

# MATHEMATICS

CLASS - V



# MATHEMATICS

## CLASS - V

FREE



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**Department of Women Development & Child Welfare - Childline Foundation**

When abused in or out of school.

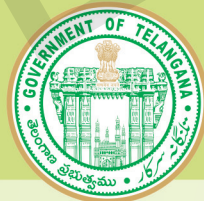
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When the children are denied school and compelled to work.

When the family members or relatives misbehave.

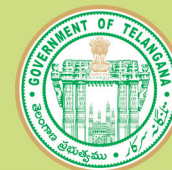
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### **CHILDREN! THESE INSTRUCTIONS FOR YOU...**

- ◆ For each and every conceptual understanding, a real life context with appropriate illustrations are given in the textbook. Try to understand the concept through keen reading of context along with observation of illustration.
- ◆ While understanding the concepts through activities, some doubts may arise. Clarify those doubts by through discussion with your friends and teachers, understand the mathematical concepts without any doubts.
- ◆ "Do this/Do these" exercises are given to test yourself, how far the concept has been understood. If you are facing any difficulty in solving problems in these exercises, you can clarify them by discussing with your teacher.
- ◆ The problems given in "Try this/try these", can be solved by reasoning, thinking creatively and extensively. When you face difficulty in solving these problems, you can take the help of your friends and teachers.
- ◆ The activities or discussion points given "Think & discuss" have been given for extensive understanding of the concept by thinking critically. These activities should be solved by discussions with your fellow students and teachers.
- ◆ Different types of problems with different concepts discussed in the chapter are given in an "Exercise" given at the end of the concept/chapter. Try to solve these problems by yourself at home or at leisure time in school.
- ◆ The purpose of "Do this"/Do these", and "Try this/Try these" exercises is to solve problems in the presence of teacher only in the class itself.
- ◆ Where ever the "project works" are given in the textbook, you should conduct them in groups. But the reports of project works should be submitted individually.
- ◆ Try to solve the problems given as homework on the day itself. Clarify your doubts and make corrections also on the day itself by discussions with your teachers.
- ◆ Try to collect more problems or make new problems on the concepts learnt and show them to your teachers and fellow students.
- ◆ Try to collect more puzzles, games and interesting things related to mathematical concepts and share with your friends and teachers.
- ◆ Do not confine mathematical conceptual understanding only to classroom. But, try to relate them with your surroundings outside the classroom.
- ◆ Student must solve problems, give reasons and make proofs, be able to communicate mathematically, connect concepts to understand more concepts & solve problems and able to represent in Mathematics learning.
- ◆ Whenever you face difficulty in achieving above competencies/skills/standards, you may take the help of your teachers.

# MATHEMATICS

CLASS - V



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## CLASS - V

SALE



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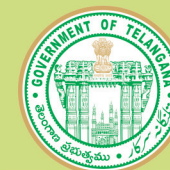
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## CLASS - V

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## FORE WORD

*Mathematics is a part of every child's daily life. A child who is helping parents in the kitchen or in the field or even playing with friends is constantly engaging with mathematical problems of various types. So, far from knowing 'no mathematics' a child who starts coming to school brings a variety of experiences about numbers and space, often much richer than any one of us appreciate.*

*Children also have immense potential to learn and more importantly all children are capable of learning mathematics. Their curiosity about the world and the need to understand it complements their capability. Children's innate abilities for mathematics such as those for classification, matching, estimation, analysis, mapping, generalization etc., along with their experiences of quantity and space are aids to classroom teaching which all of us as teachers should utilize during classroom time.*

*It is also important to appreciate that while Mathematics learns from human experiences, its growth and progression is not dependent on them; what it relies on is the logic and creativity of the human mind. So, the goal of mathematics teaching goes beyond developing 'useful' numeracy capabilities and the ability to reason mathematically and handle abstraction are central to mathematics learning. Mathematics learning should not be equated to learning only numbers and spatial visualizations, patterns etc., It is also an integral part of mathematical knowledge that children should be asked to engage with.*

*The aforesaid vision of mathematics teaching presented in State Curriculum Framework (SCF)-2011 has been elaborated in its Mathematics Position Paper which also clearly lays down the Academic Standards of mathematics teaching in the State. The textbooks make an attempt to concretize all these sentiments in these documents.*

*Concepts are placed in meaningful contexts and they are also arrived at by observing patterns, and providing children opportunities to state them in their own words. Use of definitions and irrelevant terminology has been avoided. Multiple ways in which children can solve a problem are encouraged and various attempts have also been made to help children understand the algorithm than engage with it mechanically. Problem posing is an important part of math and children have been encouraged to create a variety of problems. Space has been provided for both individual work and collaborative learning. Pictures have been used thoughtfully to both aid concept building and also act as fillers to encourage ideas such as collaborative learning. The book is designed in colour to add to a child's interest.*

*The State Council of Education, Research and Training, Telangana appreciates the hard work of the textbook development committee. Several teachers from all over Telangana have contributed to the development of this textbook. We are grateful to the district education officers, mandal education officers and head teachers for making this possible. We also thank the institutions and organizations which have given their time in the development of this textbook. We are grateful to the office of the Commissioner & Director- School Education for extending its co-operation in developing this textbook. In the endeavor to continuously improve the quality of our work, we welcome your comments and suggestions on this book.*

**Director,  
SCERT, Hyderabad**

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## OUR NATIONAL ANTHEM

- *Rabindranath Tagore*

Jana-gana-mana-adhinayaka, jaya he

Bharata-bhagya-vidhata.

Punjab-Sindh-Gujarat-Maratha

Dravida-Utkala-Banga

Vindhya-Himachala-Yamuna-Ganga

Uchchala-Jaladhi-taranga.

Tava shubha name jage,

Tava shubha asisa mage,

Gahe tava jaya gatha,

Jana-gana-mangala-dayaka jaya he

Bharata-bhagya-vidhata.

Jaya he, jaya he, jaya he,

Jaya jaya jaya, jaya he!

## PLEDGE

- *Pydimarri Venkata Subba Rao*

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

I love my country, and I am proud of its rich and varied heritage.

I shall always strive to be worthy of it.

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

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

# 1

## Bigger numbers

It is cricket time and the children of class 5 were busy discussing the events of yesterday's match between India and Sri Lanka. The class teacher was aware about children's cricket fever and came well prepared into the classroom and started asking them about their favourite bowlers.



Teacher then made the following table on the board-

Name of the bowler	Country	Wickets taken in international matches till September 2012
Muralidharan	Sri Lanka	1347
Sharne Warne	Australia	1001
Anil Kumble	India	956
Kapil Dev	India	687
Walsh	West Indies	519

Teacher then started asking children questions based on the numbers written on the board.

- Who has taken the highest number of wickets? \_\_\_\_\_
- How many more wickets has Kumble taken than Kapil Dev? \_\_\_\_\_
- How many more wickets has Kapil Dev taken than Walsh? \_\_\_\_\_

Teacher: Now, do not calculate the exact number of wickets but estimate and tell me about how many more wickets has Muralidharan taken than Walsh?

Rehana explained : Teacher, Walsh has taken about 500 wickets and Muralidharan has taken about 1300, so Muralidharan has taken about 800 wickets more.

Teacher: Good!

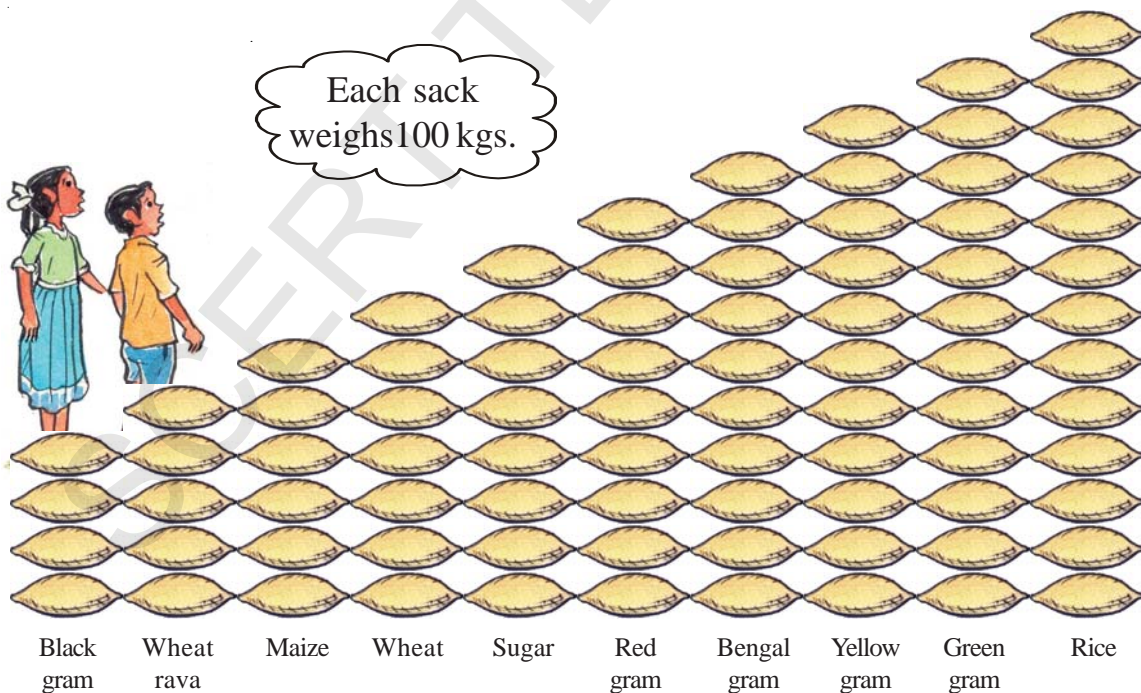
Now, you estimate and answer the following questions.

- About how many more wickets has Muralidharan taken than Kapil Dev? \_\_\_\_\_
- About how many more wickets has Muralidharan taken than Kumble? \_\_\_\_\_
- About how many more wickets has Muralidharan taken than Warne? \_\_\_\_\_



### Raghavendra's wholesale shop

Raghavendra is a wholesale merchant. He has stocked the grains and pulses. He sells to various grocery shops like this-



Now answer the following questions.

- How many sugar bags are there in the shop? How many kg of sugar is there in the shop?
- How many kg of Bengal gram is there in the shop?
- The weight of which pair of items is less than 1000 kg?
- The weight of which pair of items is equal to 1000 kg?
- Which items are more than 1000 kg in weight?
- What is the weight of wheat, maize and rice taken together?
- Make more questions of your choice on the picture given in the previous page.

### The 100 Number Table

We had used this beads chain with 100 beads in class 4.



Now, let us use the 100 number table.

Carefully study this number table .

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

- How many numbers are there in each row?
- What is the difference between any 2 consecutive numbers in any row?
- What is the difference between any 2 consecutive numbers in any column?

Now, carefully look at the darkened window with 54 at its centre.

What is the relationship that 54 has with all the numbers surrounding it. Let us find out.

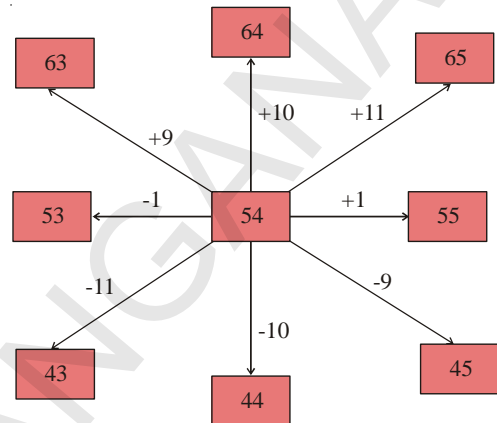
54 is one more than 53 and one less than 55.

54 is 10 more than 44 and 10 less than 64.

54 is 11 more than 43 and 11 less than 65.

54 is 9 more than 45 and 9 less than 63.

- Now choose any other window from the number chart, and see whether the relationships are the same.



### Do This

Now fill up the following windows based on the above relationships.

(a)

	73	

(c)

	39	

(b)

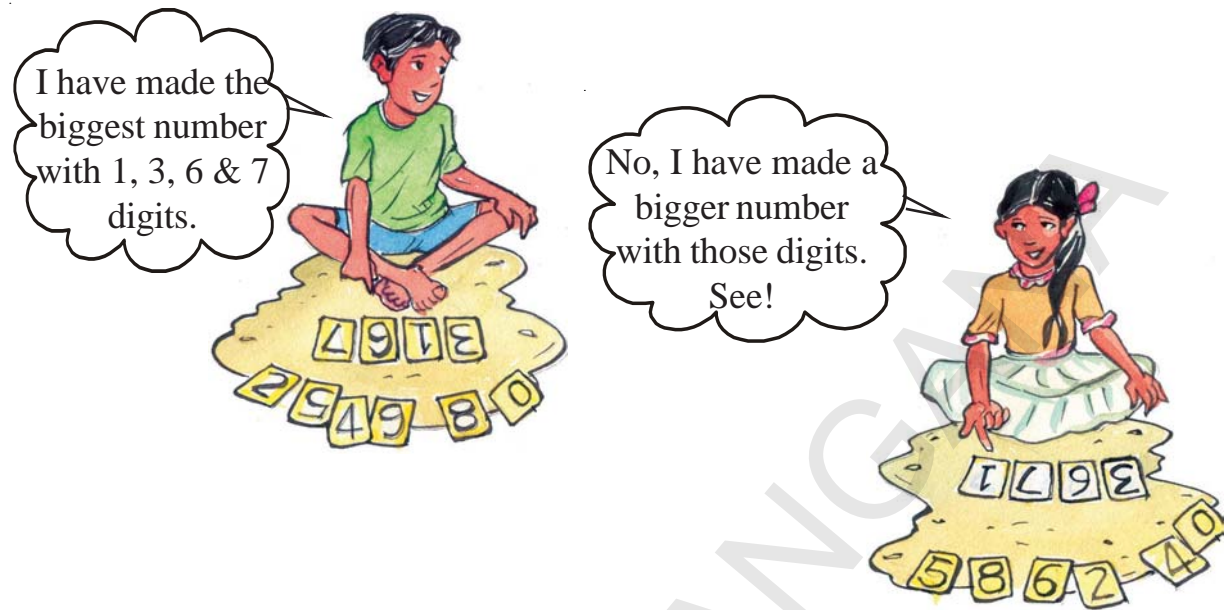
	115	

(d)

	184	

## Comparing bigger numbers

Chandu and Sindhu are making numbers with digits 0-9 again.



Chandu : How do you know that your number is bigger than mine?

Sindhu : Let me show you.

She writes in her notebook.

$$\begin{aligned} 3671 &= 3 \text{ thousands} + 6 \text{ hundreds} + 7 \text{ tens} + 1 \text{ one} \\ &= 3000 + 600 + 70 + 1 \end{aligned}$$

$$\begin{aligned} 3167 &= 3 \text{ thousands} + 1 \text{ hundred} + 6 \text{ tens} + 7 \text{ ones} \\ &= 3000 + 100 + 60 + 7 \end{aligned}$$

There are 3 thousands in both 3671 and 3167. However, there are 6 hundreds in 3671 and 1 hundred in 3167.

So, 3671 is more than 3167.

Now, you make all the four digit numbers that are possible with the digits 3, 6, 7, 1.  
Hint : 24 such numbers are possible

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

- (a) Which is the largest number?  
(b) Which is the smallest number?

### Do This

1. (a) Complete the table as shown below-

3666	=	three thousand six hundred and sixty six
	=	3 thousand + 6 hundred + 6 ten + 6 ones
	=	3000 + 600 + 60 + 6
3579	=	_____
	=	_____
	=	_____
3584	=	_____
	=	_____
	=	_____
3967	=	_____
	=	_____
	=	_____
3200	=	_____
	=	_____
	=	_____

- (b) Which is the largest number and which is the smallest number?
2. Write the greatest and smallest four digit numbers that can be made from the following digits.

Digits	Largest	Smallest
5, 1, 0, 9	_____	_____
2, 5, 1, 4	_____	_____
7, 3, 6, 8	_____	_____
9, 2, 7, 3	_____	_____

3. Encircle the place value of the underlined digit in the number.

(a) 8999 = 900, 90, 9000, 9

(b) 7074 = 4, 40, 400, 4000

(c) 6363 = 600, 6000, 60, 6

(d) 1273 = 1, 1000, 100, 10

(e) 9291 = 9000, 90, 9, 900

### The highest mountains

The heights of the bigger mountains in the world are given below.

Name of the mountain	Height	Country
Kanchanjunga	8586 m	India/Nepal
K-2	8611 m	Pakistan
Mt Everest	8848 m	Nepal/Tibet
Makal	8485 m	Nepal/Tibet
Lhotse	8516 m	Nepal

- (a) Write the names of mountains in the order of their heights from highest to lowest.

Name of mountain	Height

- (b) Which is the highest mountain in the world? Is the height about 8000 m or 9000 m?

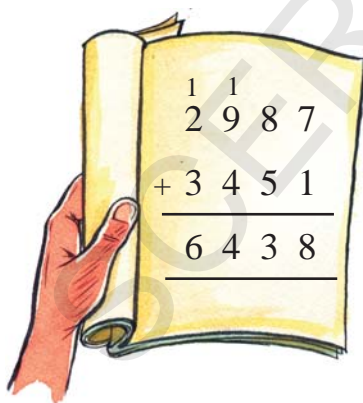
### Addition and subtraction of bigger numbers

Children are doing bigger additions and subtractions in class today.

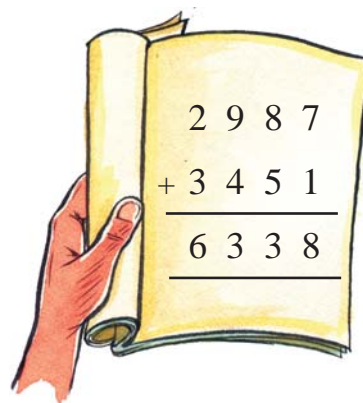
Jyothi teacher wrote this problem on the board-

$$2987 + 3451 = ?$$

John did it like this



Karuna did it like this

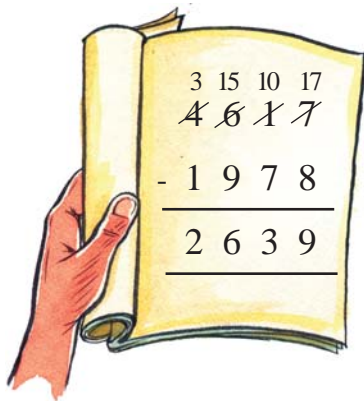


- (a) Who has done the problem incorrectly? Discuss the reason for the mistake with your friends.

The teacher then wrote another problem on the board.

$$4617 - 1978 = ?$$

Pooja did it like this-



Vamshi did it like this-



- (b) Who has done the problem incorrectly? Discuss the reason for the mistake with your friends.

### Buying things for the house

Sridhar needs the following things for his house. So he goes to the market and finds the cost of each item.

Fan	-	₹ 1175
Bed	-	₹ 2950
Cupboard	-	₹ 4080
Cycle	-	₹ 3690
Gas stove	-	₹ 1200

- (a) How much do the bed and cupboard cost together?
- (b) If Sridhar goes to the market with ₹ 10,000, can he buy all the things mentioned above? Estimate without adding the costs of all the items.
- (c) Make more word problems of addition and subtraction based on the above information.

## Population of some villages in Rajanna Sircilla district

The population of some villages in Rajanna Sircilla district as per 2001 census are given below.

Village	Male	Female	Total population
Cheerlavancha	2595	2682	
Thadur	3135	3191	
Peddur	1372	1349	
Sarampalle	1027	971	

Source: 2001 census

Answer the following-

- (a) Find out the total population of each village and complete the table given above.
- (b) In which villages is the female population less than the male population? By how much?
- (c) About how many men are there in all the villages? Encircle the nearest of the following.
- 7000      8000      9000
- (d) About how many women are there in all the villages? Encircle the nearest of the following.
- 7000      8000      9000
- (e) About how much is the total population of the four villages? Encircle the nearest of the following.
- 14000      16000      18000

### Do This

1. Fill in the blanks with appropriate numbers to get 999

(a)  $235 + 341 + \underline{\hspace{2cm}} = 999$

(b)  $630 + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 999$

(c)  $\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 999$

(d)  $\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 999$

2. Identify the rule and fill the blanks.

(a)  $25 + 75 = 100$

$100 - 25 = \underline{\hspace{2cm}}$

(c)  $48 + 58 = 106$

$106 - \underline{\hspace{2cm}} = 48$

(e)  $150 + 325 = 475$

$475 - 150 = \underline{\hspace{2cm}}$

(g)  $567 + 115 = 682$

$682 - 115 = \underline{\hspace{2cm}}$

(i)  $6247 + 2984 = 9231$

$\underline{\hspace{2cm}} - 6247 = 2984$

(b)  $60 + 40 = 100$

$100 - \underline{\hspace{2cm}} = 60$

(d)  $36 + 89 = \underline{\hspace{2cm}}$

$125 - 36 = \underline{\hspace{2cm}}$

(f)  $267 + 625 = 892$

$892 - \underline{\hspace{2cm}} = 267$

(h)  $1235 + 4111 = 5346$

$5346 - \underline{\hspace{2cm}} = 4111$

(j)  $6250 + 2500 = 8750$

$8750 - 2500 = \underline{\hspace{2cm}}$

3. Identify the rule and fill the blanks.

(a)  $39 + 42 = 42 + \underline{\hspace{2cm}}$

(b)  $121 + 99 = 99 + \underline{\hspace{2cm}}$

(c)  $536 + 677 = \underline{\hspace{2cm}} + 536$

(d)  $1010 + 69 = \underline{\hspace{2cm}} + 1010$

(e)  $\underline{\hspace{2cm}} + 1747 = 1747 + 3829$

(f)  $9017 + \underline{\hspace{2cm}} = 1150 + 9017$

**Do not find the exact answer. Just estimate!**

Choose an answer closest to the correct answer and encircle it.

1. Shambhu went to the market and spent ₹ 128 on food items and ₹ 413 on clothes. About how much money did Shambhu spend in the market?

₹400

₹500

₹600

2. Ganga goes to the market with ₹ 372 and spends ₹ 193. About how much money does she have in her purse now?

₹200

₹100

₹300

3. Krishna has ₹ 321 in his purse. His mother gives him ₹ 618 more. About how much money does Krishna have in his purse now?

900                  1200                  800

4. There are 1482 men and 1683 women in Rachapally village according to the 2011 census. About how much is the population of the village?

3000                  4000                  5000

5. There are 842 pages in a book. Anthony has read 421 pages. About how many pages does he still has to read?

500                  300                  400

6. There are 417 coconut trees in one grove and 386 in the other. About how many trees are there in all in the two groves?

700                  900                  800

7. About how much is 904 more than 418?

500                  600                  400

### Try This

1. Tick the most appropriate answer to these problems given below.

Hint : What is the largest possible answer in each case?

What is the smallest possible answer in each case?

(a) 
$$\begin{array}{r} 6 \square \\ + 7 \square \\ \hline \end{array}$$

(i) 2 0 0

(ii) 1 0 0

(iii) 1 4 0

(b) 
$$\begin{array}{r} 2 \square \\ + 7 \square \\ \hline \end{array}$$

(i) 5 5

(ii) 9 9

(iii) 1 9 8

(c)

$$\begin{array}{r} 1 \quad \square \quad \square \\ + \quad \quad 9 \quad \square \\ \hline \hline \end{array}$$

- (i) 3 1 2  
(ii) 1 5 0  
(iii) 2 4 1

(d)

$$\begin{array}{r} 2 \quad \square \quad \square \\ + \quad \quad 6 \quad \square \\ \hline \hline \end{array}$$

- (i) 1 9 7  
(ii) 3 9 4  
(iii) 3 6 0

(e)

$$\begin{array}{r} 9 \quad \square \\ - \quad 5 \quad \square \\ \hline \hline \end{array}$$

- (i) 2 8  
(ii) 4 6  
(iii) 8 7

(f)

$$\begin{array}{r} 3 \quad \square \quad \square \\ - \quad \quad 7 \quad \square \\ \hline \hline \end{array}$$

- (i) 8 4  
(ii) 3 5 0  
(iii) 3 2 1

2. Put the appropriate signs.

Example :  $584 = 486 \quad (+) \quad 421 \quad (-) \quad 323$

(a)  $584 = 205 \quad \square \quad 201 \quad \square \quad 580$

(b)  $584 = 266 \quad \square \quad 124 \quad \square \quad 194$

(c)  $584 = 1000 \quad \square \quad 350 \quad \square \quad 66$

## Exercise

1. The table given below provides information about the number of international cricket matches that have been played by various countries till September 2012.

Country	No. of matches played
Australia	744
India	926
England	464
Pakistan	370
South Africa	369
West Indies	486

- (a) Which country played the highest number of matches? How many?
- (b) How many more matches has Australia played than West Indies?
- (c) If India has lost 267 matches and 330 matches have ended as draw, then how many matches has India won?
- (d) Estimate, about how many more matches has India played than West Indies?
- (e) Estimate, about how many more matches has India played than Pakistan?
- (f) Make more word problems of addition and subtraction on the information given in the table.
2. The table given below shows the runs scored by Indian cricketers in test cricket during their life time.

Saurav Ganguly	7212
Azharuddin	6215
Kapil Dev	5248
VVS Laxman	8628
Ravi Shastri	6014

Now answer the following-

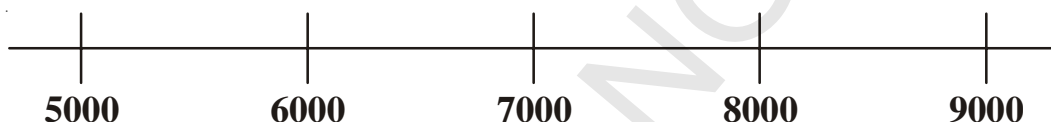
- (a) Who has scored the highest runs? How many runs did he score?
- (b) How many more runs has Laxman scored than Ravi Shastri?
- (c) About how many more runs has Saurav Ganguly scored than Azharuddin? Encircle to the nearest of the following.

500                  1000                  1500

- (d) About how many runs has Laxman scored more than Kapil Dev? Encircle to the nearest of the following.

2000                  4000                  6000

- (e) Show the runs made by the cricketers on the number line given below-



- 3. Jyothi's school is 560 meters from her house. One day she left home and walked 215 meters. Then she realized that she had forgotten her pencil box and maths book. She went back home, collected the things she had forgotten and went back to school. How many meters did Jyothi walk on that day for going to school altogether?
- 4. The ticket collections of a bus from Monday to Friday are ₹ 2350, ₹ 1335, ₹ 1750, ₹ 2250 and ₹ 1900. What is the total ticket collection in these 5 days?
- 5. Sridhar earns ₹ 9250 per month and his wife earns ₹ 7650 per month. If they spend ₹ 12725 per month, how much do they save?
- 6. I am a three-digit number. The digit in the units place is 1, the digit in the tens place is 4 and the digit in the hundreds place is 6. Who am I?
- 7. I am a three-digit number. The digit in the units place is 7 and hundreds place is 2. The digit in the tens place is 4 times the digit in the hundreds place. Who am I?
- 8. What is the difference between the largest three-digit number and the largest two-digit number?
- 9. What is the difference between the smallest three-digit number and the largest two-digit number?

10. Write all the three digit numbers with the same digit in the units and hundreds place and 0 in the tens place.
11. Write all the three-digit numbers where the digit in the hundreds place is 3 times in the digit the units place and the digit in the tens place is 2 times the digit in the ones place.
12. I am a four-digit number. 6 is in the thousands place, 7 is in the hundreds place, 8 is in the tens place and 9 is in the ones place. Who am I?
13. I am a four-digit number. The digit in thousands place is largest single digit. The digit in the ones places is smallest single digit. 5 is in both, the tens and hundreds place. Who am I?
14. Write all the four digit numbers where the digit in the thousands place is 4 times the digit in the units place, the digit in the hundreds place is 3 times the digit in the ones place and the digit in the tens place is 2 times the digit in the ones place.
15. In the number 5678, what is the difference between the place values of 5 and 7?
16. Subtract the smallest three digit number from the largest four digit number.
17. What should be added to 3600 to make it equal to 7450?
18. What should be subtracted from 2380 to get 1200?

## 2

# Multiply and divide

The Mahatma Gandhi Bus Station at Hyderabad is a very busy bus station. Buses travel to all districts and major cities of Telangana from this station.



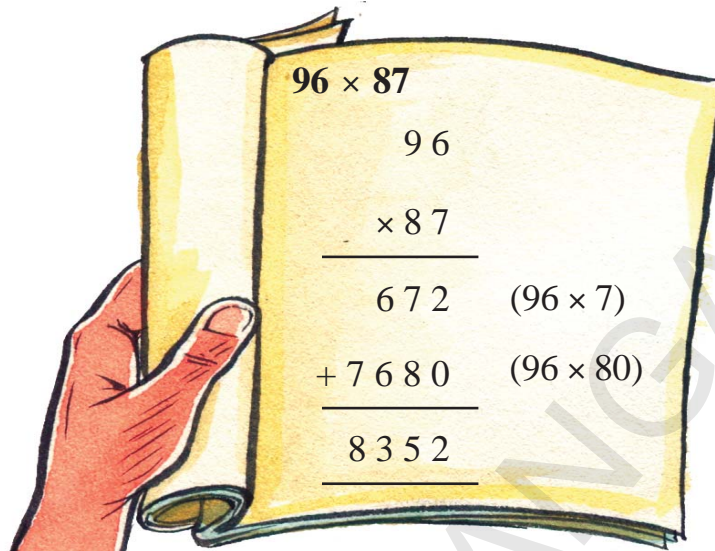
Given below are the bus fares of three different types of buses from Hyderabad to Warangal-

Express	-	₹ 96
Deluxe	-	₹ 135
Indra (air condition)	-	₹ 171

On one day, 87 people purchased Express tickets between 9 and 10 o'clock in the morning. During this time 61 tickets of Deluxe buses and 36 tickets for the air conditioned (Indra) buses are sold.

