. By now, you know different units of measuring length. We will study the units for measuring length, kilometre, in detail in a later chapter.

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Find something in the classroom whose count is a—
(i) 4-digit number. (ii) 5-digit number.

List some quantities whose count is a 4-digit or a 5-digit number in the context of—

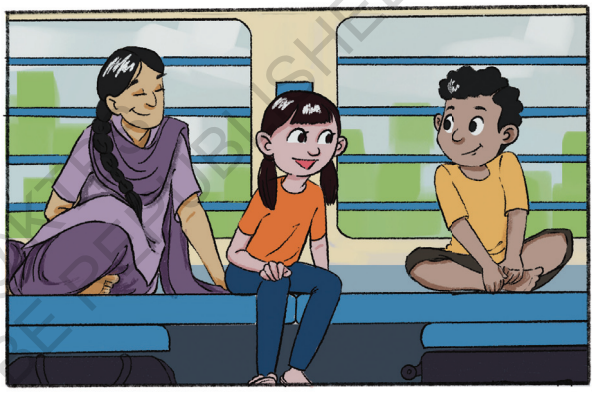
(i) A tree.

(ii) Your village/town/city, or any other place of your choice.

Pastime Mathematics

Sanju and Mira are traveling on a train. To pass time, they challenge each other with games and puzzles.

1. Mira poses the **river crossing puzzle** to Sanju.



A boatman wants to cross a river in a boat. He has to take a lion, a sheep, and a bundle of grass with him. He can take one of them at a time. If the sheep and grass are left on the shore, the sheep will eat the grass. And, if the sheep and lion are left on the shore, the lion will eat the sheep.

How can the boatman take the lion, sheep, and grass across the river?

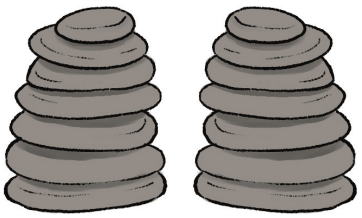
Help him so that he can ferry the lion, sheep, and grass across the river safely, and in the minimum number of trips.



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2. Sanju introduces a game called **pile of pebbles** to Mira.



There are two piles of pebbles. Each pile contains 7 pebbles. Each player can pick as many pebbles they want from either of the piles. The player who picks the last pebble wins.

Try this game with your friends. Now, how do you play so that you win?

To find a winning strategy, try playing with 1 pebble in each pile, two in each, three in each, and so on.

3. Now, it's Mira's turn. She gives a fun puzzle to Sanju with the following steps—

		For example
(a)	Take any two different digits.	→ 3 and 7
(b)	Make two 2-digit numbers using them.	→ 37 and 73
(c)	Subtract the smaller number from the bigger number.	→ 73 – 37 = 36

Now, use the two digits in the difference and repeat steps (b) and (c).

Continue this process until you get a 1-digit number. Even before everyone could finish, Mira exclaimed, "Mind you! No matter which two numbers you choose, you will get 9 in the end."

The whole process will look as shown below.

$$\begin{array}{r} 73 \\ -\,37 \\ \hline 36 \end{array} \longrightarrow \begin{array}{r} 63 \\ -\,36 \\ \hline 27 \end{array} \longrightarrow \begin{array}{r} 72 \\ -\,27 \\ \hline 45 \end{array} \longrightarrow \begin{array}{r} 54 \\ -\,45 \\ \hline 9 \end{array}$$

How did Mira know what the 1-digit number in the end would be?

Let us explore.

(1) Observe the differences you get in each step above. Do you notice anything in common?

(2) Try the puzzle using any other pair of digits. What is common to these differences? What do you get in the end?

(3) What digits can you choose so that you get a 1-digit number in the first step itself? Give some examples. Describe the pattern in the digits.

Note for Teachers: Encourage the students to think logically and strategically while solving these puzzles. Such thinking underlies all of mathematics.

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(4) Now, find different digits such that the difference between the numbers is 27.

(5) Mira found an interesting relationship between the two digits and the difference obtained. Can you see it in the table that Mira made?

Digits	Differences in digits	Difference in numbers formed by the digits
3, 7	7 – 3 = 4	73 – 37 = 36
1, 9	9 – 1 = 8	91 – 19 = 72
2, 8	8 – 2 = 6	82 – 28 = 54
4, 5	5 – 4 = 1	54 – 45 = 9

Extend this table by choosing appropriate digits so that the resulting differences are 2, 3, 5, and 7 respectively.

What do the differences between the digits indicate?

List the numbers that give a 1-digit number in the third subtraction.

Identify pairs of digits that lead to the 1-digit number after the maximum possible number of subtractions. Compare your answers with your friends.

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Let Us Do

1. Write 5 numbers between the numbers 23,568 and 24,234.

   _____, _____, _____, _____, and _____

2. Write 5 numbers that are more than 38,125 but less than 38,600.

   _____, _____, _____, _____, and _____

3. Ravi's car has been driven for 56,987 km till now. Sheetal's car has been driven 67,543 km. Whose car has been driven more? _____.

4. The following are the prices of different electric bikes. Arrange the prices in ascending (increasing) order.

   ₹90,000 ₹89,999 ₹94,983 ₹49,900 ₹93,743 ₹39,999

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5. The following table shows the population of some towns. Arrange them in a descending (decreasing) order.

Town	Population
Town 1	65,232
Town 2	53,231
Town 3	56,380
Town 4	51,336
Town 5	45,858
Town 6	66,540

_____, _____, _____, _____, _____, _____,

6. Find numbers between 42,750 and 53,500 such that the ones, tens, and hundreds digits are all 0? _____.

7. Write the following numbers in the expanded form. One has been done for you.

(a) 783 = 700 + 80 + 3

(b) 8,062 = _____.

(c) 9,980 = _____.

(d) 10,304 = _____.

(e) 23,004 = _____.

(f) 70,405 = _____.

8. Fill in the blanks with the correct answer. Share your thoughts in class.

90 Tens is 900, so remaining 83 will be Ones

(a) 983 = 90 Tens + 83 Ones

(b) 68 = __Tens + 18 Ones

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(c) 607 = 4 Hundreds + ___Ones

(d) 5,621 = 4 Thousand + ___Hundreds + 2 Tens + ___Ones

(e) 7,069 = ___ Thousand + 20 Hundreds + ___Ones

(f) 37,608 = ___Ten Thousand + 17 Thousand + ___Hundreds + 8 Ones

(g) 43,001 = 3 Ten Thousand + ____ Thousand + ____ Hundreds + 1 Ones

9. Fill in the blanks with the correct answers.

3 Tens is 30, 90 Tens in 900, and 700 Tens in 7000

(a) How many notes of ₹10 are there in ₹7,934? 793

(b) How many notes of ₹100 are there in ₹7,934? _____

(c) How many thousands are there in 7,934? _____

(d) How many ₹500 notes are there in ₹7,934? _____

(Hint: Observe the answer of (iii))

(e) How many notes of ₹10 are there in ₹65,342? _____

(f) How many notes of ₹100 are there in ₹65,342? _____

(g) How many thousands are there in 65,342? _____

(h) How many ₹500 notes are there in ₹65,342? _____

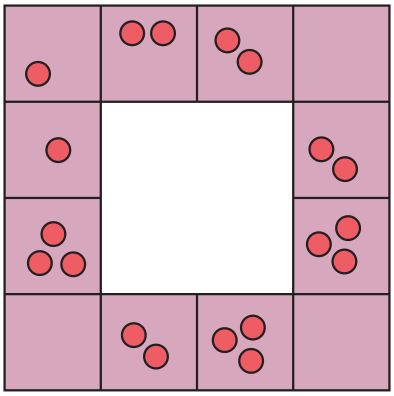
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King's Horses

Once upon a time, there was a king who was very fond of horses. He had 20 horses of the best breed. The horses were kept in the royal stable, and cared for by a caretaker.

One night, a thief stole one of the horses. Fearing punishment, the caretaker arranged the horses in the stable as shown in the picture here.

The next day, when the king came to check on the horses, the caretaker led him around the square stable. "Please count the number of horses along each side, your majesty," he said.



The dots above show how the horses were arranged in the stable.

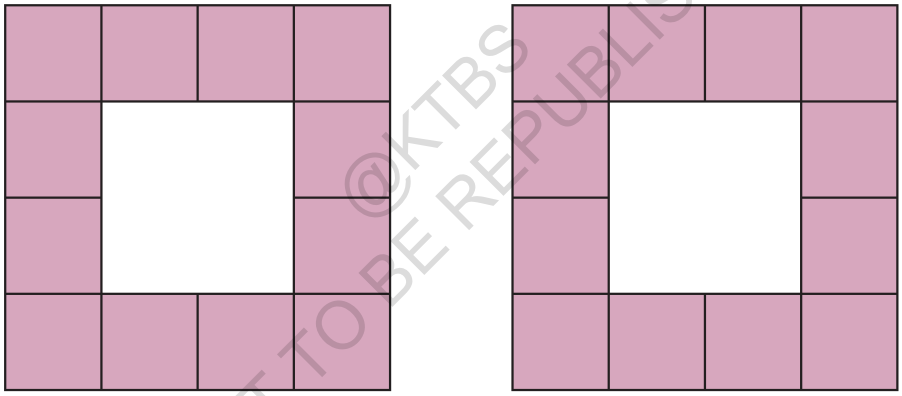
The king counted 5 horses along each side. “We have 5 horses along each side and there are 4 sides. So there are a total of 20 horses, your majesty,” the caretaker explained.

Satisfied with the explanation, the king returned to his palace.

But wait, were there really 20 horses in the stable? Count the horses one by one and check! What was the mistake in the caretaker’s explanation?

The following night, the thief stole another horse from the stable. Now, only 18 horses remained. The caretaker once again cleverly arranged the 18 horses, so that there were 5 horses on each side of the square stable. How do you think he was able to do it? Arrange the 18 horses in the stable with 5 on each side.

How many more horses can the thief steal before the king notices something is wrong? Try making the arrangements yourself.



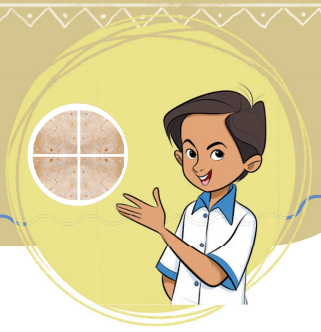
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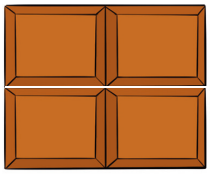
Chapter

2 Fractions

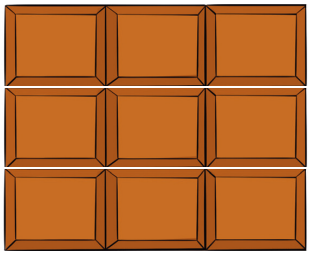
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Tamanna is a student of Grade 5. She has two chocolates of different sizes. She says that $\frac{1}{3}$ of one of her chocolates is bigger than $\frac{1}{2}$ of the other chocolate. Is that correct? Explain why this is so.



Identify $\frac{1}{2}$ of the chocolate



Identify $\frac{1}{3}$ of the chocolate



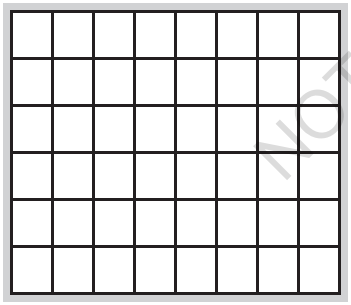
When can we say that $\frac{1}{2}$ of something is greater than $\frac{1}{3}$ of something?

To compare two fractions of two wholes, the wholes from which the fractions are derived must be the same.

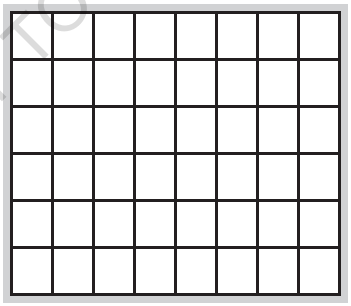
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Playing with a Grid

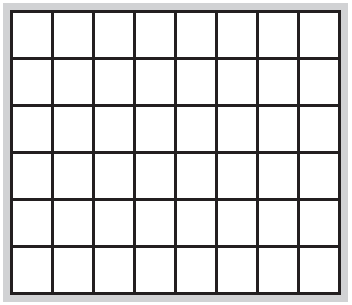
A



B



C



- Shade $\frac{1}{8}$ of Grid A in **red**.
- Shade $\frac{1}{6}$ of Grid B in **blue**.
- Shade $\frac{1}{12}$ of Grid C in **yellow**.
- Do you see $\frac{1}{3}$ in any of the grids? Mark it.

Is $\frac{1}{3}$ equal to $\frac{2}{6}$? Let us find out.

Look at the picture and identify the fractions.



Are there two different ways to write the fraction represented by the shaded part? _____

Do you see that $\frac{1}{3} = \frac{2}{6}$? Yes. These are called '**equivalent fractions**'.

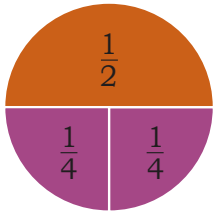
Let us see how equivalent fractions can be generated.

Fun with Fraction Kit

Gurpreet is playing with his fraction kit (a kit is given at the end of the textbook). Do you remember how to make a whole with pieces of the same size? How many $\frac{1}{5}$ pieces will you need to make a whole?

He makes a whole using two different fraction pieces. The whole looks like the following.

One piece of $\frac{1}{2}$ and two pieces of $\frac{1}{4}$ make a whole. What is the relation between $\frac{1}{2}$ and $\frac{1}{4}$? Discuss in class.



$\frac{1}{2} = \frac{2}{4}$ ($\frac{1}{2}$ is equivalent to $\frac{2}{4}$).

When a $\frac{1}{2}$ piece is broken into 2 equal parts, each part is a $\frac{1}{4}$ piece.

2 pieces of $\frac{1}{4}$ are equal to $\frac{1}{2}$.

What else is equivalent to $\frac{1}{2}$?

$\frac{1}{2} = \frac{2}{4} =$ ____ $=$ ____ $=$ ____

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Let Us Do

1. In groups of 3 or 4, find different ways of making a whole with different fraction pieces from your kit. Write the equivalent fractions for the following that you may find in the process.

   (a) $\frac{1}{3}$ = = = (b) $\frac{1}{4}$ = = =

   (c) $\frac{1}{5}$ = = = (d) $\frac{1}{6}$ = = =

Do you see how to generate equivalent fractions for any given fraction? Discuss in class.

2. Find the following using your kit. You can also shade and check by shading the following. The first one is partially done for you.

   A. How many $\frac{1}{6}$s make $\frac{1}{3}$?



The shaded part is $\frac{1}{3}$. Identify $\frac{1}{6}$ in the same whole and find how many $\frac{1}{6}$s fit into $\frac{1}{3}$?

   B. How many $\frac{1}{8}$s make

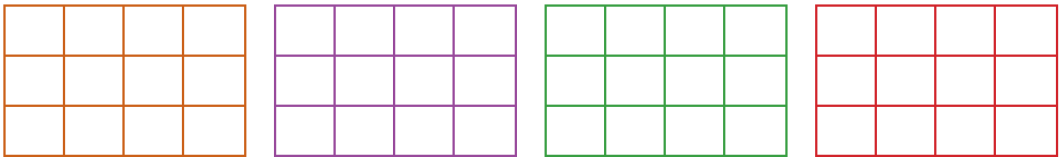
   (a) $\frac{1}{4}$? (b) $\frac{1}{2}$?





   C. How many $\frac{1}{12}$s make

   (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$?



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3. Do as instructed using your fraction kit.

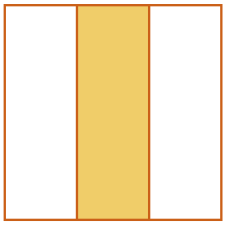
- Make a whole using only $\frac{1}{6}$ and $\frac{1}{12}$ pieces.
- Make a whole using $\frac{1}{12}$, $\frac{1}{4}$, and $\frac{1}{2}$ pieces.
- Make a whole using any five pieces of the same size.
- Make a whole using any seven pieces.

Play in a group with this kit and find other interesting combinations to make a whole. Write or draw your findings.

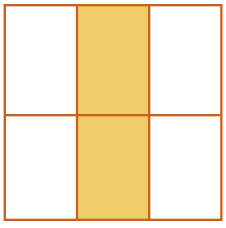
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Making Equivalent Fractions

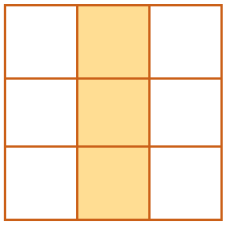
Sameer has shaded one-third of the following figures. He draws horizontal lines to divide the shapes into more equal parts.



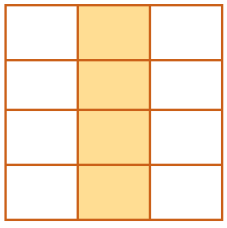
$\frac{1}{3}$



$\frac{2}{6}$



$\frac{3}{9}$



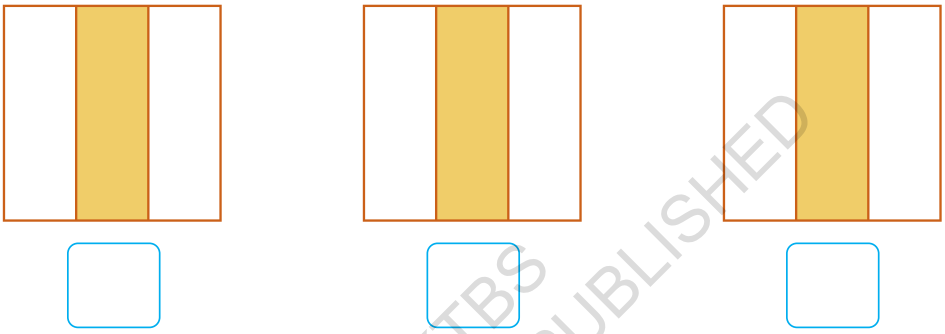
$\frac{4}{12}$

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He observes an interesting pattern and says that $\frac{1}{3}$, $\frac{2}{6}$, $\frac{3}{9}$, and $\frac{4}{12}$ show the same shaded region.

$\frac{2}{6}$, $\frac{3}{9}$, and $\frac{4}{12}$ are all equivalent to $\frac{1}{3}$. We use the word '**equivalent**' to indicate the same part of a whole, with different names.

Divide the wholes given below into more equal parts and find fractions equivalent to $\frac{1}{3}$. Write them in the boxes below the images.

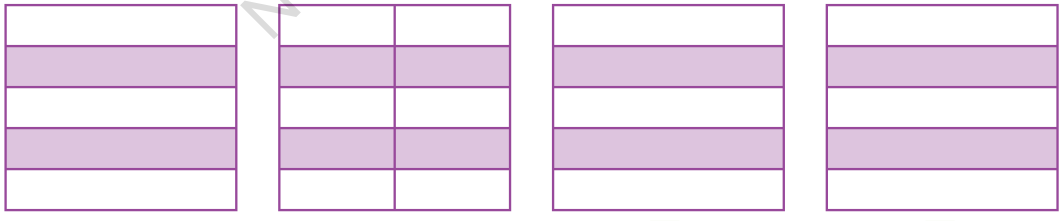


Do you see any pattern in all the equivalent fractions that you found?

$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12} = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \frac{\square}{24} = \frac{\square}{36}$

How do you know when a fraction is equivalent to another? Discuss in class.

The below pictures show $\frac{2}{5}$ of a whole. Find the different fractions that are equivalent to $\frac{2}{5}$ and write your fractions below each image.



$\frac{2}{5}$ $\quad$ $\frac{4}{10}$ $\quad$ $\frac{\square}{\square}$ $\quad$ $\frac{\square}{\square}$

$\frac{2}{5} = \frac{4}{10} = \_\_\_\_ = \_\_\_\_ = \frac{\square}{50} = \frac{\square}{100}$

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Let Us Do

1. Fill in the blanks with equivalent fractions. There may be more than one answer.

   (a) $\frac{1}{7}$ = _____ (b) $\frac{2}{3}$ = _____

   (c) $\frac{3}{4}$ = _____ (d) $\frac{3}{5}$ = _____

2. Put a tick (✓) against the fractions that are equivalent.

   (a) $\frac{2}{3}$ and $\frac{3}{4}$ (b) $\frac{3}{5}$ and $\frac{6}{10}$

   (c) $\frac{4}{12}$ and $\frac{2}{6}$ (d) $\frac{6}{9}$ and $\frac{1}{3}$

3. Fill in the boxes such that the fractions become equivalent.

   (a) $\frac{2}{5} = \frac{\square}{10}$ (b) $\frac{3}{4} = \frac{\square}{16}$

   (c) $\frac{4}{7} = \frac{8}{\square}$ (d) $\frac{5}{9} = \frac{25}{\square}$

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Comparing Fractions—Same Denominator

Sevi and Shami divided a piece of *chikki* between themselves. Sevi ate $\frac{1}{3}$ and Shami ate the rest, that is, $\frac{2}{3}$. Who ate more?

2 pieces of $\frac{1}{3}$ are more than 1 piece of $\frac{1}{3}$. So, Shami ate more.

$\frac{2}{3} > \frac{1}{3}$



Let Us Do

1. Compare the fractions given below using < and > signs.

(a) $\frac{1}{4}$ _____ $\frac{3}{4}$

(b) $\frac{3}{5}$ _____ $\frac{4}{5}$

(c) $\frac{5}{7}$ _____ $\frac{2}{7}$

(d) $\frac{7}{8}$ _____ $\frac{3}{8}$

(e) $\frac{5}{10}$ _____ $\frac{6}{10}$

(f) $\frac{2}{6}$ _____ $\frac{1}{6}$

Comparing Fractions—Same Numerator



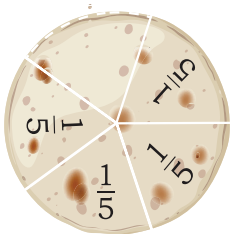
I ate $\frac{4}{6}$ paratha yesterday evening.