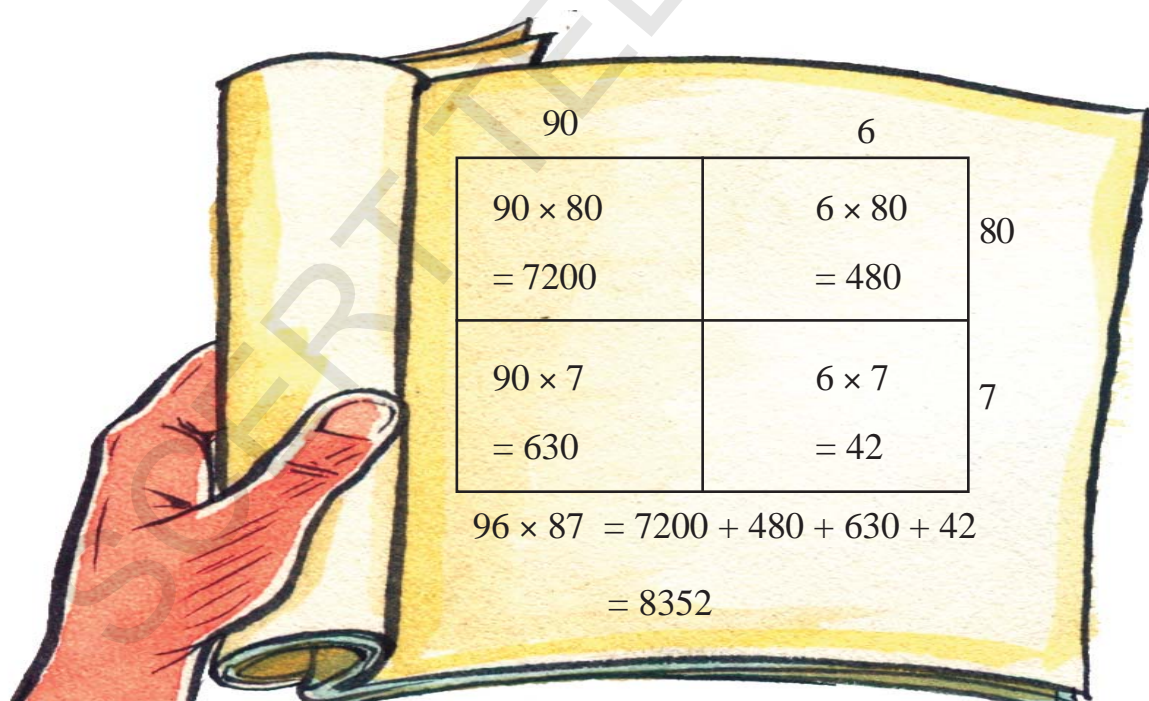
Nageshwar is the ticket seller and he has to record the ticket collections made in every hour. The computers are not working on that day. So he is multiplying in a notebook.

He calculated the ticket collections made by the Express buses like this



$$\begin{array}{r}
 96 \times 87 \\
 \quad 96 \\
 \times 87 \\
 \hline
 672 \quad (96 \times 7) \\
 + 7680 \quad (96 \times 80) \\
 \hline
 8352
 \end{array}$$

He asked his friend Sreedhar to multiply and see whether his product is correct or not. Sreedhara multiplied like this



90	6	
$90 \times 80$ $= 7200$	$6 \times 80$ $= 480$	80
$90 \times 7$ $= 630$	$6 \times 7$ $= 42$	7

$$96 \times 87 = 7200 + 480 + 630 + 42 = 8352$$

Has Nageshwar calculated the ticket collection of the Express buses correctly? Discuss the differences in Nageshwar and Sreedhar's methods with your friends .

Nageshwar then calculated the money collected for the Deluxe buses

Cost of one ticket of deluxe bus = ₹ 135  
 No of passengers that purchased tickets for deluxe bus = 61  
 Total money collected =  $135 \times 61$

$$\begin{array}{r} 135 \\ \times 61 \\ \hline 135 \quad (135 \times 1) \\ + 8100 \quad (135 \times 60) \\ \hline 8235 \end{array}$$

Total money collected for the Deluxe bus tickets = ₹ 8235

Sreedhar checked like this:

	100	30	5	
	$100 \times 60$ $= 6000$	$30 \times 60$ $= 1800$	$5 \times 60$ $= 300$	60
	$100 \times 1$ $= 100$	$30 \times 1$ $= 30$	$5 \times 1$ $= 5$	1
$135 \times 61 = 6000 + 1800 + 300 + 100 + 30 + 5$ $= 8235$				

Now you find the ticket money collected for the Indra buses using both the methods.

### Sachin in cricket world

Up to September 2012, Sachin Tendulkar had made 15533 runs in international test cricket and 18426 runs in international one-day cricket. The table given below gives details of the 100s and 50s scored by him in test and one-day cricket in this period.

Type of match	100s	50s
Test cricket	51	65
One-day cricket	49	96

- (a) How many runs has Sachin Tendulkar made in 100s in test cricket?
- (b) How many runs has he made in 50s in test cricket?
- (c) How many runs has he made in 100s and 50s taken together (in test cricket)?
- (d) How many runs has Sachin Tendulkar made in 100s in one-day cricket?
- (e) How many runs has Sachin Tendulkar made in 50s in one-day cricket?
- (f) How many runs other than 100s and 50s has Sachin Tendulkar made in test cricket?
- (g) Make more word problems on this question.

### Hostel kitchen

The following items were bought by a hostel kitchen for one month-

Item	Quantity (in kgs)	Cost per kg (₹)	Total Cost
Rice	600	25	
Bengal Gram	45	50	
Cooking oil	30	125	
Red gram	15	75	
Ravva	15	25	

- (a) What was the total cost of the above items?
- (b) Make more word problems on this question.

### Chalk box

A box of chalks contains 100 chalks.



- (a) 2 boxes will contain \_\_\_\_\_ chalks
- (b) 8 boxes will contain \_\_\_\_\_ chalks
- (c) 16 boxes will contain \_\_\_\_\_ chalks
- (d) 18 boxes will contain \_\_\_\_\_ chalks
- (e) 36 boxes will contain \_\_\_\_\_ chalks
- (f) 72 boxes will contain \_\_\_\_\_ chalks

If a carton contained 10 such boxes of chalk, it would hold how many chalks? \_\_\_\_\_

- (a) 2 such cartons will contain \_\_\_\_\_ chalks
- (b) 4 such cartons will contain \_\_\_\_\_ chalks
- (c) 6 such cartons will contain \_\_\_\_\_ chalks
- (d) 8 such cartons will contain \_\_\_\_\_ chalks
- (e) 10 such cartons will contain \_\_\_\_\_ chalks

### Try This

1. Observe the pattern and fill in the blanks.

$$2 \times 200 = 400$$

$$2 \times 300 = 600$$

$$2 \times 400 = 800$$

$$3 \times 200 = 600$$

$$3 \times 300 = 900$$

$$3 \times 400 = 1200$$

$$4 \times 200 = 800$$

$$4 \times 300 = 1200$$

$$4 \times 400 = 1600$$

$$5 \times 200 = 1000$$

$$5 \times 300 = 1500$$

$$5 \times 400 = 2000$$

$$6 \times 200 = \underline{\hspace{2cm}}$$

$$6 \times 300 = \underline{\hspace{2cm}}$$

$$6 \times 400 = \underline{\hspace{2cm}}$$

$$7 \times 200 = \underline{\hspace{2cm}}$$

$$7 \times 300 = \underline{\hspace{2cm}}$$

$$7 \times 400 = \underline{\hspace{2cm}}$$

$$8 \times 200 = \underline{\hspace{2cm}}$$

$$8 \times 300 = \underline{\hspace{2cm}}$$

$$8 \times 400 = \underline{\hspace{2cm}}$$

$9 \times 200 = \underline{\quad}$

$9 \times 300 = \underline{\quad}$

$9 \times 400 = \underline{\quad}$

$10 \times 200 = \underline{\quad}$

$10 \times 300 = \underline{\quad}$

$10 \times 400 = \underline{\quad}$

$11 \times 200 = \underline{\quad}$

$11 \times 300 = \underline{\quad}$

$11 \times 400 = \underline{\quad}$

$14 \times 200 = \underline{\quad}$

$14 \times 300 = \underline{\quad}$

$14 \times 400 = \underline{\quad}$

$15 \times 200 = \underline{\quad}$

$15 \times 300 = \underline{\quad}$

$15 \times 400 = \underline{\quad}$

$25 \times 200 = \underline{\quad}$

$25 \times 300 = \underline{\quad}$

$25 \times 400 = \underline{\quad}$

$27 \times 200 = \underline{\quad}$

$27 \times 300 = \underline{\quad}$

$27 \times 400 = \underline{\quad}$

$39 \times 200 = \underline{\quad}$

$39 \times 300 = \underline{\quad}$

$39 \times 400 = \underline{\quad}$

$48 \times 200 = \underline{\quad}$

$48 \times 300 = \underline{\quad}$

$48 \times 400 = \underline{\quad}$

$50 \times 200 = \underline{\quad}$

$50 \times 300 = \underline{\quad}$

$50 \times 400 = \underline{\quad}$

2. Multiply a series of numbers with 500, 600 and 700. What is the pattern that you observe? Is it the same as shown above?

**Are they equal?**

1.  $9 \times 8 = \underline{\quad}$

$8 \times 9 = \underline{\quad}$

2.  $12 \times 8 = \underline{\quad}$

$8 \times 12 = \underline{\quad}$

3.  $25 \times 30 = \underline{\quad}$

$30 \times 25 = \underline{\quad}$

4.  $100 \times 54 = \underline{\quad}$

$54 \times 100 = \underline{\quad}$

5.  $123 \times 3 = \underline{\quad}$

$3 \times 123 = \underline{\quad}$

6.  $130 \times 75 = \underline{\quad}$

$75 \times 130 = \underline{\quad}$

Take any two numbers of your choice and multiply and see whether the above relationship is true. Do this with as many numbers as you want.

What conclusion can you draw?

## Do This

1. Fill in the blanks

(a)  $18 \times 19 = \underline{\hspace{2cm}} \times 18$

(d)  $999 \times \underline{\hspace{2cm}} = 1 \times 999$

(b)  $49 \times 10 = \underline{\hspace{2cm}} \times 49$

(e)  $900 \times 7 = 7 \times \underline{\hspace{2cm}}$

(c)  $16 \times 56 = 56 \times \underline{\hspace{2cm}}$

(f)  $\underline{\hspace{2cm}} \times 145 = 145 \times 99$

## Shopping for clothes

Vishnu goes to the shop to buy a shirt for himself.

When he gets into the shop, the shop owner tells him that shirts are available in four colours blue, white, pink and green. Also each colour is available in 3 designs check, stripped and plain. So, How many types of shirts are available in the shop for Vishnu to choose?



Number of colours in which the shirts are available = 4

Number of designs in which each shirt is available = 3

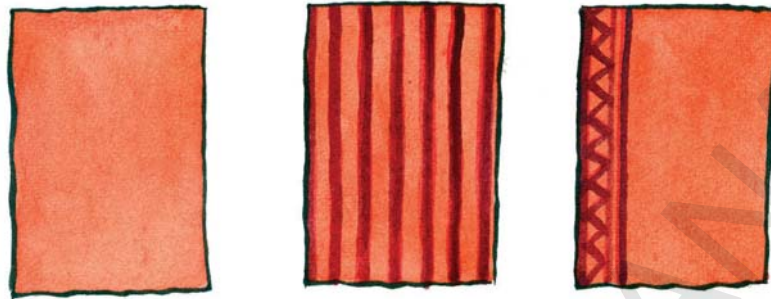
So, total number of shirts that vishnu can choose from =  $3 \times 4 = 12$  shirts.

## Do This

1. A furniture shop sells both wooden and plastic tables. Both types of tables are available in circular, rectangular and square shapes. Srinivas goes to buy a table for his house. So, from total of how many types of tables will he choose from?



2. A shopkeeper sells managalgiri cotton cloth in 8 colours. In each colour there are 3 designs- plain, stripped and with border. Padma goes to the shop to buy material for her suit. So, from total of how many types of dress materials she has to choose?



3. At a curtain shop, curtains are available in 8 colours and 4 designs in each colour-



What is the total number of choices that a customer can choose from?

### Price Rise



- How many times has the price of sunflower oil gone up in ten years?
- How many times has the price of Red gram dal gone up in ten years?
- How much more will 8 litres of sunflower oil cost today, than 10 years back?
- How much more will 5 kg of Red gram dal cost today, than 10 years back?

**Do not find the exact answer. Just estimate!**

- The table given below gives the prices of some essential commodities in 2002 and in 2012.

- About how many times have the prices of each of these commodities gone up in the past ten years?

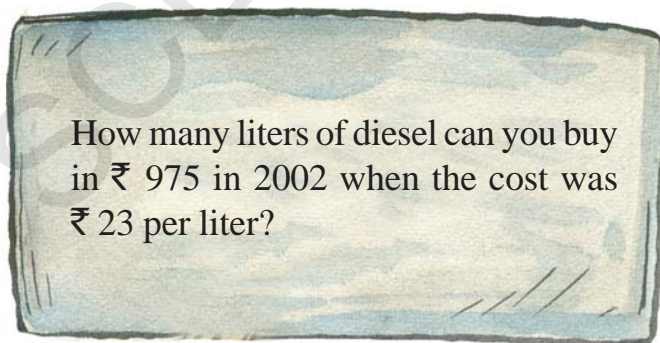
Item	2002	2012	About how many times has the price increased?
Petrol	₹ 35	₹ 72	
LPG	₹ 181	₹ 384	
Mustard oil	₹ 35	₹ 100	
Milk	₹ 12	₹ 30	

- Extend this list by finding out the prices of items of your choice and state about how many times their prices have increased during the period 2002-2012.
- Sudha earns ₹ 189 in a day and Radha earns ₹ 112 in a day. About how much will each of them earn in 30 days?
  - One meter of Pochampalli cloth cost ₹ 194. About how much will 79 meters of such cloth cost?
  - The cost of a bag of 5 kg wheat flour is ₹ 124. About how much will 42 such bags cost?
  - About how much is the product of 523 and 63?

## Do This

1. A farmer harvested 30 bags of paddy. He sold 20 bags for ₹ 400 per bag. He later sold the remaining paddy for ₹ 350 per bag. How much money did the farmer get in all?
2. If one box contains 26 laddoos then how many laddoos will 385 such boxes contain?
3. There are 47 rows of seats in a cinema hall. 29 people can be seated in each row. How many people can be seated in the hall?
4. Cost of a bus ticket from Hyderabad to Nalgonda for a child is ₹ 65 and for an adult it is ₹ 110. Find the total cost of tickets for 3 children and 4 adults?
5. The monthly rent of a room is ₹ 950. How much will the rent for 2 years be?
6. Pravalika is in class 5. She is ten years old. Her father's age is 4 times of her age. Find the age of her father?
7. A garden has 125 rows of trees. In each row there are 75 trees. How many trees are there in the garden?
8. How many minutes are there in a day?
9. How many seconds are there in an hour?
10. A bicycle costs ₹ 2850. Ramayya bought 3 bicycles and gave to the shopkeeper ₹ 9000. How much will the shopkeeper give back to Ramayya?

The teacher wrote this problem on the board-



Estimate the answer before you calculate.

Vanaja did the problem like this-

$$\begin{array}{r} 10 + 10 + 10 + 10 + 2 \\ 23 \overline{)975} \\ \underline{230} \\ 745 \\ \underline{230} \\ 515 \\ \underline{230} \\ 285 \\ \underline{230} \\ 55 \\ \underline{46} \\ 9 \end{array}$$

Kunal did it like this-

$$\begin{array}{r} 20 + 20 + 2 \\ 23 \overline{)975} \\ \underline{460} \\ 515 \\ \underline{460} \\ 55 \\ \underline{46} \\ 9 \end{array}$$

Sonali did it like this

$$\begin{array}{r} 42 \\ 23 \overline{)975} \\ \underline{92} \\ 55 \\ \underline{46} \\ 9 \end{array}$$

- (a) Are all the answers correct? Discuss the differences in the methods with your friends and teacher.
- (b) How many liters of diesel can you buy in with ₹ 2012 when the cost is ₹ 49 per liter? Estimate, before you calculate.

### Try This

1. Complete the following table.

Problem	Quotient	Remainder
$300 \div 100$		
$425 \div 100$		
$682 \div 100$		
$810 \div 100$		
$905 \div 100$		
$1500 \div 100$		
$4320 \div 100$		
$5002 \div 100$		
$6123 \div 100$		
$7999 \div 100$		

### Krishna Animal Farm

Krishna owns an animal farm. He has 27 cows, 18 buffaloes and 200 chickens in his farm

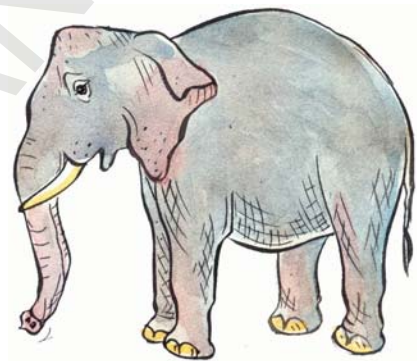
The table given below gives details about the water and food requirements of each animal and 100 birds per day.

Animal/Bird	Water required (litres)	Food required (kg)
Cow	50	12
Buffalo	65	15
Chickens (per 100)	25	5

1.
  - (a) How much water does Krishna need to give every day for the animals?
  - (b) How many kg of food does he require for the animals in a day?
  - (c) If 13 cows give 24 litres of milk daily and 14 cows give 29 liters of milk daily then how many litres of milk is obtained each day?
2.
  - (a) On one day the chickens laid 180 eggs. If these eggs are packed into packets of 6 eggs each then, how many such packets will be made?
  - (b) If the eggs were packed in packets of 12 eggs each, then how many packets will be made?
  - (c) What if there were packets of 30 eggs? Will some eggs remain unpacked? If so, how many?

**How much water and food do the heaviest animals in the world require?**

- (a) An elephant needs 80 litres of water in a day and 150 kg of food. How much water and food does the elephant need in 7 days?



- (b) A blue whale drinks 40 times the water and 6 times the food required by an elephant in a day. How much of water and how much of food does a blue whale require?



**Do not find the exact answer. Just estimate!**

The distance between various towns of Telangana is given below-

Sircilla and Kamareddi	52 km
Hyderabad and Medaram	236 km
Nirmal and Warangal	212 km
Medchal and Adilabad	265 km
Nalgonda and Gajwel	119 km
Utnoor and Eturunagaram	297 km
Basara and Bhadrachalam	436 km

- (a) A car travels 25 km with one litre of petrol. About how many litres of petrol will it need for each journey?

**Divide and multiply**

(a)  $4 \times 25 = \underline{\hspace{2cm}}$

$100 \div \underline{\hspace{2cm}} = 25$

(b)  $8 \times 25 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} \div 8 = 25$

(c)  $2 \times 50 = \underline{\hspace{2cm}}$

$100 \div 2 = \underline{\hspace{2cm}}$

(d)  $4 \times 50 = \underline{\hspace{2cm}}$

$200 \div \underline{\hspace{2cm}} = 50$

(e)  $75 \times 2 = \underline{\hspace{2cm}}$

$150 \div \underline{\hspace{2cm}} = 75$

(f)  $75 \times 4 = \underline{\hspace{2cm}}$

$300 \div \underline{\hspace{2cm}} = 4$

(g)  $125 \times 4 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} \div 4 = 125$

(h)  $125 \times 8 = \underline{\hspace{2cm}}$

$1000 \div 8 = \underline{\hspace{2cm}}$

The teacher wrote this division problem on the board-

$$50 \div 3 = ?$$

Lata did like this-

$$\begin{array}{r} 15 \\ 3 \overline{)50} \\ \underline{3} \phantom{0} \\ 20 \\ \underline{15} \\ 5 \end{array}$$

Bhagya did like this-

$$\begin{array}{r} 16 \\ 3 \overline{)50} \\ \underline{3} \phantom{0} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

Lata and Bhagya started arguing. Both felt that their answers were correct. They checked their divisions as follows.

Both multiplied the divisor with the quotient and then added the remainder to the product.

Lata's checking of division

$$\begin{aligned} 3 \times 15 &+ 5 \\ = 45 + 5 \\ = 50 \end{aligned}$$

Bhagya's checking of division

$$\begin{aligned} 3 \times 16 &+ 2 \\ = 48 + 2 \\ = 50 \end{aligned}$$

Both Bhagya and Lata got answers that were equal to the dividend, 50. So, both continued to argue that their answers were correct.

Now can you say who has divided correctly? Discuss with your friends, why Lata and Bhagya have got different quotients?

Can the remainder be more than the divisor?

## Try This

- Some of the divisions given below are incorrect. Identify them and discuss the reasons for the mistakes with your friends.

$$\begin{array}{r} 11 \\ 4 \overline{) 404} \\ \underline{4} \phantom{00} \\ 04 \\ \underline{4} \phantom{00} \\ 0 \end{array}$$

$$\begin{array}{r} 05 \\ 4 \overline{) 25} \\ \underline{0} \phantom{00} \\ 25 \\ \underline{20} \phantom{00} \\ 5 \end{array}$$

$$\begin{array}{r} 14 \\ 3 \overline{) 312} \\ \underline{3} \phantom{00} \\ 012 \\ \underline{12} \phantom{00} \\ 0 \end{array}$$

$$\begin{array}{r} 50 \\ 12 \overline{) 602} \\ \underline{60} \phantom{00} \\ 002 \\ \underline{0} \phantom{00} \\ 2 \end{array}$$

$$\begin{array}{r} 81 \\ 9 \overline{) 729} \\ \underline{72} \phantom{00} \\ 009 \\ \underline{0} \phantom{00} \\ 9 \\ \underline{9} \phantom{00} \\ 0 \end{array}$$

$$\begin{array}{r} 100 \\ 9 \overline{) 908} \\ \underline{9} \phantom{00} \\ 08 \\ \underline{00} \phantom{00} \\ 8 \end{array}$$

$$\begin{array}{r} 101 \\ 8 \overline{) 809} \\ \underline{8} \phantom{00} \\ 09 \\ \underline{08} \phantom{00} \\ 1 \end{array}$$

$$\begin{array}{r} 58 \\ 13 \overline{) 774} \\ \underline{65} \phantom{00} \\ 124 \\ \underline{104} \phantom{00} \\ 20 \end{array}$$

$$\begin{array}{r} 43 \\ 22 \overline{) 963} \\ \underline{88} \phantom{00} \\ 83 \\ \underline{66} \phantom{00} \\ 17 \end{array}$$

- Entry ticket for an exhibition for a child is ₹ 6 for and an adult is ₹ 10. If a family spends ₹ 58 for tickets. How many children and adults are there in that family?
- Chandana counted 32 wheels of some buses and cars. If a bus have 6 wheels, car have 4 wheels. How many buses and cars were there?

### Magic division

Write a 3 digit number, which have consecutive digits \_\_\_\_\_.

Example : 456

Divide it by 3 \_\_\_\_\_

Is it exactly divisible by 3?

Try with some more consecutive digits by dividing with 3.

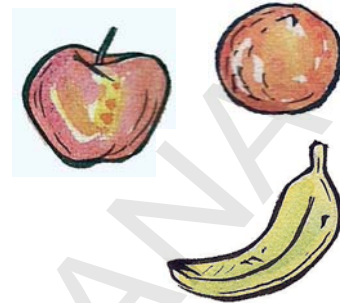
## Exercise

1. Valli took a loan of ₹ 9750 for farming purposes. She has to pay it back in equal amounts in 6 months. How much will she have to pay every month?
2. 936 apples were plucked from an orchard in a day. They were packed into 12 boxes and sent to the market for sale. If each box contained an equal number of apples then how many apples were there in each box?
3. When the apples reached the market, each apple was sold for ₹ 14. How much would each box be sold for?
4. How many dozen bananas are there in 216 bananas?
5. How many 100s are there in 771? How much is remaining?
6. How many 1000s are there in 7645? How much is remaining?
7. How many days are there in 104 weeks? (1 week = 7 days)
8. How many weeks are there in 150 days?
9. If you read 8 pages in a day, how many days will it take you to read 120 pages?
10. There are 21 children in class 1, 24 children in class 2, 32 children in class 3, 30 children in class 4 and 18 in class 5 of Annaram Primary School. The daily cost of mid-day meal for each child is ₹ 4. What is the daily cost of mid-day meal for the school? What is the monthly cost of mid-day meal for the school?
11. A roll of Sircilla cloth contains 79 m of cloth and a roll of Pochampalli cloth contains 56 m of cloth. The Sircilla cloth is sold for ₹ 128 a metre and the Pochampalli cloth is sold for ₹ 217 a metre. If both the rolls are sold by the shopkeeper within the month, then how much money has he received on their sale?

# 3

## Smart tables

On Children's Day, the class teacher wanted to give each child a fruit of their choice. She asked the class leaders, Lasya and Hasini to note down children's choices. Both the children recorded this information in their notebook as follows.



R.No.	Fruit	R.No.	Fruit	R.No.	Fruit	R.No.	Fruit
1	Banana	11	Orange	21	Banana	31	Orange
2	Apple	12	Banana	22	Orange	32	Apple
3	Orange	13	Apple	23	Banana	33	Orange
4	Banana	14	Orange	24	Apple	34	Banana
5	Apple	15	Apple	25	Orange	35	Banana
6	Banana	16	Apple	26	Banana	36	Orange
7	Orange	17	Orange	27	Orange	37	Apple
8	Apple	18	Banana	28	Apple	38	Banana
9	Orange	19	Apple	29	Orange	39	Orange
10	Apple	20	Orange	30	Banana	40	Apple

Lasya counted the number of children each fruit required by putting tally marks for each child on the list and made this table.

Fruit	Tally marks	No. of children
Banana		
Apple		
Orange		

Hasini also used tally marks, but differently. For every 5th child she used a slanting tally mark ( / ).

Fruit	Tally marks	No. of children
Banana		
Apple		
Orange		

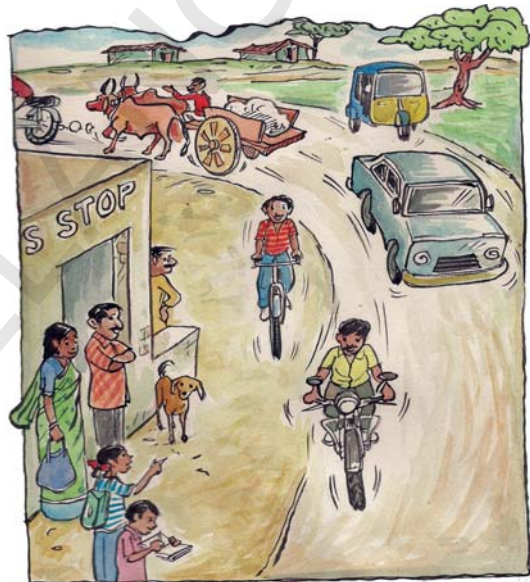
In which case did you find it easier to count the tally marks? Why?

### At the Bus Stop

Akhila and Abhi were going to their grand mother's house in the holidays. They were waiting at the bus stop with their parents. The bus was late and they were getting very bored.

Akhila had an idea Abhi lets count the vehicles that are passing on the road.

Abhi took out a notebook from his bag and made the following table. The children then started putting tally marks as and when they saw a vehicle. They did this for an hour, till their bus arrived.



Put the correct number of tally marks and complete the table.




Vehicle	Tally marks	No. of vehicles
Cycle		9
Auto		12
Motorcycle (Bike)		18
Bullock cart		3
Car		7

Now, answer the following questions
































- How many vehicles did Akhila and Abhi see in 1 hour's time?
- Which vehicle did they see the maximum number of times?
- The number of motorcycles is how many times the number of cycles?
- The number of bullock carts is  $\frac{1}{4}$  of the number of autos. Is this statement correct based on the information presented in the table?
- The number of motor cycles is how many times the number of bullock carts?

### Sunny weather - Cloudy weather




Shankar was noting down the weather, on each day of August, 2012 in the calendar by drawing pictures for sunny, cloudy and rainy weather like this.

Sunny  Cloudy  Rainy 

### August-2012

MON	TUE	WED	THU	FRI	SAT	SUN
		 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		

Study the calendar and put tally marks appropriately.

Weather condition	Tally marks	No. of days
		
		
		

Which of the conclusions are true based on the information in the above table. Write True or False.

- (a) 10 days of the month are sunny.
- (b) 9 days of the month are cloudy.
- (c) Most days of the month are sunny.
- (d) Most days of the month are either cloudy or rainy.

☐

☐

☐

☐



### Pulse Polio Immunization Campaign

Pulse polio drops are being given to children below the age of 5 years in Abbapur revenue village. The village is a big one with 4 habitations.

Since there are many children, the health worker decided that she would make this face ☺ in her records for every 3 children she immunized. She has recorded the particulars in the following table.



☺ = 3 children























Habitation	No. of children given polio drops	No. of children
Abbapur	☺ ☺ ☺	9
Banala Palli	☺ ☺ ☺ ☺ ☺	
Shriramula Palli	☺ ☺ ☺ ☺ ☺ ☺	
Ramchandruni Palli	☺ ☺	

How many children have been given pulse polio drops in the entire village?

### How many students are there in the school?

The class-wise strength of a Kasindevipet Primary School is given below in the table.

 = 5 students

Class	No. of students in each class	No. of students
I	 	
II	    	
III	   	
IV	      	
V	   	

How many students are there in the school?

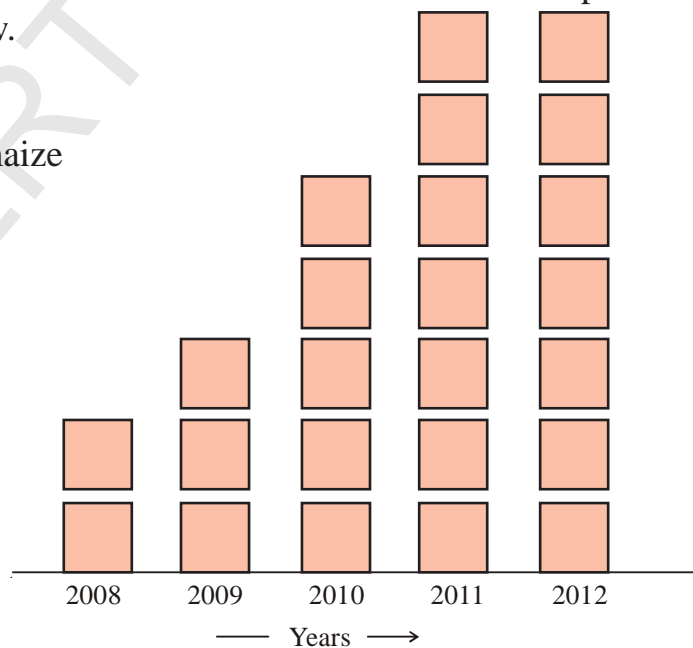
### Try This

If  was to represent 10 students, what would be the strength of the school?

### Ramaiah's maize production

Ramaiah grows maize in his field. He recorded the maize production over the 5 years as given below.