I ate $\frac{4}{5}$ paratha yesterday evening.



Between Sevi and Shami, can you tell who ate more? Use your fraction kit to find the answer.

Do the following pictures help you reason? Share your thoughts in the class.





$\frac{1}{6}$ piece is smaller than $\frac{1}{5}$ piece. Therefore, $\frac{4}{6} < \frac{4}{5}$.

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Let Us Do

1. Compare the following fractions using < and > signs.

(a) $\frac{3}{8}$ _____ $\frac{3}{7}$

(b) $\frac{4}{9}$ _____ $\frac{4}{10}$

(c) $\frac{2}{7}$ _____ $\frac{2}{5}$

(d) $\frac{5}{7}$ _____ $\frac{5}{6}$

(e) $\frac{6}{9}$ _____ $\frac{6}{10}$

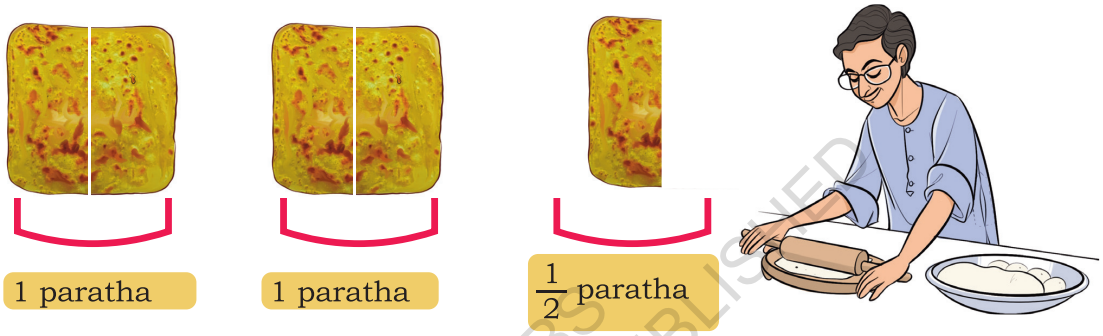
(f) $\frac{7}{9}$ _____ $\frac{7}{11}$

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Fractions Greater Than 1

Raman's father makes nice soft parathas. He cuts the parathas either into halves (2 equal parts) or fourths (4 equal parts) before serving them. He asks his children (Raman and Radhika) each day to find out the number of parathas he made.

Maa took 5 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat?



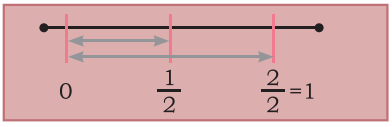
$\underbrace{\frac{1}{2}+\frac{1}{2}}_{1}+\underbrace{\frac{1}{2}+\frac{1}{2}}_{1}+\frac{1}{2}$

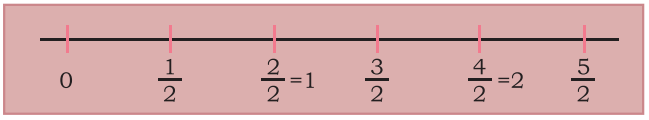
5 pieces of $\frac{1}{2}$ paratha = $\frac{5}{2}$ parathas

$= 2 + \frac{1}{2}$ parathas

$= 2\frac{1}{2}$ parathas

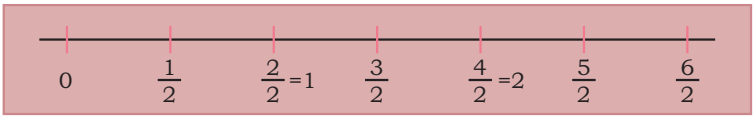
We can also show the same on a number line. Divide the distance between 0 and 1 in two equal parts. Each part is $\frac{1}{2}$. 2 halves make 1. Placing 5 halves next to each other takes us to $\frac{5}{2}$ or $2\frac{1}{2}$.





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Raman's sister Radhika took 6 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat?



$\underbrace{\frac{1}{2}+\frac{1}{2}}_{1} + \underbrace{\frac{1}{2}+\frac{1}{2}}_{1} + \underbrace{\frac{1}{2}+\frac{1}{2}}_{1} = \frac{6}{2}$ parathas = 3 parathas.

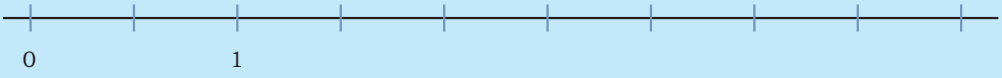
Dadiji had 7 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat? Find out.

Raman ate 6 pieces of $\frac{1}{2}$ paratha, *Dadaji* ate 7 pieces of $\frac{1}{2}$ paratha and *Baba* ate 5 pieces of $\frac{1}{2}$ paratha. How many parathas did each of them eat? Use the number line to find the answer.

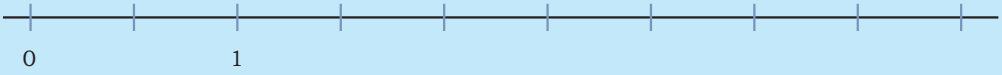
Quantity of Raman's paratha



Quantity of *Dadaji*'s paratha



Quantity of Baba's paratha

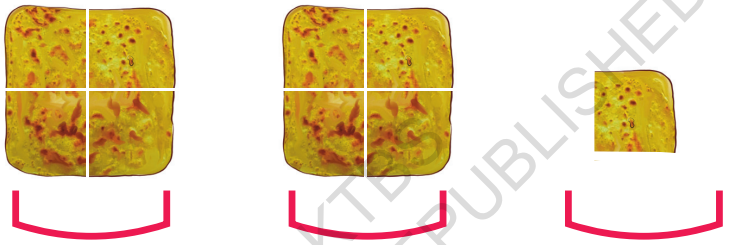


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How many parathas were made on this day? Find out.

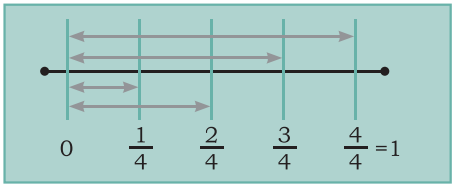
Another day, Raman's father cut all the parathas in $\frac{1}{4}$. *Dadaji* took 9 pieces of $\frac{1}{4}$ paratha. How many parathas did he eat?



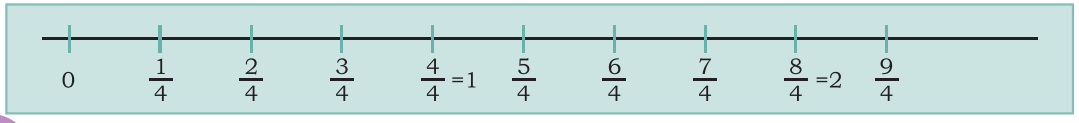
$\underbrace{\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}}_{1} + \underbrace{\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}}_{1} + \frac{1}{4} = \frac{9}{4}$ parathas =

$2 + \frac{1}{4}$ parathas

$= 2\frac{1}{4}$ parathas



We can also show the same on a number line. Divide the distance between 0 and 1 into four equal parts. Each part is $\frac{1}{4}$. 4 one-fourths make 1. Placing 9 one-fourths next to each other takes us to $\frac{9}{4}$ or $2\frac{1}{4}$.



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Raman ate 7 pieces of $\frac{1}{4}$, Radhika ate 6 pieces of $\frac{1}{4}$, *Maa* ate 8 pieces of $\frac{1}{4}$, *Dadiji* ate 10 pieces of $\frac{1}{4}$, and *Baba* ate 12 pieces of $\frac{1}{4}$ paratha. Use a number line to find out how many parathas were eaten by each of them.

Quantity of Raman's paratha

0 1

Quantity of Radhika's paratha

0 1

Quantity of *Maa*'s paratha

0 1

Quantity of *Dadiji*'s paratha

0 1

Quantity of *Baba*'s paratha

0 1

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How many parathas were made on this day? Find out.

Raman's family of 6 members ordered 2 pizzas and cut each pizza into 3 equal slices so that each family member had one slice. *Dadiji* and *Dadaji* gave their slices to Raman, *Maa,* and *Baba* gave theirs to Radhika. How much pizza do each of them have after this?



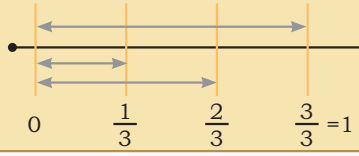
Raman's slice



Raman's total share

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1$$

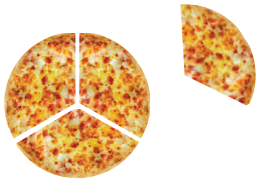
Raman's total share—whole pizza



Raman could eat only 2 slices of pizza. So, he gave 1 to Radhika. How much pizza does Radhika have now?

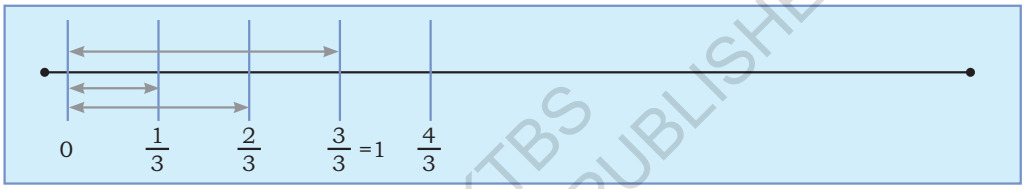


Radhika's slice



Radhika's total share

$$\underbrace{\frac{1}{3}+\frac{1}{3}+\frac{1}{3}}_{1}+\frac{1}{3} = \frac{4}{3} = 1+\frac{1}{3} = 1\frac{1}{3}$$



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Let Us Do

1. Use parathas and number lines to show the following fractions in your notebook.

   (a) $\frac{2}{3}$ and $\frac{5}{3}$ (b) $\frac{3}{4}$ and $\frac{5}{4}$ (c) $\frac{4}{8}$ and $\frac{9}{8}$

2. Circle the fractions that are greater than one (whole). How do you know? Discuss your reasoning in the class.

$\frac{7}{9}$ $\frac{3}{9}$ $\frac{7}{11}$ $\frac{9}{4}$ $\frac{9}{4}$ $\frac{4}{9}$ $\frac{2}{5}$ $\frac{5}{7}$ $\frac{7}{3}$ $\frac{5}{4}$ $\frac{2}{3}$ $\frac{13}{11}$ $\frac{12}{5}$ $\frac{12}{8}$

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Comparing Fractions With Reference to 1

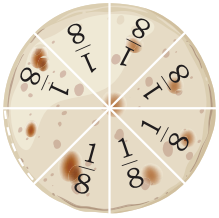
Let us compare some more fractions. Between Sevi and Shami can you tell who ate less?



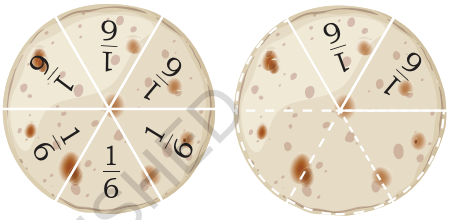
I ate $\frac{7}{8}$ paratha yesterday evening.

I ate $\frac{8}{6}$ paratha yesterday evening.





$\frac{7}{8}$ is less than 1 and $\frac{8}{6}$ is more than 1. So, $\frac{7}{8} < \frac{8}{6}$.



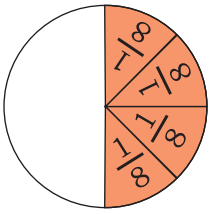
Let Us Do

1. Compare the following fractions using 1 as a reference. Share your reasoning in the class.

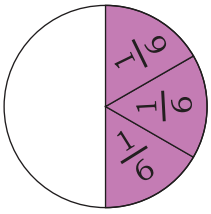
(a) $\frac{8}{7}$ ——— $\frac{9}{15}$ (b) $\frac{13}{20}$ ——— $\frac{17}{15}$ (c) $\frac{7}{6}$ ——— $\frac{8}{8}$

(d) $\frac{6}{6}$ ——— $\frac{19}{12}$ (e) $\frac{12}{9}$ ——— $\frac{4}{5}$ (f) $\frac{15}{5}$ ——— $\frac{16}{4}$

Comparing Fractions with Reference to $\frac{1}{2}$



$\frac{4}{8} = \frac{1}{2}$



$\frac{3}{6} = \frac{1}{2}$

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Let Us Do

1. Circle the fractions below that are equal to $\frac{1}{2}$.

$\frac{2}{4}$ $\frac{3}{5}$ $\frac{5}{7}$ $\frac{7}{14}$ $\frac{5}{10}$ $\frac{8}{16}$

$\frac{5}{9}$ $\frac{6}{12}$ $\frac{10}{20}$ $\frac{6}{8}$

2. Some fractions are written in the box below. Circle the fractions that are less than half. How do you know? Discuss your reasoning in the class.

$\frac{3}{9}$ $\frac{2}{4}$ $\frac{12}{15}$ $\frac{8}{15}$ $\frac{11}{12}$ $\frac{3}{15}$

$\frac{4}{8}$ $\frac{1}{3}$ $\frac{7}{11}$ $\frac{11}{16}$ $\frac{15}{31}$ $\frac{6}{18}$

Now let us compare fractions using $\frac{1}{2}$.

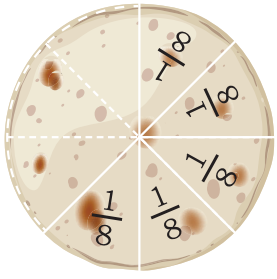


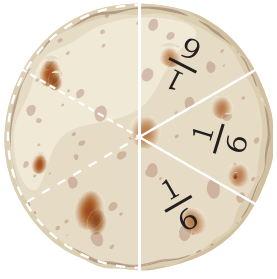
I ate $\frac{5}{8}$ paratha yesterday evening

I ate $\frac{3}{6}$ paratha yesterday evening



Who do you think ate more paratha?





$\frac{3}{6}$ is half. But $\frac{5}{8}$ is more than $\frac{1}{2}$.

So, $\frac{5}{8} > \frac{3}{6}$.

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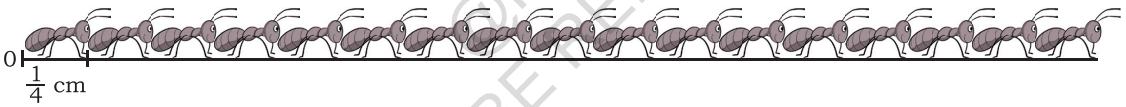
Let Us Do

1. Compare the following fractions. Where possible, compare the fractions with $\frac{1}{2}$.

$\frac{2}{9}$ and $\frac{4}{7}$	$\frac{11}{14}$ and $\frac{7}{20}$	$\frac{5}{7}$ and $\frac{3}{9}$	$\frac{6}{7}$ and $\frac{4}{10}$
$\frac{9}{17}$ and $\frac{3}{15}$	$\frac{7}{12}$ and $\frac{3}{11}$	$\frac{1}{3}$ and $\frac{5}{9}$	$\frac{3}{9}$ and $\frac{4}{7}$

Try This:

If the length of an ant is $\frac{1}{4}$ cm—then what is the total length of 16 such ants walking in a line? Use the number line given below.



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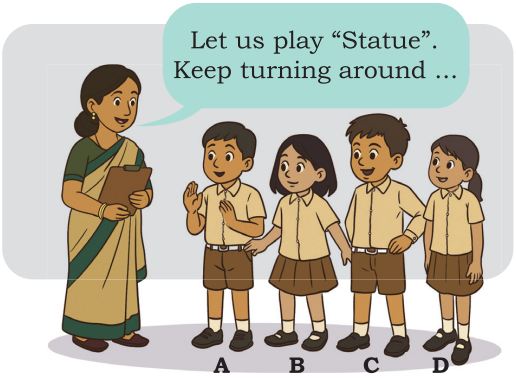
Chapter

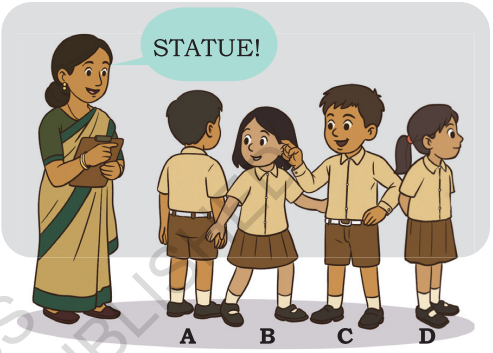
3 Angles as Turns

0533CH03



Can you recognise the child in the picture who has made a full turn? Who has made a half turn? How do you know? Discuss in class.





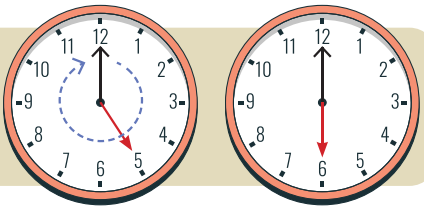
Give examples of real-life situations where you observe turns.



Ashutosh and Sahana are making circles, each having one foot fixed and rotating at one spot on the ground.

Ashutosh made a complete circle by making a full turn. Sahana is making a half-moon shape with a half turn.

The minute hand makes a full turn when it comes back to the initial position.



Note for Teachers: Encourage the learners to play the "statue" game. Learners can be asked to rotate themselves around and stop as the teacher announces "statue". The learners can notice how much they have turned with respect to their original position.

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A giant wheel makes a full turn when it comes back to the starting position E.

Reema takes two half turns in the same direction.

It is like a _____turn.

What happens if she takes 2 quarter turns in the same direction?

It is like a _____turn.

What happens if she takes 4 quarter turns in the same direction?

It is like a ____ turn.



Write some of the everyday objects that involve turns. For example, taps, _____, _____, _____, _____, and _____.

What is the maximum possible turn in each of these cases? Check and tick.

Object	Less than a $\frac{1}{4}$ turn	$\frac{1}{4}$ turn	More than a $\frac{1}{4}$ turn
Clothes clip			
Door with hinge			
Tongs			
Scissors			
File cover			

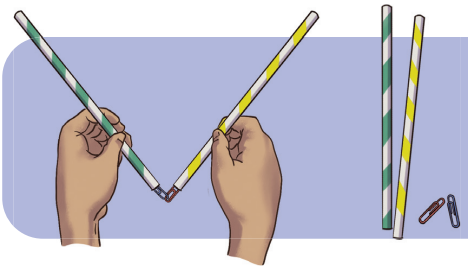
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- Do any of the above objects make a half turn? Write their names below—

  .....

- Do any of the above objects make a full turn? Write their names below—

  .....



Pragya joined a green and yellow straw with paper clips. She holds the green straw steady and turns the yellow straw around. Observe different turns of the yellow straw.

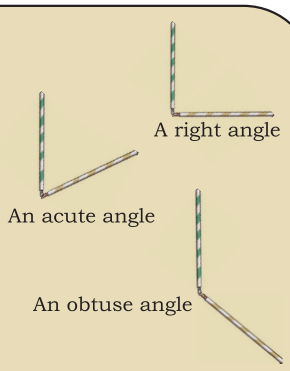
Chapter-3 Angles as Turn.indd 33 7/2/2025 3:32:10 PM

I made a quarter ($\frac{1}{4}$) of a full turn, so it looks like a right angle.

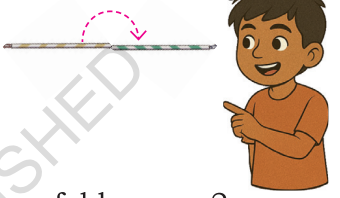
I made less than a quarter turn, so it looks like an acute angle.

Now I made more than a quarter turn, but less than a half turn. That looks like an obtuse angle.

I made two quarter turns. I wonder what it is called?





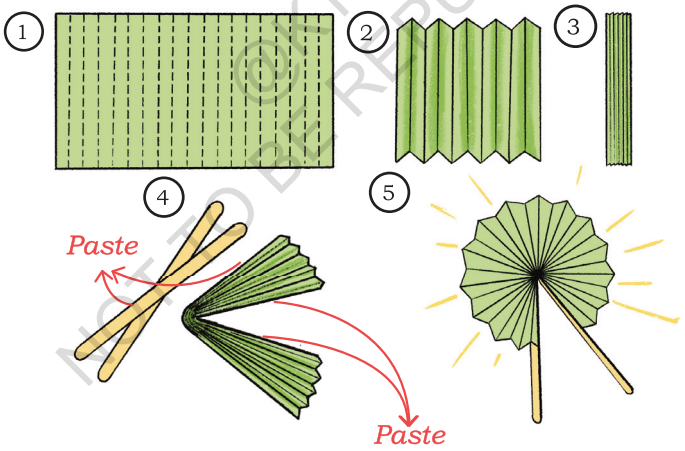


It is a straight angle.

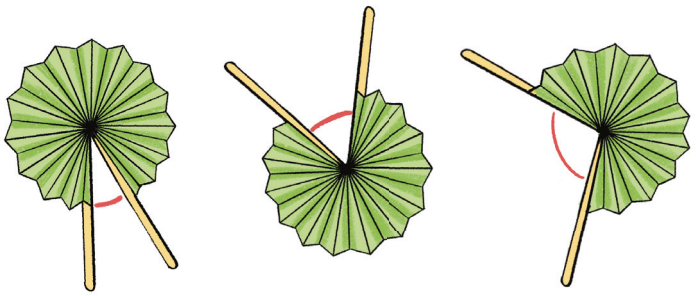
Angles arise in situations that involve a turn.

Let Us Do

(a) Making a paper fan. Take a rectangular paper, fold every 2 cm as shown in the picture. Paste ice cream sticks as shown below to create a paper fan.



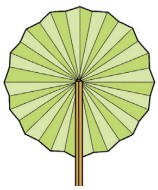
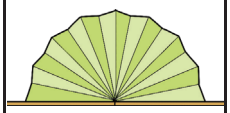
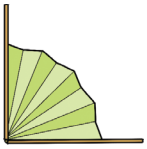
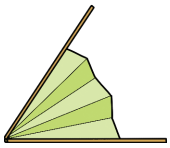
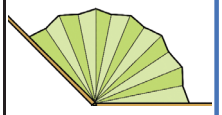
Use your paper fan to show different acute angles and obtuse angles.



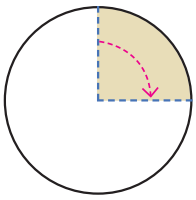
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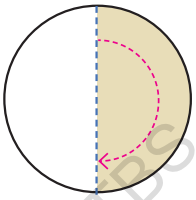
Let us look at the turns made by the paper fan, keeping one side fixed.

Full turn	$\frac{1}{2}$ turn (straight angle)	$\frac{1}{4}$ turn (right angle)	Less than a $\frac{1}{4}$ turn (acute angle)	Between a $\frac{1}{4}$ and $\frac{1}{2}$ turn (obtuse angle)
				

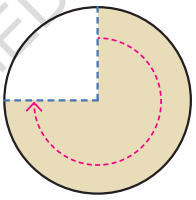
Make an acute turn with the straws or fan. Continue to make another acute turn. Can the two acute turns together make another acute turn?



This shows a $\frac{1}{4}$ turn, or a right angle.



This shows a $\frac{1}{2}$ turn, or a straight angle.

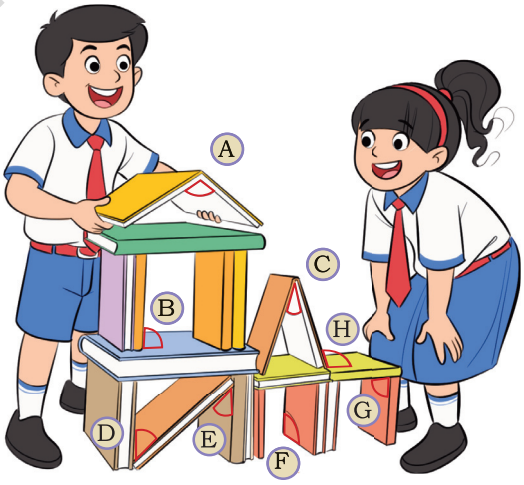


This shows a $\frac{3}{4}$ turn, which is more than a straight angle.

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(b) You might have built houses using the hard covers of notebooks or cardboard pieces.

Look at the angles marked in the house. What angles are you able to see in this house?



Write your answers as right, acute or obtuse angle.

A: _____ B: _____

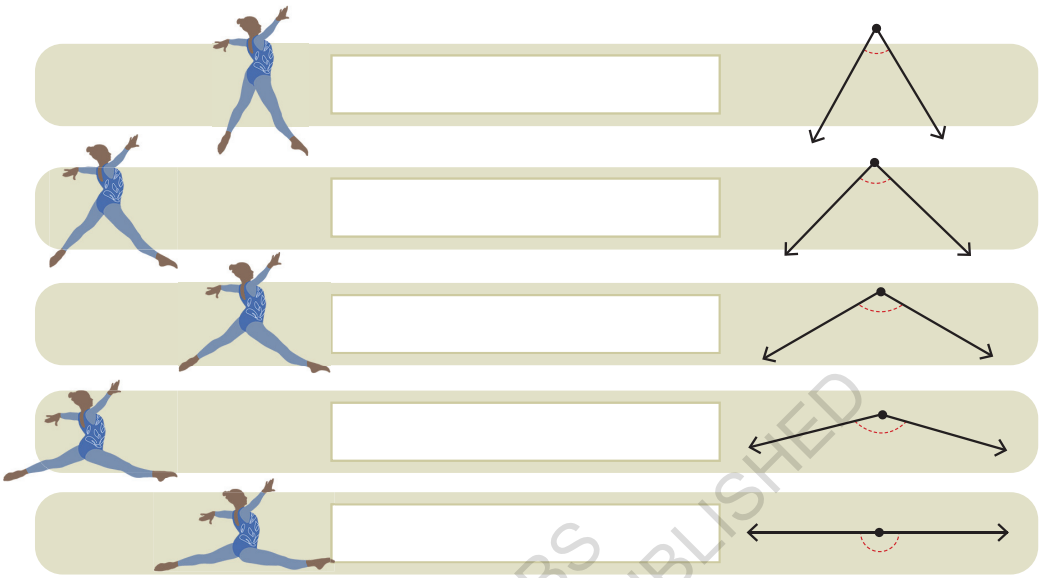
C: _____ D: _____

E: _____ F: _____

G: _____ H: _____

(c) Make a 5-sided shape with 2 right angles, 2 obtuse angles, and 1 acute angle in your notebook.

(d) Look at the angle formation between the legs of these gymnasts. Identify whether the angles are acute, obtuse, right or straight.

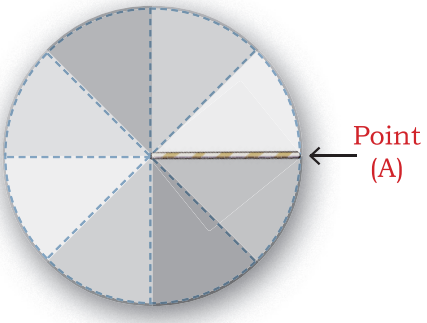


Angle Measuring Tool

Let us make our tool to measure turns.

(a) Cut out a circle from a tracing paper and fold it to make 8 equal parts.

Attach a straw to the centre and mark the starting point as shown.



(b) Now, try this.

- Show a $\frac{1}{8}$ turn of the straw.
- Show a $\frac{2}{8}$ turn. Show a $\frac{1}{4}$ turn. Show a $\frac{3}{8}$ turn.
- What angle have you made with a $\frac{2}{8}$ turn? A $\frac{1}{8}$ turn is half of a quarter turn.
- What angle have you made with a $\frac{4}{8}$ turn?

Continue turning by $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, and $\frac{8}{8}$. Check when you have completed a $\frac{3}{4}$ turn and a full turn.

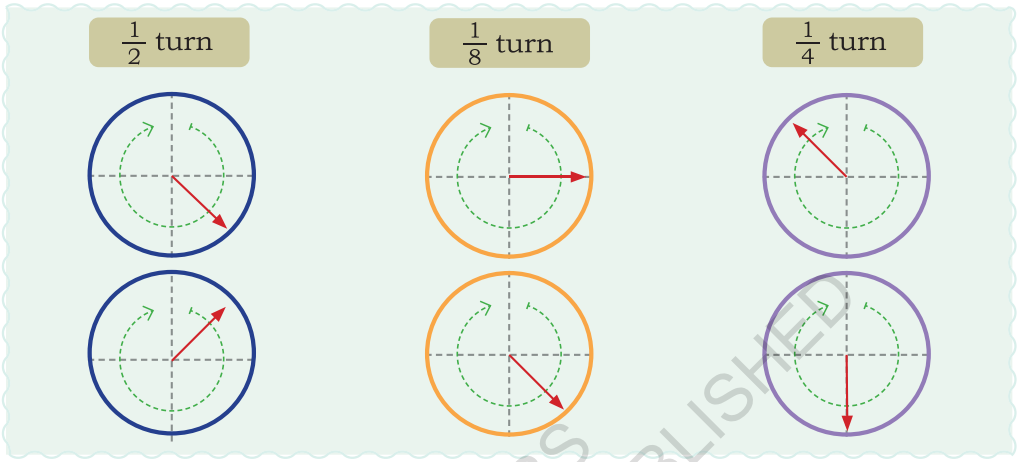
Now, cut out $\frac{1}{8}$ part and $\frac{2}{8}$ parts of the circle and paste them on a thicker paper or board. Use these as angle measuring tools.

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Let Us Think

1. In the following circles, the end points of $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ turns are shown. Draw arrows to show the starting points.

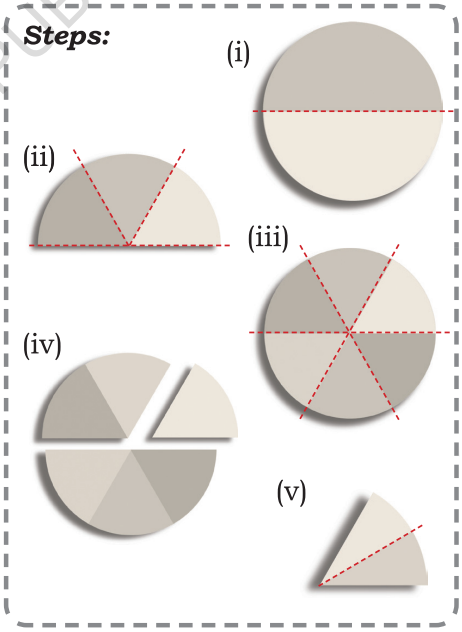


Now, cut out a circle from a tracing paper. First, fold the circle in half, and then fold it again into 3 equal parts. Attach a straw at the centre of the circle. Mark the starting point and show the turns equal to $\frac{1}{6}$, $\frac{2}{6}$, and so on until you complete a full circle.

Cut out $\frac{1}{6}$ part and $\frac{2}{6}$ part of the circle. Fold one of the $\frac{1}{6}$ parts into half.

Can you guess what turn of the straw will be equal to half of a $\frac{1}{6}$ turn? This is the same as a $\frac{1}{12}$ turn.

Paste these parts on a thicker paper or board and you can use them as angle measuring tools.

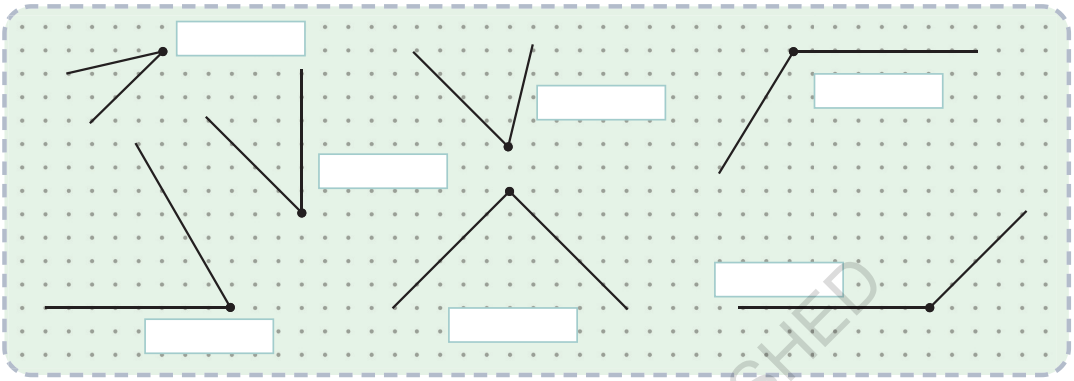


Note for Teachers: Help the learners to make the angle measuring tools using tracing paper. Use these for measuring various angles. Let them mark the starting point. Also, help them fix a straw at the centre and measure the turns with respect to the starting point.

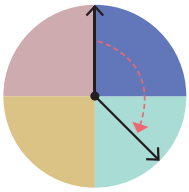
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Let Us Do

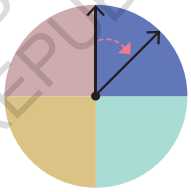
1. Guess the measures of each of the angles shown below. Then, check using your angle measuring tools. You may need to use a combination of measures. Also, state whether each of the angles is acute, right, or obtuse.



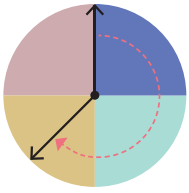
2. Guess the measure of the turns made by the arrow in each of the following cases. Verify with a combination of angle measuring tools.

(a) 

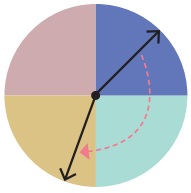
$\frac{1}{4} + \frac{1}{8}$ turn
or $\frac{3}{8}$ turn

(c) 

_____ turn

(b) 

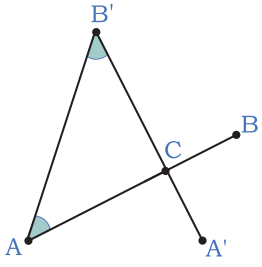
_____ turn

(d) 

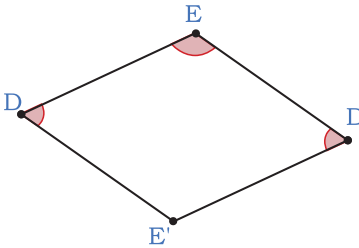
_____ turn

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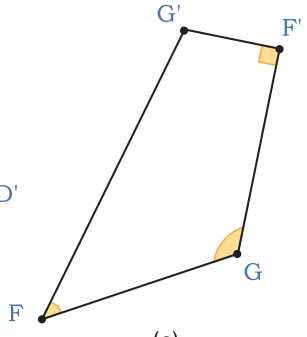
3. Measure each angle in the given shapes. Write the measure of the angles in terms of turns and describe whether they are acute, obtuse or right angles.



(a)

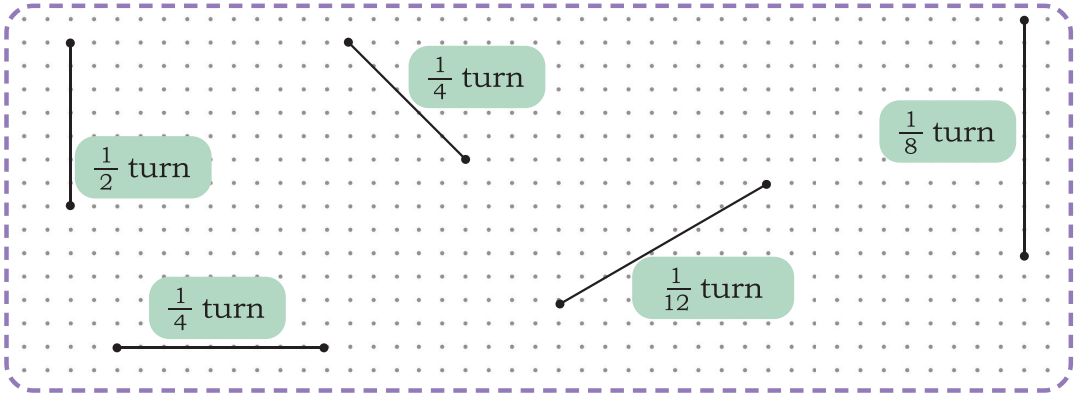


(b)



(c)

4. Draw angles for the given measures of turns using the given lines.

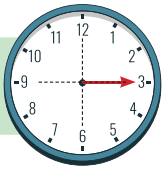


5. Draw the angles formed by the following turns in your notebook.

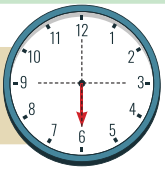
   $\frac{1}{2}$ turn, $\frac{1}{4}$ turn, $\frac{2}{4}$ turn, $\frac{1}{6}$ turn, $\frac{4}{6}$ turn, $\frac{3}{12}$ turn, $\frac{1}{2} + \frac{1}{4}$ turn, and $\frac{1}{8} + \frac{1}{6}$ turn.

6. Guess the measure of turns the minute hand of a clock makes in each of the following cases. The initial position of the minute hand is given. Draw the final position of the minute hand on the clock face. Discuss your reasoning in class.

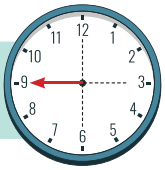
(a) When the minute hand moves by 15 minutes, it has made a _____ turn of the circle.



(b) When the minute hand moves by 30 minutes, it has made a _____ turn of the circle.



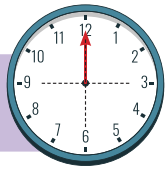
(c) When the minute hand moves by 45 minutes, it has made a _____ turn of the circle.



(d) When the minute hand has turned by $\frac{1}{12}$ of a full turn, it has moved by _____ minutes.



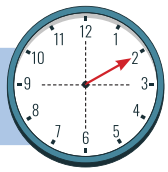
(e) When the minute hand has turned a full-circle, it has moved by _____ minutes.



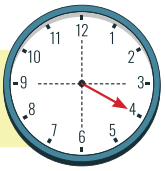
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(f) When the minute hand has turned by $\frac{1}{6}$ of a full turn, it has moved by _____ minutes.



(g) When the minute hand has turned by $\frac{4}{12}$ of a full turn, it has moved by _____ minutes.

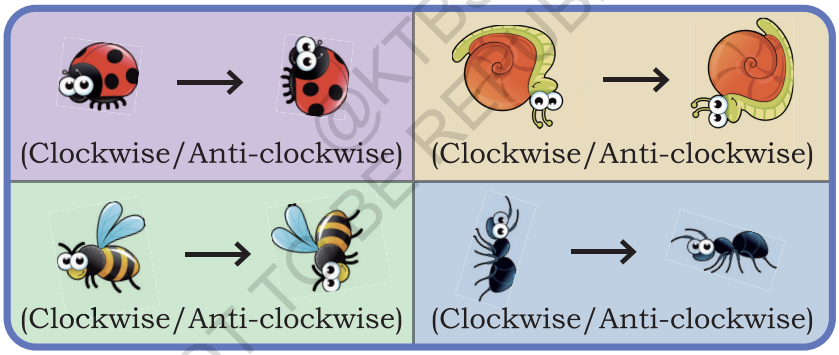


Which direction?

In which direction do the hands of a clock move?

The direction in which the hands of the clock move is called clockwise movement. The opposite movement is called anti-clockwise movement.

The creatures below have made a quarter turn once. Tick the direction in which they have moved.



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Try these

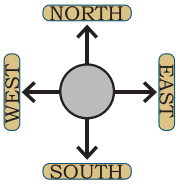
Observe the direction of movement while opening a tap, unscrewing a lid or loosening a nut. Do they move clockwise or anti-clockwise?

Fun with Turns

1. The children in a class are playing a game in which the teacher tells them the direction in which they should rotate. Complete the table by filling the direction the children will face on completing the given turns.

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The starting direction is given in the table.



Starting Direction	Turns	Ending Direction
North	Two right angles, clockwise	
South	Two right angles, anti-clockwise	
East	Four right angles, anti-clockwise	
West	Four right angles, clockwise	
North	5 right angles, clockwise	
South	3 right angles clockwise, $\frac{1}{2}$ right angle clockwise, $\frac{1}{2}$ right angle clockwise	
West	right angles clockwise, four $\frac{1}{2}$ right angles anti-clockwise	

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2. Padma is facing the toy shop. What place will she face if she takes a half turn clockwise?



What other way can she turn to face the same place?

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Chapter 4

We the Travellers—II

0533CH04



Making Sums Equal

In each of the following, there are two groups of numbers. Look carefully at the numbers in each group and their sums. Interchange pairs of numbers between the two groups to make their sums equal. Try to do this using the least number of moves. You could write each number on a small piece of paper.

Think what will happen to the sums if we interchange 2 and 5? Try interchanging other pairs of numbers and find the one that will make the sums equal.

(a)

	1	3
	2	4
	7	5
+	9	+ 9
	19	21

(b)

	5	9
	7	11
	12	13
+	15	+ 14
	39	47

(c)

	11	13
	15	17
	19	21
+	23	+ 25
	68	76

(d)

	77	81
	78	82
	79	83
+	80	+ 84
	314	330

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Fuel Arithmetic

Different vehicles need different quantities of fuel. This quantity can vary from 5 to 15 litres in the case of motorbikes, 15 to 50 litres in the case of cars, 150 to 500 litres in the case of lorries and trucks, and 5,000 litres in the case of a train.

Remember—We must save fuel as it is a limited resource. Reducing fuel usage also helps in cutting down pollution. Electric vehicles are now available that help conserve natural fuel and reduce pollution.

1. A lorry has 28 litres of fuel in its tank. An additional 75 litres is filled. What is the total quantity of fuel in the lorry?

   The total quantity of fuel in the tank is 28 *l* + 75 *l*.

Do you remember how to add two numbers using place value of numbers?

	H	T	O
	1	1	
		2	8
+		7	5
	1	0	13

Regroup, 10 Ones = 1 Ten

Let us try one more.

2. Find the sum of 49 and 89.

	H	T	O
		4	9
+		8	9

Let Us Solve

Add the following numbers. Wherever possible, find easier ways to add the pairs of numbers.

1. 15 + 79
2. 46 + 99
3. 38 + 35
4. 5 + 89
5. 76 + 28
6. 69 + 20

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Relationship Between Addition and Subtraction

1. Find the relationship between the numbers in the given statements and fill in the blanks appropriately.

   (a) If 46 + 21 = 67, then,
   67 – 21 = _____.
   67 – 46 = _____.

   (b) If 198 – 98 = 100, then,
   100 + _____ = 198.
   198 – _____ = 98.

   (c) If 189 + 98 = 287, then,
   287 – 98 = _____.
   287 – 189 = _____.

   (d) If 872 – 672 = 200, then,
   200 + _____ = 872.
   872 – _____ = 672.

2. In each of the following, write the subtraction and addition sentences that follow from the given sentence.

(a) If 78 + 164 = 242, then,
_____
_____.

(b) If 462 + 839 = 1301, then,
_____
_____.

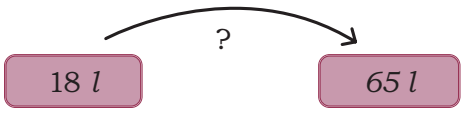
(c) If 921 – 137 = 784, then,
_____
_____.

(d) If 824 – 234 = 590, then,
_____
_____.

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More Fuel Arithmetic

A minibus has 18 *l* of fuel left. After refuelling, the fuel meter indicates 65 *l*. How much fuel has been filled in the fuel tank of the minibus?



The quantity of fuel filled is 65 *l* – 18 *l*.

	T	O
	5	15
	6	5
–	1	8
	4	7

Regroup, 1 Tens = 10 Ones

Check if 18 + 47 = 65?

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Let Us Solve

1. What is the difference between 82 and 37?

	T	O
	8	2
–	3	7

Remember subtraction using place value? Try this.

Check your answer. Is 37 + ____ = 82?