 = 40 kgs of maize



Read the box chart and give three conclusions about Ramaiah's maize production.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

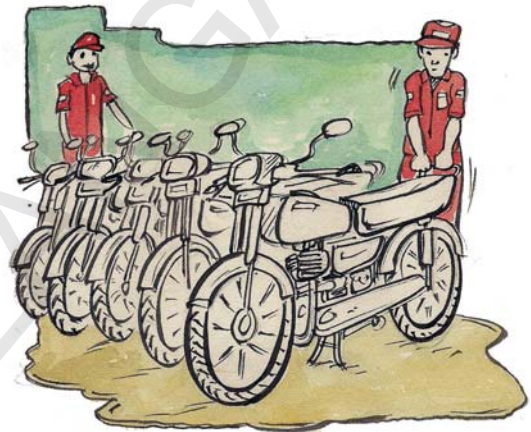
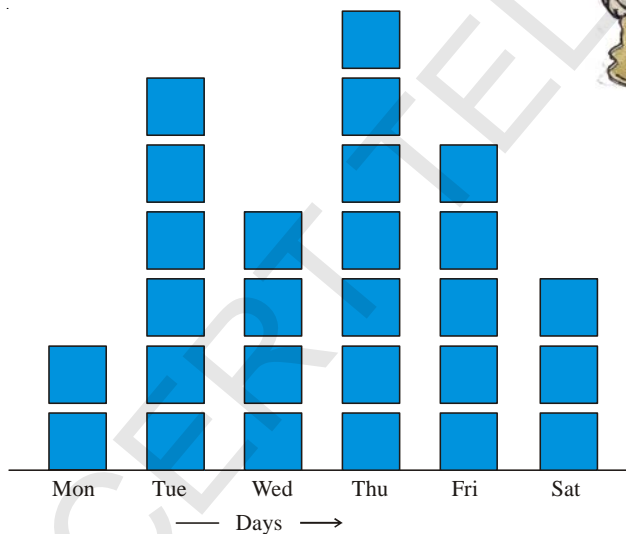
### Try This

Find out the particulars of production of Paddy / Maize in the last 5 years either by your family or in your surroundings (**or**) Find out the enrolment of children in your school in the last 5 years. Represent it in the form of a box chart.

### Sales of Motorcycles

A motorcycle company dealer showed the sale of motorcycles in a week in the box chart given below.

 = 10 motor cycles.



Read this box chart and answer the following questions.

1. How many motorcycles were sold on Wednesday?
2. On which day is the sale lowest? How many motor cycles are sold?
3. How many times the sale is on Tuesday than on Saturday?
4. On which day is the sale highest?
5. What is the total number of motor cycles sold in the week?

## 4 Smaller lengths - bigger lengths

Estimate, how long these pencils are?



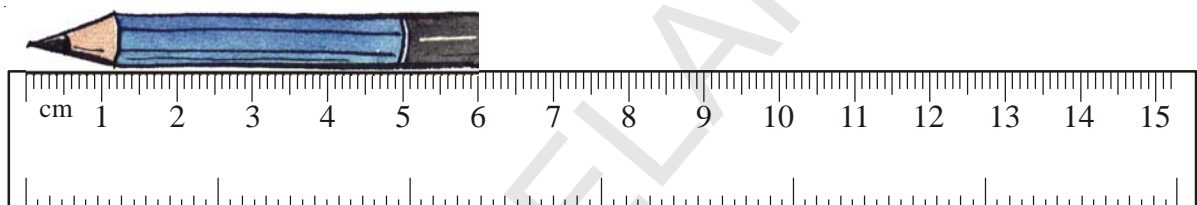
\_\_\_\_\_ cm



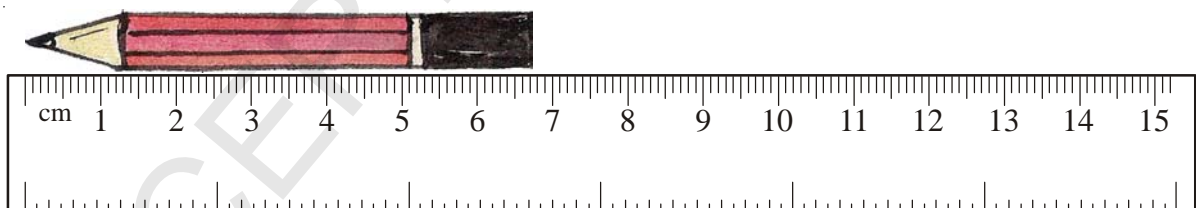
\_\_\_\_\_ cm

Now, measure them by using a scale.

The blue pencil is 6 cm.



The red pencil is more than 6 cm but less than 7cm.



One centimeter is divided into 10 smaller lengths called millimeters. 10 millimeters are equal to a centimeter. So each millimeter is one-tenth of a centimeter.

So the red pencil is 6 centimeters 7 millimeters long. Millimeter is represented by mm.

The red pencil is \_\_\_\_\_ mm more in length than blue pencil.

## Do This

1. Measure the length of the Object/Item given below and record in the table.

Item/Object	Measured length
Your pencil	_____ cm _____ mm
Your chalk	_____ cm _____ mm
Your thumb nail	_____ cm _____ mm
Your longest finger of hand	_____ cm _____ mm
Your rubber	_____ cm _____ mm

2. Estimate, draw and then measure length of the lines

- (a) A line of half a cm                      (b) A line of 6 cm  
(c) A line of 10 cm                          (d) A line of 15 cm

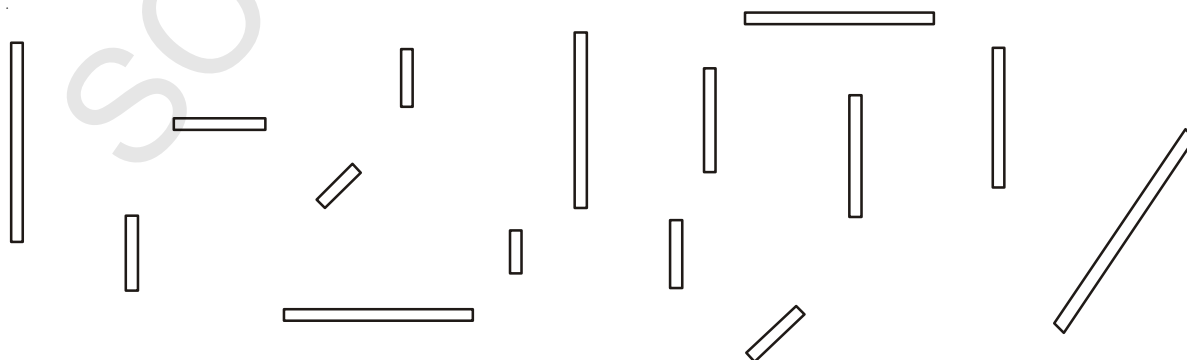
## Try This

1. Which insects that you know are of less than one cm in length?
2. Estimate the length of the chalk pieces and colour them as given below.  
Then measure and check if your estimate was correct.

Chalk of length less than 1cm - Red

Chalk of length between 1 and 2 cm - Blue

Chalk of length between 2 and 3 cm - Green



## Sports Day

Today is Rangayapally school's sports day.



The results of long jump made by 6 children are given in the table below.

Name of child	Distance jumped
Sandhya	3 m 10 cm
Laxmi	3 m 25 cm
Shailaja	3 m 60 cm
Kiran	3 m 5 cm
Bhairav	3 m 20 cm
Nithin	3 m 50 cm

- Who is the winner? \_\_\_\_\_
- How long has she jumped? \_\_\_\_\_
- What is the difference in the length of the jump of the girl who has jumped the longest and the one who has jumped the shortest?
- How many more cms are to be jumped to meet the 4 m target?
  - Shailaja      3 m 60 cm + \_\_\_\_\_ = 4 m
  - Kiran          3 m 5 cm + \_\_\_\_\_ = 4 m
  - Bhairav       3 m 20 cm + \_\_\_\_\_ = 4 m
  - Nithin        3 m 50 cm + \_\_\_\_\_ = 4 m

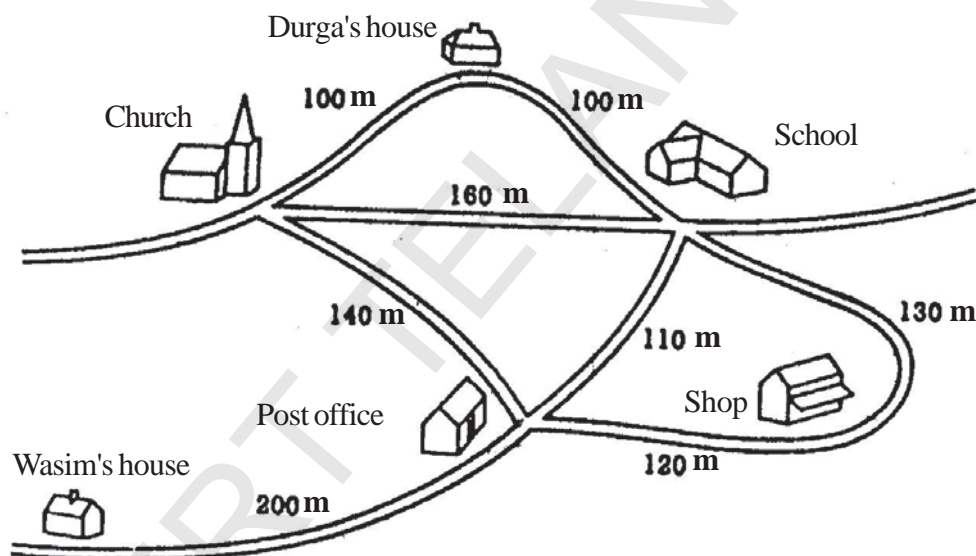
### Which vehicle can pass under the bridge?

Only vehicles less than 3m 50 cm in height can pass under the bridge. Which of these vehicles will be able to pass under the bridge?



### Gorantla Village

The route map given below gives the distances between important places in Gorantla village.

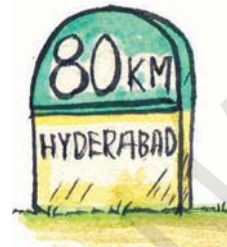
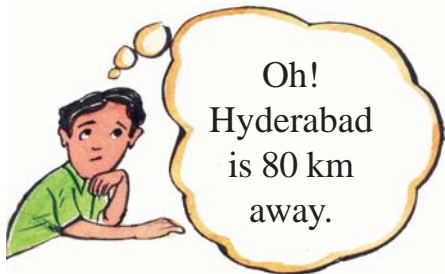


Now, answer the following questions based on the route map.

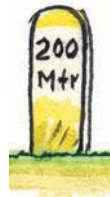
- Wasim crossed the post office, shop and school to reach Durga's house. How much distance did Wasim cover?
- Durga left her house at the same time as Wasim to meet him. She crossed the church and post office to reach Wasim's house. How much distance did Durga travel to reach Wasim's house?
- Who took the longer route?

## Shanu's bus trip to Hyderabad

Shanu is going to Hyderabad to visit his uncle's house. On the way to the Hyderabad, he observed some milestones.



He then observed this milestone-



Then after a few minutes he saw this milestone-



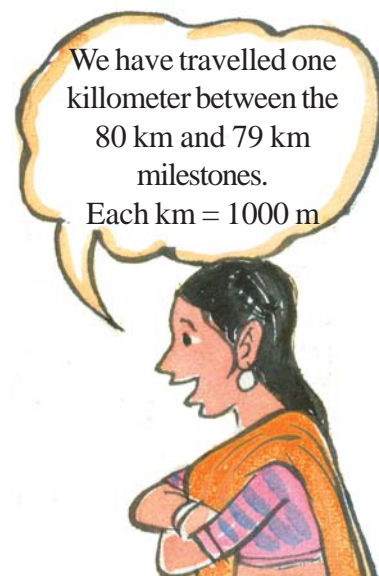
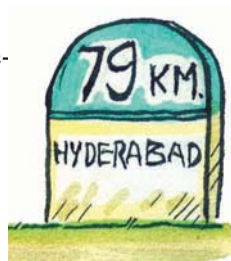
Again, after a few minutes he saw this milestone-



And then this-



Then he observed this milestone-



He looked confused. His mother explained.

### Try This

1. How many 200 m are there in a kilometer? \_\_\_\_\_
2. How many 100 m are there in a kilometer? \_\_\_\_\_
3.  $\frac{1}{2}$  km = \_\_\_\_\_ m
4.  $\frac{1}{4}$  km = \_\_\_\_\_ m

### The lengthy rivers of India

The table given below gives details of the length of some major rivers of India.

Name of River	Length
Godavri	1465 km
Ganga	2526 km
Krishna	1400 km
Yamuna	1376 km
Narmada	1312 km



- (a) Write the names of the rivers in the order of their length (from the shortest to the longest).
- (b) The longest river in the world is Nile- 6650 km.  
How much shorter is the Ganga than the Nile?  
How much shorter is the Godavri than the Nile?
- (c) The length of some Bridges on the rivers is given here under. Express it in km, m and cm.  
Prakasham barrage 1223 m = \_\_\_\_\_ km \_\_\_\_\_ m  
Dhavaleshwaram Barrage 2701 m = \_\_\_\_\_ km \_\_\_\_\_ m

## Try This

1. Estimate, what is the distance between your school and home?
2. Estimate, what is the distance between your village and your mandal headquarters.

### How tall I am?

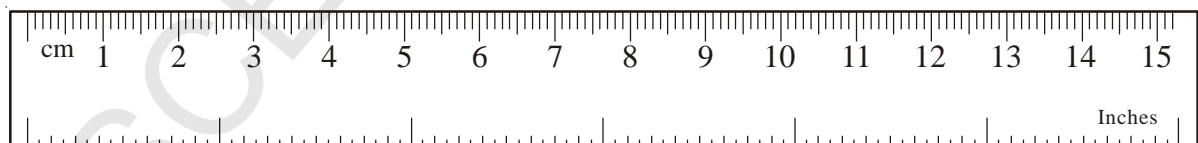
The teachers of Motlapally Primary School conducted a health camp. The doctor recorded the height and weight of children in their health cards.

This is Sony's Health Card-

Health Card		
Name	:	K. Sony
Fathers Name	:	Srinivas
Class	:	V
Height	:	4'11"
Weight	:	34 kg.

What is sony's height?

Before trying to answer this question look at the scale in your geometry box. On one side we have centimeters and on the other side inches.



A small scale like the one drawn above, shows 6 inches and a big scale shows 12 inches. 12 inches is equal to a foot. We write feet with a line (') and inches with two small lines (").

So, Sony's height is 4 feet 11 inches.

## Do This

Record your height and your four friends in feet and inches.

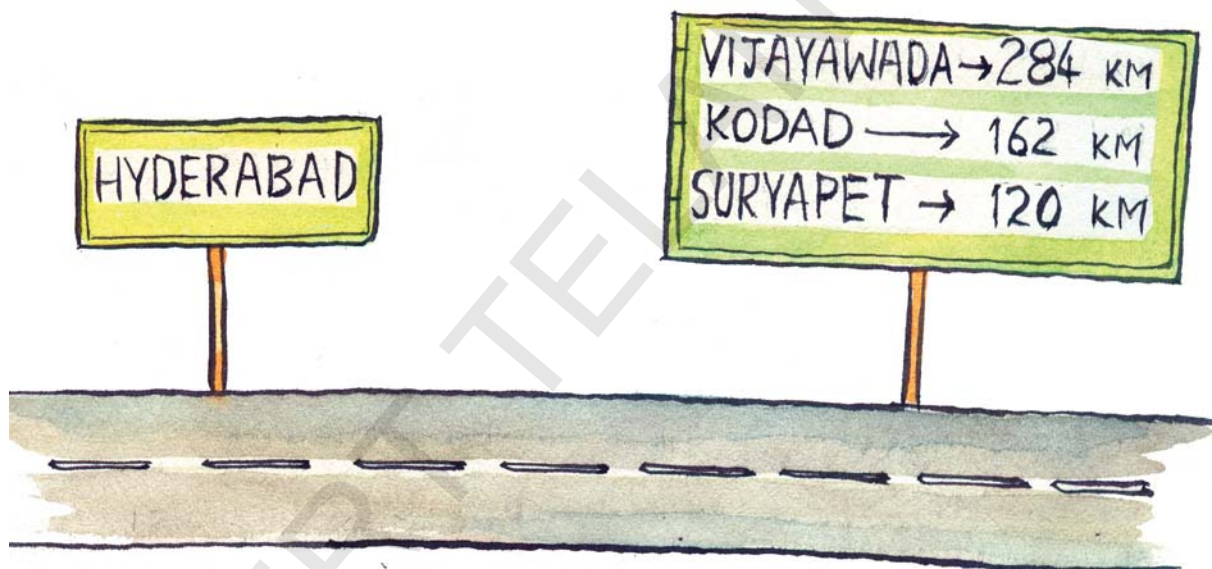
S. No.	Name	Height in feet & inches	Height in inches
Example	Sonu	4'11"	59"
1.			
2.			
3.			
4.			

Who is the tallest amongst all of you? \_\_\_\_\_

## Exercise

- Madhu's house is 3 km away from his school. He covers 2 km 350 m on cycle and the remaining distance on foot. How much distance does he cover on foot?
- How many bricks of length 20 cm will be needed to keep along the foot of a wall of 80 meters long?
- Fill in the blanks
  - 12 km = \_\_\_\_\_ m
  - 2 km 400 m = \_\_\_\_\_ m
  - 4500 m = \_\_\_\_\_ km \_\_\_\_\_ m
  - 7750 m = \_\_\_\_\_ km \_\_\_\_\_ m
  - 22 mm = \_\_\_\_\_ cm \_\_\_\_\_ mm
  - 75 mm = \_\_\_\_\_ cm \_\_\_\_\_ mm
  - 9 cm 5 mm = \_\_\_\_\_ mm
  - 12 cm 8 mm = \_\_\_\_\_ mm

4. Bindu's house and the market are in opposite directions from the school. The distance between Bindu's house and the school is 4 km 660 m and the distance between the school and the market is 2 km 800 m. Bindu goes from her house to the school and then to the market. How much distance has she travelled ?
5. If you walk from Sana's house you will first reach Ramija's house and then their school. Sana's house is 2 km 345 m from school and Ramija's house is 1 km 650 m from school. What is the distance between Sana and Ramija's house?
6. A tailor uses 3 m 10 cm of cloth to stitch one coat. How much cloth does he require to stitch 4 such coats?
7. Ashish is travelling from Hyderabad to Vijayawada. He saw this board on the highway road while starting.

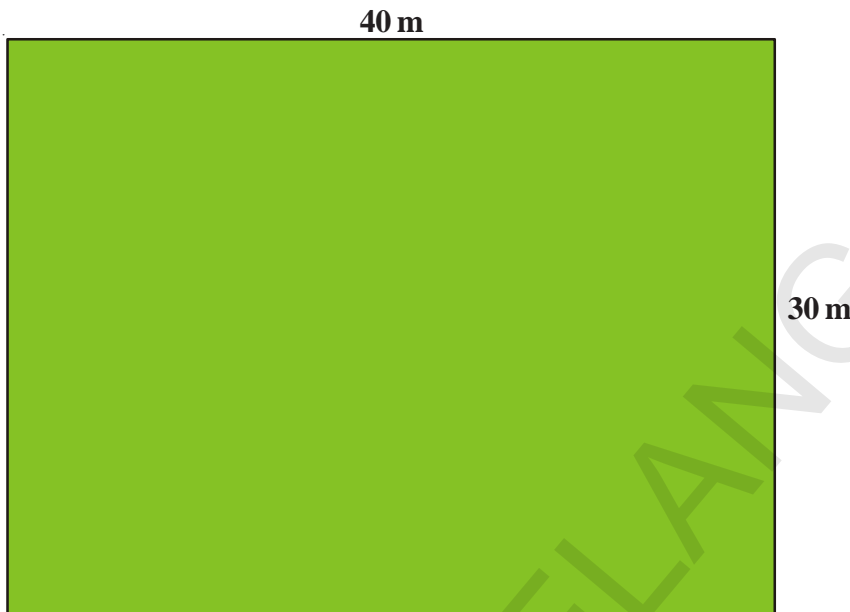


- (a) How much distance he has to travel from Hyderabad to Vijayawada?
- (b) Which distance is more - Suryapet to Kodad or Kodad to Vijayawada?
- (c) What is the distance between Suryapet and Vijayawada?

# 5

## Spaces and boundaries-1

Sakru wants to fence around his land.

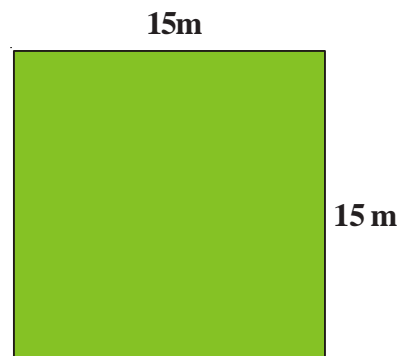


How much fencing wire does Sakru need to fence his land?

Perimeter refers to the total length of the boundary.

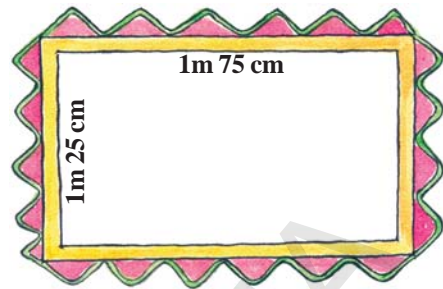
### Do This

1. What is the perimeter of Ramaiah's field? He walks along the boundary of his field to check the water level in the field, 3 times a day. What is the total distance he walks on doing so?

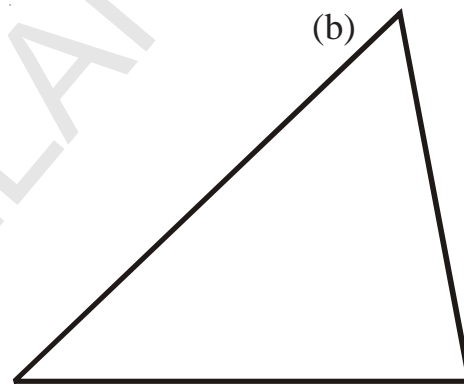
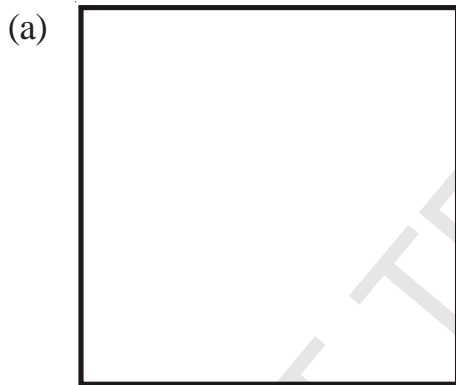


2. Rani wants to put a lace around the table cloth and 6 table mats.

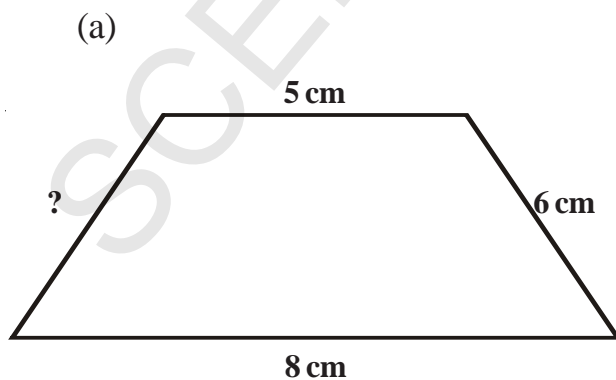
- How much lace does she need to buy for the table cloth?
- How much lace will she need to buy for 6 table mats?
- What is the total length of lace that Rani needs to buy?



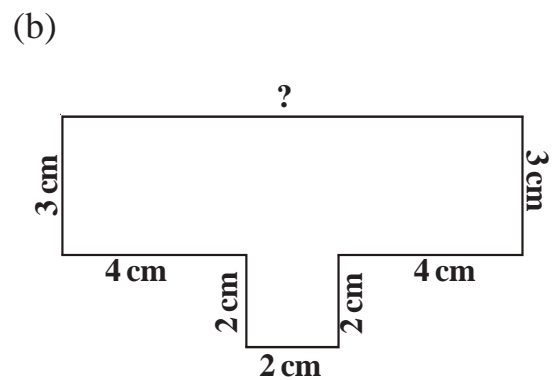
3. Measure and find the perimeter of the shapes given below.



4. The perimeter along with the shapes are given below. Find the missing length of one side.



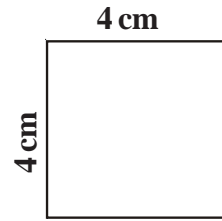
Perimeter = 24 cm



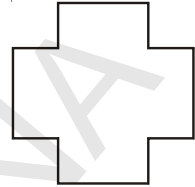
Perimeter = 30 cm

## Try This

1. (a) What is the perimeter of this square?

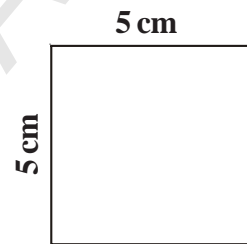


- (b) A small square of side 1 cm is cut off from each of its corners.

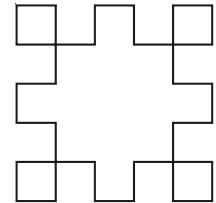


Will the perimeter change?

2. (a) What is the perimeter of this square?

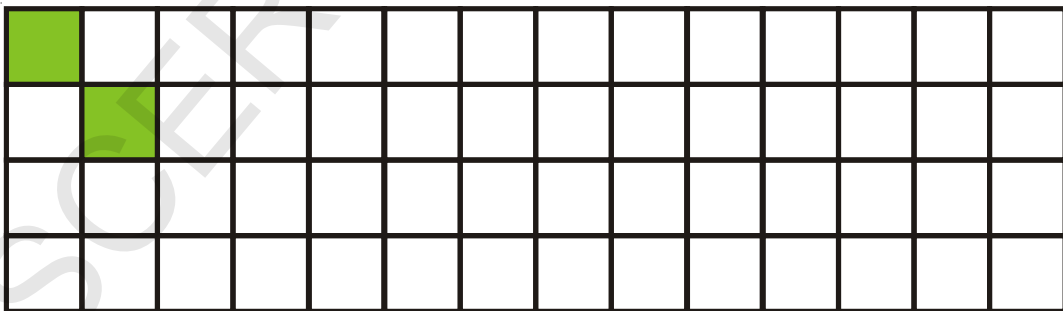


- (b) Will the perimeter of the square change, if the sides are cut off as shown here?



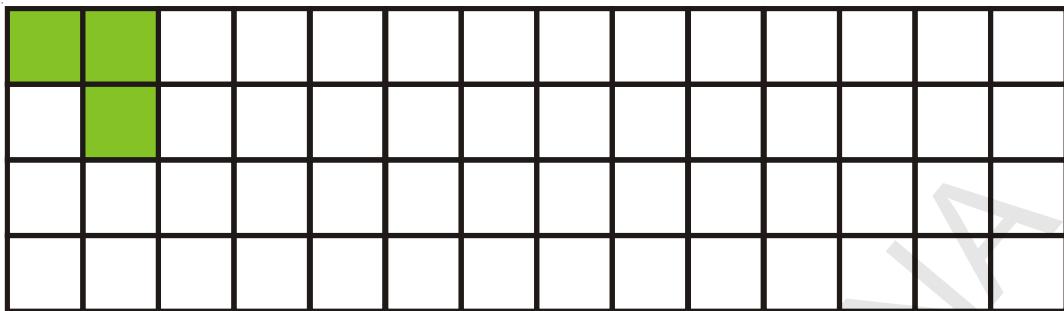
## Playing with squares

Draw as many different shapes as possible using 2 squares on the square sheet given below. One has been done for you. Do not forget to see the shapes your friends have drawn.



- (a) Are all the shapes occupying the same amount of space on the square sheet?
- (b) Do all of them have the same perimeter? Which shape has the longest perimeter and which shape has the shortest?

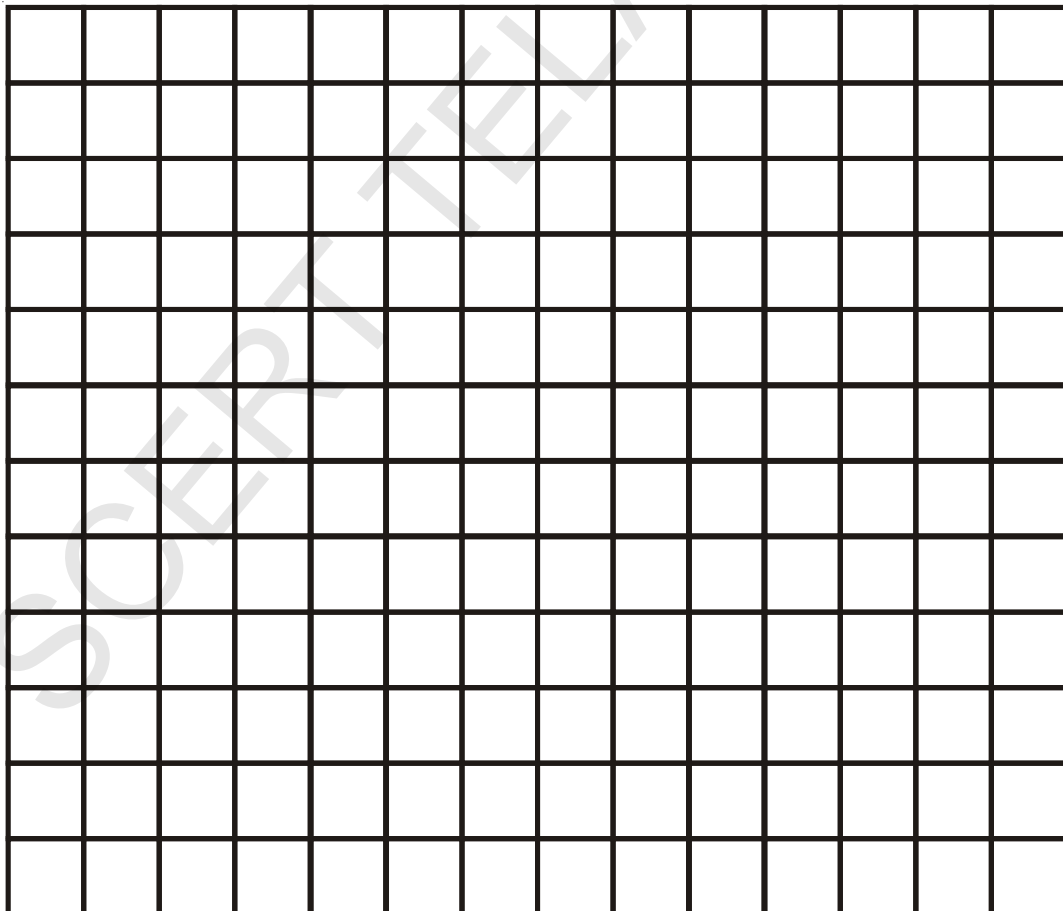
Now, draw as many different shapes as possible using 3 squares. Do not forget to see the shapes your friends have drawn.



- (a) Are all the shapes occupying the same amount of space on the square sheet?
- (b) Do all of them have the same perimeter? Which shape have the longest perimeter? Which shape has the shortest perimeter?

### Try This

Draw as many different shapes as possible using 4 squares. Do not forget to see the shapes your friends have drawn. Hint: 16 different shapes are possible.



- (a) Are all the shapes occupying the same amount of space on the square sheet?
- (b) Do all of them have the same perimeter? Which shape has the longest perimeter and which shape has the shortest?

### How many match boxes can cover your maths textbook?

Lavanya is playing a game. She is putting matchboxes on a maths textbook in such a way that there is no gap between adjacent matchboxes and the matchboxes also do not overlap each other.



25 matchboxes will cover the textbook completely.



Now, Lavanya starts covering her notebook with match boxes.

- (a) Estimate, how many boxes are still needed to cover the notebook completely?
- (b) Is the notebook smaller than the textbook?



### Try This

1. How many matchboxes will cover the following completely?

(a)



(b)

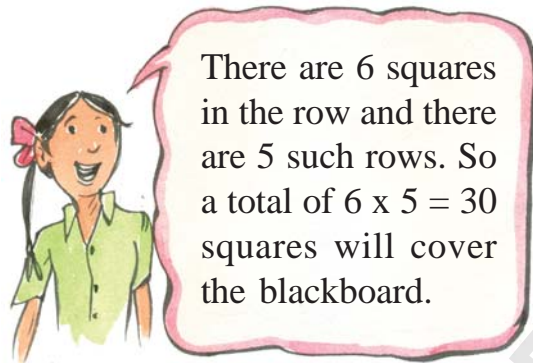


2. Estimate, how many maths textbooks will be needed to cover your teacher's table completely.

Now, check your estimate by actually covering your teacher's classroom table with maths textbooks. How many books were needed?

The teacher saw Lavanya playing her game. She decided to use this opportunity to introduce her class 5 children the meaning of area. She drew squares of the same size as shown below on the blackboard.

She then asked the children- How many such squares will cover this blackboard completely ?



Teacher : You are correct. 30 squares will cover the blackboard. So, the space occupied or area of the blackboard = 30 squares.

What about this black board?



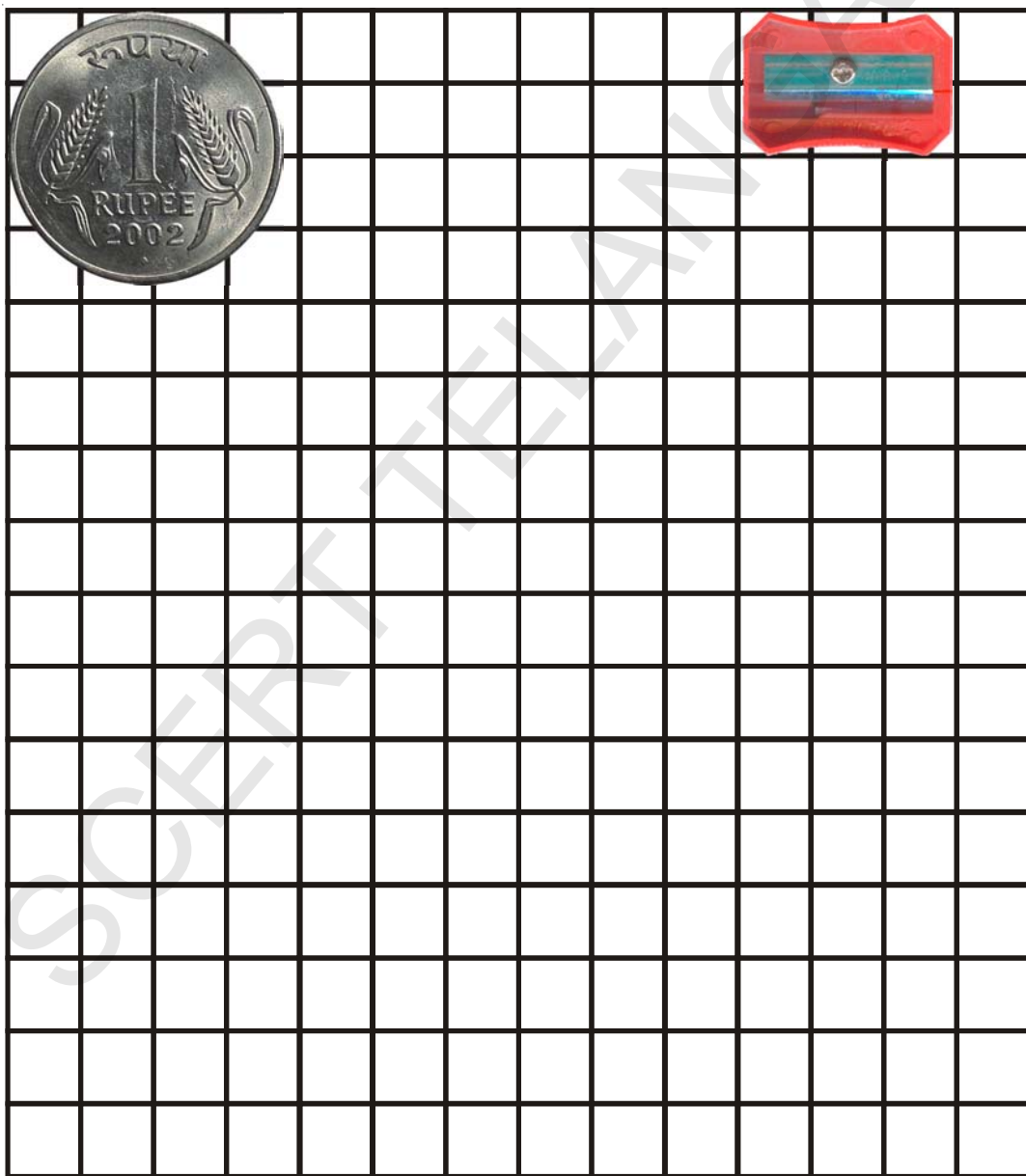
The space occupied or area of the blackboard = \_\_\_\_\_ squares

## Try This

Put your sharpener on this square sheet. How much area does each face of the sharpener occupy? What about the area occupied by your sharpener? Your geometry box? Put anything you wish on this square sheet and find out the area of its face? One example has been done for you.

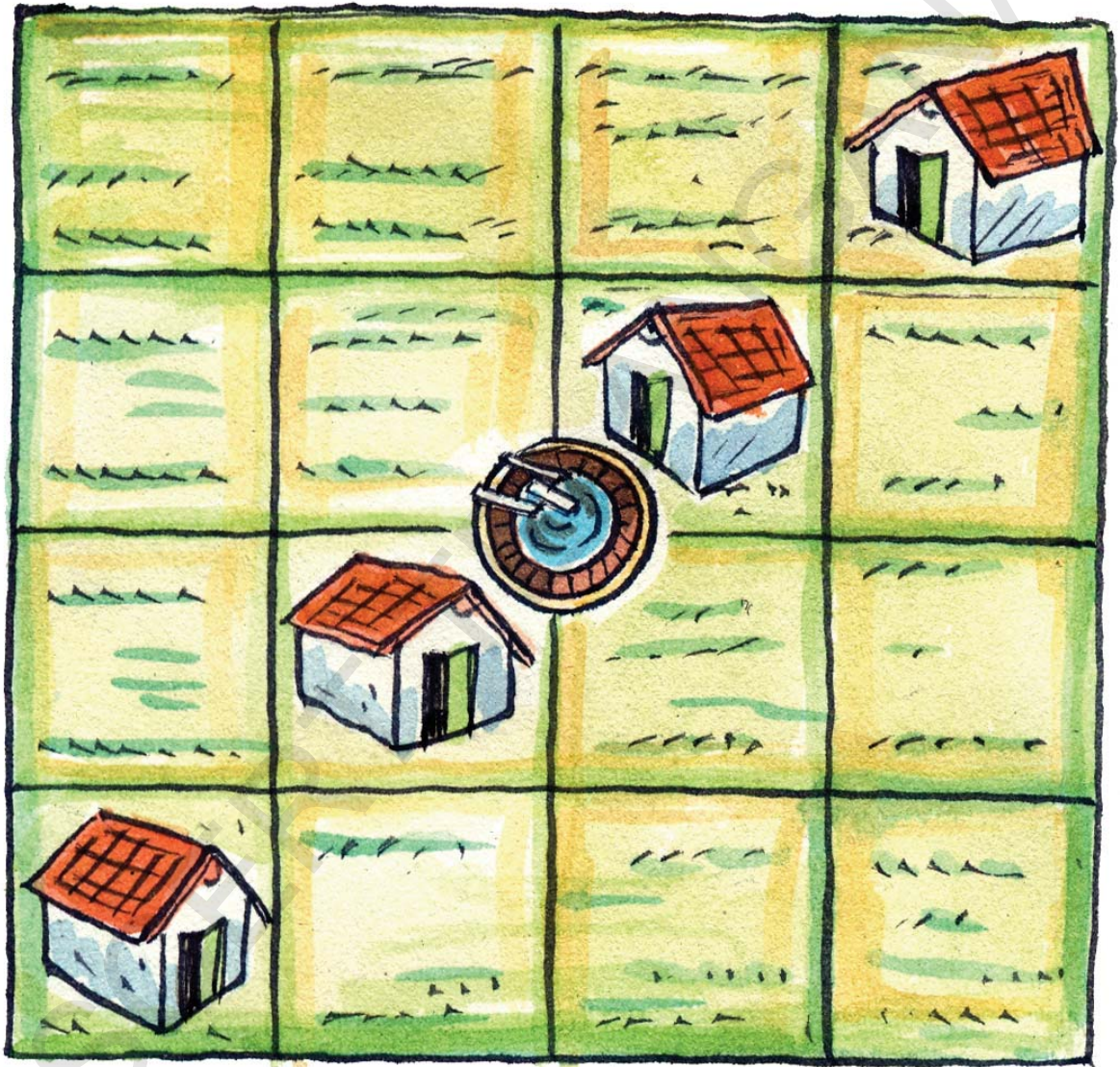
The sharpener covers about 6 squares of area.

Krishna feels that the coin covers 10 squares but Gita feels that it covers 11. What do you think?



### Try This

Farzana is dividing her land equally among her four children. She wants to distribute the land in such a way that each child gets one house as well as access to the one well on her land. Help Farzana divide her land. What part of land would each child get? Write in the form of fraction.



# 6

## Angles in our surroundings



Sujatha lives in *Khammam*. She is going to her uncle's home in *Hyderabad* for *Dasara* holidays. Sujatha's grandmother gave her an old watch before she left home.

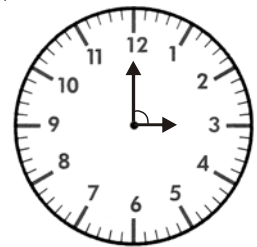
Sujatha saw the time in her watch many times during the day-

When she got on the bus it was 3 o'clock. When she stopped for tea it was 4 o'clock. When she reached her uncle's house it was 6 o'clock.

See the small and big hands of the watch at different times.

At 3 o'clock, the small hand is on 3 and the big hand is on 12.

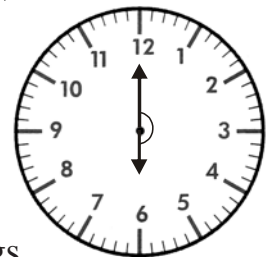
The angle between the hands of the clock is shown here.



At 4 o'clock, the small hand moves to 4 and the angle changes.

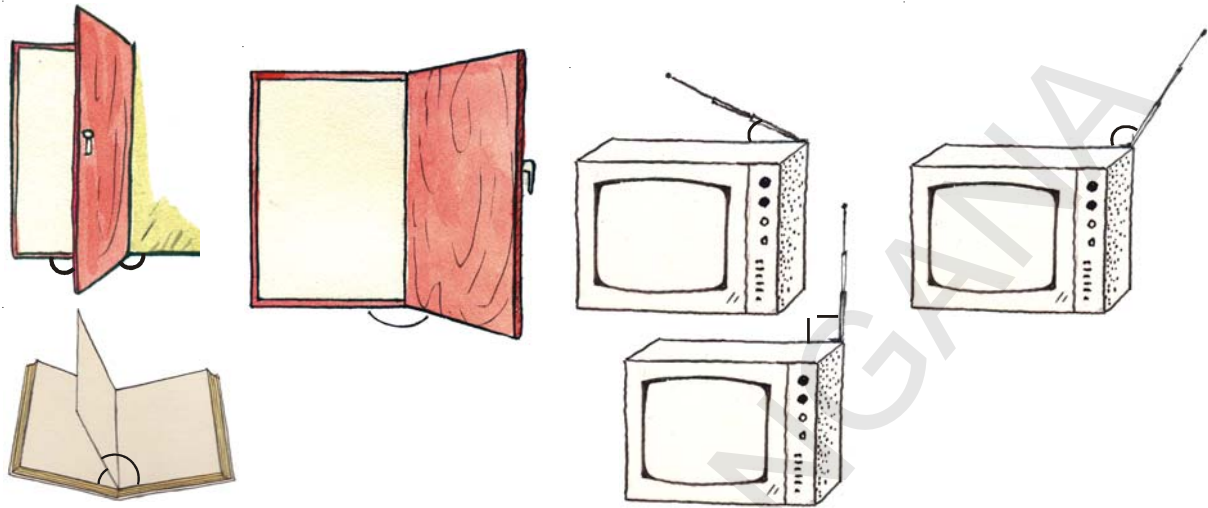


At 6 o'clock, the angle has changed again.

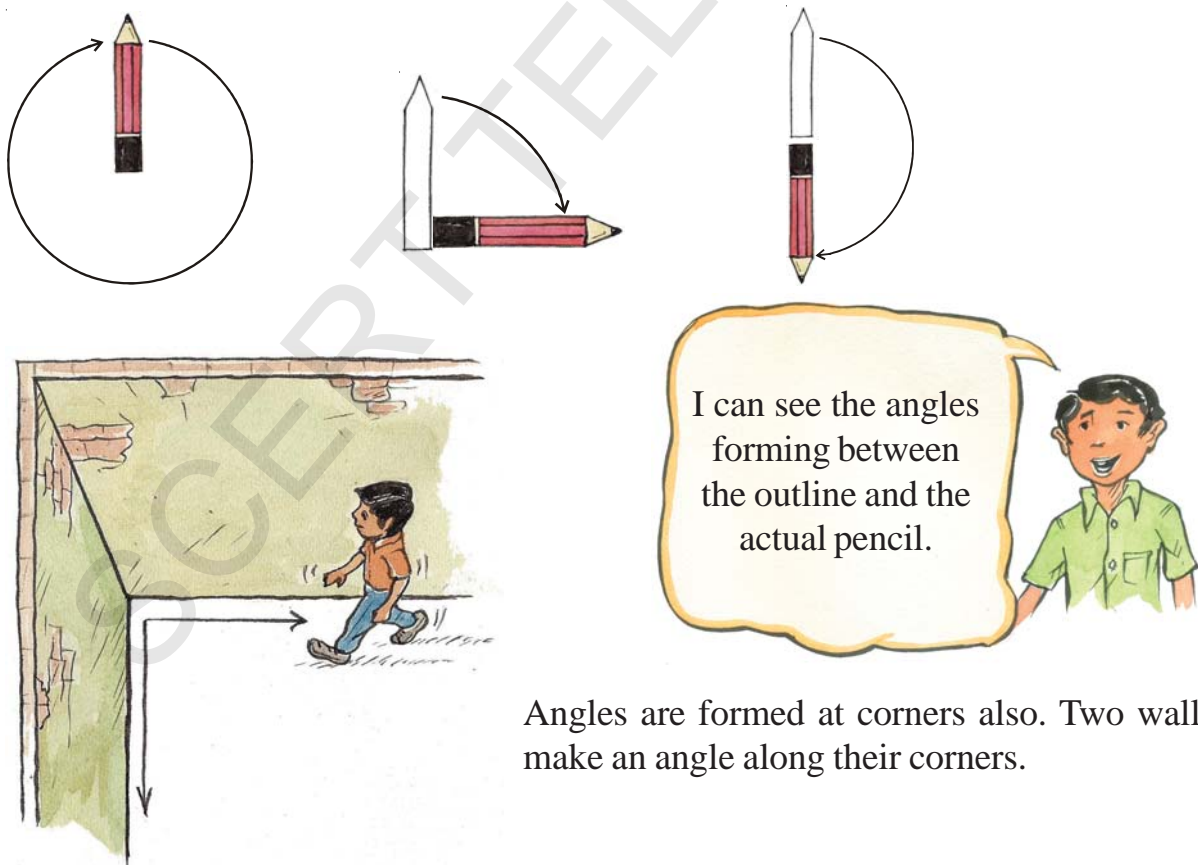


So the hands of a clock form different angles at different timings.

We can observe angles around us. Sujatha came back to Khammam after her holidays and told Abida and Keshav that angles are formed when something turns. Observe the angles between the door and the wall, between the book and its page and between the T.V. and its antena.

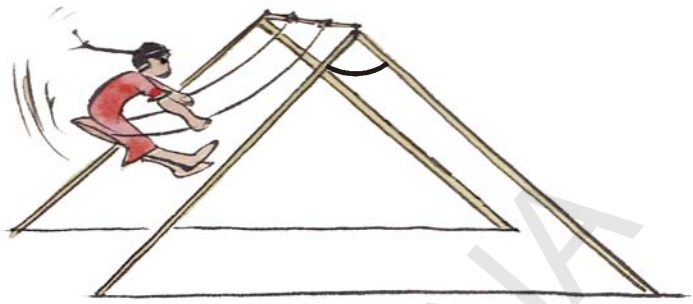
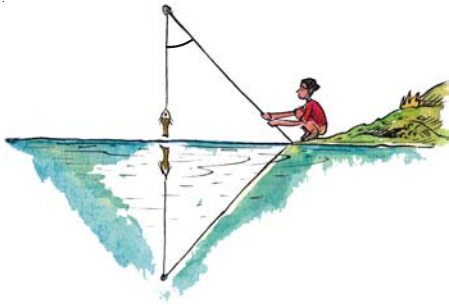


Sujatha put the pencil flat on a paper. She drew its outline. Then she turned it.



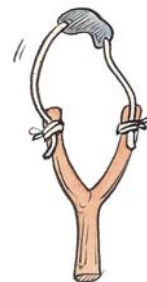
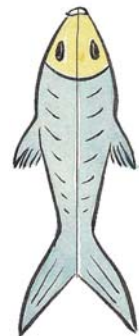
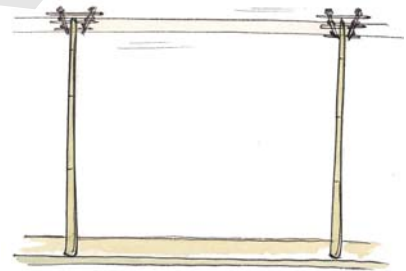
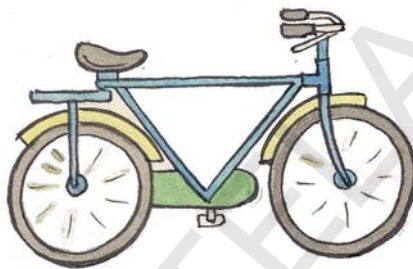
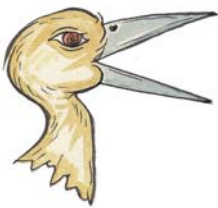
Angles are formed at corners also. Two walls make an angle along their corners.

See the angles marked in the pictures below. Mark more angles in them.



### Do This

1. Mark angles in the given pictures. Try to mark more than one angle in each picture.



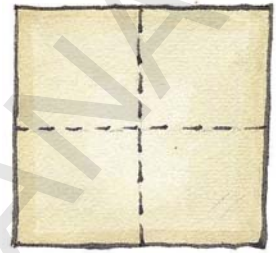
## Activity



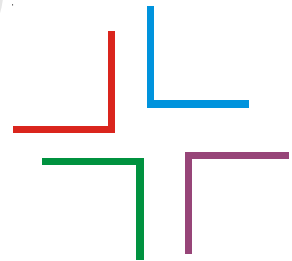
Take a square sheet of paper. Fold it twice as shown.

Unfold it and see.

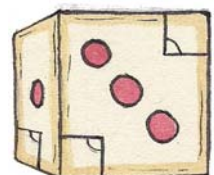
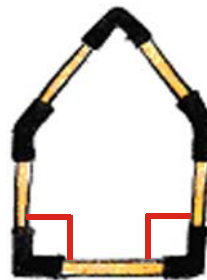
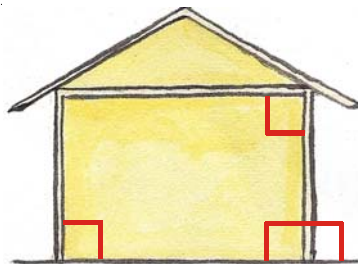
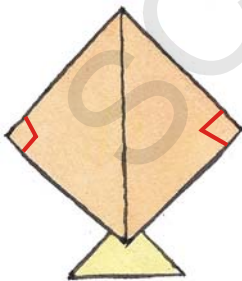
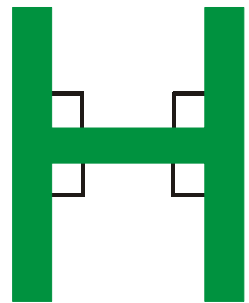
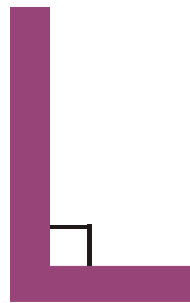
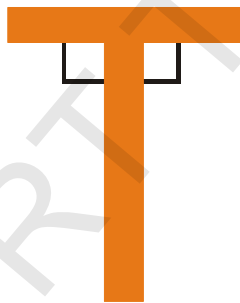
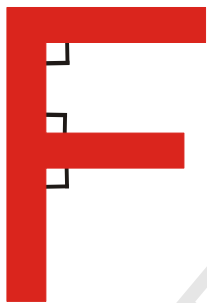
It looks like this. Observe the point where the two creases are meeting. Mark the angles. Do all the angles look same or different?



If we draw the angles they look like this. These angles are called right angles.

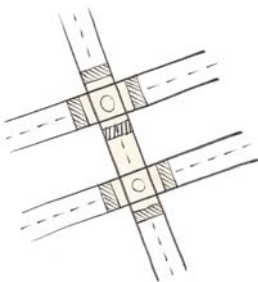
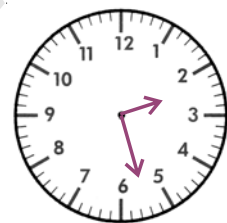
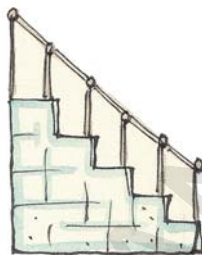
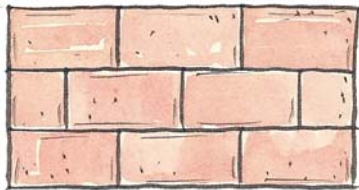
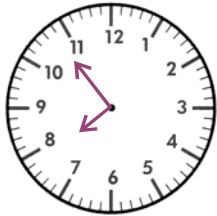


Observe the figures given below. We can see right angles in them.



## Do This

1. Mark the right angles in the given pictures. You can mark more than one angle.



Did you notice something? The hands of the clock make right angles at 3 o'clock and 9 o'clock. But they make right angles at other times also.

## Try This

1. Draw a clock where the hands form a right angle.

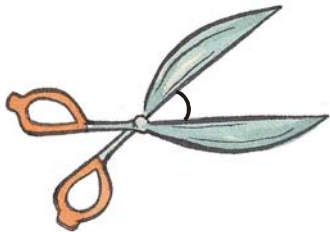
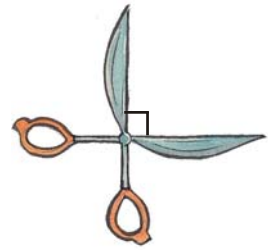


2. Look at the walls in your room. How many right angles are there? Count them.

## More or less of a right angle

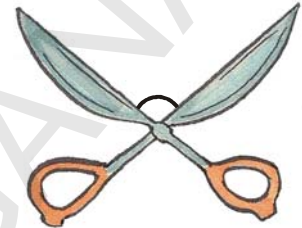
Look at the scissors. The blades are forming a right angle.

Look at the figure below.



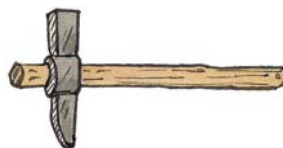
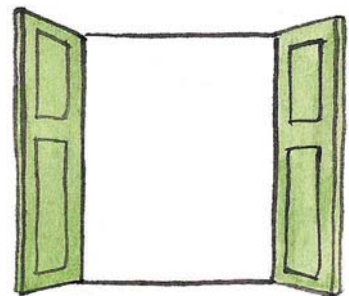
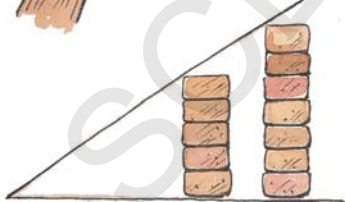
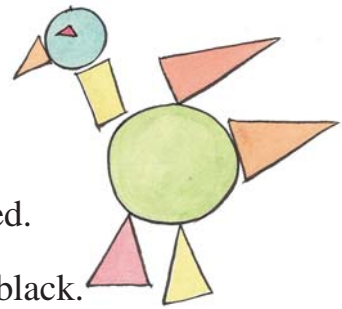
The blades are not forming a right angle; the marked angle is less than a right angle.

Can you open the scissors to get an angle more than a right angle? Try it.

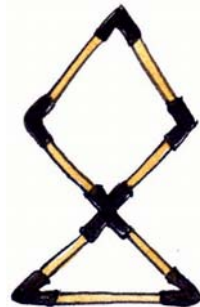


### Do This

- Look at the pictures. Mark the angles and colour them as indicated below.
  - If the angle is right angle then mark it in blue.
  - If an angle is less than a right angle then mark it in red.
  - If an angle is more than a right angle then mark it in black.



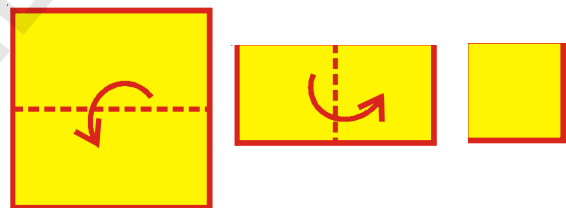
2. Identify the angles in these figures which of these are more than right angles and which of these are less than right angle?



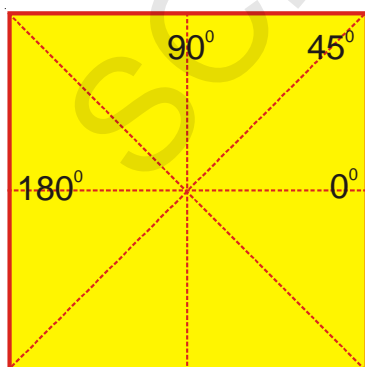
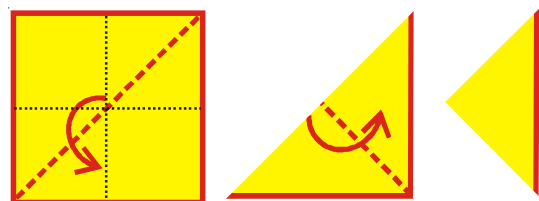
### Activity

We have seen that some angles are more than right angle and some are less. How do we measure angles? We can measure them in degrees. The measure of a right angle is  $90^\circ$ .

Take a square piece of paper. Fold it in half as shown in the figure and then fold again. Open it.



Now fold the paper in half as shown. Then fold it again. Open the paper. It will be creased.



Mark the angles as shown.

Observe where the four creases (dotted lines) are meeting. Are they meeting at the same place or same point? This is the centre of the square.

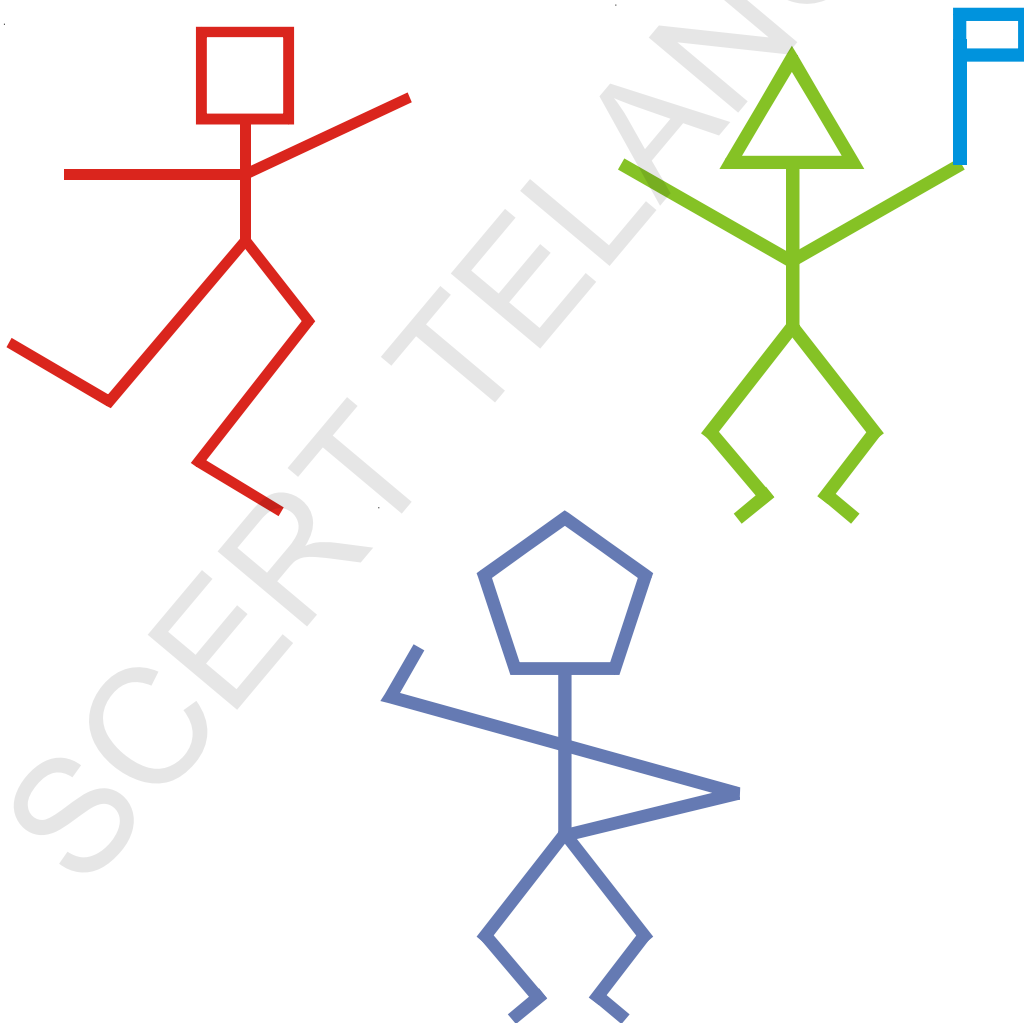
## Try This

1. We can find the centre of the circle in the same way. Take a bangle and use it to draw a circle on a paper. Cut it out.