2. 57 – 11 = _____
3. 23 – 19 = _____
4. 49 – 21 = _____
5. 56 – 18 = _____
6. 93 – 35 = _____
7. 84 – 23 = _____
8. 70 – 43 = _____
9. 65 – 47 = _____

Sums of Consecutive Numbers

Numbers that follow one another in order without skipping any number are called **consecutive numbers**. Here are some examples—

1, 2, 3, 4, 5 | 29, 30, 31, 32 | 512, 513 | 2023, 2024, 2025

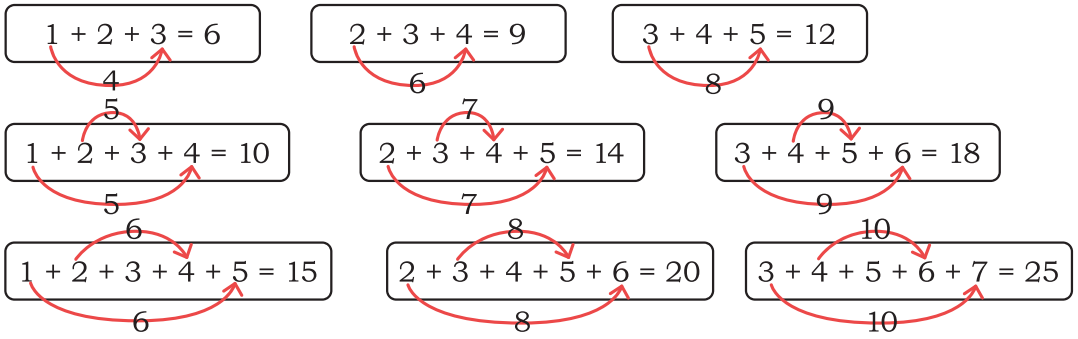
Sum of 2 consecutive numbers.	Sum of 3 consecutive numbers.	Sum of 4 consecutive numbers.
1 + 2 = 3	1 + 2 + 3 = 6	1 + 2 + 3 + 4 = 10
2 + 3 = 5	2 + 3 + 4 = 9	2 + 3 + 4 + 5 = 14
3 + 4 = 7	3 + 4 + 5 = 12	3 + 4 + 5 + 6 = 18
4 + 5 = 9	4 + 5 + 6 = 15	4 + 5 + 6 + 7 = 22

1. In each of the boxes above, state whether the sums are even or odd. Explain why this is happening.
2. What is the difference between two successive sums in each box? Is it the same throughout?
3. What will be the difference between two successive sums for—
   (a) 5 consecutive numbers (b) 6 consecutive numbers

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Let us see some more interesting patterns in sums.



Notice how the sums of 3, 4, and 5 consecutive numbers are related to the numbers being added. Use your understanding to find the following sums without adding the numbers directly.

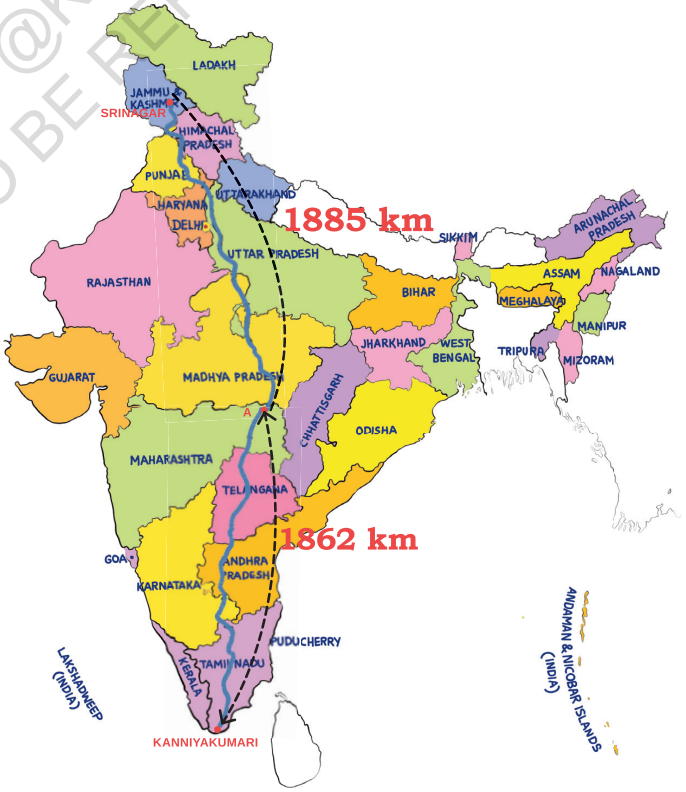
(a) 67 + 68 + 69
(b) 24 + 25 + 26+ 27
(c) 48 + 49 + 50 + 51 + 52
(d) 237 + 238 + 239 + 240 + 241 + 242

The Longest Land Route—Adding Large Numbers

The longest distance one can travel by road is between Talon (in Russia) and Sagres (in Portugal). It is 15,150 km long.

In 2019, the North–South Corridor was the longest land route within India, starting from Srinagar in Jammu and Kashmir and ending at Kanniyakumari in Tamil Nadu. Do you know how long it was? Let us find out.

One of the places on the North–South Corridor was 1,855 km from Srinagar and 1,862 km from Kanniyakumari. What was the total length of the North–South Corridor in 2019?



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The total length of the North–South Corridor was 1,855 km + 1,862 km.

Do you remember how to add large numbers?

	Th	H	T	O
	(1)	(1)		
	1	8	5	5
+	1	8	6	2
	3	~~1~~ 7	~~1~~ 1	7

Regroup, 10 Tens = 1 Hundred

The total length of the North–South Corridor was 3,717 km in 2019.

Now, let us try finding the sum of 5-digit numbers.

Mahesh and his family decide to drive from Srinagar to Kanniyakumari. He spends ₹21,880 on fuel and toll tax, and ₹38,900 on other expenses during this journey. How much did he spend in total?

	TTh	Th	H	T	O
	(1)	(1)	( )	( )	
	2	1	8	8	0
+	3	8	9	0	0
	6	~~1~~ 0	~~1~~ 7	8	0

Adding larger numbers is the same as adding smaller numbers

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If we keep the digits aligned—Ones below Ones, Tens below Tens, and so on, we do not need to label each place value.

	(1)	(1)	( )
	2	6	7
+		5	4
	3	~~1~~ 2	~~1~~ 1

Mentally track the positions of the digits as you add.

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Let Us Solve

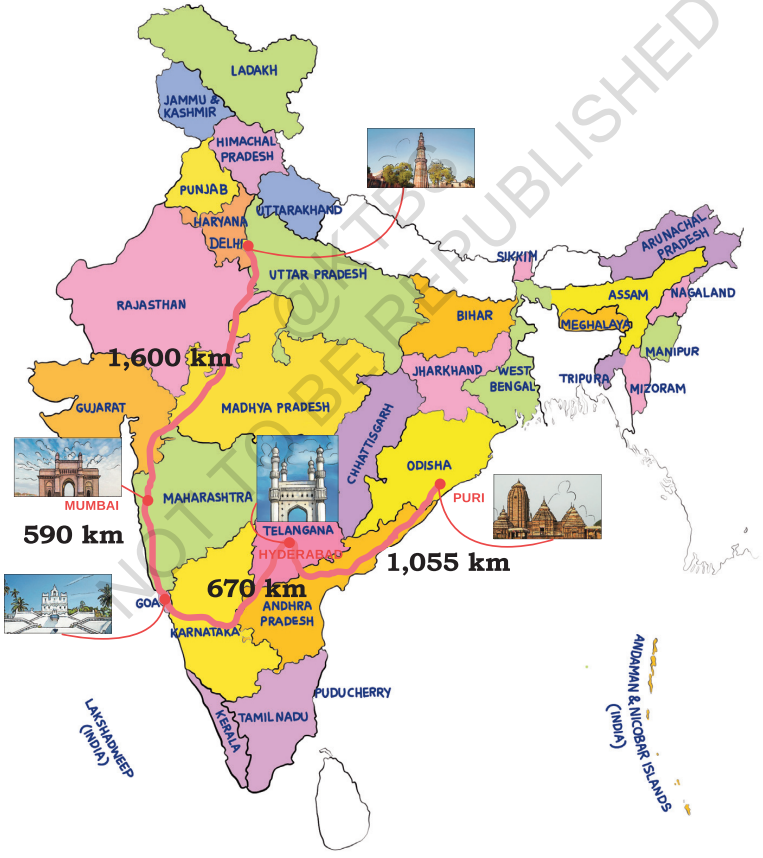
1. Find the following sums. Try not to write TTh, Th, H, T, and O at the top. Just align the digits properly, at least for the smaller numbers.

(a)	238 + 367	(c)	12+123	(e)	878 + 8,789
(b)	1,234 + 12,345	(d)	46,120 +12,890	(f)	1,749 + 17,490

2. The great Indian road trip!

Nazrana and her friends planned a road trip across India, starting from Delhi. They first drove to Mumbai, then Goa, then Hyderabad, and finally Puri.

Look at the distances marked on the map and help them find the total distance travelled.



3. Find 2 numbers among 5,205, 6,220, 7,095, 8,455, and 4,840 whose sum is closest to the following.

(a) 10,000 (b) 15,000 (c) 13,000 (d) 16,000

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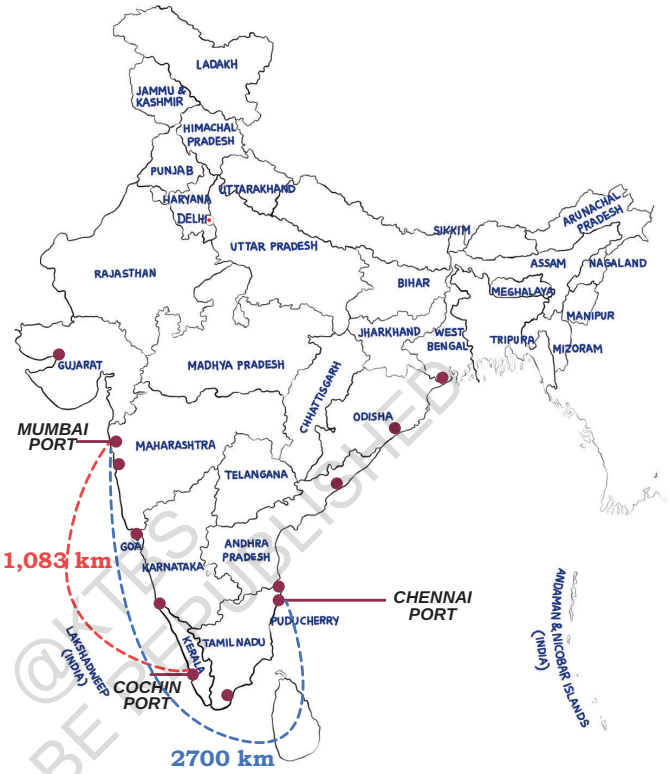
Subtracting Large Numbers

The place where passengers board a bus is called a bus stand or bus station.

Similarly, a railway station is the place where people board trains.

The place where people board ships is called a port.

The ports of Mumbai and Chennai are two of the important ports of India. Ships going from Mumbai to Chennai must pass by another important port—Cochin Port. Spot these places on the map of India.



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The total distance of the sea route from Mumbai to Chennai is 2,700 km. A ship starting from Mumbai first reaches the Cochin port, travelling 1,083 km by sea. How much more distance does it have to travel to reach the Chennai port?

The remaining distance to be travelled by the ship is 2,700 km – 1,083 km.

Do you remember how to subtract numbers using place value?

	Th	H	T	O
		6	9	10
	2	7	0	0
–	1	0	8	3
	1	6	1	7

Regroup 1 H = 10 T. and 1 T = 10 O

Check if the solution is correct.

The ship has to travel 1,617 km more to reach Chennai.

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As you learnt earlier, the longest land route is 15,150 km between Talon (Russia) and Sagres (Portugal). The longest highway in Africa is 10,228 km long, connecting the cities of Cairo, in Egypt and Cape Town, in South Africa. How much longer is the land route between Talon and Sagres compared to the highway between Cairo and Cape Town?

The difference between the two roads is 15,150 km – 10,228 km.

	TTh	Th	H	T	O
		4	11	4	10
	1	~~5~~	~~1~~	~~5~~	~~0~~
–	1	0	2	2	8
	0	4	9	2	2

We subtract large numbers in the same way as smaller numbers.

Check if the answer is correct.

The land route connecting Talon and Sagres is 4,922 km or longer than the road connecting Cairo and Cape Town.

Like addition, here too we can try not to write the positions of the digits and align the numbers appropriately.

For example:

	5	10	13
	~~6~~	~~1~~	~~3~~
–	1	5	4
	4	5	9

Keep track of the position of the digits mentally.

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Let Us Solve

1. Subtract the following. Try not to write TTh, Th, H, T, and O at the top. Align the digits carefully.

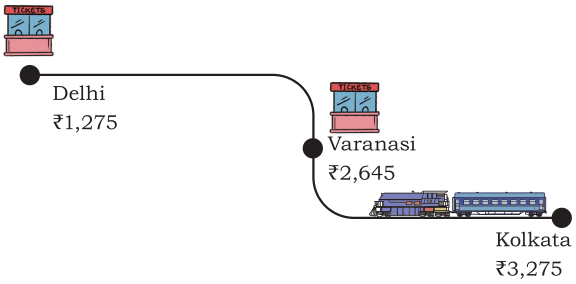
   (a) 4,578 – 2,222
   (b) 15,324 – 11,780
   (c) 5,423 – 423
   (d) 123 – 12
   (e) 77,777 – 777
   (f) 826 – 752

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2. Mary's train journey to Delhi.

Mary is on a train journey. She starts from Kolkata with ₹12,540.

She spends ₹3,275 on food and other expenses during her trip to Varanasi. In Varanasi, her uncle gives her a gift worth ₹4,900. She then travels to Delhi, spending ₹2,645 on the train ticket. She spends ₹1,275 on souvenirs in Delhi. How much money is Mary left with at the end of the Delhi trip?





3. Members of a school council have raised ₹70,500. They plan to setup a Maths Lab with some games and models worth ₹39,785, buy library books worth ₹9,545, and purchase sports equipment worth ₹19,548.

   (a) Estimate whether the school council has raised enough money to make the purchases. Share your thoughts in the class.
   (b) Check your estimate with calculations.

4. A truck can carry 8,250 kg of goods. A factory loads 3,675 kg of cement and 2,850 kg of steel on it.

   (a) What is the total weight loaded onto the truck?
   (b) How much more weight can the truck carry before reaching its maximum capacity?

Quick Sums and Differences

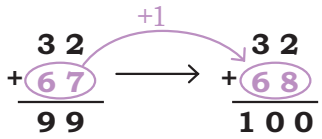
Sukanta likes the numbers 10, 100, 1,000, and 10,000. He wants to figure out what number he should add to a given number such that the sum is 100 or 1,000. Help him fill in the blanks with an appropriate number.

32 + _____ = 100

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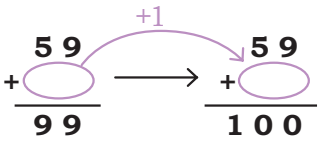
Sukanta's friend Piku shows him an interesting way to solve the problems.



Do you think this method will always work?

59 + _____ = 100

Try this method for the number 59.



Now, use this method to solve the following.

877 + _____ = 1,000 and 666 + _____ = 1,000
4,103 + _____ = 10,000 and 5,555 + _____ = 10,000

Will this method work if the units digit is 0? What do you think? What other methods can you use to find the missing number to fill in the blanks? Share your thoughts in the class.

(a) 180 + _____ = 1,000
(b) 760 + _____ = 1,000
(c) 400 + _____ = 1,000

Namita likes the number 9. She wants to subtract 9 or 99 from any number. Find a way to quickly subtract 9 or 99 from any number.

(a) 67 – 9 = _____
(b) 83 – 9 = _____
(c) 144 – 9 = _____
(d) 187 – 99 = _____
(e) 247 – 99 = _____
(f) 763 – 99 = _____

Now, use the above solutions to find answers to the following problems. Do not calculate again.

Namita wonders if she can get 9 or 99 as the answer to any subtraction problem. Find a way to get the desired answer.

(a) 32 – _____ = 9
(b) 56 – _____ = 9
(c) 877 – _____ = 99
(d) 666 – _____ = 99

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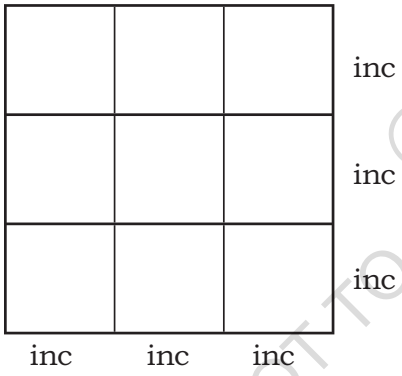
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Let Us Think and Solve

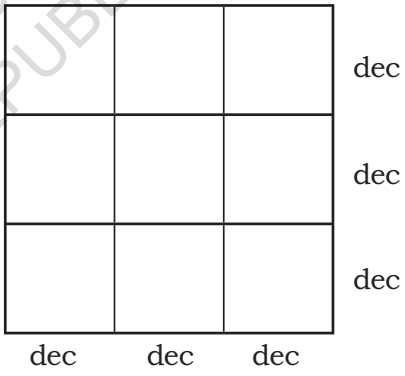
1. Nitin likes numbers that read the same when read from left to right or from right to left. Such numbers are called **palindrome numbers**. The numbers 22, 363, 404, and 8,558 are some examples.

   List all palindrome numbers between 100 and 200.
   List all palindrome numbers between 900 and 1,200.
   List all palindrome numbers between 25,000 and 27,000.

2. In a 3×3 grid, arrange the numbers 1 to 9 such that each row and each column has numbers in an increasing (inc) order. Each number should be used only once.

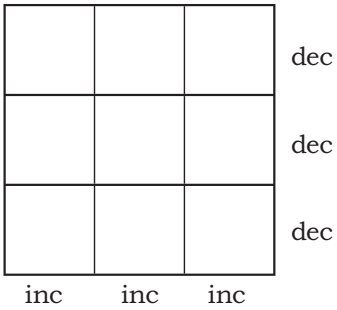


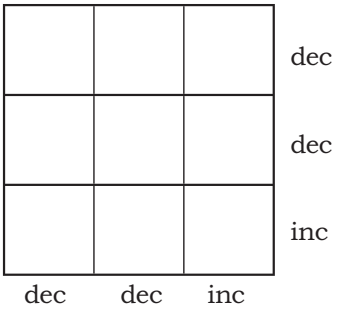
This time, fill the grid such that each row and column has numbers in decreasing (dec) order.

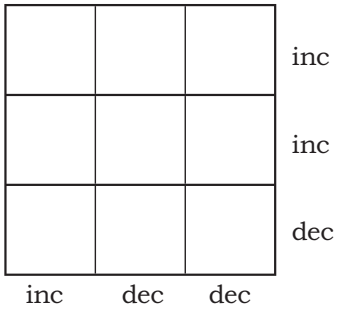


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Now, fill the grids below with numbers (1–9) based on the inc (increasing) and dec (decreasing) conditions, as indicated below.







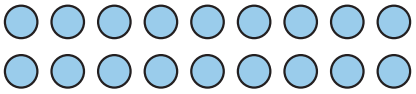
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Even and Odd Numbers

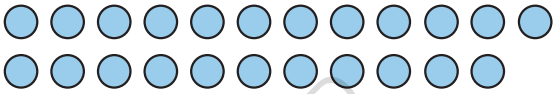
1. Circle the numbers that are even.

(a) 297	(e) 199	(i) 846
(b) 498	(f) 789	(j) 111
(c) 724	(g) 49	(k) 222
(d) 100	(h) 6,893	(l) 1,023

2. Observe the given arrangement.



Paired arrangement for 18



Paired arrangement for 23

Add 2 to 18. What changes or does not change in the arrangement?

Add 2 to 23. What changes or does not change in the arrangement?

3. What do you notice about the sums in each of the following cases? Do you think it will be true for all pairs of such numbers? Explain your observations. You may use the paired arrangement to explain your thinking.
   (a) 12 and 6 are a pair of even numbers. Choose 5 such pairs of even numbers. Add the numbers in each of the pairs.
   (b) 13 and 9 are a pair of odd numbers. Choose 5 such pairs of odd numbers. Add the numbers in each of the pairs.
   (c) 7 and 12 are a pair of odd and even numbers. Choose 5 such pairs of odd and even numbers. Add the numbers in each of the pairs.

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Let Us Think

1. Jincy opened her piggy bank. She found 8 coins of ₹1, 9 coins of ₹2 and 5 coins of ₹5. She wants to buy stickers worth ₹38. What possible combination of coins can she use to pay the exact amount?

2. Raghu is fond of his grandfather's torch. He starts playing with it. He presses the switch once and the light turns ON. He presses it a second time and the light turns OFF. He presses the switch a third time and the light turns ON. He keeps doing this several times. Will the torch be ON or OFF after the 23rd press? How do you know?

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For what number of presses will the torch be ON? For what number of presses of the switch will the torch be OFF?

3. Mountain climbing

Priyanka Mohite is the first Indian woman to climb five Himalayan peaks above 8,000 metres. In addition to that, she has also climbed mountain peaks in other parts of the world. Read the table below and answer the questions that follow.

Mountain Range	Height (in metres)	Climbed in the Year
Mount Kanchenjunga (India and Nepal border)	8,586	2022
Mount Everest (Nepal–China border)	8,848	2013
Mount Makalu (China–Nepal border)	8,485	2019
Mount Lhotse (Tibet–Nepal border)	8,516	2018
Mount Kilimanjaro (Africa)	5,895	2016
Mount Elbrus (Russia)	5,642	2017
Mount Annapurna I (Nepal)	8,091	2021



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(a) Which is the highest peak she climbed?
(b) What is the difference in height between the highest and lowest peaks she has climbed, as per the table.
(c) What is the difference between heights of Mount Elbrus and Mount Kanchenjunga?
(d) If Priyanka was 20 years old when she summited Mount Everest in 2013, in which year was she born?