Now fold the circle to get the four angles. Also mark the centre of the circle.

### Angles of the dancing postures

Look at the dancing postures. Mark the angles. Draw two more dancing postures.



# 7

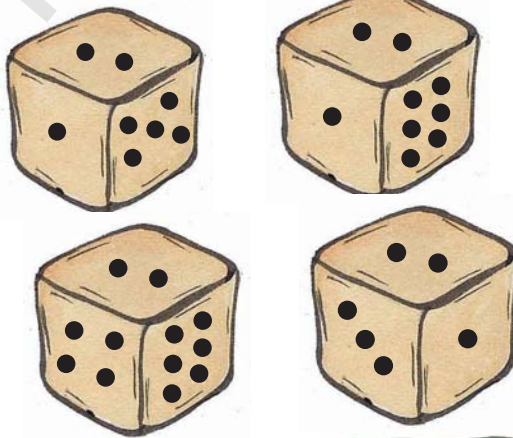
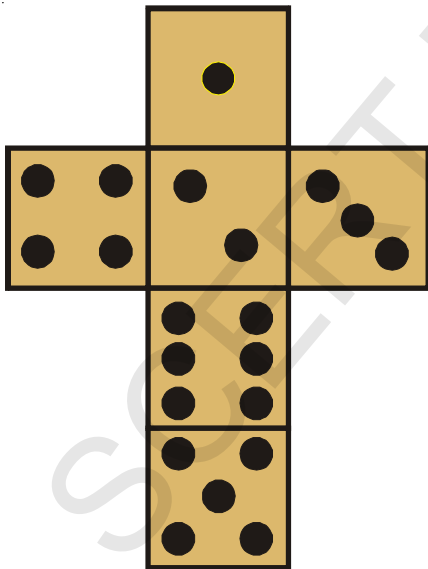
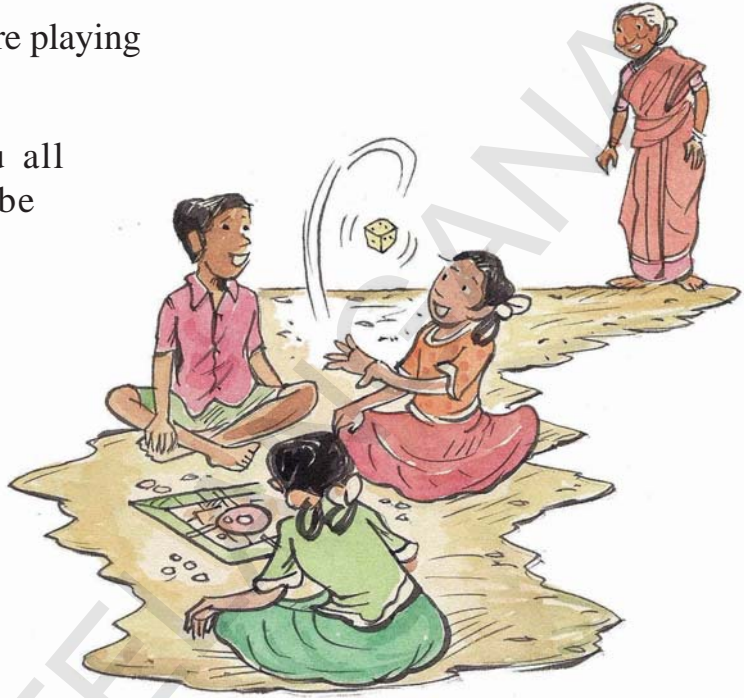
## Playing with shapes

Sujatha, Vani and Gautham were playing ludo.

Grandmother: Why are you all wasting time? You should be studying.

Vani: We are learning maths while playing with the dice.

The next day the teacher gave this problem to Vani in class. Match this cut-out of the dice with the actual dice. Try yourself.

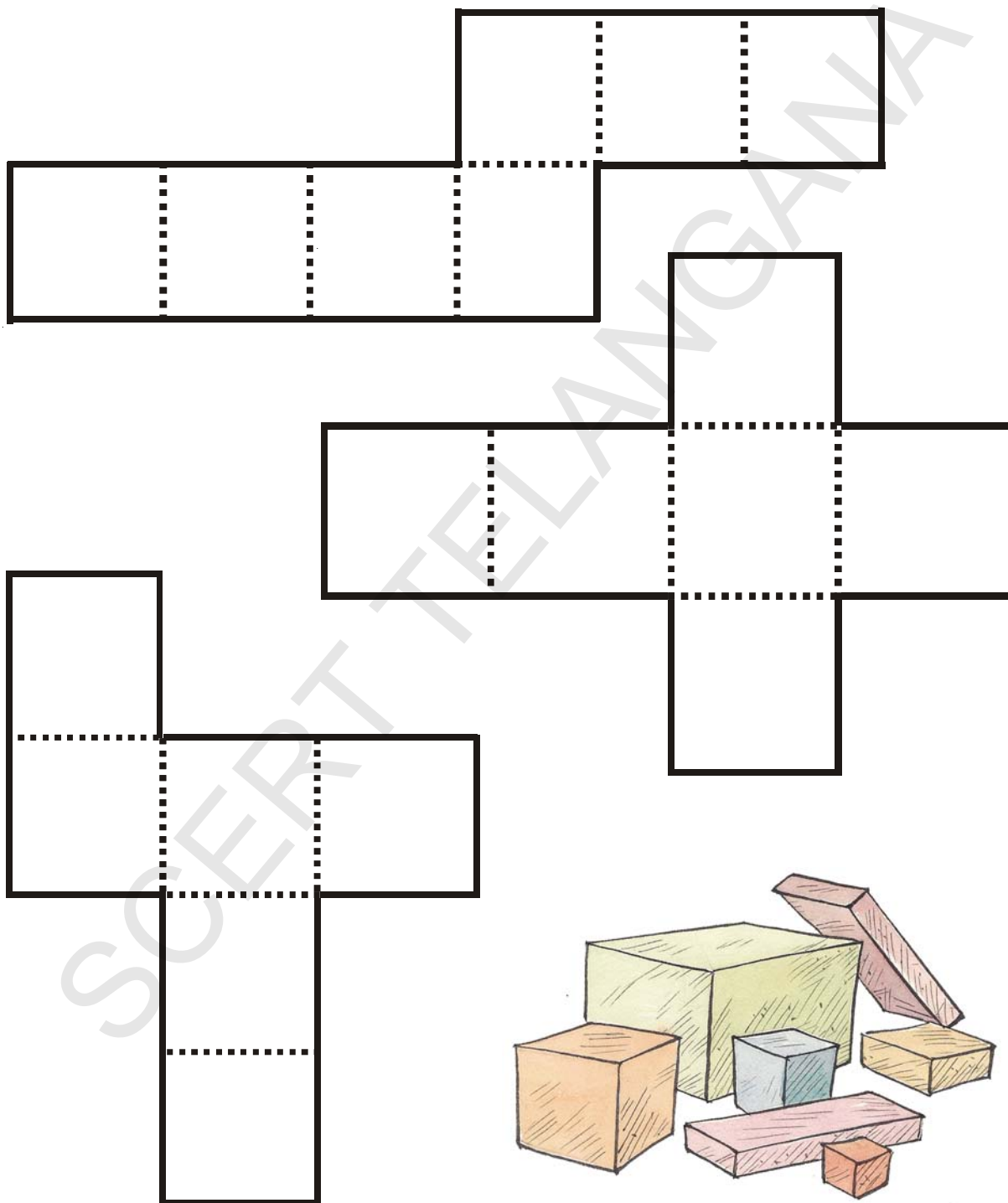


A dice is cube shaped.



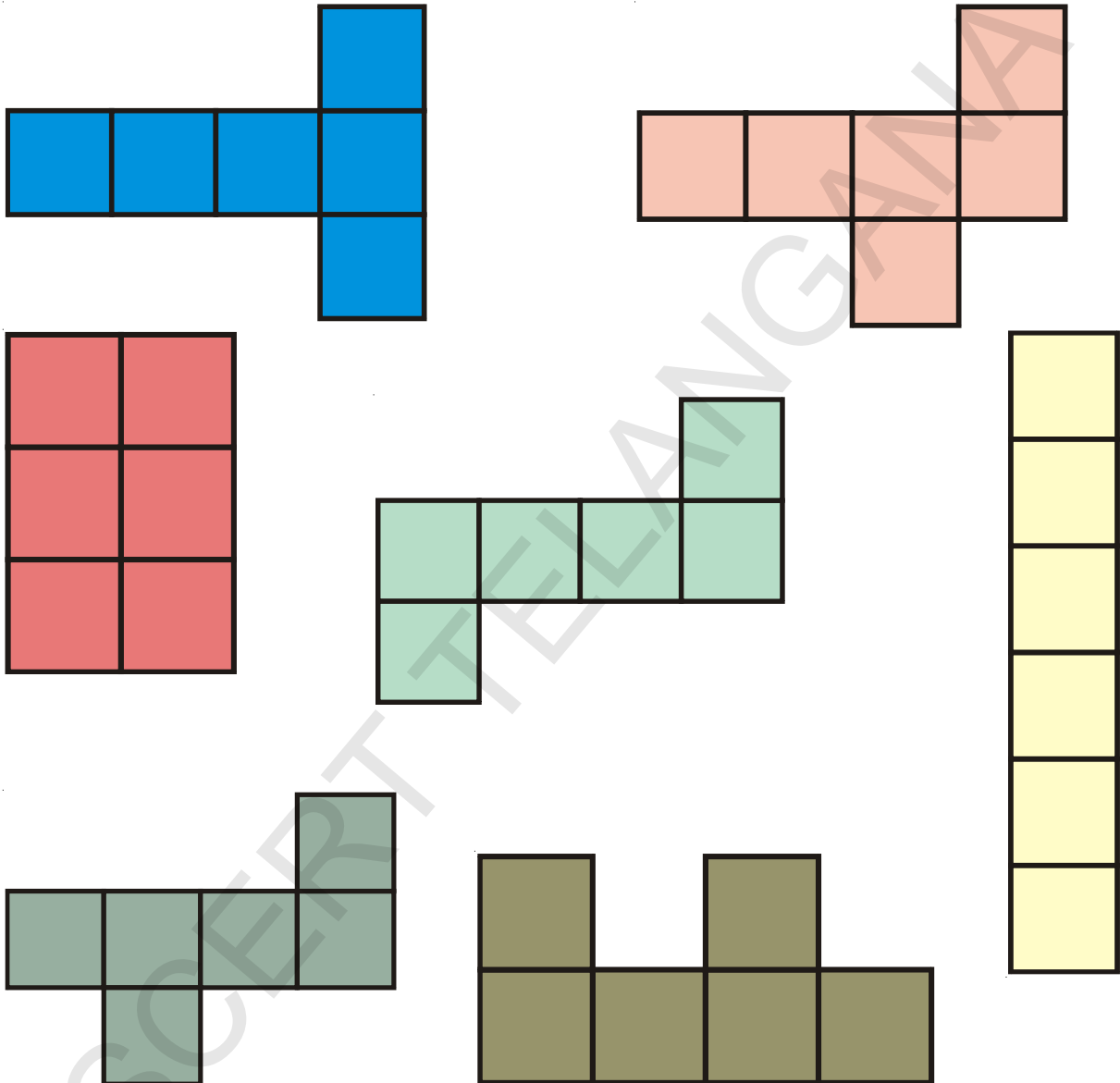
## Activity

3 nets have been given below. Trace them on paper. Cut along the dark lines. Which of these nets can be folded into cube shaped figures?



### Do This

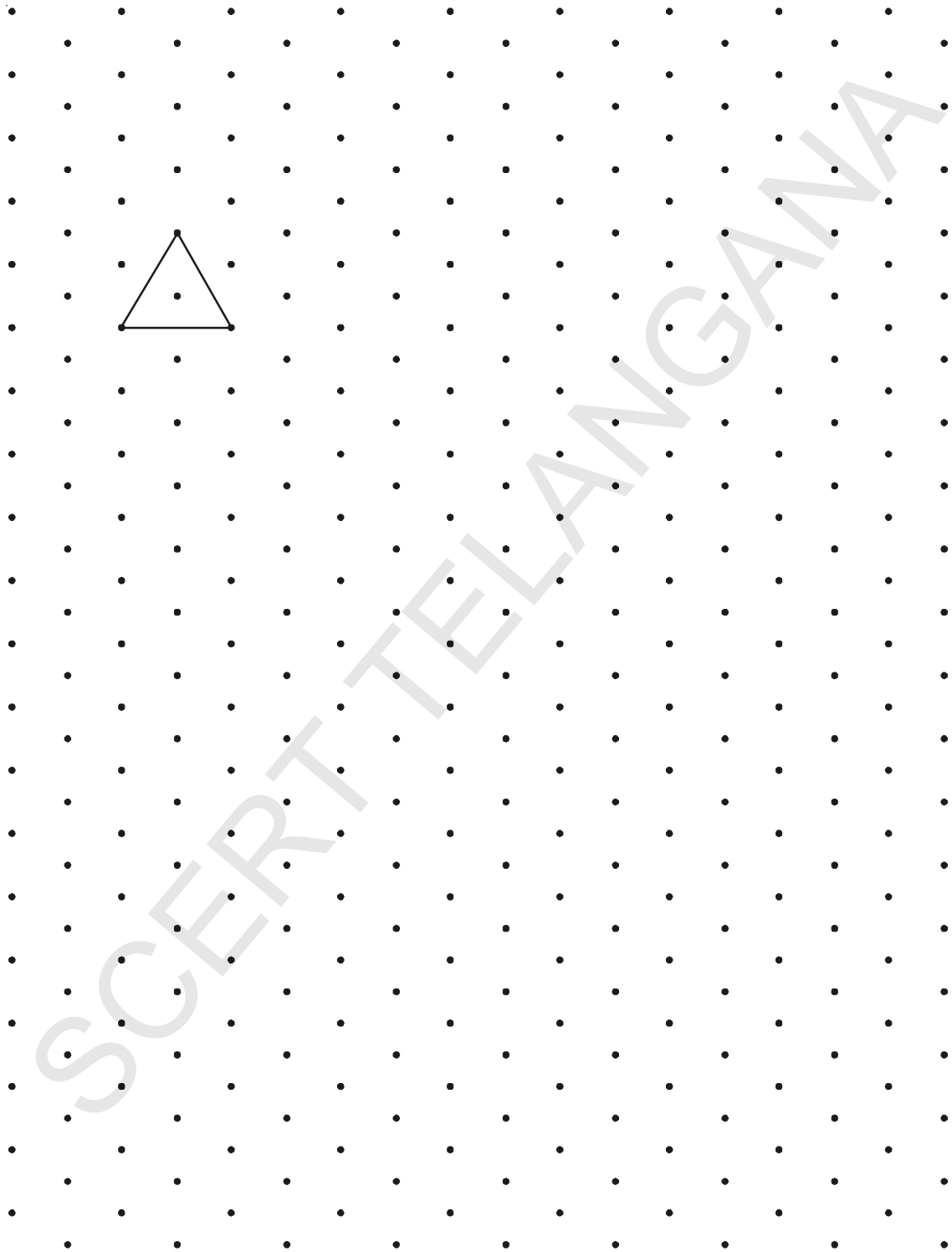
1. Look at the given nets. Tick (✓) the ones that can be folded into a cube.



- (a) Now, draw a different nets that can be folded into a cube in your notebook.
- (b) Also, Draw a net that will not give you a cube.

**Can you draw shapes on these dots?**

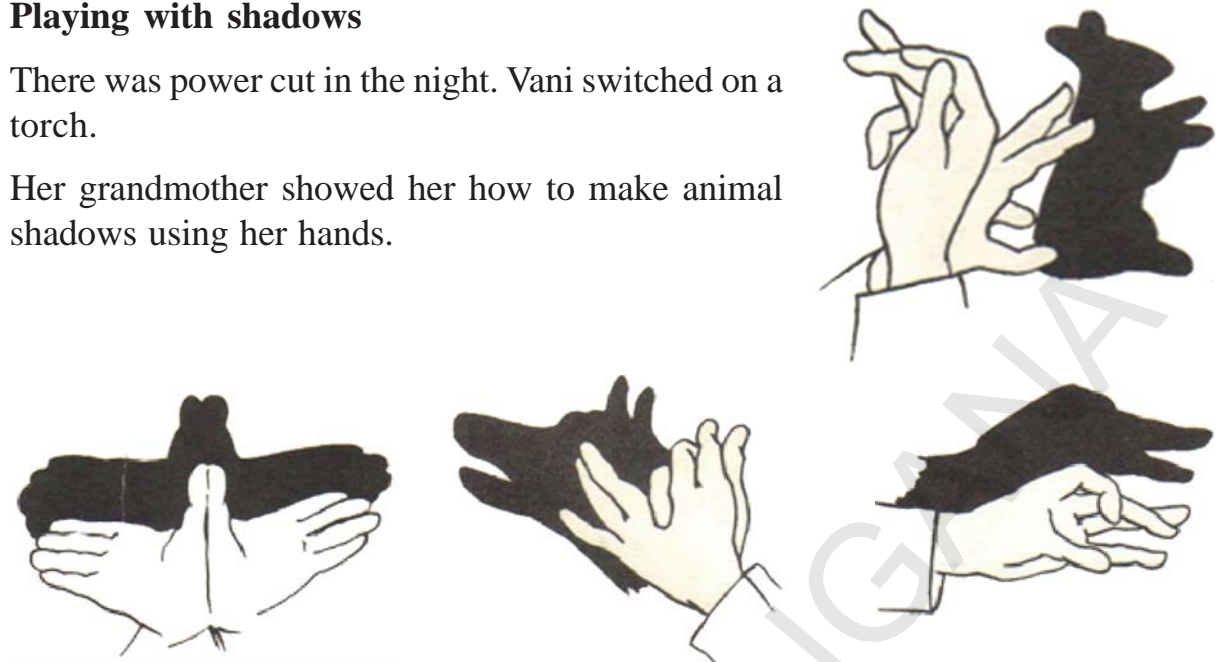
Make squares, rectangles and triangles of different sizes by joining the dots given below. one has been done for you.



## Playing with shadows

There was power cut in the night. Vani switched on a torch.

Her grandmother showed her how to make animal shadows using her hands.



### Try This

1. Make different animal shadows using your hands.

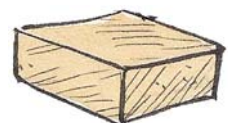
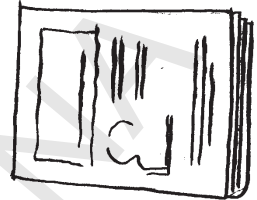
Vani and her Grandmother started looking at shadows of different objects.



Vani: We can get a rectangle shadow from a book. We can also get a rectangle shadow from a match box.

## Do This

- Can you match the shadows with the objects? Remember what Vani said that two different objects may have similar shadows.



## Circle

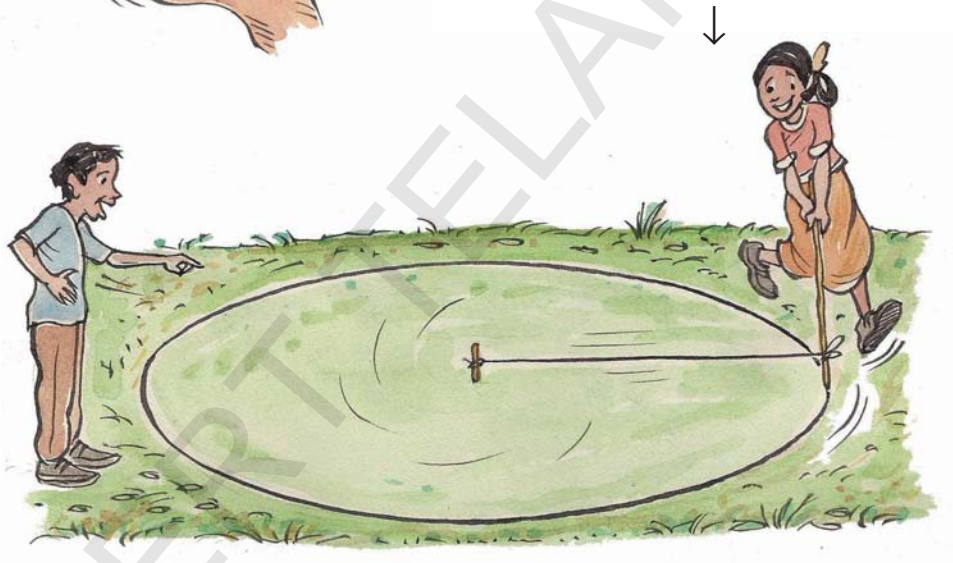
Vani saw that there were many objects whose shadows were circles, Ex:- bangles, balls and coins.

Next day Vani drew a circle with her bangle in the school.

Goutham also drew a circle with his coin.



Sujatha took a rope. She tied thick pieces of wood on both ends of the rope. She and Goutham made a circle on the ground using the rope. See the picture.



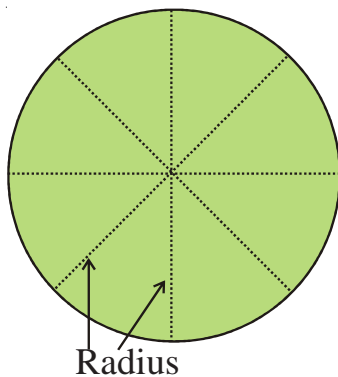
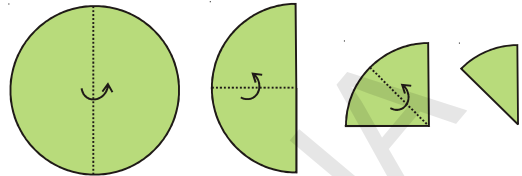
### Try This

1. Vani wants to make a smaller circle using the same rope. How can she do it?
2. Go out side with your friends. Make circles on the ground like Goutham and Sujatha.

Do you remember finding the centre of a square in the chapter on angles. Now, Let us find the centre of a circle.

### Activity

Take a bangle and draw circle on a piece of paper using it. Cut the circle. Fold it 3 times as shown in the picture.



Open it. Do you see the creases on the paper?

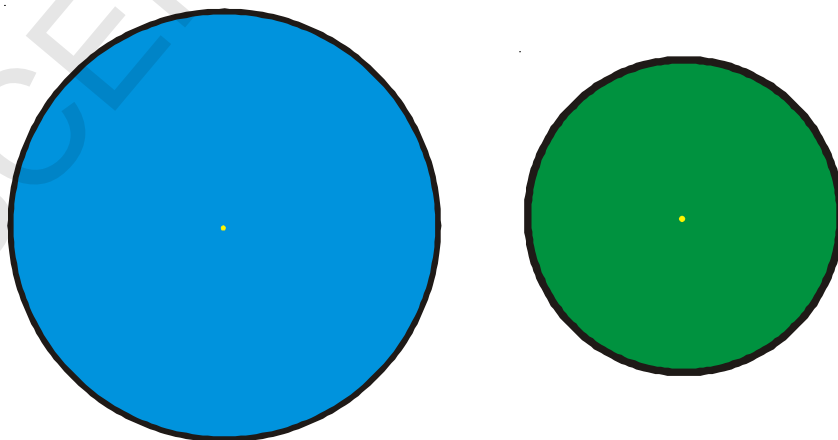
They are all meeting at one point. This is the centre of the circle.

Take a scale. Measure the length from the centre to the edge of the circle. Take as many different points on the edge, as you want.

You will find that the length from the center to the edge is the same each time. This length is called the radius of the circle.

### Do This

1. Tick (✓) the circle with the longer radius.
  - (a) The radius of the bigger circle is \_\_\_\_\_ cm.
  - (b) The radius of the smaller circle is \_\_\_\_\_ cm.



## Tangram

Grandmother was very happy that Vani was studying hard. She decided to reward Vani.

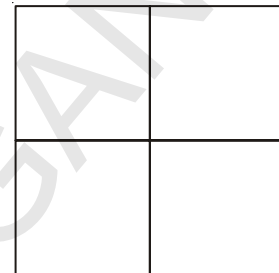
Grandmother: I will reward you with a Chinese puzzle - it is called **Tangram!!** Let us make a tangram set.

### Activity

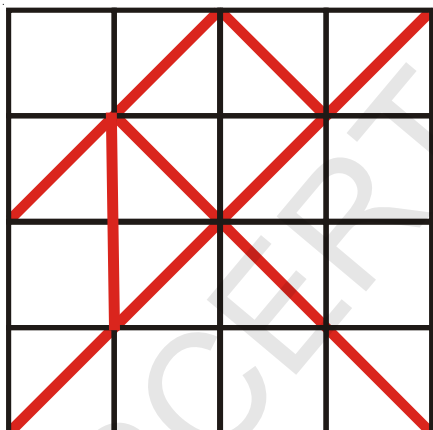
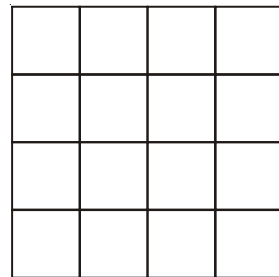
#### Lets make tangram

Take a hard sheet of paper. Use cartridge sheets or old cards or stick some white paper on cardboard.

Cut a big square from the sheet. Draw it into 4 equal parts as shown here.

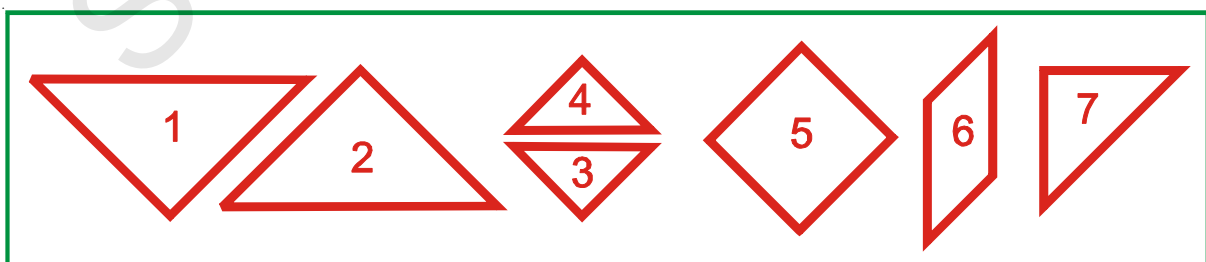


Then divide each of these parts into four more equal parts as shown-

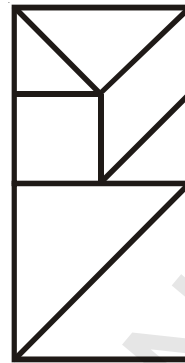
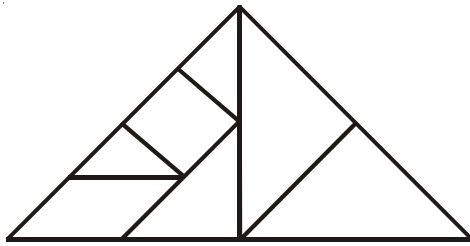


We get a grid with sixteen equal squares. Draw dark lines on the grid as shown.

Cut carefully along the dark lines. This is our **tangram set!** It has seven pieces. **How many squares are there? How many triangles are there?**



All the pieces of the tangram can be used to make different shapes a triangle and a rectangle have been made below



Now you make the some other shapes using all the pieces of tangram.


### Try This

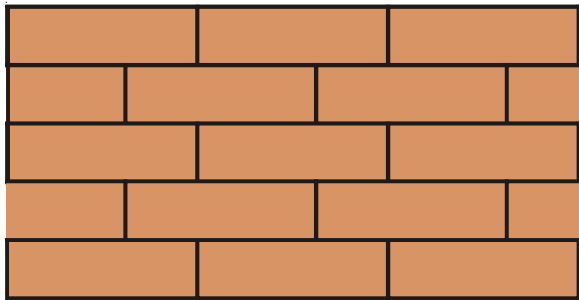
1. Make the figures given below using your tangram set.



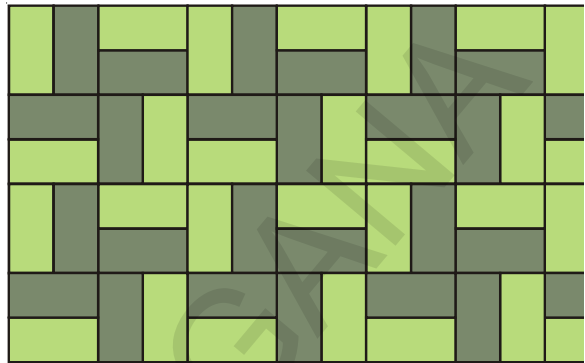
2. Make more new figures with your tangram set using all 7 pieces. Do not forget to look at the figures your classmates have made?

## Tiles

In a tangram, we have 7 different pieces. What if we had only 1 type of piece? Suppose you have  tile. We can arrange it as follows.



This looks like a brick wall.



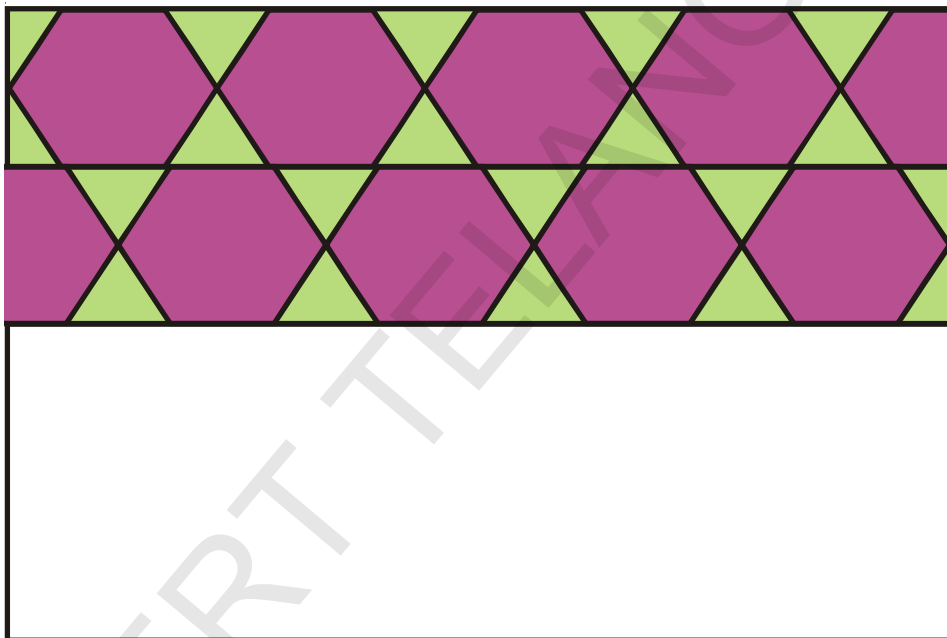
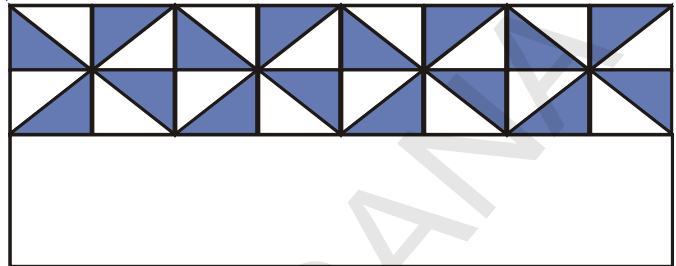
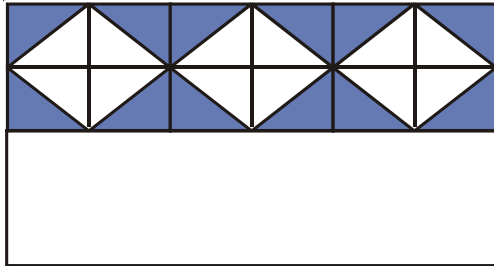
This looks like a floor pattern.