The Tenzing Norgay National Adventure Award, formerly called the National Adventure Award is the highest adventure sports honour in India. Priyanka Mohite received this award in 2020.

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Math Metric Mela

A grand Math Metric Mela was held at the district level to celebrate young math whizzes. Every participating student was to receive a certificate of participation. The organisers got certificates printed for each district before the Mela. The number of certificates printed and the number of students who attended the competition in each district are as follows.

District	Certificates Printed	Students Attended
Chittoor, A.P.	18,225	18,104
Jaunpur, U.P.	19,043	19,265
Raigad, Maharashtra	20,863	19,974

For each district, find out if the number of certificates were sufficient?

If insufficient, calculate how many certificates fell short.

If extra, calculate how many certificates were in excess.

Let Us Do

1. Add.

   (a) 2,009 + 7,388
   (b) 26,444 + 71,111
   (c) 777 + 888
   (d) 1,234 + 1,234
   (e) 56 + 56,789
   (f) 777 + 77,777
   (f) 5,922 + 9,221
   (g) 4,321 + 8,765
   (h) 50,050 + 55,000

2. Subtract.

   (a) 458 – 226
   (b) 7,777 – 4,449
   (c) 65,447 – 47,299
   (d) 1,234 – 123
   (e) 12,345 – 1,234
   (f) 56,789 – 56
   (f) 87,326 – 11,111
   (g) 878 – 52
   (h) 749 – 222

3. Ambrish saved ₹92,375 over a year to buy cows and goats. He buys a cow for ₹26,000 and a goat for ₹17,000. He also buys a milking machine for ₹19,873. Does he have enough money to buy these? How much more or less does he have than he needs?

4. A factory produces 54,000 nuts and bolts in a day. An order is placed for 85,300 nuts and bolts. How many more nuts and bolts does the factory need to produce to complete the order?

5. Virat Kohli has scored 27,599 runs. He has 6,758 runs less than Sachin Tendulkar. How many runs has Sachin Tendulkar scored?

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Chapter 5

Far and Near

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We have learnt about measuring length and some standard units we use to measure length. In this chapter we will learn some more units of measuring distances and the relationships between different units.

Let Us Find

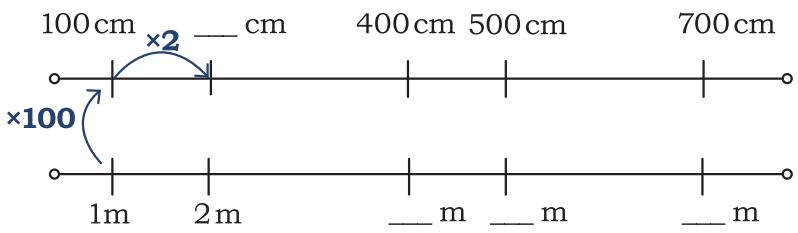
Identify the appropriate units for measuring each of the following.

Quantity	Unit of measurement Metre (m) or centimetre (cm)
Height of India Gate	42
Length of a handkerchief	40
Depth of a well	50
Length of a mobile phone	13
Length of an elephant's trunk	2
Distance between two buttons on a shirt	5

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Different Units but Same Measure

Shikha and Sonu are measuring the lengths of saris and stoles in the village weaving centre. Find which measures represent the same sari or stole. You can take help of the double number line below.

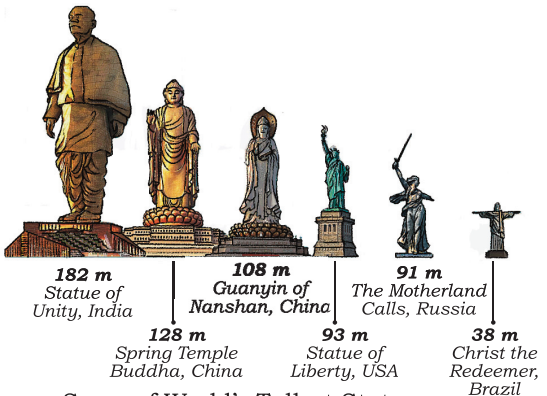


204 cm	5 metre 40 cm
540 cm	2 metre 204 cm
750 cm	2 metre 4 cm
240 cm	2 metre 40 cm
404 cm	6 metre 150 cm

Let Us Compare

1. Ritika is comparing the lengths of different rods. Compare them using <, =, > signs.
   (a) 456 cm ____ 5 m
   (b) 55 cm + 200 cm ____ 200 cm + 54 cm
   (c) 6 m 5 cm ___ 6 m 50 cm
   (d) 2 m 150 cm ___ 3 m 50 cm
   (e) 238 cm ____ 138 cm + 1 m

2. World's tallest statue
   (a) What is the difference between the height of the tallest statue in the world and the Statue of Liberty?
   (b) Identify the statues whose heights have the least difference.
   (c) Identify the statues whose heights have the largest difference.
   (d) The height of which statue will be equal to the height of the Statue of Unity, if it is doubled?



Some of World's Tallest Statues

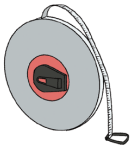
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Measuring Long Distances

Here are some ways in which you can measure long distances.

Long Tape





Rodometer—measuring wheel



Rangefinder



Laser Distance Meter

Let Us Do

Measure 100 m and 200 m on your school playground, or any other place in and around your school, using a Long Tape. Mark these points and draw a straight line. Walk on the lines and count the number of steps. Use this relationship between the number of steps taken and distance walked to find distances around you for at least 3 locations. Wherever possible, walk and find the number of steps. Otherwise, find the distance and estimate the number of steps.

(a) Identify and write the locations that are the nearest and the farthest from your home.

Nearest location _____.

Farthest location _____.

(b) Write the distances obtained above in increasing order.

_____, _____, _____, _____.

(c) Name a location that is equal to or more than 1,000 m from your home.

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Let Us Explore

When we walk 1,000 m, we say we have walked 1 km.

1,000 m = 1 km

Kilo stands for thousand. This unit is used to measure long distances.

Length of rope	Number of ropes needed to make 1 km
1,000 m	1
100 m	
10 m	
200 m	
500 m	
250 m	

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Kilometre Race

Sheena and Jennifer are helping to organise a 3-km race. Help them with the arrangements for the race.

1. Water stations are to be arranged after every 500 m. How many water stations must be set up? At what positions from the starting point will these water stations be placed?
2. Children need to stand at an interval of 300 m to direct the runners. How many children are needed? At what positions from the starting point will the children be standing?
3. Red and blue flags are to be placed alternately at every 50 m. How many red and blue flags are needed till the finish line?

Let Us Do

Longest Train Journey

The longest train journey in India is by The Vivek Express which runs from Dibrugarh in Assam to Kanniyakumari in Tamil Nadu. Look at the stations on the route shown in the table below and answer the questions.

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Station number	Name of the station	Distance from Dibrugarh
9	Dimapur	306 km
14	Guwahati	556 km
22	Jalpaiguri Road	983 km
34	Bhubaneswar	2,007 km
40	Visakhapatnam	2,450 km
45	Vijayawada JN	2,800 km
55	Coimbatore JN	3,675 km
65	Kanniyakumari	4,187 km

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1. The total length of the route from Dibrugarh to Kanniyakumari is _____ km.
2. The distance between Vijayawada and Jalpaiguri road is _____.
3. Distance between Vijayawada and Visakhapatnam is _____.
4. Which two stations are farther apart—Guwahati and Dimapur or Bhubaneswar and Jalpaiguri Road?
5. What is the distance between Guwahati and Coimbatore JN?

Let Us Explore

The World of Small Things

How can we measure small things like the ones shown here?



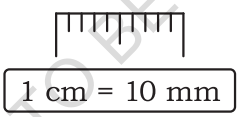
sprout small screws nail

Let us look at the scale. Do you notice the small marks between 1 cm and 2 cm? Count how many marks are there between 1 cm and 2 cm?



One centimetre is divided into ten equal parts. Each part is called 1 millimetre (mm).

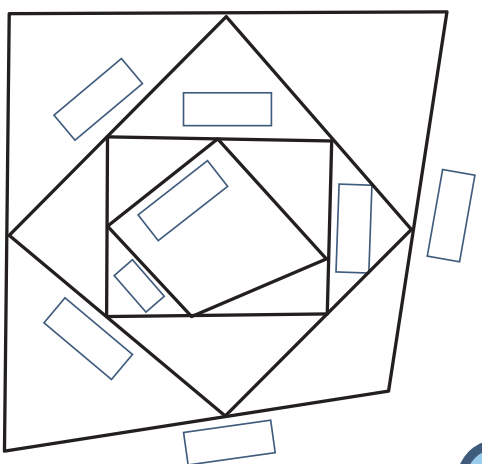
1 cm = 10 mm



These small marks between any two centimetre marks help us measure the smaller lengths. Thus, it adds to the precision in measurement.

Let Us Measure

Measure the lines in the design and write their measurements in cm and mm.



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Let Us Do

Soak some seeds of whole moong or black or white chana overnight. Next morning, take them out and wrap them in a moist cloth to sprout them. Over the next 4 days, take out one seed each day and measure the length of sprout. For ease of measurement, you can either place the seed on a paper and mark the length of the sprout, or use a thread to find its length.

Number of days	Length of the sprout (in mm)
Day 1	
Day 2	
Day 3	
Day 4	

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Let Us Draw

Draw lines of the following lengths in your notebook using a scale.

1. 5 cm 5 mm
2. 3 cm 6 mm
3. 8 cm 3 mm
4. 36 mm
5. 67 mm

How did you draw lines of lengths 36 mm and 67 mm? Share your thoughts in class.

Relationships between Different Units

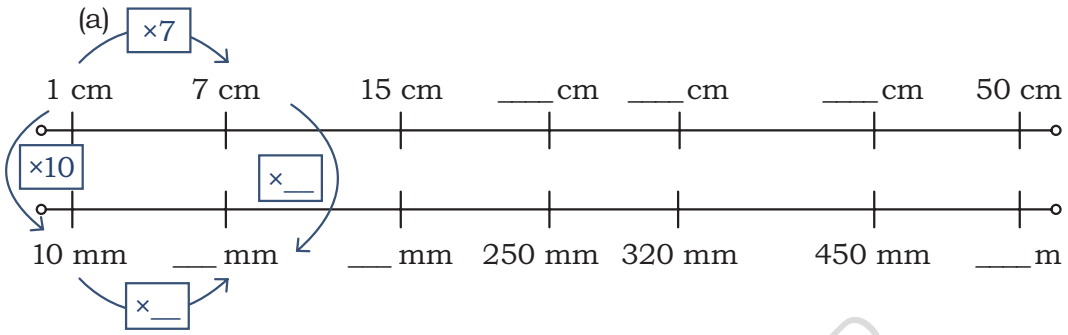
10 mm = 1 cm
100 cm = 1 m
1,000 m = 1 km

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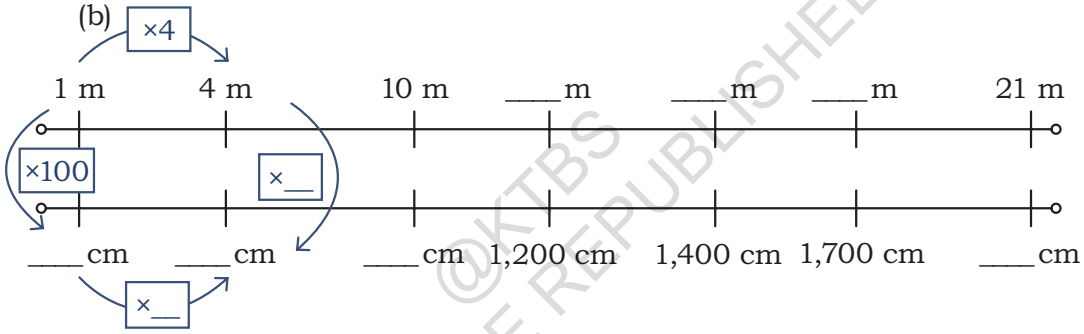
Let Us Do

1. Fill in the blanks appropriately in the double number lines given below.

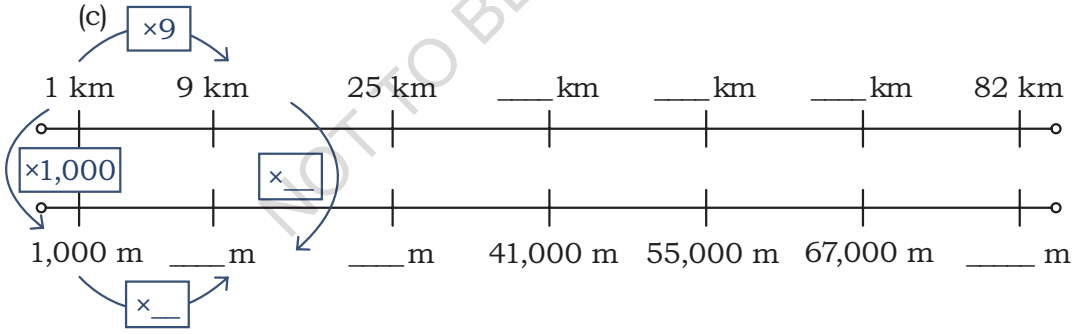
(a)



(b)



(c)



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2. Use your understanding from above to fill in the blanks appropriately.
   (a) 4 cm 5 mm = _____ mm
   (b) 89 mm = ___ cm ___ mm
   (c) 234 cm = ___ mm
   (d) 514 mm = ___ cm ___ mm
   (e) 6 m 34 cm = ___ cm
   (f) 20 m 12 cm = ___ cm
   (g) 397 m = _____ cm

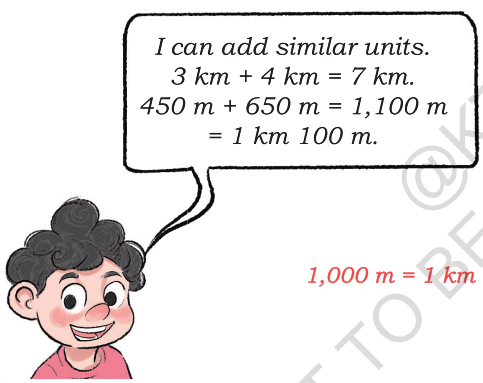
89 mm = 80 mm + 9 mm
= 8 cm 9 mm

(h) 5,792 cm = _____m _____ cm
(i) 9,108 cm = _____ m _____ cm
(j) 34 km = _____ m
(k) 6,870 m = ____ km ___ m
(l) 10,552 m = ____ km ___ m
(m) 29 km 30 m = ____ m
(n) 32 km 359 m = ____ m

5,792 cm = 5,700 cm + 92 cm
= 57 m 92 cm

Adding and Subtracting Lengths

Saji saw on his smartphone that he walked 3 km 450 m in the morning and another 4 km 650 m in the evening. How much did he walk in the whole day? How would you solve this problem? Share your thoughts in class.



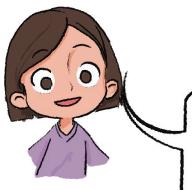
I can add similar units.
3 km + 4 km = 7 km.
450 m + 650 m = 1,100 m
= 1 km 100 m.

km		m		
	1			
3	4	5	0	
+ 4	6	5	0	
7	1	1	1	0 0

1,000 m = 1 km

7 km + 1,100 m = 8 km + 100 m = 8 km 100 m

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I can convert everything into metres and add, that is 3,450 m + 4,650 m

	m			
	1	1		
3	4	5	0	
+ 4	6	5	0	
8	1	1	1	0 0

8,100 m = 8,000 m + 100 m
= 8 km 100 m

Electricians are changing the cables in a house. They need 63 m of cable for this purpose. They used 16 m 75 cm cable in the first room.
What is the length of the cable left?

Convert 1 m = 100 cm

Convert the quantities in cm.
6,300 cm – 1,675 cm



	cm			
	5	12	9	10
	~~6~~	~~3~~	~~0~~	~~0~~
–	1	6	7	5
	4	6	2	5

4625 cm = 4600 cm + 25 cm = 46 m 25 cm.

We can also subtract like units, as above.

	m		cm			m		cm		
		2				5	12	0	9	10
	6	~~3~~	1	0	0	~~6~~	~~3~~	~~1~~	~~0~~	~~0~~
–	1	6		7	5	– 1	6		7	5
						4	6		2	5

Therefore, 46 m 25 cm cable is left.

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Note for the Teachers: Lengths can be added and subtracted in different ways. We can orally calculate whenever the numbers are convenient, like 200, 250, 400, 500, or 750, etc. In fact, we should encourage the use of mental strategies so that students can use mathematics for solving daily-life problems. When numbers are not suitable for oral calculations, the learners can choose one of the column strategies provided here based on their comfort. Help learners notice the similarity between operations on numbers and on quantities like length.

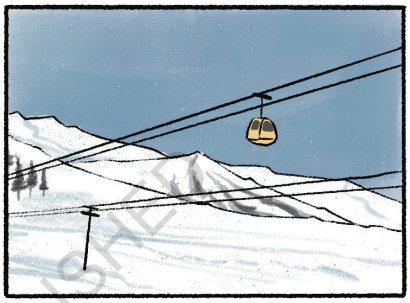
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Let Us Do

1. Rani has two red-coloured ribbon rolls, one of length 3 m 75 cm and another 2 m 25 cm long. How much ribbon does she have?

2. The distance from Bhopal to Sanchi is 48 km 700 m. Bhadbhada Ghat waterfall is on the way, and 17 km 900 m away from Bhopal. How far is Sanchi from the waterfall?

3. Gulmarg Gondola in Gulmarg, Kashmir is the second longest and second highest cable car in the world. It is divided into two sections. The first section covers 2 km 300 m and the second section covers 2 km 650 m. What is the total distance covered by the cable car?



4. Circle the bigger length and find the difference.

(a) 11 mm and 1 cm	Difference — _____
(b) 26 mm and 2 cm	Difference — _____
(c) 20 cm and 201 mm	Difference — _____
(d) 1,020 mm and 1m	Difference — _____
(e) 2 m and 245 cm	Difference — _____
(f) 5,678 m and 6 km	Difference — _____
(g) 6 km 1,480m and 7 km 479m	Difference — _____

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Multiplying and Dividing Lengths

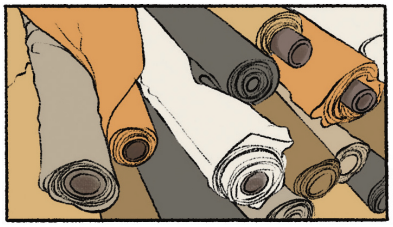
1. We need a 1 m 80 cm cloth to make a shirt for a 10-year old child. How much cloth will be needed to make shirts for 20 such children?

20×1 m 80 cm $= 20 \times 1$ m and 20×80 cm
$= 20$ m + 1600 cm
$= 20$ m + 16 m
$= 36$ m.

Break the quantity into m and cm and multiply. You can also convert it into cm and multiply.

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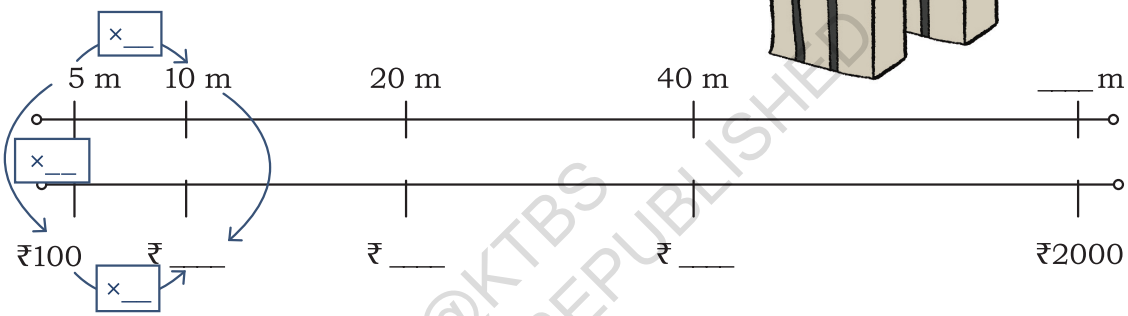
2. A shop sells cloth for making bags at ₹100 for 5 m. How much money is needed to buy a 1 m cloth?



If 5 m cloth costs ₹100, then a 1 m cloth costs 100 ÷ 5 = ₹20.

Now, use the double number line to find the cost of the cloth or the length of cloth that we can buy at a particular cost.





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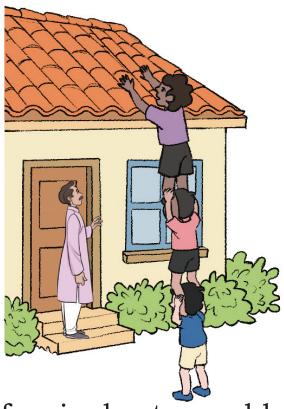
3. Anita is making an embroidery on the border of a sari. She needs a 1 m long thread to embroider a 50 cm sari. How much thread would she need for a 5 m sari border?



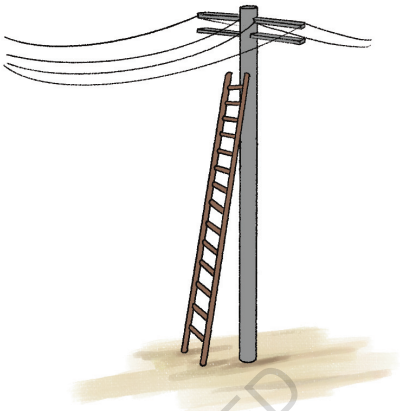
A 1 m long thread costs ₹50. How much money will be needed to buy the thread?

4. A road 12 km 600 m long is being laid in a town. The workers lay an equal length of road each day, and complete the work in 6 days. How much road-laying work is done on each day?

Let Us Estimate



Height of a single-storeyed house



Height of an electric pole

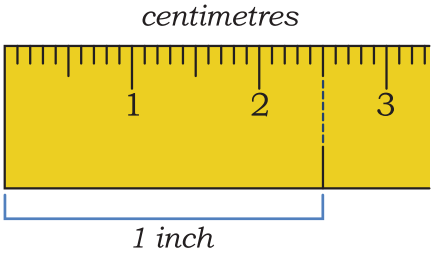
Estimate the following. Share your reasoning in class.

1. The height of the tallest building in your neighbourhood. What did you use as a reference to estimate the height?
2. The height of the tallest tree in your neighbourhood. What did you use as a reference?
3. The depth of a well or swimming pool in your neighbourhood. How did you find out?

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Let Us Explore

In daily life, we use other units of measuring length as well. Height is usually measured in feet and inches. Look at your ruler to see if inches are also marked on it. Find out how many cm and mm equal 1 inch.



1 inch = 2 cm 5 mm

1 foot = 12 inches or 30 cm.

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Measure Your Height



Stand against a wall and mark your height. Measure the distance between the floor and the marked point in feet and inches.

Similarly, other students in the class can also measure their heights.

Find out who is the tallest student in your class. What is his or her height in feet and inches?

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Chapter 6

The Dairy Farm

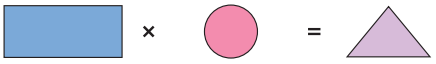
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By now, we know several multiplication facts. We have also learnt how to multiply two numbers. We will continue to explore different ways of multiplying in this chapter.

Let Us Think

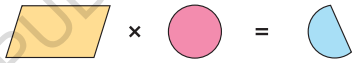
1. The given shapes stand for numbers between 1 and 24. The same shape denotes the same number across all problems. Find the numbers hiding in all the shapes.

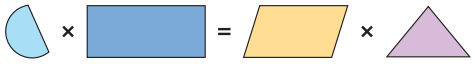
a) 

b) 

c) 

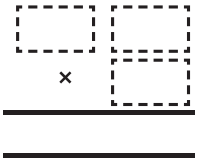
d) 

e) 

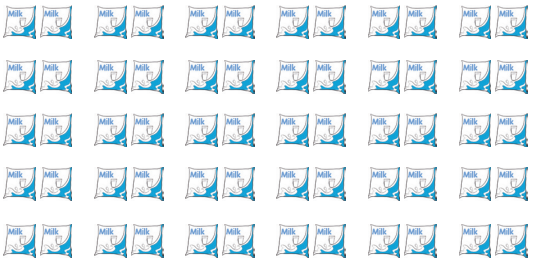
f) 

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2. Place the digits 2, 5, and 3 appropriately to get a product close to 100. Share your reasoning in class.



3. A dairy has packed butter milk pouches in the following manner. Find the number of pouches kept in each arrangement. One is done for you.



30 × 2 = 60



___ × ___ = 60



___ × ___ = 60



___ × ___ = 60

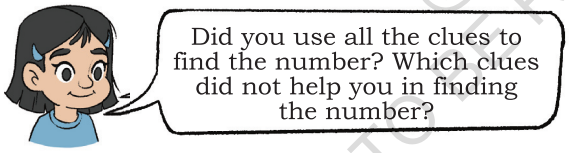
What other groups can you make?

4. Which number am I?

I am a two-digit number. Find me with the help of the following clues.

(a) I am greater than 8.
(b) I am not a multiple of 4.
(c) I am a multiple of 9.
(d) I am an odd number.
(e) I am not a multiple of 11.
(f) I am less than 50.
(g) My ones digit is even
(h) My tens digit is odd.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99



5. Make your own numbers.

Choose any two numbers and one operation from the grid. Try to make all the numbers between 0 and 20. For example, 2 can be formed as 4 – 2. Could you make all the numbers?

100	25	5	–
10	2	36	×
12	4	3	+
			÷

Which numbers could you not make? Is it possible to make these numbers using three numbers? You can use two operations, if needed. Which numbers between 0–20 can you get in more than one way?

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Order of Numbers in Multiplication

Daljeet Kaur runs a milk processing unit. She has arranged the butter packets in the following ways. Find the number of butter packets in each case. What pattern do you notice (or observe)? Discuss in class.

a)

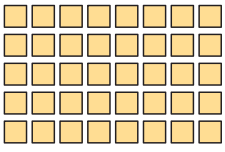


2 × 3 =

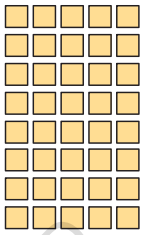


3 × 2 =

b)

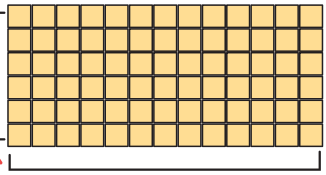


5 × 8 =



8 × 5 =

Number of groups: 6

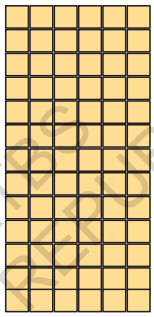


Group size: 13

6 × 13 =

13 × 6 =





Is this true for the product of any two numbers? Discuss in class.

e) 10 × 5 =

5 × 10 =

f) 8 × 20 =

20 × 8 =

g) 12 × 9 =

9 × 12 =

What is 9 × 0? 0 × 9?

The number of groups and the group size are interchanged in each case above, but the total number of butter packets remain the same.

Patterns in Multiplication by 10s and 100s

1. Let us revise multiplication by 10s and 100s.

a) 4 × 10 = _____

b) 20 × 10 = _____

c) 10 × 40 = _____

d) 10 × 10 = 100

e) 20 × 50 = _____

f) 80 × 10 = _____

g) 3 × 100 = 100 × 3 = 300

h) 8 × 100 = _____ = _____

i) 10 × 100 = _____ = _____

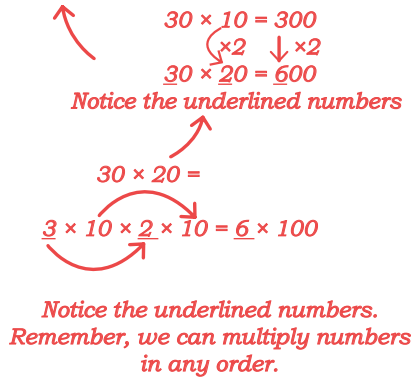
Note for Teachers: Encourage the learners to understand that when we multiply a number by 10, it becomes 10 times, and each digit moves one place value to the left. Multiplying by 100 makes the number 100 times larger, shifting each digit two place value to the left. Let them notice the pattern of zeros in the place value table.

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2. Find answers to the following questions. Fill in the table below and describe the pattern. Discuss in class.

100 × 90 = __,000	400 × 10 = ___	60 × 50 = ____
30 × 20 = 600	700 × 4 = _,_ 00	10 × 45 = ____



How should we write 450 in the table below?

Problem	Th	H	T	O
10 × 45 =				
30 × 20 =		6	0	0
400 × 10 =				
700 × 8 =				
100 × 90 =	9	0	0	0

Problem	Th	H	T	O
60 × 50 =				
220 × 20 =				
11 × 300 =				

Problem	Th	H	T	O
80 × 90 =				
10 × 63 =				
40 × 12 =				

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What will happen if we multiply numbers by 1,000?

2 × 1,000 = 2 thousand = 2,000 [1,000] [1,000]

5 × 1,000 = 5 thousand = 5,000 [1,000] [1,000] [1,000] [1,000] [1,000]

10 × 1,000 = 10 thousand= 10,000 20 × 1,000 = 20 thousand = 20,000

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Let us fill in the table and observe the patterns.

Problem	TTh	Th	H	T	O
2 × 1,000 =		2	0	0	0
5 × 1,000 =		5	0	0	0
10 × 1,000=	1	0	0	0	0
20 × 1,000=	2	0	0	0	0
3 × 5,000 =					
8 × 3,000 =					
5 × 7,000 =					

Problem	TTh	Th	H	T	O
20 × 100 =					
40 × 500 =					
60 × 300 =					
600 × 30 =					
80 × 900 =					
70 × 600 =					
5 × 7,000 =					

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Many Ways to Multiply

What is **18** × **5**

Do you think they are all correct? Why do you think so?



Half of 18 is 9. 9×5 is 45 and 9×5 is 45. I added 45 and 45 together to get 90.



First, I doubled 18 to get 36. Then I doubled 36 to get 72 and then I added 18 to 72 to get 90.

I separated 18 into 8 and 10. 8×5 is 40. 10×5 is 50. then I added 40 and 50 together to get 90.





18×5 = 9×10. So, 90.

I did 20×5, which is 100. Then I took away 2×5, which is 10. So, 100–10 = 90.

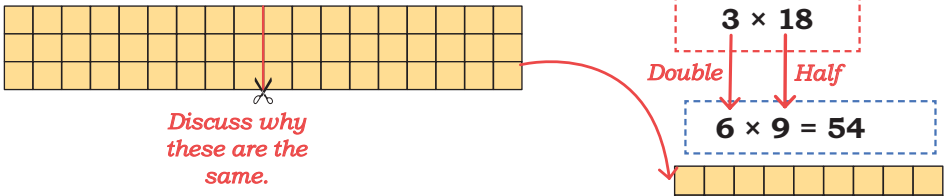


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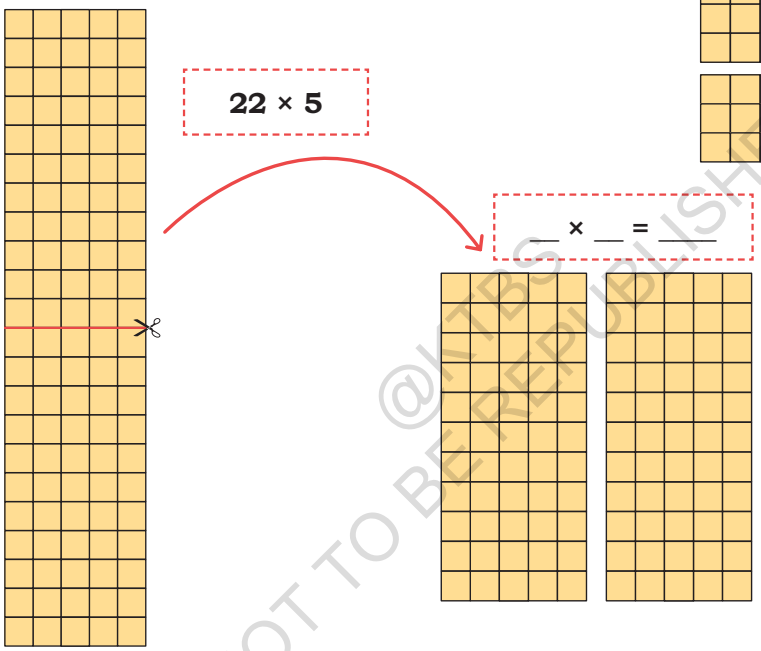
Doubling and Halving

Butter packets are arranged in the following ways. Let us find some strategies to calculate the total number of packets.

a)



b)



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c) Solve the following problems like the previous ones.

14 × 3 =

Half	Double
	×

38 × 5 =

Half	Double
	×

16 × 4 =

	×

35 × 14 =

	×

This halving and doubling strategy works well when we have to multiply with numbers like 5 and 25. Discuss why?

(d) Find the product by halving and doubling either the multiplier or the multiplicand.

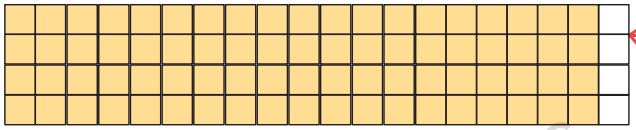
1) 5 × 18 2) 50 × 28 3) 15 × 22

4) 25 × 12 5) 12 × 45 6) 16 × 45

(e) Give 5 examples of multiplication problems where halving and doubling will help in finding the product easily. Find the products as well.

Nearest Multiple

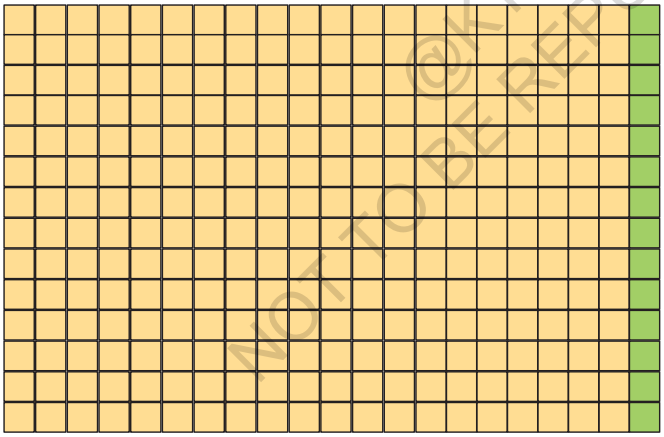
(a) 4 × 19



Observe the picture and find why we need to subtract 4

4 × 19 = 4 × 20 – 4
= 80 – 4
= 76

(b) 14 × 21



Observe the picture and find why we need to add 14.

14 × 21 = 14 × 20 + 14
= 280 + 14
= 294

(c) Give 5 examples of problems where you can use the nearest multiple to find the product easily. Find the products as well.

(d) Find the products of the following numbers by finding the nearest multiple.

1) 7 × 52 2) 12 × 28 3) 75 × 31

4) 99 × 15 5) 8 × 25 6) 22 × 42

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Let Us Solve

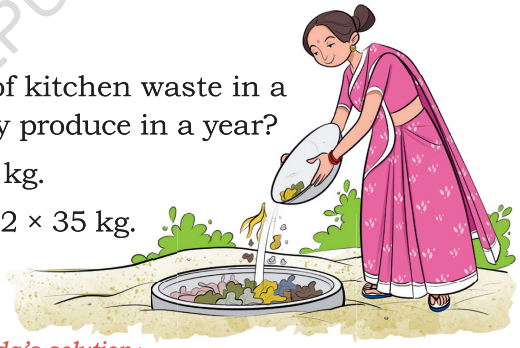
Use strategies flexibly to answer the following questions. Discuss your thoughts in class.

1. A school has an auditorium with 35 rows, with 42 seats in each row. How many people can sit in this auditorium?
2. Priya jogs 4 kilometres every day. How many kilometers will she jog in 31 days?
3. A school has received 36 boxes of books with 48 books in each box. How many total books did the school receive in the boxes?
4. Priya uses 16 metres of cloth to make 4 kurtas. How much cloth would she need to make 8 kurtas?
5. Gollappa has 29 cows on his farm. Each cow produces 5 litres of milk per day. How many litres of milk do the cow produce in total, each day?
6. Maska Cow Farm has 297 cows. Each cow requires 18 kg of fodder per day. How much total fodder is needed to feed 297 cows every day?

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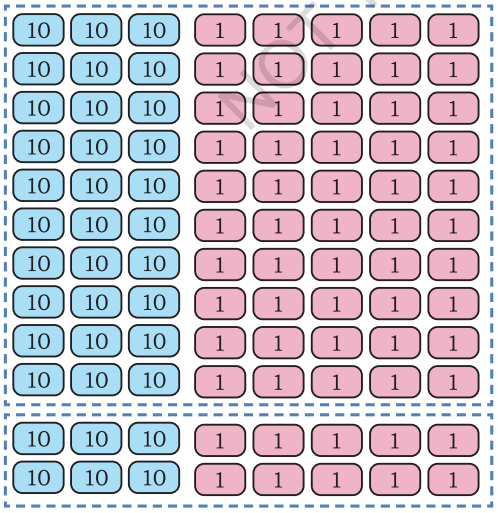
Waste and Composting

1. A family of 4 produces around 35 kg of kitchen waste in a month. How much waste will the family produce in a year?



Quantity of kitchen waste in 1 month is 35 kg.

Quantity of kitchen waste in 12 months is 12 × 35 kg.



Nida's solution

×	30 kg	5 kg
10	300	50
2	60	10
	360	60
	420	

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Kanti and John tried to solve it in the following ways.

Kanti's solution

$$
\begin{array}{r}
35\ (30+5) \\
\times\ 12\ (10+2) \\
\hline
10\ (2\times 5) \\
60\ (2\times 30) \\
50\ (10\times 5) \\
300\ (10\times 30) \\
\hline
420
\end{array}
$$

John's solution

$$
\begin{array}{r}
35\ \ (30+5) \\
\times\ 12\ \ (10+2) \\
\hline
60+10\ =\ \ 70\ (2\times 35) \\
300+50\ =\ 350\ (10\times 35) \\
\hline
=\ 420
\end{array}
$$

The family produces _____ kg of waste in a year.

How are these solutions same or different? Discuss in class.

2. The family regularly composts the collected waste. They get around 150 kg of compost each year, which they use in their garden. 1 kg of compost is often sold in the market at ₹24. By creating their own compost, how much money have they saved in a year?

   Savings on 1 kg compost is ₹24. Savings on 150 kg will be ₹24 × 150.

×	100	50
20	2,000	1,000
4	400	200
	2,400	1200
	3,600	

The family saves ₹3,600.

$$
\begin{array}{r}
150\ (100+50) \\
\times\ \ 24\ (20+4) \\
\hline
200\ \ (4\times 50) \\
400\ (4\times 100) \\
1{,}000\ (20\times 50) \\
2{,}000\ (20\times 100) \\
\hline
3{,}600
\end{array}
$$

Another way:

$$
\begin{array}{r}
150\ (100+50) \\
\times\ 24\ (20+4) \\
\hline
400+\ \ 200+0\ =\ \ \ 600\ (4\times 150) \\
2{,}000+1{,}000+0\ =\ 3{,}000\ (20\times 150) \\
\hline
=\ 3{,}600
\end{array}
$$

Note for Teachers: Help the learners see the similarities and differences between the solutions. Let them discuss and identify the more efficient solution. Draw the similarities between the steps, especially highlighting the place values of the digits, and multiplication by 10s and 100s in each step.

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Let Us Multiply

(a) 32 × 8

×	30	2
8		

```
   32 (30 + 2)
×     8
-------------
____ (8 × 2)
   0 (8 × 30)
-------------
  256
```

```
        32 (30 + 2)
          × 8
-------------------
___ 0 + 16 = 256
```

(b) 69 × 45

×	60	9
40		
5		
	2700	405
	3105	

```
   69 (60 + 9)
×  45 (40 + 5)
-------------
  45 (5 × 9)
___ 0 (5 × 60)   ←
___ 0 (40 × 9)
  00 (40 × 60)
-------------
3,105
```

```
          69 (60 + 9)
        × 45 (40 + 5)
-----------------------
300 + __  =  345 (5 × 69)
__ + ___  = 2760 (40 × 69)
-----------------------
          = 3,105
```

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Let Us Do

1. Solve the following problems like Nida did.

a) 78 × 4

×		

b) 83 × 9

×		

c) 67 × 28

×		

d) 53 × 37

×		

2. Solve the following problems like Kanti.

a) 94 × 5 b) 49 × 6 c) 37 × 53 d) 28 × 79

3. Solve the following problems like John.

a) 86 × 3 b) 72 × 7 c) 94 × 36 d) 66 × 22

4. Solve the following problems:

(a) A movie theater has 8 rows of seats, and each row has 12 seats. If half the seats are filled, how many people are watching the movie? If 3 more rows get filled, how many total people will be there?



(b) In a test match between India and West Indies, the Indian team hit twenty-four 4s and eighteen 6s across the two innings. How many runs were scored in 4s and 6s each? 234 runs were made by running between the wickets. If 23 runs were extras, how many runs were scored by Indian team in the two innings?

(c) Anjali buys 15 bulbs and 12 tube lights from Sudha Electricals. Each bulb costs ₹25 and each tube light costs ₹34. How much money should Anjali give to the shopkeeper?

(d) A shopkeeper sold 28 bags of rice. Each bag costs ₹350. How much money did he earn by selling rice bags?

(e) A school library has 86 shelves and each shelf has 162 books. Find the number of books in the library.

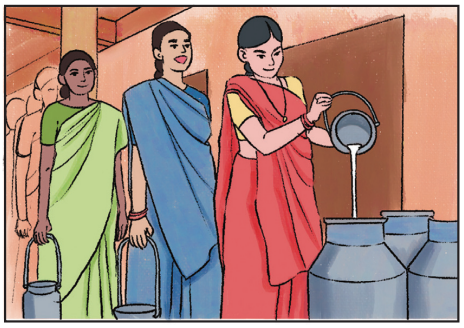
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Dairy Cooperative

1. A dairy cooperative in a small town gets its milk from 268 villagers. Each villager has at least 4 milk-giving cows. What is the minimum number of cows the dairy cooperative gets its milk from?

   1 villager has at least 4 milk-giving cows. 268 villagers will have at least 268 × 4 cows.



$$\begin{array}{r} 268\ (200 + 60 + 8) \\ \times\ \ 4 \\ \hline 800 + 240 + 32 = 1{,}072 \end{array}$$

Remember!
4 × 6 Tens = 24 Tens = 240
4 × 2 Hundreds = 8 Hundreds = 800

200 is added to 4×200 = 800

30 is added to 4 × 60 = 240

30 from 32 is added to 4×60, not to 60



Mili says her father has taught her to use place values of digits to multiply large numbers.



Th	H	T	O
	2	3	
	2	6	8
×			4
1	0	2	7	3	2

200 from 270 is added to 4×200, not to 200

Discuss how this multiplication is being carried out!

The dairy cooperative gets milk from a minimum of 1,072 cows.

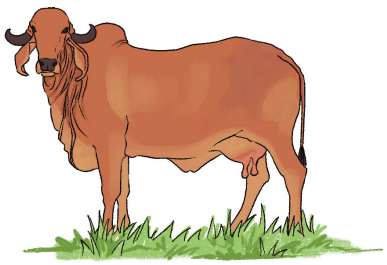
Many women dairy entreprenuers are playing significant role in the dairy sector. Jamanaben Maganbhai Naku of village Tuked in Surat possesses 27 Gir cows and rears the cows through Low-cost Farm Investment.