Now use  tile to make atleast 2 more floor patterns.



## Do This

1. Extend the given floor patterns. Also identify the tile which is repeating itself.

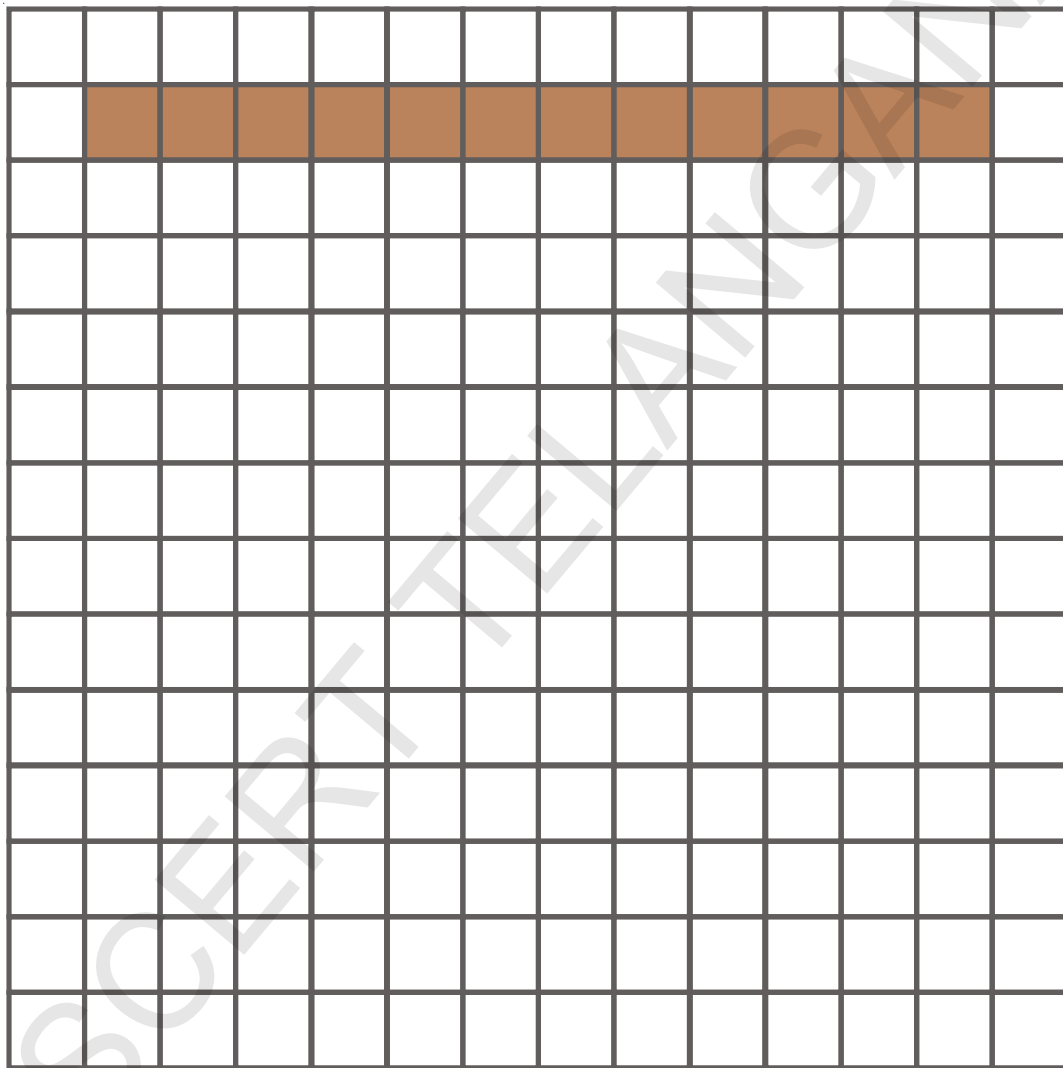


2. Make at least 3 floor patterns using the given tile .

# 8

## Spaces and boundaries-2

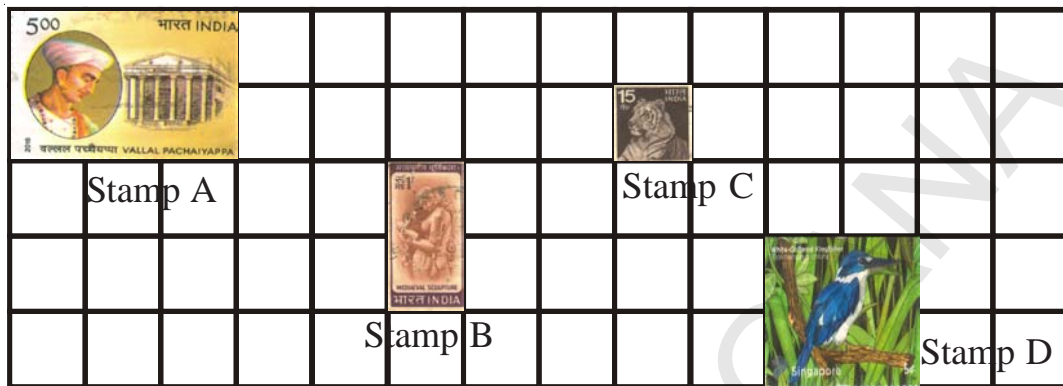
Use 12 squares to make as many types of rectangles as you can on the square sheet below. One has been done for you.



- (a) Do all the rectangles occupy the same area ?
- (b) Do all of them have the same perimeter? Which rectangle has the longest perimeter and which has the shortest?

### How much area do these stamps occupy?

- (a) How many squares of 1 cm side does stamp A cover?
- (b) How many squares of 1 cm side does stamp B cover?

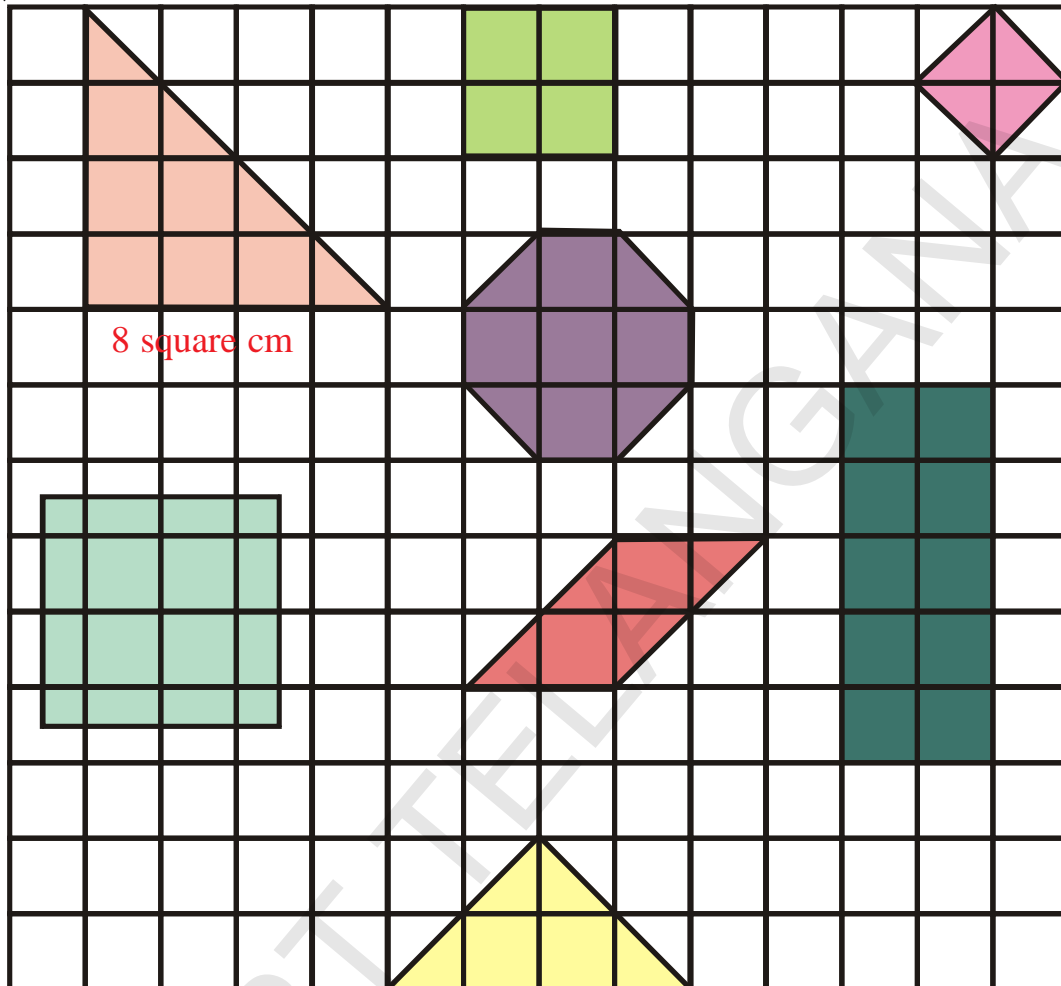


Stamp D covers 4 squares. Each square is of side 1 cm. So the area of the stamp is 4 square cm.

- (c) (i) Which stamp covers the largest area? \_\_\_\_\_
- (ii) How many squares of side 1 cm does this stamp cover? \_\_\_\_\_
- So this stamp's area = \_\_\_\_\_ square cm
- (d) (i) Which stamp covers the smallest area? \_\_\_\_\_
- (ii) How many squares of side 1 cm does this stamp cover? \_\_\_\_\_
- So this stamp's area = \_\_\_\_\_ square cm
- (e) What is the difference in the area of biggest and smallest stamp? \_\_\_\_\_ square cm

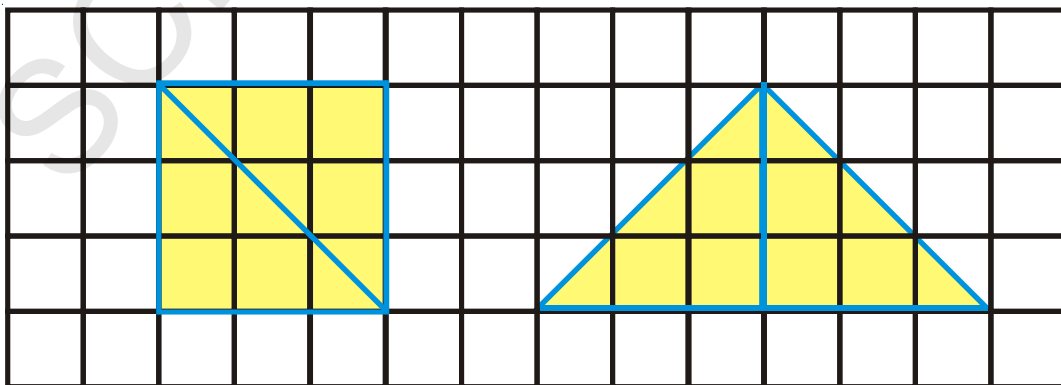
What is the area of the following figures drawn on the square sheet? Each square has side 1 cm. One has been done for you.

Hint : Two half squares make a whole square.



### Try This

1. Is the area of the square equal to the area of the triangle?

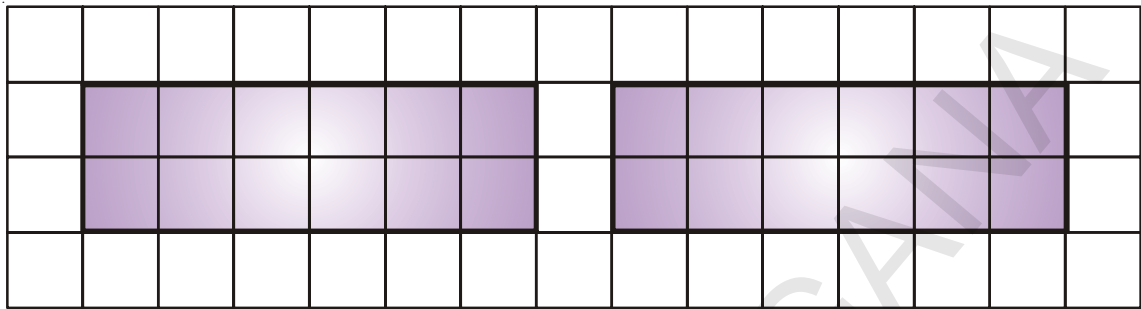


## Fun with rectangles

**Divide rectangles into triangles and rectangles of equal area.**

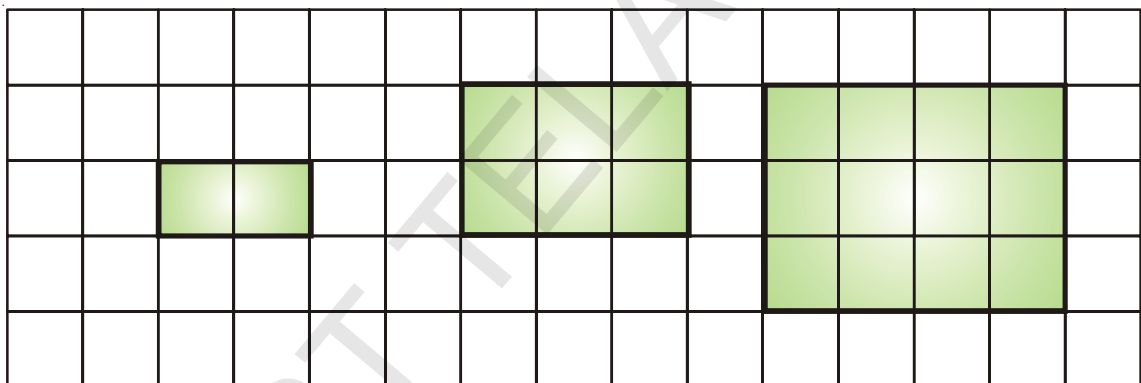
And do not forget to see how your friends have divided their rectangles.

- (a) Divide these rectangles into two smaller rectangles of equal area.



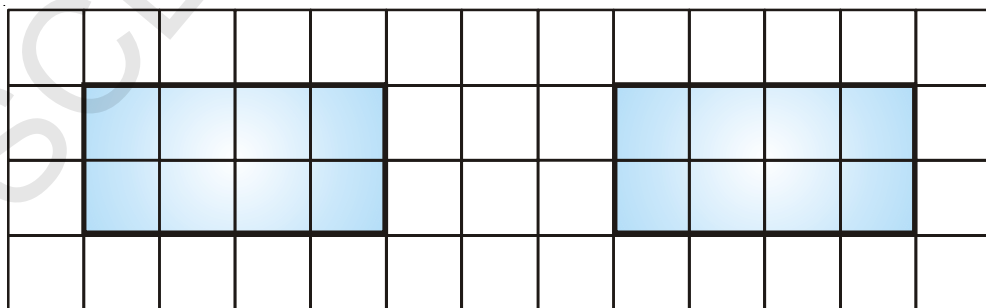
- (b) What is the area of the smaller rectangles?

- (a) Divide these rectangles into two triangles with equal area.



- (b) What is the area of the triangles?

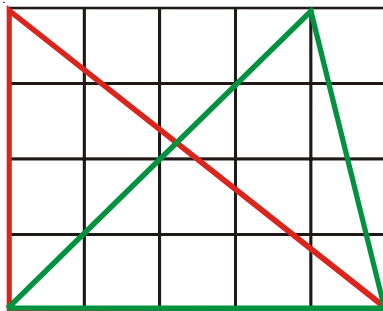
- (a) Divide these rectangles into four triangles with equal area.



- (b) What is the area of the triangles?

## Fun with Triangles

Madhu has divided the rectangle given below into 2 triangles.

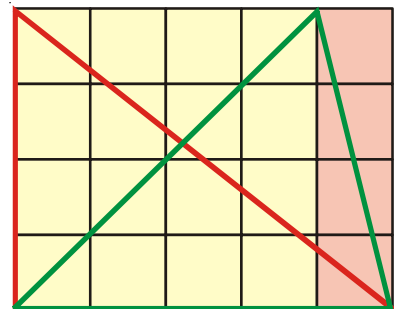


Both the triangles look different. Lets find out if their area is different?

The red triangle is half of the big rectangle. Area of the big rectangle is 20 square cm. So the area of the red triangle is \_\_\_\_\_ square cm.

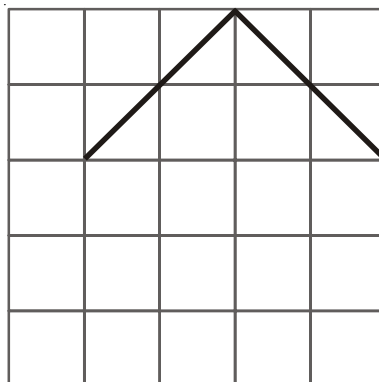
The green triangle contains halves of one square and one rectangle. Now you find the area of the square and rectangle and then the area of the triangle.

What is the area of the green triangle? \_\_\_\_\_



## Complete the shape according to its area

Sherya drew two sides of a shape. She asked Ravi to complete the shape with two more sides, so that its area is 8 square cm.



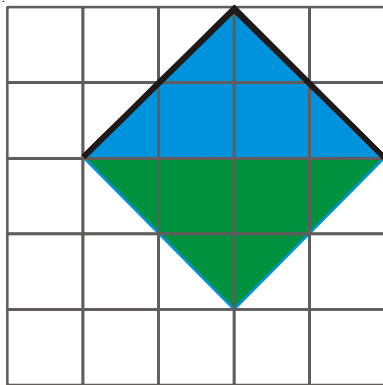
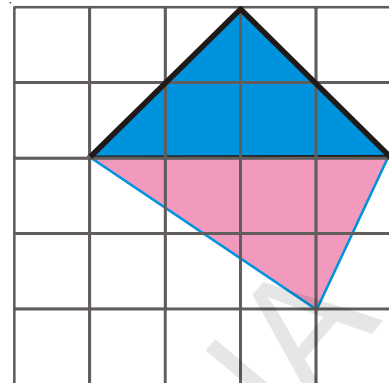
Ravi completed the shape like this.

(a) What is the area occupied by the blue triangle?

(b) What is the area occupied by the pink triangle?

Hint : The pink triangle contains halves of which two squares?

(c) Is the area of Ravi's shape 8 square cm?



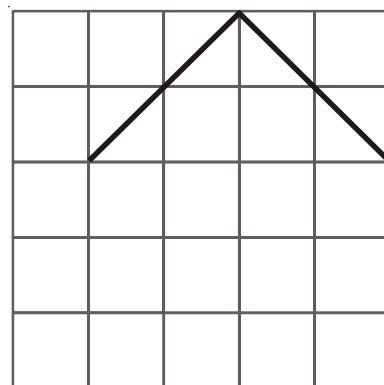
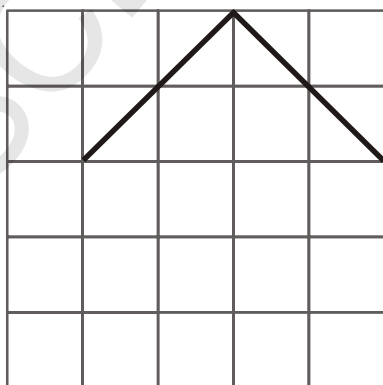
Oh, I thought of doing it differently! If you draw like this, the area is still 8 square cm.



(d) The green triangle contains halves of which two squares? Is the area of Sherya's shape also 8 square cm?

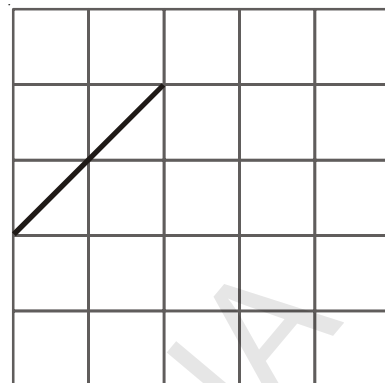
### Try This

1. Can you think of some other ways of completing the shape such that its area is 8 square cm?

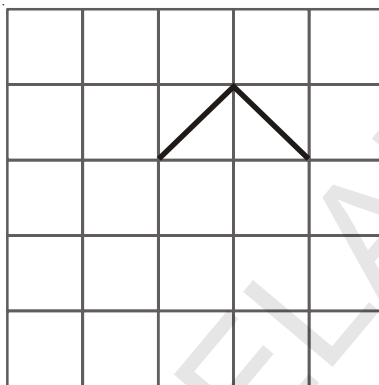


## Do This

1. This is one of the sides of a shape. Complete the shape so that its area is 6 square cm.



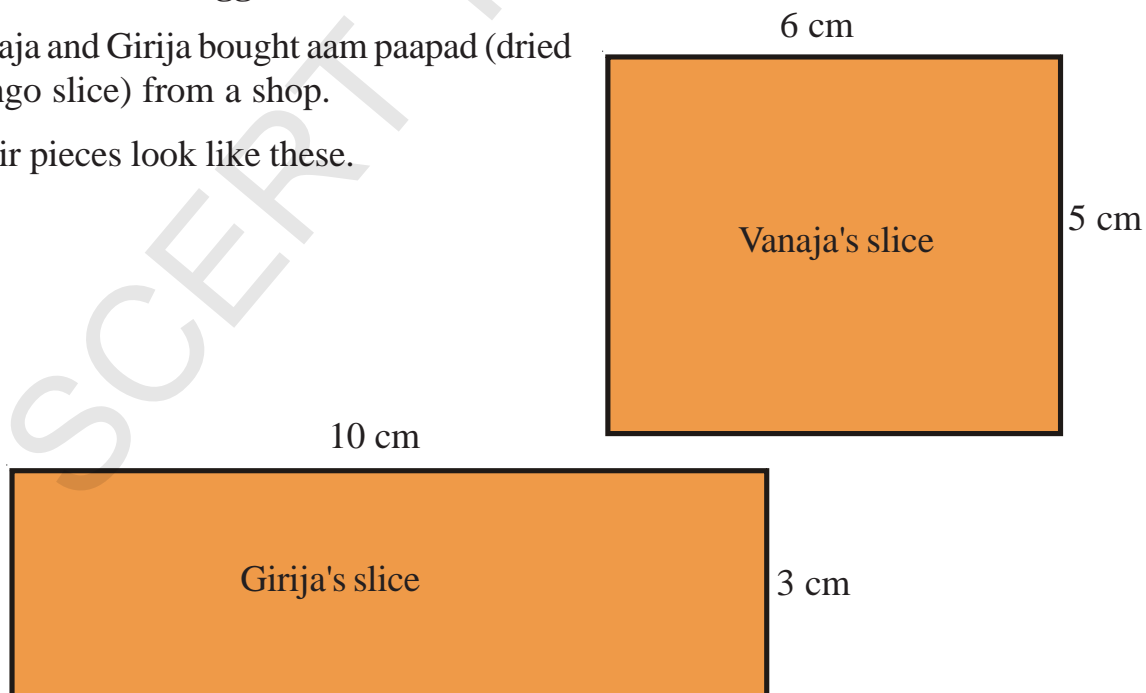
2. Two sides of a shape are drawn here. Complete the shape by drawing two more sides so that its area is 2 square cm.



## Whose slice is bigger?

Vanaja and Girija bought aam paapad (dried mango slice) from a shop.

Their pieces look like these.



Both felt that their peice was bigger than the other's. Can you think of some ways of finding out whether they are correct?

A friend of Vanaja and Girija showed one way, using small squares.

The length of Vanaja's slice is 6 cm.

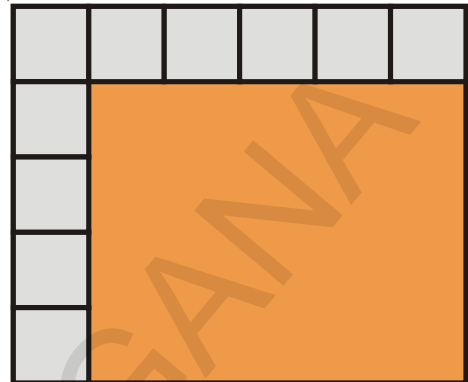
So 6 squares of side 1 cm can be arranged along its length.

The width of Vanaja's slice is 5 cm.

So 5 squares can be arranged along its width.

Altogether how many squares can be arranged on the aam papad? \_\_\_\_\_

So the area of Vanaja's piece is = \_\_\_\_\_ square cm.



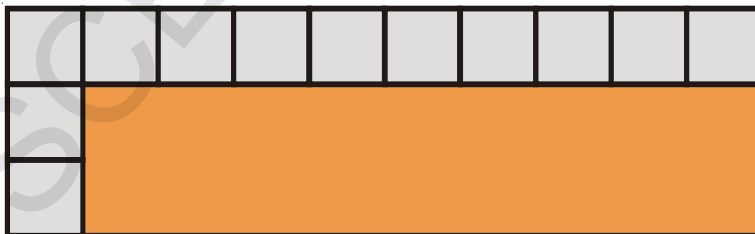
Vanaja : It's silly to count them all! Just multiply!

$$5 \times 6 = \text{_____ squares.}$$

In the same way find the area of Girija's piece.

What is the area of Girija's piece?

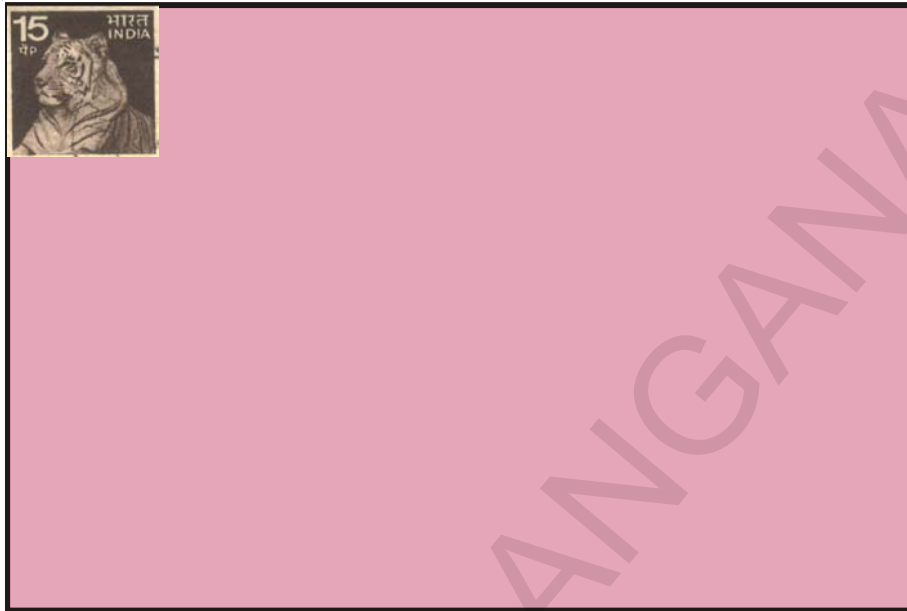
$$\text{_____} \times \text{_____} = \text{_____ squares}$$



Is Vanaja's piece bigger than Girija's?

### Cover with stamps

This stamp has an area of 4 square cm. Estimate, how many such stamps will cover this big pink rectangle.



### Check your estimate

- (a) How many stamps can be placed along the length of the pink rectangle?  
\_\_\_\_\_
- (b) Now, measure the length of pink rectangle. It is \_\_\_\_\_ cm long.
- (c) How many stamps can be placed along the width of the pink rectangle?  
\_\_\_\_\_
- (d) Now, measure how wide is the rectangle? \_\_\_\_\_ cm
- (e) How many stamps are needed to cover the rectangle? \_\_\_\_\_
- (g) What is the area of the rectangle? \_\_\_\_\_ square cm
- (h) What is the perimeter of the rectangle? \_\_\_\_\_ cm

### Area of bigger spaces

You must have seen a meter rod at the tailor's shop. You might have also used a meter rope to measure various lengths in school.

Now use a chalk and draw a square of length 1 meter at one corner of your classroom like Gita has done?

Estimate, how many such squares will cover the floor of your classroom?

What is the area of your classroom?  
\_\_\_\_\_ square meters.



### Try This

If you were to find the area of each of the the things written in the table below, which unit would you choose? Tick the correct option (✓).

	Square cm	Square meter
Handkerchief		
Sari		
Page of your book		
School land		

# 9

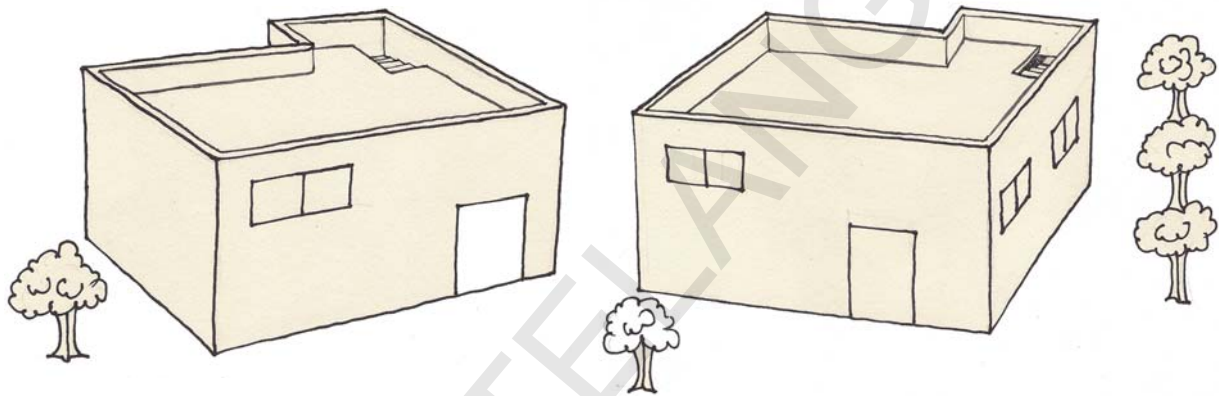
## Maps and Routes

Sheela along with her mother visited her grandmother in the village.



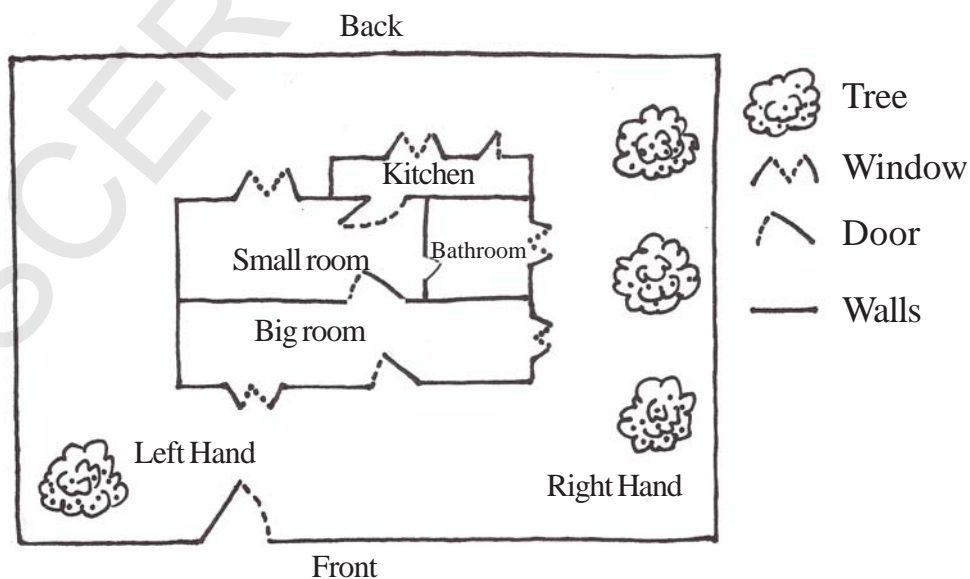
How does Grandma's house look like?

Sheela's mother drew the following pictures and has shown to Vani.



Sheela: This is how the house looks from outside. But how can I know how many rooms are there? How many doors and windows!

Then her mother drew the following map.



The lower part of the map shows the front of the house. Trees, doors, windows, walls and rooms are marked.

### Do This

Look at the map and answer:

- How many windows are there in the big room?
- How many trees are on the right side of the house?
- How many doors are there in the small room?
- Write the correct name to the following sign.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

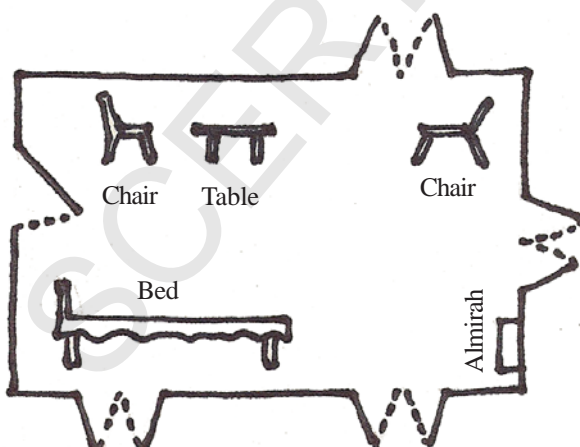


\_\_\_\_\_

- How many rooms are there in the house? \_\_\_\_\_

### Sheela's room

Sheela decided to draw the floor map of her room. Look.



These maps are called 'Floor Maps'

### Try This

1. Look at Sheela's map and draw the symbols for the following:

Chair

Bed

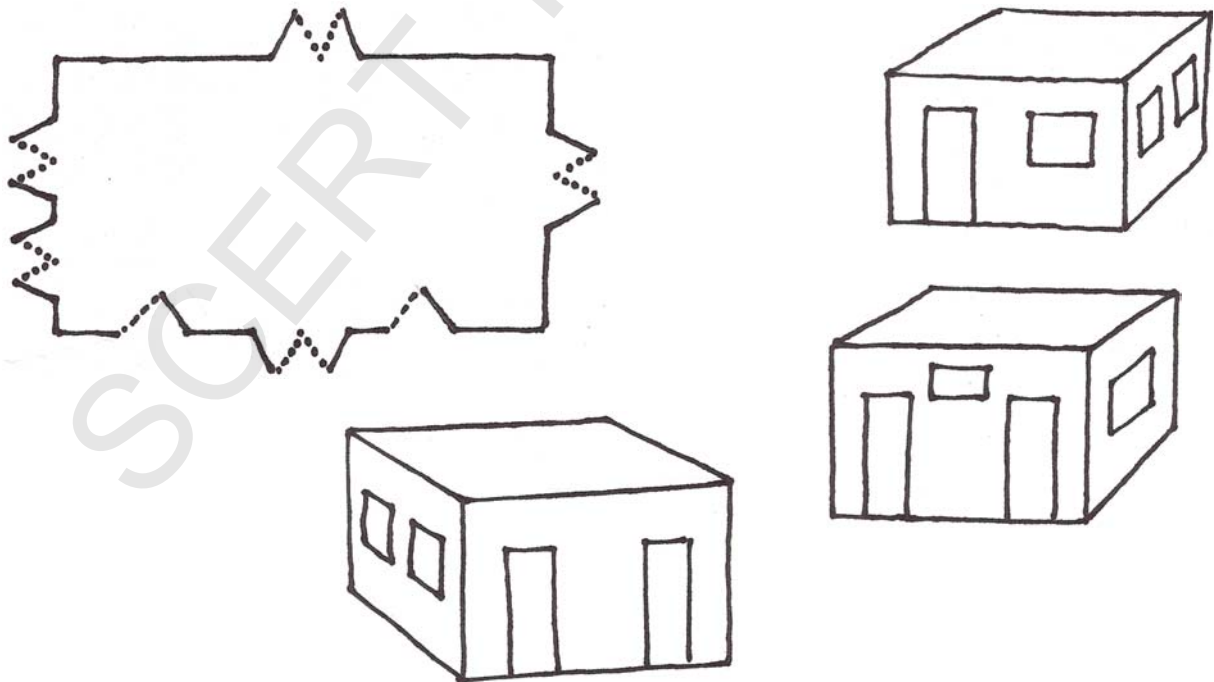
Door

2. Now look around your classroom and draw its floor map. Remember to draw the front of the room on the lower side of paper. Mark the following on your floormap:

Black board, Place where teacher stands, Place where children sit, doors and windows.

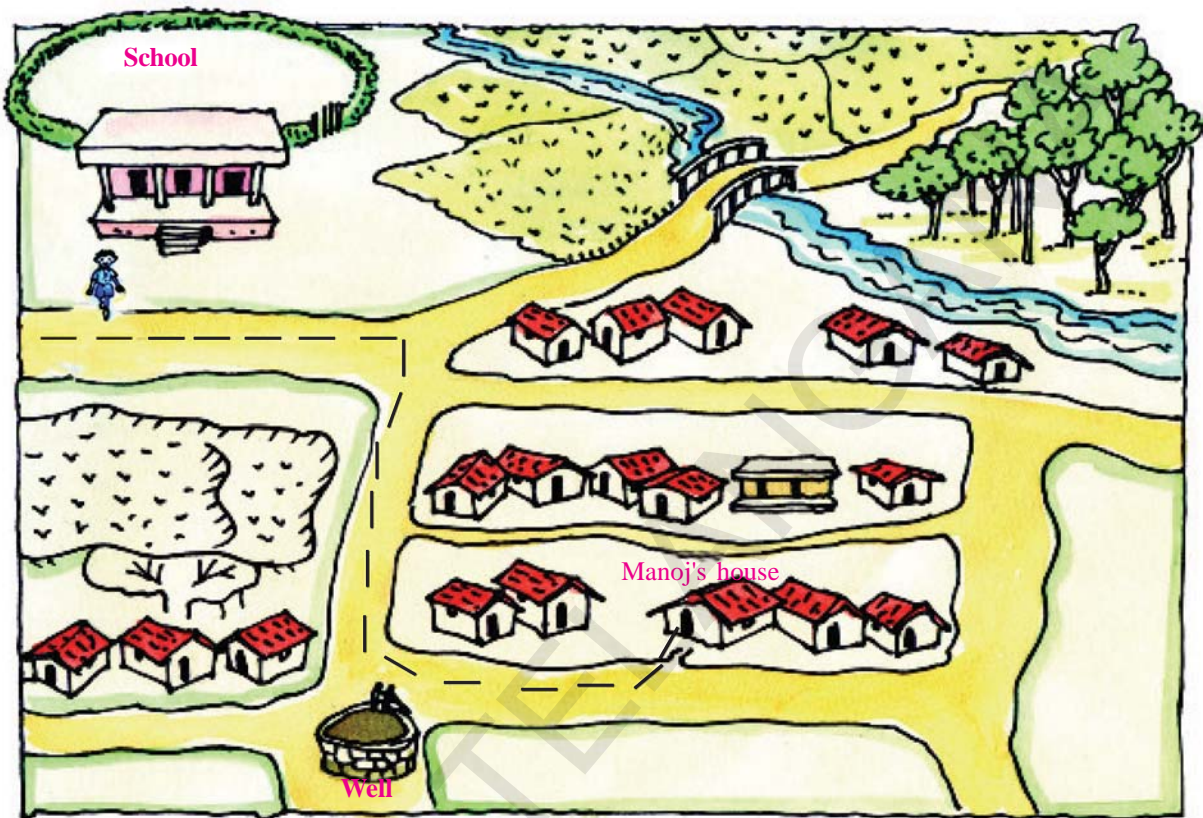
### Do This

1. Can you match the floor map with the correct house?



### Route map to the school

A new boy Manoj had come to school. He did not know the way to school. So the teacher drew a map to help him.



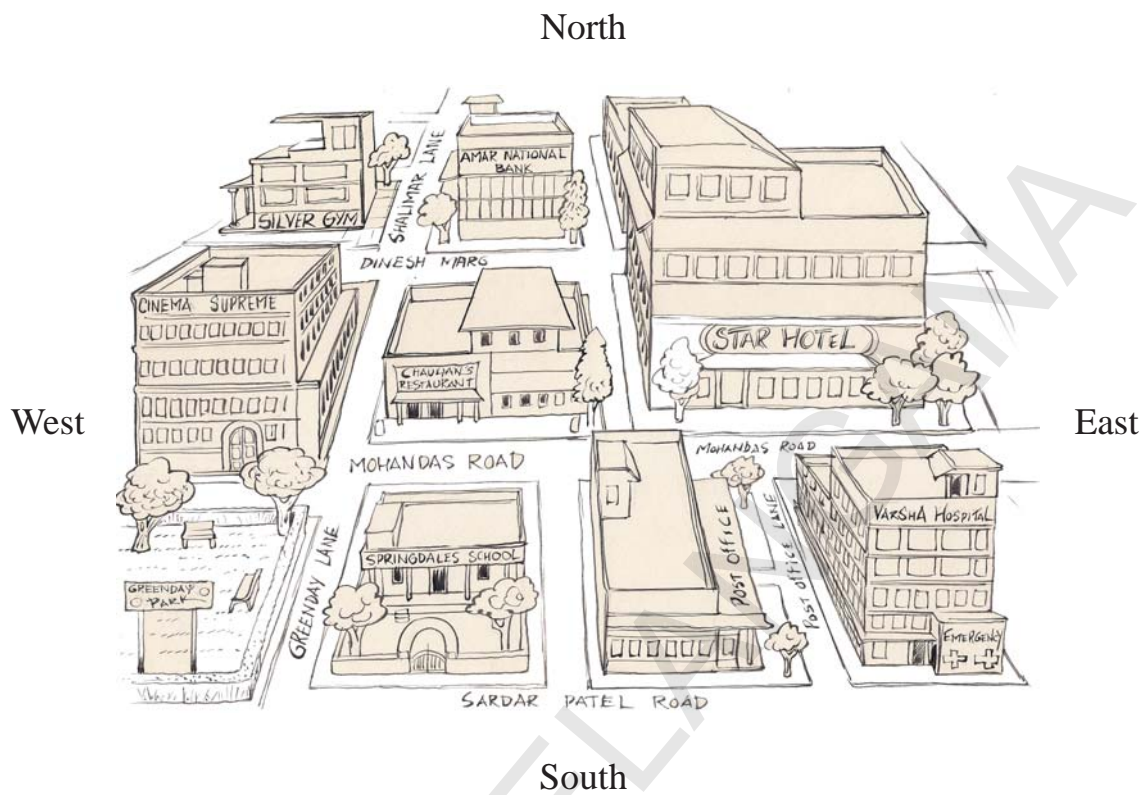
#### Do This

Fill in the blanks and tell Manoj the way from school to his home.

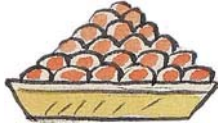
Come out from the school. Turn \_\_\_\_ on the road. Then walk straight and turn on the first \_\_\_\_\_. Then again walk straight. You will see a well. Turn \_\_\_\_\_.

The third house is Manoj's house.

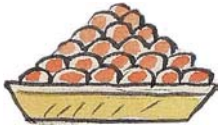
## Do This



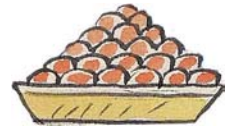
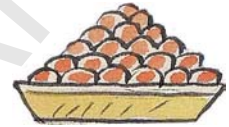
1. Look at the map given above.
  - (a) If you walk from Cinema supreme to star Hotel, Chauhan's restaurant is on which side?
  - (b) Sheela is at Silver gym. Tell her the way from Gym to Varsha Hospital, Emergency Room.



It is festival time and Raghu's mother is making 5 kg of laddoos. She gives Raghu this grocery list



<b>Bengal gram flour</b>	<b>2 kg</b>
<b>Sugar</b>	<b>3 kg</b>
<b>Kishmish</b>	<b>200 gms</b>
<b>Kaaju</b>	<b>150 gms</b>
<b>Badam</b>	<b>100 gms</b>



- What is the total weight of dry fruits that Raghu has been asked to bring?
- Write the items on the list in the order of their weights, from lightest to heaviest.
- If Raghu's mother had to make 10 kg of laddoos, then how much more of each item would Raghu have to buy from the store?

### Tea Lovers

Pooja lives in Hyderabad with her parents. They all love having tea. They use 3 spoons of tea powder each time they make tea for the three of them. They take daily three times in a day. Each spoon holds about 5 gm of powder leaves.



1. In summer the family has tea, 4 times in the day.
  - (a) How many grams of tea powder will they use on a summer day?
  - (b) How much tea powder will they use in a summer month? Is this more than one kg or less than one kg?
2. In winter they make tea, 6 times in the day.
  - (a) How many grams of tea powder will they use on a winter day?
  - (b) How much tea powder will they use in a winter month? Is this more than one kg or less than one kg?

### Do This

1. Go to your nearest grocery shop. Hold the following objects and estimate their weight. Then read their weights and check your estimates.

Item name	Estimated weight	Actual weight
Soap		
Toothpaste		
Washing powder packet		
Rice sack		
Salt packet		
Red gram dal packet		

2. At your home, which items in the kitchen are purchased in grams and which in kilograms?

Items Purchased in kilograms	Items Purchased in grams

### Vishal's shop

Vishal has a big scrap shop. Today, he has received 45 kg of old newspaper, 26 kg scrap iron and 8 kg of waste plastic at his shop.



- (a) What is the total weight of his collection in the day?
- (b) Vishal paid ₹ 8 for every 1 kg old paper. How much he would have paid for 45 kg?
- (c) Vishal paid ₹ 520 for all the scrap iron that he collected. How much did he pay for 1 kg of scrap iron?
- (d) If Vishal paid ₹ 1000 for all the material given above, then how much did he pay for 8 kg of plastic material? How much did he pay for 1 kg of plastic material?
- (e) Vishal sold each of the three items for ₹ 3 per kg more than what he had purchased them for. So, how much has he earned in the day?

## Measure your weight

Find out your weight and the weight of 4 of your friends using a measuring scale.

Name	Weight
	_____ kg _____ gm



Who is the heaviest? \_\_\_\_\_

Who is the lightest? \_\_\_\_\_

## At the Grocery Shop

A shopkeeper has 170 kg of Bengal gram dal, 450 kg of Red gram dal and 240 kg Green gram dal in stock. He sells these dals in packets of 2 kg, 1 kg and 500 gm.



- He makes 2 kg packets of Red gram that he has in stock. How many packets will he have?
- He packs 80 kg of Bengal gram in 1 kg packets and 90 kg in 500 gm packets. How many packets of each weight will he have?
- He packs 80 kg of Green gram in 2 kg packets, 40 kg in 1 kg packets and 120 kg in 500 gm packets. How many packets of each weight will he have?

A wholesale grocer has items in larger quantities.

Fill in the table with total weight of each item.

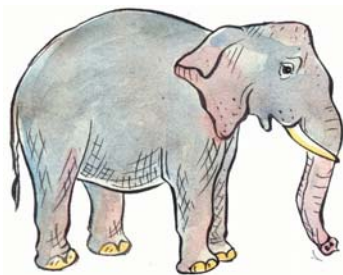
1 Quintal = 100 kilograms

Item	No. of bags	Weight of each bag	Total weight	
			kg	quintals
Onions	20	40 kg		
Paddy	18	75 kg		
Red gram	10	70 kg		

### The heaviest animals in the world

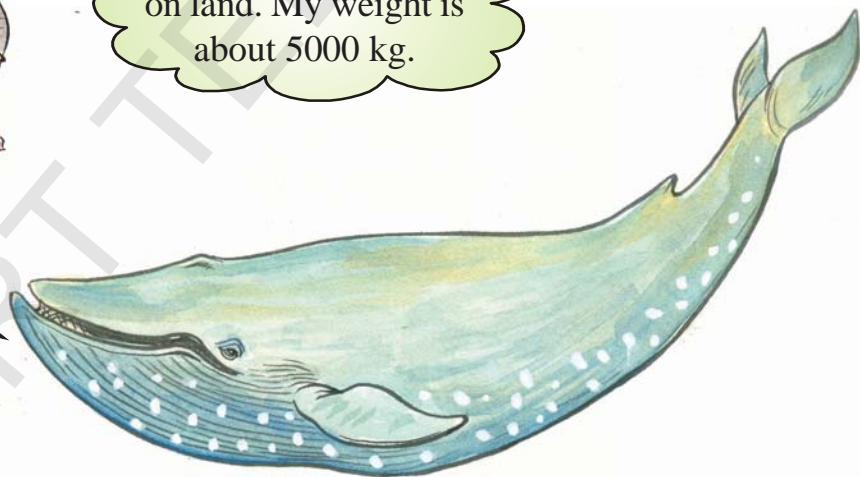
About how many kilograms do you think a cat weighs? Similarly Dog's? Pig's? Cow's?

Who do you think is the heaviest animal in the world?



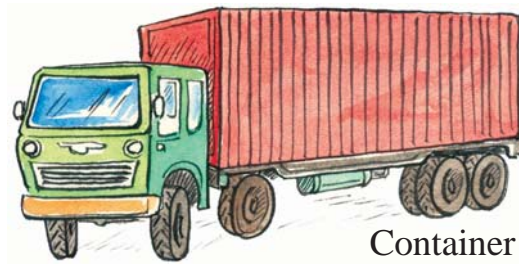
I am the heaviest animal on land. My weight is about 5000 kg.

My weight is about 35 times more than yours. I live in sea.



- Think, which animal in your surroundings weighs closest to your weight?
- If each child in your class weighs 25 kg, then will the weight of all the students in your class be more than or less than an elephant's weight?
- The weight of the elephant is about how many times of your weight?
- How many quintals does the elephant weigh?

## Heavy weight carriers



Container Truck



Truck



Lorry

How much weight can these trucks carry?

- (a) The lorry can carry 7500 kg. of weight. If one carton weighs 15 kg then how many such cartons can the lorry carry?
- (b) The truck can carry 9,000 kg. of weight Shyam is loading sacks of rice into the truck, each weighing about 50kg. How many such sacks can Shyam load into the truck?
- (c) The container truck can carry 20,000kg. of weight. How many cars weighing each about 2500 kg can the truck carry?
- (d) How many quintals of weight can the three types of vehicles carry?

### Exercise

1. The weight of one mango is 400 gm, one guava is 200 gm and one musk melon is 1 kg 200 gm. Now fill this table based on this information.

Weight of 2 mangoes = Weight of \_\_\_\_\_ guavas

Weight of 5 musk melons = Weight of \_\_\_\_\_ mangoes

Weight of 5 mangoes and 2 guavas = Weight of \_\_\_\_\_ musk melons

2. Bhanu bought 3 kg 500 gm of jilebi, 2 kg 250 gm of mysorepak and 1 kg 750 gm badhushaw and 750 gm of jamun. What is the total weight of the sweets that Bhanu bought?
3. A box contains 8 kg 750 grams of apples. If there are 12 such boxes, find the total weight of apples?
4. A school received 6 quintals of rice for mid-day meal in the month of June. They utilized 475 kg. How many kg of rice is unutilized?
5. This truck can carry 10000 kg of weight.



- (a) So how many quintals can the truck carry?
- (b) If it is already loaded with 3650 kg, how many more kilograms of weight can it carry? the weight equals to about how many quintals?

# 11

## Many more litres

Ichoda milk cooperative society collects milk from surrounding villages.



1 litre = 1000 millilitres

Litre is written in short as L or l.

Millilitre is written in short as mL or ml.

Four farmers from Ponna village supply to it milk in the following quantities

Laxmi : 12 L 500 ml

Ramaiah : 9 L

Rahim : 8 L 800 ml

Jani : 10 L 700 ml

- Arrange the names of the farmers in the order of the amounts of milk supplied from highest to lowest.
- What is the total quantity of milk supplied by the farmers of Ponna village?
- If the cooperative society pays ₹ 20 per litre to the farmers, how much money will Rahim get?

Hint : What part of a litre is 800 ml?

- If 12 villages supply the same amount of milk in a day as Poona village, then how much milk will the cooperative society collect in a day?

### At the milk processing and packaging unit

The cooperative milk society actually collects 336 L of milk in a day. After processing they pack the milk into packets of 1 L, 500 ml and 250 ml.



- (a) 110 L of milk is packed into 1 L packets. How many such packets will be made?
- (b) 90 L of milk is packed into 500 ml packets. How many such packets will be made?

Hint : How many 500 ml are there in 1 L?

- (c) 100 L of milk is packed into 250 ml packets. How many such packets will be made?

Hint : How many 250 ml are there in 1 L?

- (d) How many litres of milk is packeted?
- (e) The rest of the milk is wasted during processing. How much milk is wasted?

### Sending milk to various homes

The cooperative society employs various milk boys to sell its milk. Each milk boy gets a daily commission of ₹ 65 for his work.

Kishan has sold 12 packets of 500 ml, 24 packets of 250 ml and 22 packets of 1 L, in a day.

- (a) How much milk has he sold in the day?

Balaji supplies 8 L of milk in 500 ml packets and 6 L of milk in 250 ml packets.

- (a) How many 500 ml packets he sold?
- (b) How many 250 ml packets he sold?



## Try This

1. A milk boy sold milk in packets of 250 ml and 500 ml. He sold 6 L of milk in 17 packets . How many packets of each type did he sell?

### Painting home

Amar wants to paint his home. He went to the paint shop and bought white, yellow, red and green colour paints. The details of the quantity of each paint he bought are given below.



Colour	Capacity per can	No. of cans	Cost per litre
Yellow	50 ml	3	₹ 400
Green	100 ml	2	₹ 500
Red	200 ml	3	₹ 500
White	10 litres	4	₹ 120

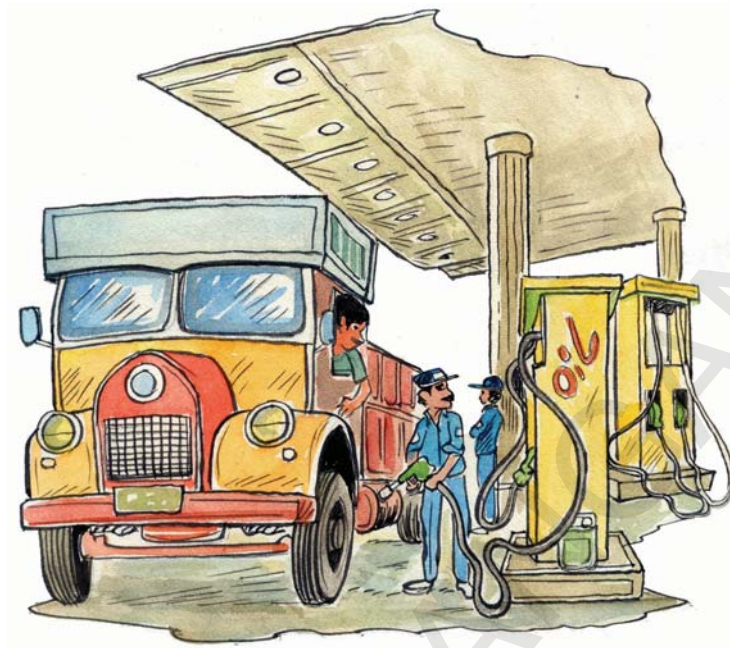


- (a) How many litres of paint did Amar buy in all?
- (b) How much would one 100 ml can of green paint cost?  
How much money did Amar spend on green paint?  
Hint : What part of 1 L is 100 ml?
- (c) How much would one 200 ml can of red paint cost? How much money did Amar spend on red paint?  
Hint : What part of 1 L is 200 ml?
- (d) How much would one 50 ml can of yellow paint cost? How much money did Amar spend on yellow paint?  
Hint : What part of 1 L is 50 ml?
- (e) How much does 10 L of white paint cost? How much money did Amar spend on white paint?
- (f) What is the total amount that Amar spent on paint?



## Petrol pump

Ganesh petrol pump is a busy petrol pump.



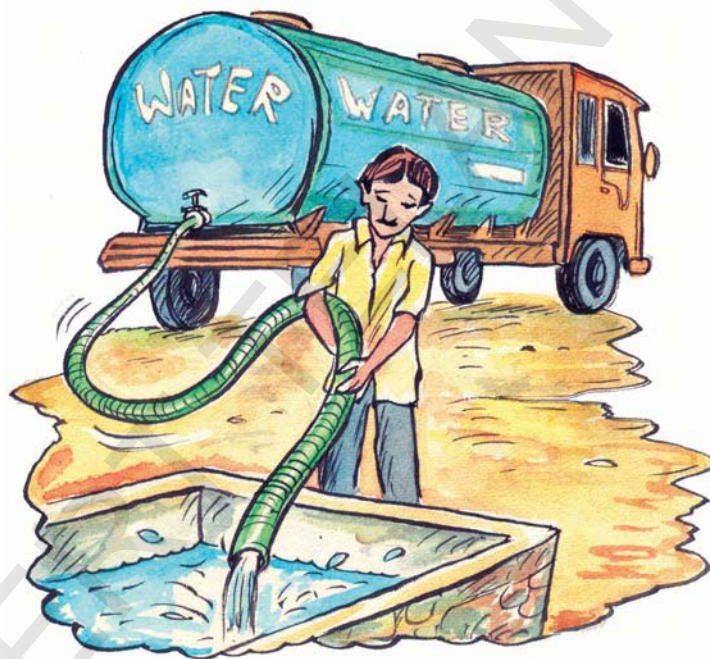
The following are the details of the sale of petrol and diesel made by the petrol pump in a day.

Vehicle	Fuel	Number of litres per vehicle	Total number of litres
4 container trucks	Diesel	1000	
4 trucks	Diesel	800	
4 lorries	Diesel	600	
6 buses	Diesel	300	
6 cars	Petrol	30	
7 Jeeps	Diesel	40	

- How many litres of petrol and diesel did the pump sell in the day?
- If the underground tank which stores diesel at the pump holds 16000 litres in the morning, how much diesel will it hold at the end of the day?
- If the petrol pump has to maintain a full tank of 16000 L by next morning, how many more litres of diesel need to be pumped into it?

## Exercise

1. A juice vendor sold 67 glasses of orange juice in a day. If each glass of juice holds 250 ml then how many litres of juice did the vendor sell? If the vendor sold 15 glasses of pineapple juice, then how many litres of pineapple juice did he sell?
2. A cow gave 14 L 500 ml of milk in the morning and 13 L and 750 ml of milk in the evening. How much milk did the cow give in one day?
3. A cup can hold 50 ml of tea. How much tea will be there in 12 such cups?
4. A tanker is carrying 9000 litres of water. If it has to deliver 1500 litres of water at each location, then to how many locations can it deliver water?



5. Raju fills 5 litres of petrol in his car every 3 days. How many litres of petrol does he fill in a month? If the cost of petrol is ₹ 69 per litre, how much does Raju spend on petrol every month?
6. A bus driver paid ₹ 2250 at petrol pump for diesel. If the cost of diesel is ₹ 50 per litre, then how many litres of diesel did he buy?

Gayathri's school is celebrating Children's day. All the parents got an invitation card, along with the programme.

### Do This

Look at the card and answer :

- The group song will start at \_\_\_\_\_ and end at \_\_\_\_\_.
- The group dance is \_\_\_\_\_ minutes long.
- \_\_\_\_\_ is the longest item in the programme.
- The whole programme is \_\_\_\_\_ hours and \_\_\_\_\_ minutes long.

### We Welcome You Programme

<i>Programme</i>	<i>Time</i>
<i>Welcome</i>	9:00
<i>Group song</i>	9:10
<i>Drama</i>	9:15
<i>Violin Recital</i>	9:45
<i>Solo song</i>	9:55
<i>Quiz</i>	10:00
<i>Group Dance</i>	10:30
<i>JAM</i>	10:40
<i>Prize Distribution</i>	10:50
<i>National Anthem</i>	11:10
<i>Bid farewell to Chief Guest</i>	11:15

### 9 o'clock in the morning or 9 o'clock in the night?

Gayathri took the invitation card home.

Gayathri : Grand Mother, you must come to my school.  
The programme will start at 9:00.

Grand Mother : At 9:00 in the morning or 9:00 at night?

Gayathri : Don't joke, Grand Mother! Of course in the morning.

But later Gayathri asked her mother 9 o'clock comes twice in the day. How can we show that it is morning or evening?



Mother : We use 'am' and 'pm'.

Gayathri : But how do I know when to put 'am' or 'pm'.

Mother : If the time is before 12 noon, we use am and if it is afterwards then pm.

Gayathri was confused so mother gave her some exercises.