Note for Teachers: The algorithm for multiplication is challenging for learners to understand. While learners should surely be able to multiply large numbers using the ways they have learnt till now, this last step (Mili's father's method) need not be over-emphasised. Please support them if your students are ready for this. Otherwise, it is perfectly fine if learners can carry out multiplication of large numbers using John's methods.

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2. The villagers rear various breeds of cows. Gir is an Indian cow breed from Gujarat, with a high milk-producing capacity. Among the villagers, there are 453 Gir cows. Each of these cows give 13 litres of milk each day. How many litres of milk does the dairy cooperative receive from Gir cows everyday?



One Gir cow produces 13 litres of milk. 453 Gir cows will produce, 453 × 13 litres of milk.

100 is added to 3 × 400 = 1200

453 (400 + 50 + 3)
× 13 (10 + 3)
1200 + 150 + 9 = 1359 (3 × 453)
4000 + 500 + 30 = 4530 (10 × 453)
= 5889

3 × 5 T = 15 T = 150
3 × 4 H = 12 H = 1,200

Mili's father's method

	Th	H	T	O
		1		
		4	5	3
×			1	3
	1	3	1	5	9
+	4	5	3	0
	5	8	8	9

The 100 from 150 is added to 3×400 = 1200, not to 400

1 Ten × 453 = 453 Tens = 4530

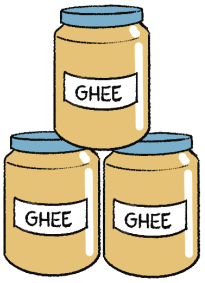
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The dairy cooperative receives 5,889 litres of milk from Gir cows every day.

Note for Teachers: The learners' attention needs to be drawn continuously to the place values of numbers and their products. Draw similarities with the steps between the different methods. Remind them to put appropriate zeros when multiplying by 10s and 100s.

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3. The dairy cooperative sells 1 kg cow ghee for ₹574. The cooperative is able to produce around 125 kg of ghee in a month. How much do they earn by selling ghee in a month?



Discuss what the same coloured digits might mean.

574 (500 + 70 + 4)
× 125 (100 + 20 + 5)

2,500 + 350 + 20	**= 2,870 (5 × 574)**
10,000 + 1,400 + 80	**= 11,480 (20 × 574)**
50,000 + 7,000 + 400	**= 57,400 (100 × 574)**
	= 71,750

T Th	Th	H	T	O	
		1			
		3	2		
		5	7	4	
	×	1	2	5	
	2	2	8	3	7	2	0	*2 Tens × 574 = 2 × 3,740*
	1	1	1	1	4	8	0	
+	5	7	4	0	0		*1 Hundred × 574 = 574 Hundreds = 57,400*
	7	1	7	5	0		

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The cooperative earns ₹ 71,750 from the sale of cow ghee.

Let Us Solve

1. Solve the following problems like Nida.
   a) 548 × 6 b) 682 × 3 c) 324 × 18 d) 507 × 23 e) 190 × 65

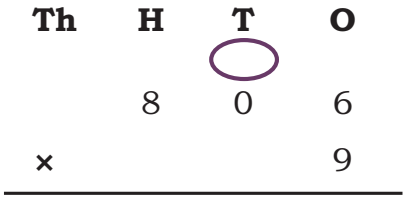
2. Solve the following problems like John.

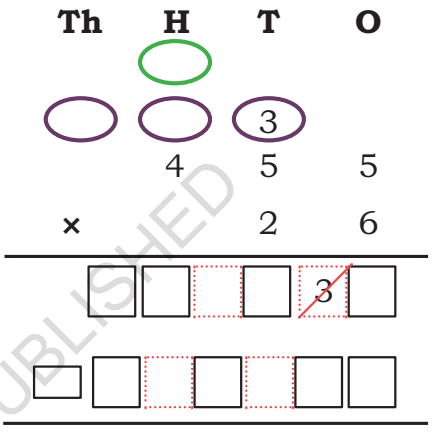
a) 123 × 84 b) 368 × 32

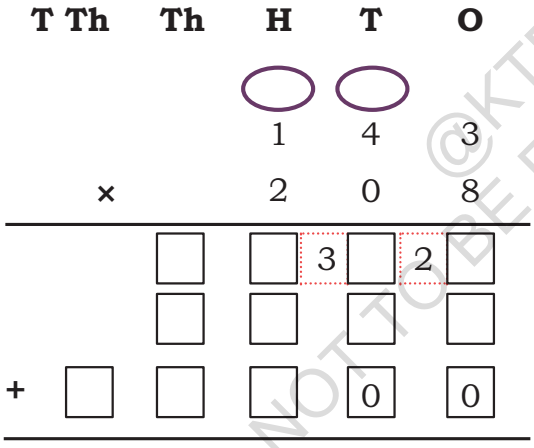
c) 159 × 324 d) 239 × 401

e) 592 × 5 f) 101 × 22

3. Let us solve a few questions like Mili's father.







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Now use Mili's father's method to solve the following questions.

(a) 807 × 5 (d) 450 × 38 (g) 604 × 54

(b) 143 × 28 (e) 584 × 23 (h) 112 × 23

(c) 309 × 9 (f) 302 × 13 (i) 237 × 19

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Check, Check!

Check if the following children's solutions are correct. If correct, explain why the solution is correct. If it is incorrect, then identify the error and correct the solution.

a) Asma's solution



for 46 × 59

```
   46
 × 59
------
2,000
  300
  360
   54
------
2,714
```

b) Pankaj's solution



for 203 × 54

```
   203
 ×  54
---------
 80 + 12 =  92
100 + 15 = 115
---------------
       = 135
```

c) Lado's solution



for 38 × 150

```
    38
 ×  150
-----------
1,500 + 400  = 1,900
3,000 + 800  = 3,800
-------------------
       = 5,700
```

d) Kira's solution



for 193 × 272

```
     193
 ×   272
-------------------
200 +  180 +   6 =   386
700 +  630 +  21 =  1,351
20,000 + 18,000 + 600 = 38,600
-----------------------------
                = 40,337
```

e) Asher's solution



	T Th	Th	H	T	O
		1	1	1	
			6	2	6
×			3	2	3
		1	8	7	1 8
		1	2	5	1 2
+		1	8	7	1 8
		5	0	1	8

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Let Us Do

1. Identify the problems that have the same answer as the one given at the top of each box. Do not calculate.

12 × 17	
11 × 18	6 × 34

26 × 11	
26 × 10 and 26 × 1	20 × 11 and 6 × 11

18 × 4	
9 × 8	20 × 4 – 8

55 × 9		
50 × 9 and 5 × 9	54 × 10	55 × 10 – 55

101 × 42	
100 × 42 and 100	100 × 42 and 42

247 × 8	
250 × 8 – 24	247 × 10 – 247

1001 × 5	
1,000 × 6	1,000 × 5 and 5

1999 × 2	
2,000 × 2 – 4	2,000 × 2 – 2

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2. Find easy ways of solving these problems.

(a) 16 × 25 (b) 12 × 125 (c) 24 × 250
(d) 36 × 25 (e) 28 × 75 (f) 300 × 15
(g) 50 × 78 (h) 199 × 63 (i) 128 × 35

3. Write 5 other examples for which you can find easy ways of getting products.

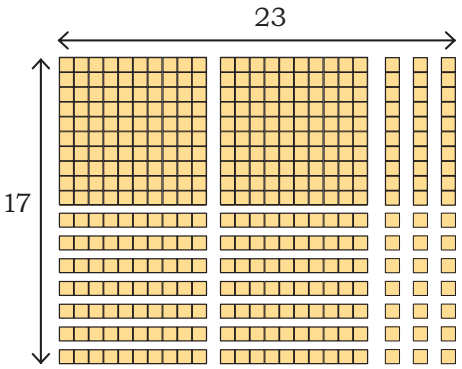
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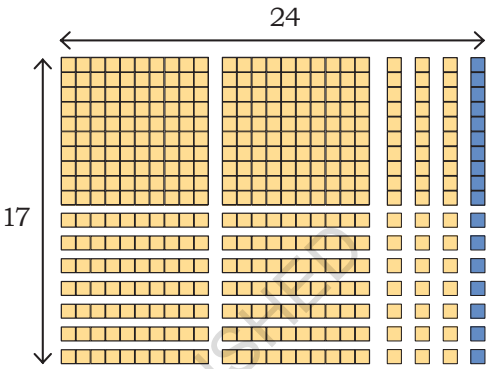
4. Find the answers to the following questions based on the given information.

(a) 17 × 23 = 391 (b) 17 × 24 = _____ (c) 17 × 22 = _____

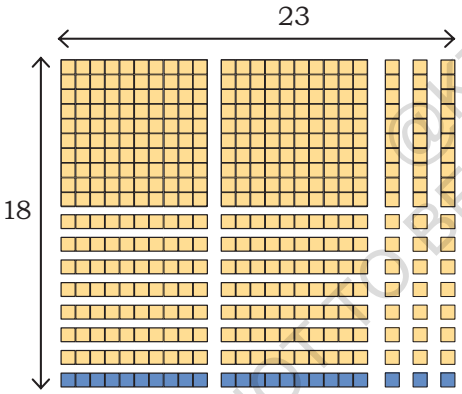
(d) 16 × 23 = _____ (e) 8 × 9 = 72 (f) 18 × 9 = _____

(g) 28 × 9 = _____ (h) 108 × 9 = _____ (i) 18 × 23 = _____





To find 17 × 24, how much is to be added to 17 × 23—17 or 23?



To find 18 × 23, how much is to be added to 17 × 23—17 or 23?

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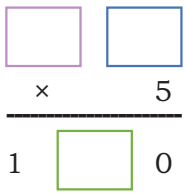
Let Us Think

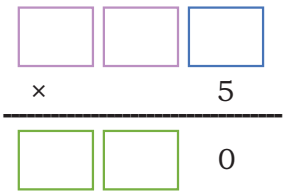
1. Find the possible values of the coloured boxes in each of the following problems. The same colour indicates the same number in a problem. Some problems can have more than one answer.

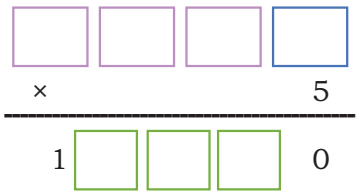
a) □□ × 3 = □□

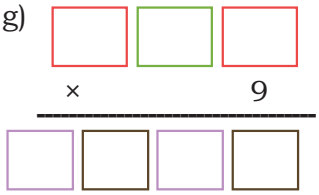
b) □□□ × 3 = □□□

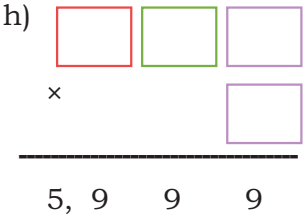
c) □□□□ × 3 = □□□□

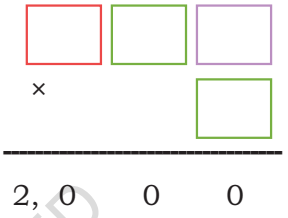
d) 

e) 

f) 

g) 

h) 

i) 

2. Estimate the products on the left and match them to the numbers given on the right.

25 × 31	2,600
132 × 19	12,500
101 × 11	300
248 × 49	750
12 × 25	1,000

Discuss how you estimated.

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The King's Reward

One day, a king decided to reward three of his most talented ministers. The king called them to his court and said, "You all have served my empire with great dedication. As a reward, I give you three choices of gold.

Choose wisely!

Choice 1: Take 5 gold coins and double the number of coins every day for 7 days.

Choice 2: Take 3 gold coins and triple the number of coins every day for 7 days.

Choice 3: Take 1 gold coin and multiply the number of coins by 5 every day for 7 days.

Minister 1—I will take 5 gold coins and double the number of coins every day for 7 days.

Minister 2—I will take 3 gold coins and triple the number of coins every day for 7 days.

Minister 3—I will take 1 gold coin and multiply the number of coins by 5 every day for 7 days.

The King gave 5 coins to Minister 1, 3 coins to Minister 2 and 1 coin to Minister 3.

Which of the rewards would you have chosen?

After a week, the 3 ministers were surprised at the final amount of gold coins. Guess who received the most gold coins? Calculate how much gold coins each minister received.

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Multiplication Patterns

1. Notice how the multiplier, multiplicand, and products are changing in each of the following. What is the relationship of the new product with the original product? Solve a) completely, and then predict the answers for the rest.

a) 16 × 44 = 704

1) 8 × 88 = 704
2) 8 × 22 = 176
3) 16 × 22 = _____
4) 32 × 44 = _____

b) 12 × 32 = 384

1) 6 × 16 = _____
2) 24 × 16 = _____
3) 24 × 64 = _____
4) 12 × 16 = _____

2. Observe and complete the given patterns

$1 \times 1 = 1$
$11 \times 11 = 121$
$111 \times 111 = 12{,}321$
$1111 \times 1111 =$ _____

$5 \times 5 = 25$
$15 \times 15 = 225$
$25 \times 25 = 625$
$35 \times 35 = 1{,}225$
$45 \times 45 =$ _____
$55 \times 55 =$ _____

5 × 5 = 25
2 × 1 = 2
5 × 5 = 25
3 × 2 = 6

$11 \times 12 = 132$
$11 \times 34 = 374$
$11 \times 56 = 616$
$11 \times 78 = 858$
$11 \times 54 =$ _____
$11 \times 82 =$ _____

H T O
1×1 1+2 1×2
H T O
1×3 3+4 1×4

$1 \times 9 + 1 = 10$
$12 \times 9 + 2 = 110$
$123 \times 9 + 3 = 1{,}110$
$1{,}234 \times 9 + 4 =$ _____

Here are some numbers. Remember **number pairs** from Grade 4? Any two adjacent numbers in a row or a column are number pairs. Can you identify the pair whose product is the smallest and another pair whose product is the largest? Do you need to find every product or can you find this by looking at the numbers?

8	35	75
32	62	13
66	11	14

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Let Us Solve

1. Mala went to a book exhibition and bought 18 books. The shop was selling 3 books for ₹150. After buying the books, she still had ₹20 left. How much money did Mala have at the beginning?
2. A village sports club organises a women's football tournament. The club earned money by selling match tickets and charging fees for team participation.

   They sold 57 tickets for ₹115 each.

   They had 3 teams joining the tournament, with each team paying a participation fee of ₹1,599.

   The teams paid ₹1,750 in total to rent the football ground and ₹1,129 for food and water.

   (a) How much money did the club collect in total from ticket sales and team participation fees?

   (b) What were the total expenses on renting the ground and food and water?
3. Ananya is watching Republic Day celebrations on the city's public ground. There are 12 rows of students sitting in front of her and 17 rows behind her. There are 18 students to her right and 22 students to her left.

   (a) How many rows of students are there in total?

   (b) How many students are there in Ananya's row?

   (c) What is the total number of students on the ground?
4. Multiply.

   (a) 67 × 78 (b) 34 × 56 (c) 45 × 263

   (d) 86 × 542 (e) 432 × 107 (f) 310 × 120
5. If 67 × 67 = 4489, without multiplication find 67 × 68.
6. If 99 × 100 = 9900, without multiplication find 99 × 99.

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Chapter 7

Shapes and Patterns

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Weaving Mats

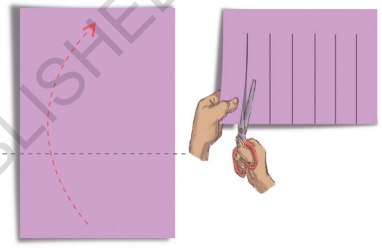


You may have seen woven baskets of different kinds. If you look closely, you will notice different weaving patterns on each basket.

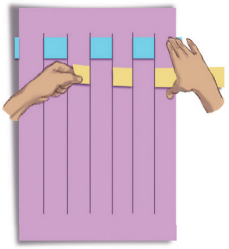
We will try weaving some mats with paper strips.

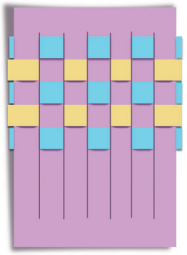
1. Let us make paper mats.

You will need—A coloured paper (30 cm long and 20 cm wide) and eight paper strips of two different colours (3 cm wide and longer than 20 cm).



(a) Take a coloured paper 30 cm long and 20 cm wide.
(b) Fold the coloured paper in half along the longer side.
(c) Draw vertical lines at equal distances from the closed end and cut slits leaving a gap of 3 cm at the top.
(d) Carefully unfold the paper. There will be no cuts in the paper at the top and the bottom.
(e) Now cut 8 paper strips of 3 cm width in 2 colours and of length slightly longer than 20 cm.
(f) Take one colour strip and weave it across the slits going 1 under and 1 over, and again 1 under and 1 over. Repeat it for the first row.
(g) Take one more strip of another colour and weave it across the slits going 1 over and 1 under, and again 1 over and 1 under. Repeat it for the second row.
(h) Weave all the strips in the same alternating pattern. Neatly fold any extra strip ends behind the mat. Your mat is ready!

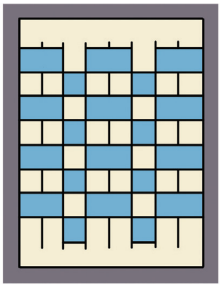




We can describe the pattern of the above weave as follows.
Row 1—1 under, 1 over, 1 under, 1 over, ... (repeat)
Row 2—1 over, 1 under, 1 over, 1 under, ... (repeat)

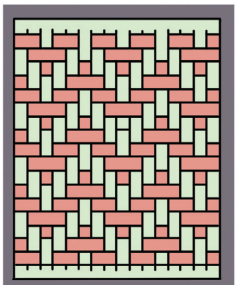
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2. Can you figure out how to make this mat?



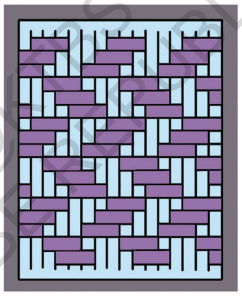
Let us try to understand how this mat is woven by looking at the pattern in the first two rows.
Row 1—2 over, 1 under, 2 over, 1 under, ...
Row 2—2 under, 1 over, 2 under, 1 over, ...
You can use strips of the same colour or 2 different colours, one for each row.

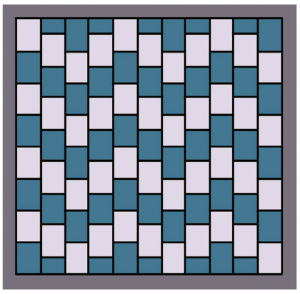
3. Try to weave a pattern, using the rules given below.



Row 1—2 over, 1 under, 2 over, 1 under, ... (repeat).
Row 2—1 under (do not repeat), 3 over, 3 under, 3 over, 3 under, ... (repeat).
Row 3—2 under, 1 over, 2 under, ... (repeat).
Row 4—1 over (do not repeat), 3 under, 3 over ... (repeat).
Continue weaving in this order.

4. Can you work out the steps for any of these designs and weave the pattern?



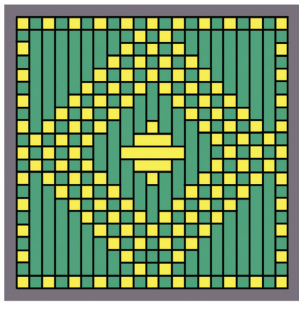


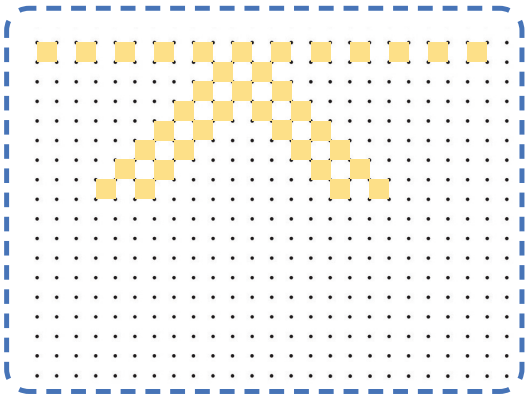
Write the steps of the pattern in your notebook for each row until it starts repeating.

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Let Us Try

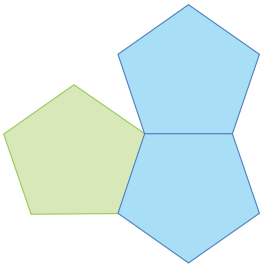
Draw the following pattern on a grid paper. Part of it is done for you. Now, complete the rest of the grid to get the full design.





Tiling and Tessellation

We often use tiles of the same shape or a combination of shapes to cover a region.



You can see pentagons (5-sided figures) in this figure.

As all its sides are equal it is a **regular pentagon.**

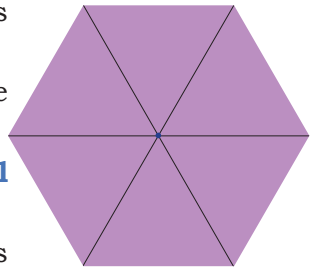
Shapes that have equal sides are called **regular shapes.**

We have placed 3 pentagons around a point. Can we fit one more into the empty space?

Pentagons cannot fill a region without leaving gaps. So, we say that regular pentagons do not tessellate.

Find Out

Can regular triangles fit together at a point without any gap? How many of them fit together? (A sample triangle is given at the end of the book). Do you see that regular triangles fit around a point as shown here?



Regular triangles when fitted around a point leave no gaps and there is no overlap.

Triangles with all equal sides are also called **equilateral triangles**.

Therefore, equilateral triangles tessellate. Can squares (a regular 4-sided shape) fit together around a point without any gap or overlap? Try it out using cutouts of squares (a sample square is given at the end of the book). How many squares did you need?

Can five squares fit together around a point without any gaps or overlaps? Why or why not?

Can **regular hexagons** (6-sided shapes with equal sides) fit together around a point without any gaps or overlaps? Try and see (a sample hexagon is given at the end of the book). How many fit together at a point?

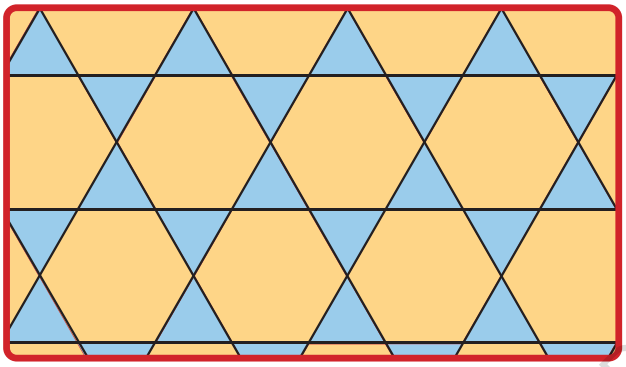


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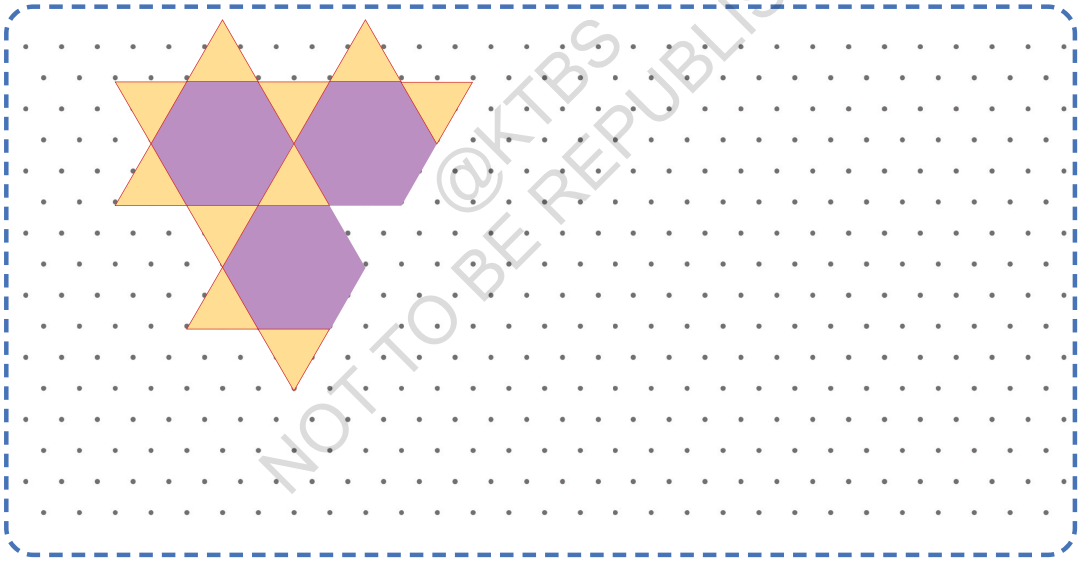
Chapter 7.indd 94 05-07-2025 16:03:08

Here is a tessellating pattern with more than one shape.

What shapes have been used in this pattern? _____, _____.



Continue the pattern given below and colour it appropriately.

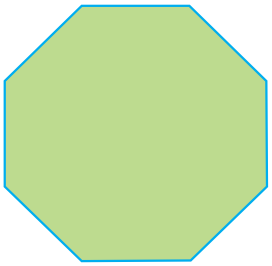


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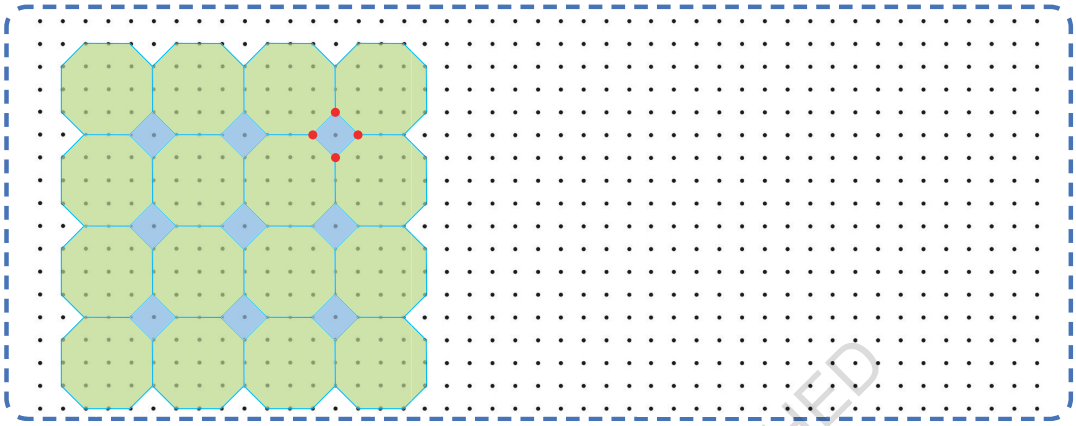
A **regular octagon** means a shape with eight equal sides.

Do regular octagons fit together without any gaps or overlaps? Try drawing the same and check.

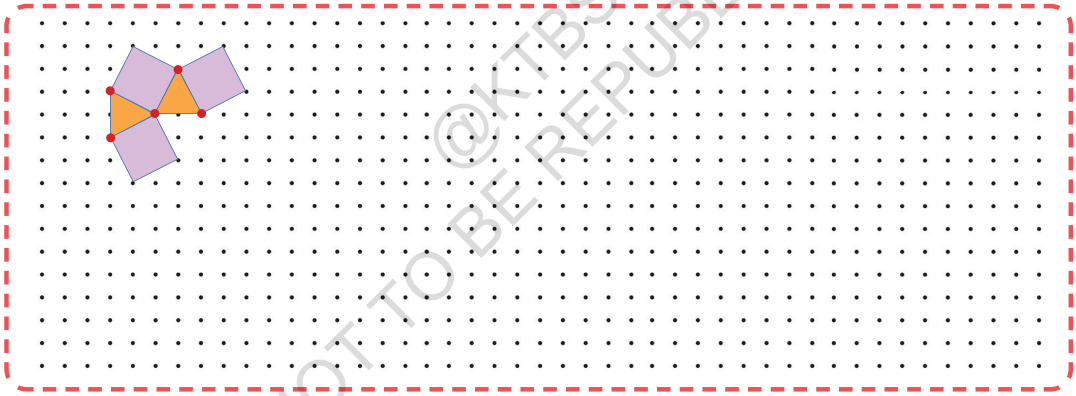
Regular octagons do not tessellate.



Look at the pattern given below. What shapes are coming together at the marked points? Are the same set of shapes coming together at these points? Continue the pattern and colour it appropriately.



Here is a tiling pattern made using two different shapes—squares and triangles. Are the triangles equilateral? Why or why not?



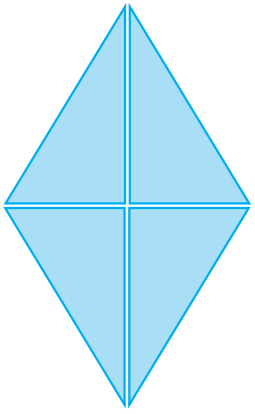
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What shapes are coming together at the marked points?

Are the same set of shapes coming together at these points? Continue the pattern and colour it appropriately.

Create similar patterns using other cutouts of shapes.

A **rhombus** is a shape with all equal sides. It has been divided into four triangles.



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You will find a copy of this rhombus at the end of the book. Cut out the triangular pieces for the following activities.

What geometrical shapes can you make by fitting 2 of these triangles together? Trace the shapes you created.

1. How many different types of triangles can you make?

   Now, observe and measure the sides of these triangles. What do you notice?

Each triangle has 2 equal sides. Such triangles are called **isosceles triangles**.

Trace the isosceles triangles on a paper and cut them out. Fold them in half. What do you notice about their angles?

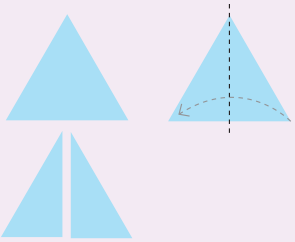
Each isosceles triangle has 2 equal angles.

2. Is it possible to make a triangle where all three sides are equal (equilateral triangle)?
3. Is it possible to make a triangle where all three sides are unequal?

Try This

Cut the equilateral triangle provided at the end of the book. Check if all the angles of an equilateral triangle are equal—just like you did with the isosceles triangle.

Equilateral triangles have equal angles.



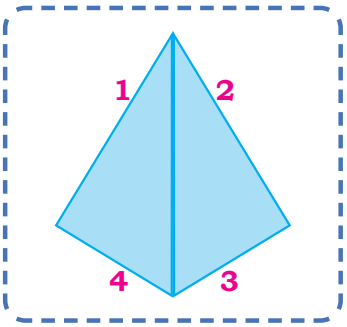
Now, cut the equilateral triangle in half. How many sides of each new triangle are equal?
Triangles that have no equal sides are called **scalene triangles**.
Check in scalene triangles whether any two or more angles are equal?

Note for Teachers: Encourage the learners to use paper folding methods to compare the angles of a shape.

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4. How many different 4-sided shapes (quadrilaterals) can you make?

Here are three possible shapes.



Have you made a shape like the one shown on the right?

This shape is called a **kite**.

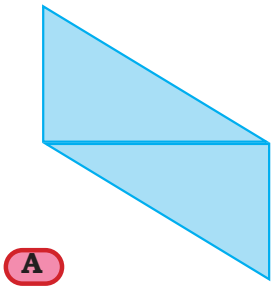
What do you notice about the sides of a kite?

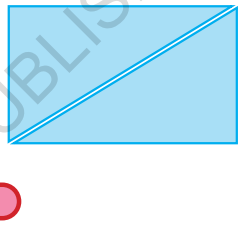
Side 1 = Side 2.

Similarly, Side 3 = Side 4.

These sides are called **adjacent sides**.

Here are two other possible quadrilaterals that are not kites.





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5. Measure the sides of each of these two quadrilaterals A and B. What do you notice?

   Are there any pairs of sides that are equal? Which pairs are equal—adjacent or opposite?

Quadrilaterals whose opposite sides are equal are called **parallelograms**.

What types of angles do quadrilaterals A and B have? Which angles are equal in each of the above parallelograms?

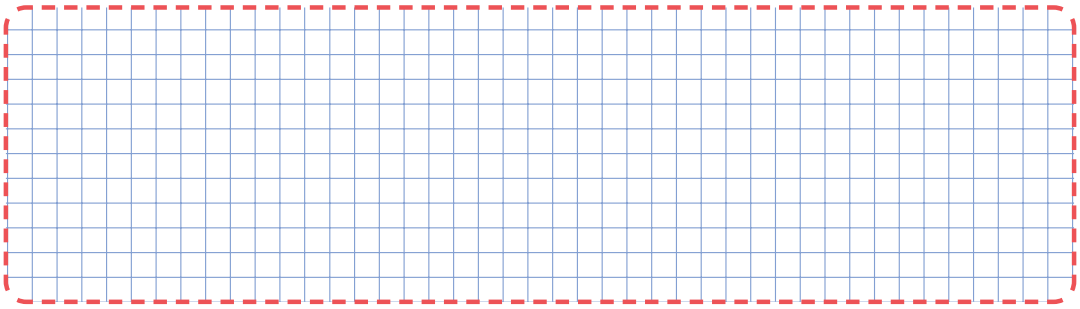
In parallelogram A, opposite angles are equal.

In parallelogram B, all angles are equal and are right angles. Such a parallelogram is called a **rectangle**.

A rectangle is a special type of parallelogram.

Chapter 7.indd 98 05-07-2025 15:05:46

6. In the grid given below, draw two different kites and parallelograms each.

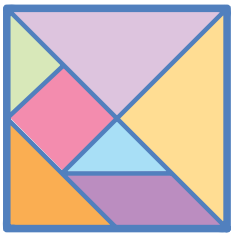


7. Now, use 3 triangles from the rhombus to form shapes. How many sides do each one of them have?

Using 3 triangular pieces of the rhombus, try creating a (a) 3-sided shape, (b) 4-sided shape, and (c) 5-sided shape.

8. Which of these shapes can be made with all 4 pieces? Try and find out.
   (a) Square
   (b) Rectangle
   (c) Triangle
   (d) Pentagon (5-sided)
   (e) Hexagon (6-sided)
   (f) Octagon (8-sided)

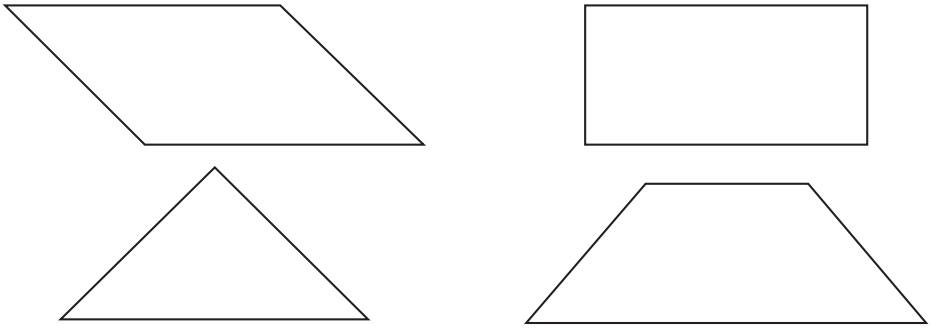
Tangram



Look at the tangram set given at the end of your textbook. Cut out all the shapes. Name them.

(a) How are they same or different from each other?
(b) What do you notice about the angles of each of the shapes?
(c) What do you notice about the sides of each of the shapes?

Now, use some or all of the pieces of your tangram set to make the following shapes. There may be more than one way to do it.



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Which Shape Am I?

Match the statements with appropriate shapes. Do some of them describe more than one shape?

	Statement	Shape
1.	All my angles are right angles, but all my sides are not equal.	 (Square)
2.	All my sides are equal, but all my angles are not.	
3.	My opposite angles are equal, but my sides do not make a right angle.	 (Rectangle)
4.	Two pairs of sides are equal, but they do not make a right angle.	
5.	All my sides make right angles with each other and are equal.	 (Rhombus)
6.	My opposite angles are equal and so are my sides.	
7.	My opposite angles are equal and my sides make right angles.	(Parallelogram)

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Kites

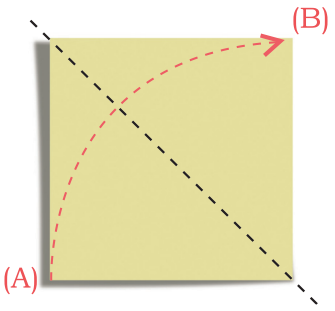
Make your own kite shape.

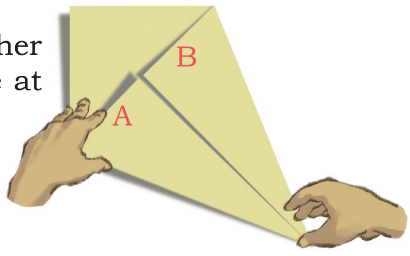
(a) Start with a square piece of paper.

(b) Take one corner of the paper and fold it towards the opposite corner, creating a sharp crease along the diagonal.

(c) Open and fold the corner A inwards, aligning the edge with the crease you just made.

(d) Repeat on the other side, folding the other corner B inwards to align with the crease at the centre.





You have a kite shape!

What shapes do you see in the kite?

Play with Circles

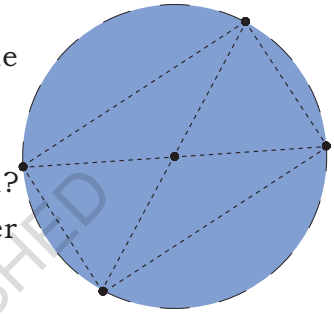
Do you remember a circle?

(a) Draw a circle with a compass and mark its centre.

(b) Draw its diameter. Mark the endpoints of the diameter.

(c) Draw another diameter of the circle and mark the endpoints.

(d) Now join the four points.



What shape is formed? Check the sides of the quadrilateral and the angles obtained.

Try with a different pair of diameters.

What do you notice about the shape that is formed?

Is it possible to create a 4-sided shape other than a rectangle through this process?

Circle Designs

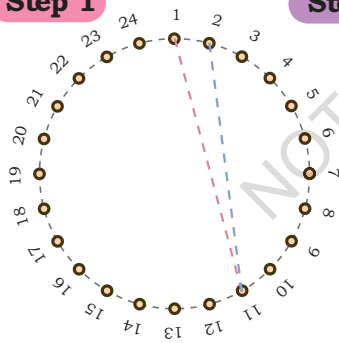
Look at the circle given below. It is marked with points 1 to 24.

Join points 1 to 11, 11 to 2, 2 to 12, and so on till you reach back at 1.

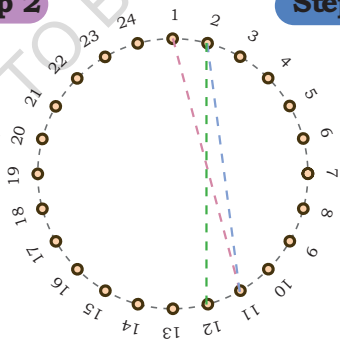
(Try it with different coloured threads on a thick paper or cloth.)

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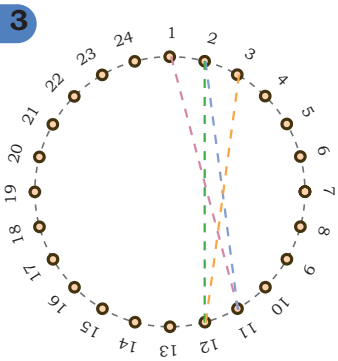
Step 1



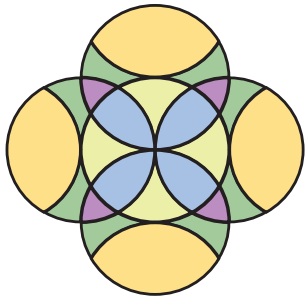
Step 2



Step 3

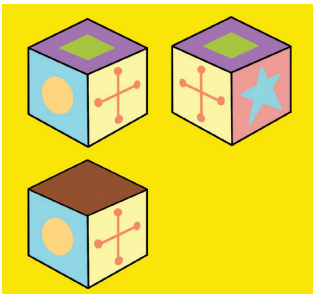


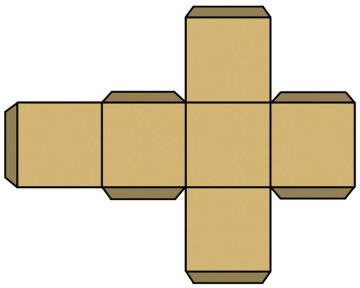
Can you think of a way to make a design exactly like the image given here? Try to make it.



Cube Connections

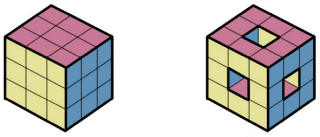
1. Here are three views of a cube. Can you draw them on the net in the correct order?



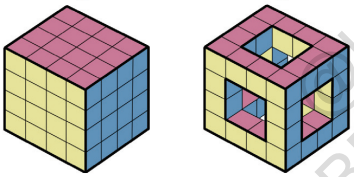


2. Here are some big solid cube frames. How many small cubes have been removed from each cube?

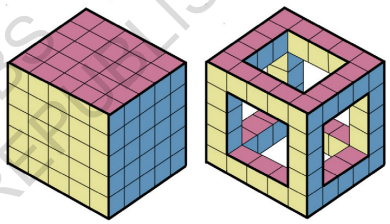
(a)



(b)



(c)



3. Nisha has glued 27 small cubes together to make a large solid cube. She paints the large cube red. How many of the original small cubes have—



(a) three faces painted red? _____ (b) two faces painted red? _____

(c) one face painted red? _____ (d) no faces painted red? _____

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Puzzle

Tanu arranged 7 shapes in a line. She used 2 squares, 2 triangles, 1 circle, 1 hexagon, and 1 rectangle.

Find her arrangement using the following clues:

(a) The square is between the circle and the rectangle.
(b) The rectangle is between the square and the triangle.
(c) The two triangles are next to the square.
(d) The hexagon is to the right of the triangle.
(e) The circle is to the left of the square.

Chapter-7 Shapes and Patterns.indd 102 7/2/2025 3:35:19 PM

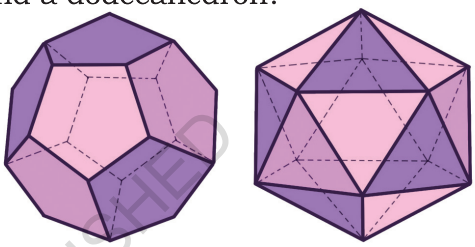
Icosahedron and Dodecahedron

What do these names mean? Once you count their faces, you will know.

Use the nets provided at the end of the book to make icosahedron and dodecahedron models.

What shapes do you see in an icosahedron and a dodecahedron?

Icosahedron: ..... Dodecahedron: .....



Do all the faces look the same?

Icosahedron: ..... Dodecahedron: .....

How many faces meet at a vertex (point)?

Icosahedron: ..... Dodecahedron: .....

Do the same number of faces meet at each vertex?

Icosahedron: ..... Dodecahedron: .....

How many edges do you see?

Icosahedron: ..... Dodecahedron: .....

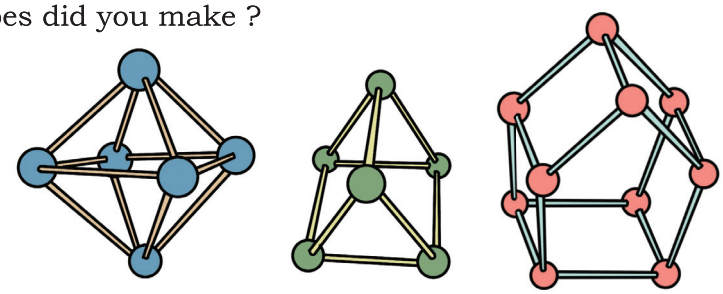
How did you count them such that you do not miss out any edge or count an edge twice?

Can you think of any other solid shapes that have faces that look the same?

Do the same number of faces meet at each common vertex? .....

You can also build some 3-D shapes using straws or ice-cream sticks and clay or play dough.

Which shapes did you make ?



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Notes

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