### Do This

1. Help Gayathri fill in the blanks with am or pm.

(a) The day/night cricket match will start at 1:30 \_\_\_\_.

(b) I do homework in the evening at 7:00 \_\_\_\_.

(c) I get up in the morning at 6:30 \_\_\_\_.

(d) The sun will set at 6:30 \_\_\_\_.

(e) Mother leaves for office at 8:30 \_\_\_\_.

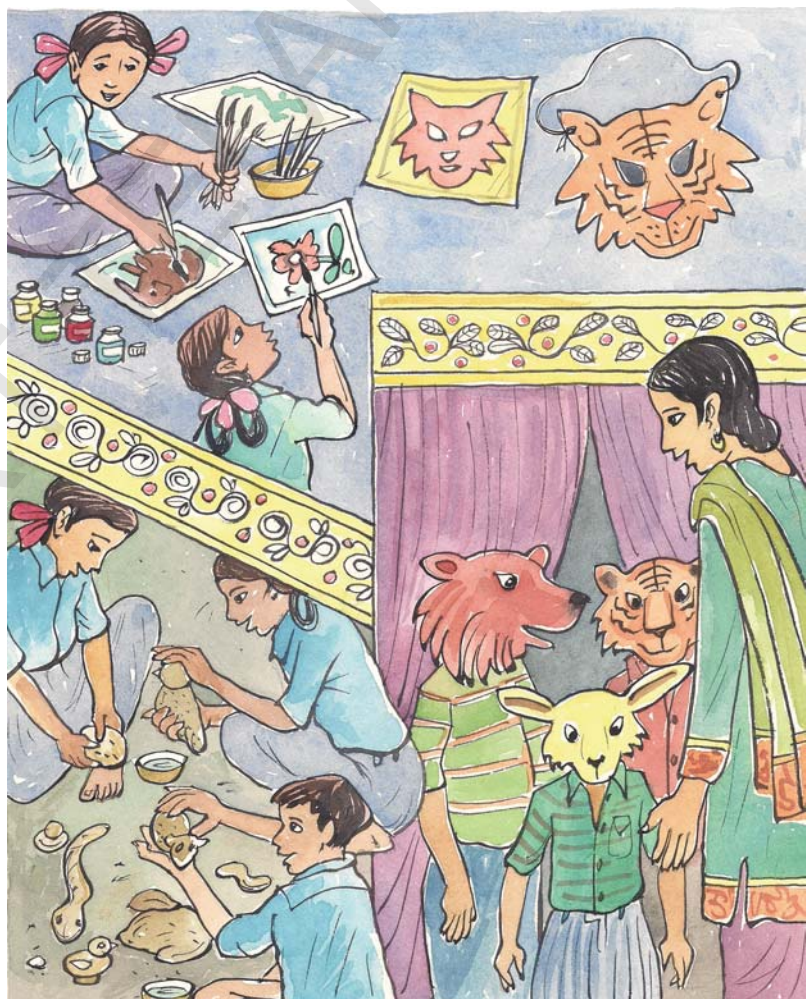
(f) My school starts at 9:00 \_\_\_\_.

(g) We can see the stars at 11:00 \_\_\_\_.

(h) Mid-day meal is at 12:30 \_\_\_\_.

### Preparing for the function

Next day Gayathri and other children started preparing items for the function. First they looked at how much time each item would take.



Fill the time-table by looking at the invitation card

S.No.	Item	Time slot	Duration
1.	Welcome	9:00-9:10	10 Minutes
2.	Group song	9:10-9:15	5 Minutes
3.	-----	-----	-----
4.	-----	-----	-----
5.	Solo Song	9:55- ----	5 Minutes
6.	-----	-----	-----
7.	-----	-----	-----
8.	JAM	10:40-10:50	10 Minutes
9.	-----	-----	-----
10.	National Anthem	11:10-11:15	5 Minutes
		Total time =	----- Minutes



All items together  
will take 135  
minutes.

No, the programme  
is 2 hours 15  
minutes long.



135 minutes and 2 hours 15 minutes are same. See how.

1 hour = 60 minutes.

2 hours =  $2 \times 60$  minutes

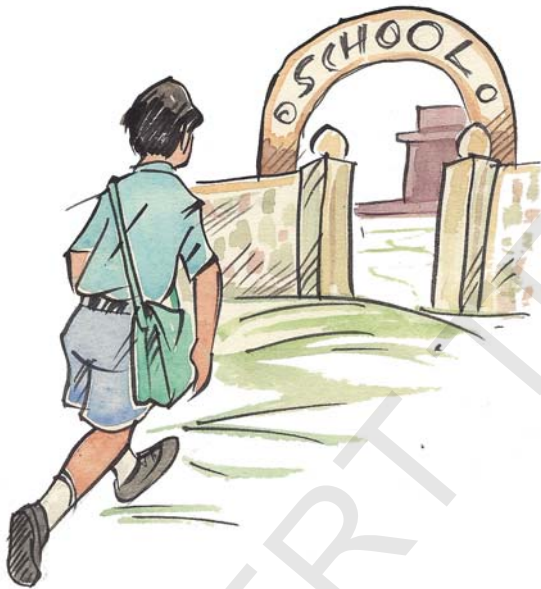
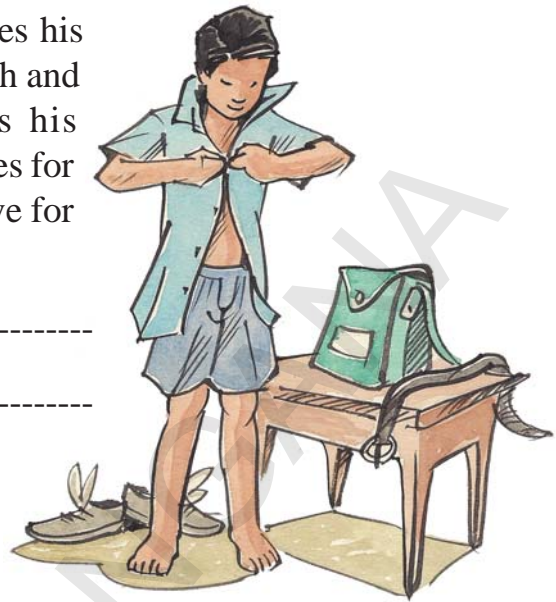
= 120 minutes

2 hours 15 minutes =  $120 + 15$  minutes

= 135 minutes.

## Do This

1. Suresh gets up at 6:00 am. He brushes his teeth for 5 minutes. Then he takes bath and get ready in 20 minutes. He eats his breakfast in 15 minutes. Then he leaves for school. At what time does Suresh leave for school?
- 
- 



2. It takes Suresh 1 hour and 5 minutes to reach school. How many minutes does Suresh take to reach school?
- 

3. Ammamma sleeps for 90 minutes in the afternoon. Ammamma sleeps for \_\_\_\_ hour \_\_\_\_ minutes.
4. Suresh studies from 7:00 pm to 8:15 pm. He studies for \_\_\_\_\_ minutes.




## Day of the function

Gayathri took part in JAM. JAM is 'just a minute.'

The participant has to speak non-stop for a minute and follow the rules no repetition, no stopping etc. The one who speaks longest wins. Two teams competed in JAM. Look at their times.

Team A		Team B	
Participant	Time (seconds)	Participants	Time (seconds)
Shafi	27	Gayathri	22
Roja	40	Fathima	46
Suresh	32	Mary	33
Total	..... seconds	Total	..... seconds

- (a) Team A spoke for \_\_\_\_\_ minutes  
\_\_\_\_\_ seconds.
- (b) Team B spoke for \_\_\_\_\_ minutes  
\_\_\_\_\_ seconds.
- (c) There are \_\_\_\_\_ seconds in 2 minutes.
- (d) There are \_\_\_\_\_ seconds in 5 minutes.
- (e) 190 seconds is equal to \_\_\_\_\_ minutes and \_\_\_\_\_ seconds.
- 1 hour has  
60 minutes and  
1 minute has  
60 seconds



## How many hours in a day?

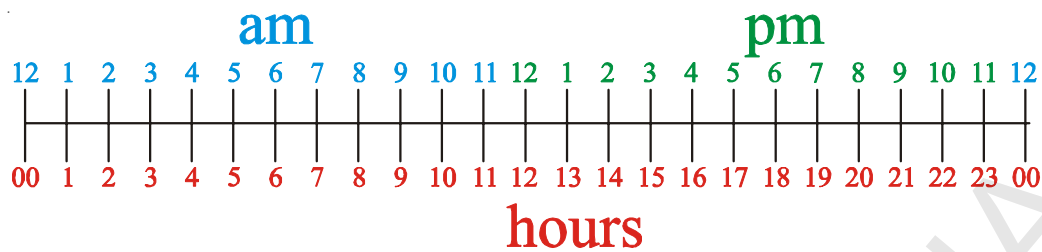
We know that one hour has 60 minutes and 1 minute has 60 seconds. But how many hours are there in a day? Look at Gayathri's daily routine.

If Gayathri gets up at 6 am and goes to bed at 9 pm, how many hours does she spend awake \_\_\_\_\_.

She goes to bed at 9:00 pm and gets up at 6:00 am. She sleeps for \_\_\_\_ hours.

If we add the two, we get 24 hours. So, number of hours in a day is 24.

So far we have read time in terms of 12 hours clock. We can also tell time based on the fact a day has 24 hours. Let us see how-



You already know that we read the time after 12 noon in terms of pm and before it in term of am. In 24 hour clock it is read differently.

An hour after 12 noon is read as 1 pm in the 12 hour clock and it is read as 13 hours in the 24 hour clock.

Similarly, 3 pm in the 12 hour clock is 15:00 hours in the 24 hour clock. What will 5 pm in 12 hour clock be read as in the 24 hour clock?

What about 11 pm?

### Do This

Fill in the blanks

Time (12 hours clock)

Time (24 hours clock)

6:00 am

\_\_\_\_\_ hours

1:30 pm

\_\_\_\_\_ hours

\_\_\_\_\_

16:30 hours

8:00 pm

\_\_\_\_\_ hours

\_\_\_\_\_

5:30 hours

### Try This

Write down how long you think it takes to do the following activities:

S.No.	Activity	In Hours	In Minutes	In Seconds
1.	Eat breakfast	$\frac{1}{3}$ hour	20 minutes	1200 s
2.	Take a bath			
3.	Watch a movie			
4.	Complete Homework			
5.	Read one page in a book			
6.	Count from 1 to 50			

### How much time does it take?


Different activities take different amounts of time. Going from your house to your neighbour's house takes 5 minutes, but going from Vizianagaram to Mumbai by train takes more than 24 hours.

### Think and Discuss

1. How long does it take yeilding of paddy crop from sowing ?
2. How long does it take for a mango tree to grow from seed to give fruits.

Look at Akhila's birth certificate.

Book No. 2037 Sl. No. 42



**GREATER HYDERABAD MUNICIPAL CORPORATION**

Form 9  
(See Rule 10 & 15)

Government of Telangana  
Greater Hyderabad Municipal Corporation

**CERTIFICATE OF BIRTH**  
(Issued under Section 12/17 of the Registration of Births and Deaths Act 1969)

This is to certify that the following information has been taken from the original record of birth which is in the register for 1997 of Tehsil Ward No: 16/15  
(Local Area)

of District Hyderabad of State TS

Name K. AKHILA Sex Female

Date of Birth 16-8-1997 Registration No. 2581


Place of Birth Cour Hosp Malapur Date of Registration 21-8-97

Permanent residential address of parents.....


Name of Father K. Rajender Reddy

Name of Mother K. Madhavi

Remarks.....



Date .....  
Seal .....

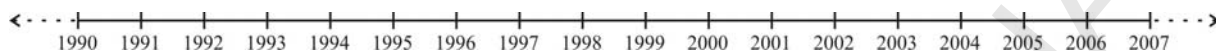
  
Signature of Issuing Authority  
Sub-Registrar,  
Births & Deaths,  
Ward No. 16 Circle No. I, M.C.H.

Akhila's date as per birth on her birth certificate is 16/08/1997. What does this mean?

16 is the day of the month. 8 is the month of the year, which is August. 1997 is the year. This means that Akhila was born on Sixteenth August Nineteen Nintyseven.

## Do This

1. Akhila would have been how many months old in 27/11/1997?
2. The number line given below shows the year in which Akhila was born and some years before and after it.



- (a) How many years old will she be in 2004?
  - (b) In which year will she be 9 years old?
  - (c) If Akhila's brother is 6 years older than her, then in which year was he born?
3. Now, collect information about your birth and fill it in the space given below-

## BIRTH CERTIFICATE

Name : \_\_\_\_\_

Sex : \_\_\_\_\_

Date of Birth : \_\_\_\_\_

Registration No. : \_\_\_\_\_

Place of Birth : \_\_\_\_\_

Date of Registration : \_\_\_\_\_

Name of Father : \_\_\_\_\_

Name of Mother : \_\_\_\_\_

Date of Issue : \_\_\_\_\_

## Exercise

1. Read the following dates and write in words
  - (a) 26/1/2000 \_\_\_\_\_
  - (b) 24/9/2010 \_\_\_\_\_
  - (c) 5/2/1999 \_\_\_\_\_
2. Write the following dates using numbers.
  - (a) 19 May 1978 \_\_\_\_\_
  - (b) 14 November 2005 \_\_\_\_\_
  - (c) 25 December 2014 \_\_\_\_\_
3. Are these dates possible? Why not?
  - (a) 33/3/2010
  - (b) 30/13/2010
4. Padmapriya will purchase some packed food on 22 February 2013. The food packet said should be consumed within 180 days of manufacture. The date of manufacture on the food packet was 31/8/2012. Should Padmapriya purchase the food?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Farhana purchased some medicines on 20/06/2012. The medicine should be consumed within 3 years of manufacture. The date of manufacture on the medicine pack was 31/12/2009. Whether the medicines purchased were valid or not?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. In the following table timings of trains leaving for various places from Hyderabad is given in 24 hour clock. Try to write them in the 12 hour clock.

**Time table**

Train	24 hour clock	12 hour clock
Hyderabad to Adilabad	21.00	
Hyderabad to Vijayawada	17.30	
Hyderabad to Tirupathi	19.15	
Hyderabad to Warangal	16.45	
Hyderabad to Delhi	6.15	
Hyderabad to Chennai	11.45	

**Think and Discuss**

If 9<sup>th</sup> September 2012 is a Sunday, what will be the day on 9<sup>th</sup> October 2012 and 9<sup>th</sup> December 2012?

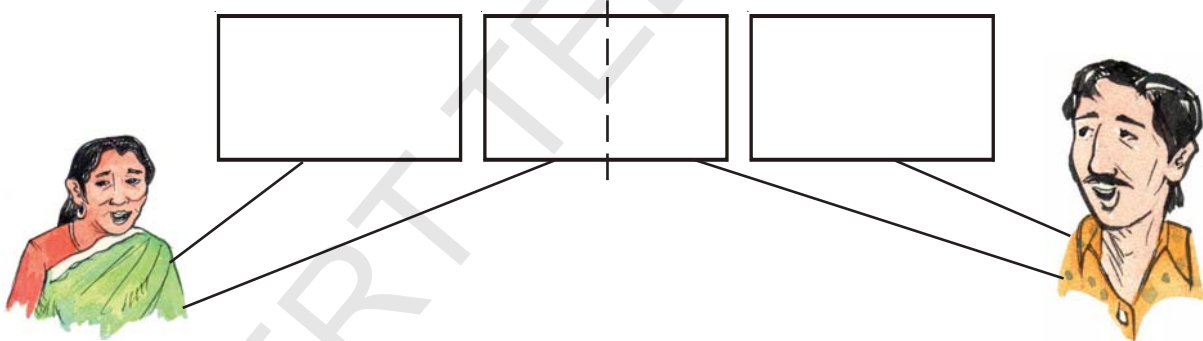
Ramulamma is getting old. She has four pieces of land, each having the same area. She keeps one piece to herself and divides the remaining 3 pieces equally between her 2 children. How many pieces of land will each child get?

Think : How many full pieces of land will each child get? How many half pieces of land will each child get?



Ramulamma divided her land like this-

She gave one piece of land to each of her children. She then divided the third piece into two equal halves and gave one each to her children.



So, each child got one and a half pieces of land.

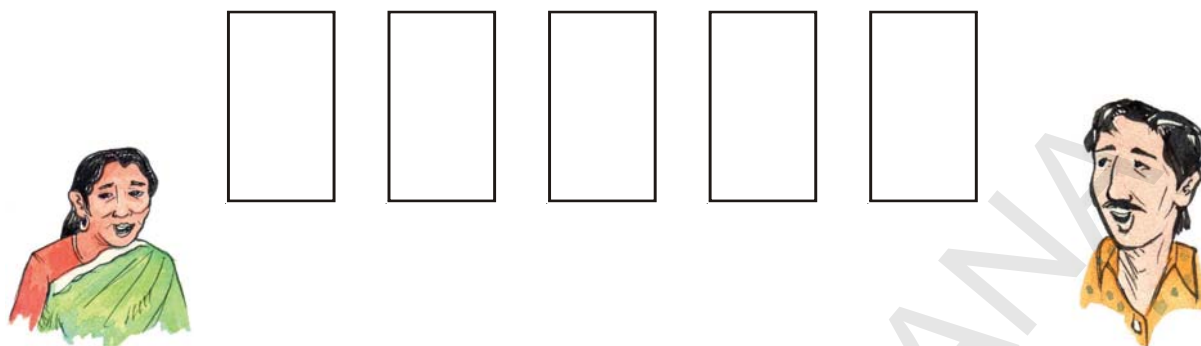
$$3 \div 2 \text{ is the same as } \frac{3}{2}$$

This is written as  $\frac{3}{2} = 1 + \frac{1}{2}$  or  $1\frac{1}{2}$  pieces of land.

So when 3 pieces of land are divided equally between 2 people, each person gets

$1 + \frac{1}{2}$  or  $1\frac{1}{2}$  piece of land.

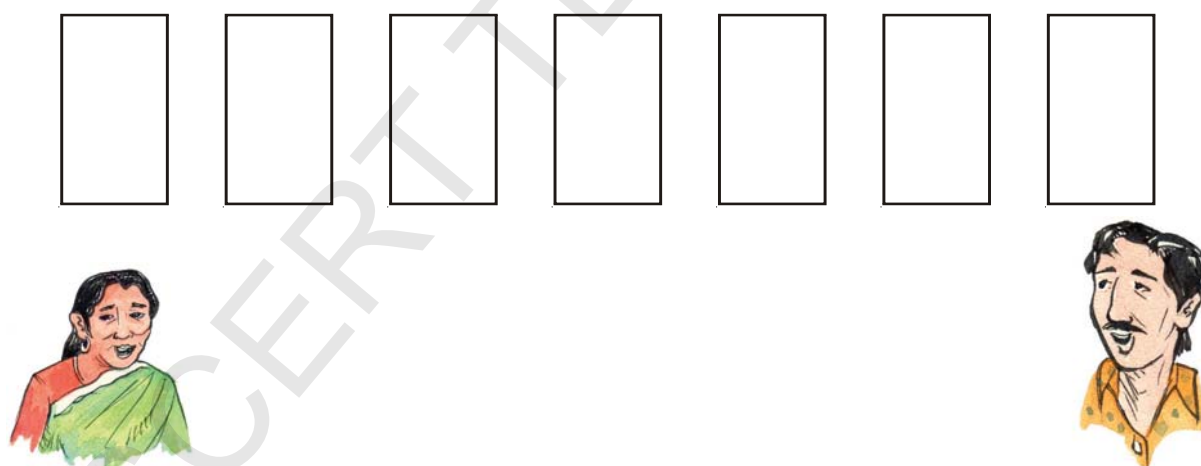
If Ramulamma had 5 pieces of land each having same area to divide between her 2 children equally then how many pieces of land would each child get?



So when 5 pieces of land are divided equally between 2 people, each person get \_\_\_\_\_ or \_\_\_\_\_ pieces of land.

$$\frac{5}{2} = \text{_____} + \text{_____} \text{ pieces of land.}$$

What about if Ramulamma had 7 pieces of land to divide between her 2 children?

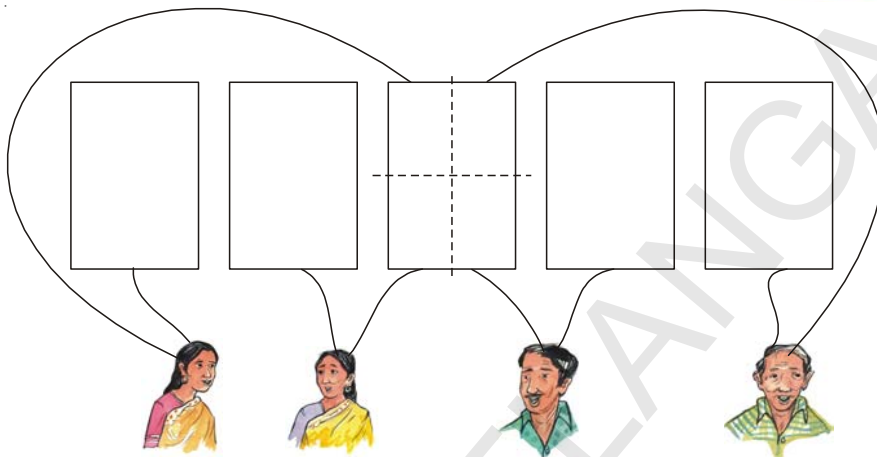


So when 7 pieces of land are divided equally between 2 people, each person get \_\_\_\_\_ or \_\_\_\_\_ pieces of land.

$$\frac{7}{2} = \text{_____} + \text{_____} \text{ pieces of land.}$$

Valya also wants to divide his 5 pieces of land equally among his 4 children. How will Valya divide his land equally among his 4 children?

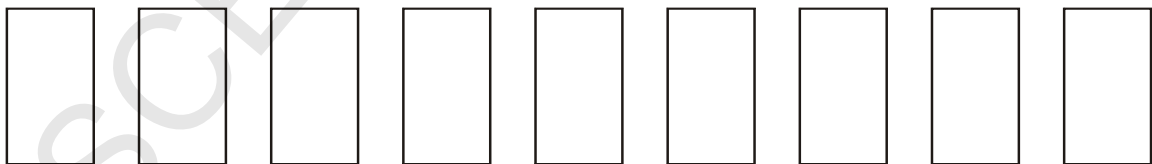
- How many full pieces of land will each child get?
- How many one-fourth pieces of land will each child get?



When 5 pieces of land are divided equally among 4 people each person gets one full piece of land and one-fourth pieces of land.

$$\frac{5}{4} = 1 + \frac{1}{4} \text{ or } 1\frac{1}{4} \text{ pieces of land.}$$

- What if Valya had to divide 9 pieces of land among his 4 children, how many pieces of land will each child get?



When 9 pieces of land are divided equally among 4 people each person will get \_\_\_\_\_ pieces of land.

$$\frac{9}{4} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \text{ or } \underline{\hspace{2cm}} \text{ pieces of land.}$$



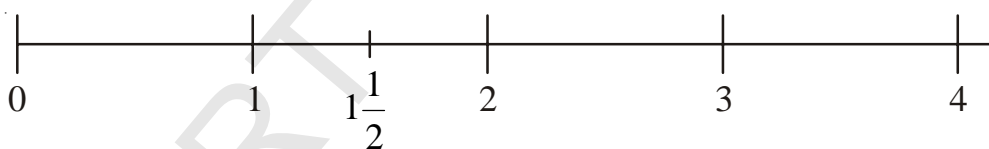
Can we show  $1\frac{1}{2}$  on the number line.

Yes, it will lie between 1 and 2 because it is more than 1 and less than 2.



$1\frac{1}{2}$  is  $\frac{1}{2}$  more than 1. If we divide the space between 1 and 2 into 2 equal parts, then one part will be equal to  $\frac{1}{2}$ . So  $1\frac{1}{2}$  will lie right in the middle of 1 and 2.

Now can you show  $\frac{1}{2}$ ,  $2\frac{1}{2}$  and  $3\frac{1}{2}$  on the number line.



Remember  $\frac{1}{2}$  is more than 0 but less than one.

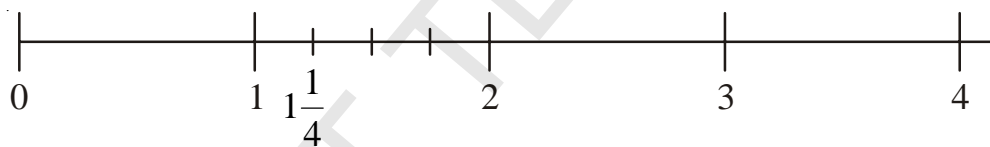
Also, remember that  $2\frac{1}{2} = 2 + \frac{1}{2}$  and  $3\frac{1}{2} = 3 + \frac{1}{2}$

Now let us show  $1\frac{1}{4}$  on the number line.



$1\frac{1}{4}$  will lie between 1 and 2 because it is more than 1 and less than 2.

$1\frac{1}{4}$  is  $\frac{1}{4}$  more than 1. If we divide the space between 1 and 2 into 4 equal parts, then one part will be equal to  $\frac{1}{4}$ .



Now can you show  $\frac{1}{4}$ ,  $\frac{9}{4}$  and  $\frac{13}{4}$  on the number line drawn above.

Remember  $\frac{1}{4}$  is more than 0 but less than 1.

Also remember that  $\frac{9}{4} = 2 + \frac{1}{4}$  and  $\frac{13}{4} = 3 + \frac{1}{4}$ .

## The grocery bill

The prices of various commodities are displayed in the grocer's shop

Item	Price
Rice	₹ 30 per kg
Wheat	₹ 20 per kg
Mustard oil	₹ 120 per liter
Turmeric	₹ 160 per kg
Salt	₹ 15 per kg
Dal	₹ 60 per kg
Sugar	₹ 32 per kg

(a) Kaumudhi purchases the following things. How much money will she have to pay for each? How much will her grocery bill be?

(i) 2 kg rice \_\_\_\_\_ (iv)  $2 + \frac{1}{2}$  kg wheat \_\_\_\_\_

(ii)  $\frac{1}{4}$  kg of Turmeric \_\_\_\_\_ (v)  $\frac{1}{2}$  litre mustard oil \_\_\_\_\_

(iii)  $\frac{1}{2}$  kg dal \_\_\_\_\_ (vi)  $1 + \frac{1}{2}$  kg sugar \_\_\_\_\_

(b) If Kaumudhi buys  $\frac{1}{2}$  kg of tea powder for ₹ 90, how much would 1 kg tea powder cost?

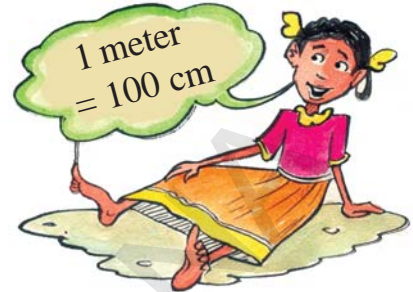
(c) If Kaumudhi buys  $\frac{1}{4}$  kg of chilli powder for ₹ 40, how much would 1 kg chilli powder cost? \_\_\_\_\_

## How much cloth did Renu use?

Renu is stitching a frock for her daughter and a shirt for her son. She purchases 1 meter of mangalgiri cotton cloth and 1 meter of pochampally cotton cloth. She

uses  $\frac{3}{4}$  part of mangalgiri cotton cloth to make the frock and  $\frac{1}{2}$  part of pochampally cotton cloth to make the shirt.

- (a) How many centimeters of mangalgiri cotton cloth does Renu use? How much is left? \_\_\_\_\_
- (b) How many centimeters of pochampalli cotton cloth does Renu use? How much is left? \_\_\_\_



### Balance the pans

Which of these weights will balance the pans given below?



How much cooking oil is there in Manju's house?



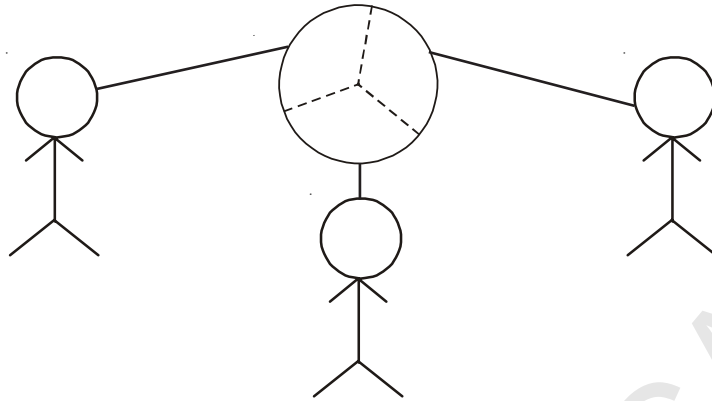
$\frac{1}{4}$  liter       $\frac{1}{2}$  liter       $\frac{3}{4}$  liter



- (a) How many liters of cooking oil does Manju have in her kitchen? \_\_\_\_\_

### Now let us divide rotis

If one roti is divided among 3 people equally then how much will each person get?



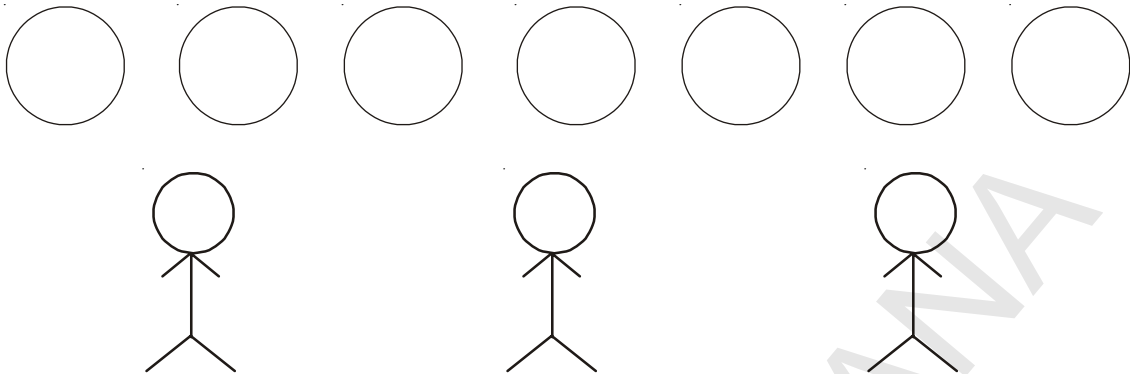
Each child will get one part out of three parts or one-third of the roti or  $\frac{1}{3}$  roti.

Similarly, if one roti is divided equally among 5 people then each person will get one part out of 5 parts or one fifth of the roti or  $\frac{1}{5}$  roti.

#### Do This

1. If one roti is divided among 6 people equally then how much will each person get? Write in words and as a number.
2. If one roti is divided among 8 people equally then how much will each person get? Write in words and as a number.
3. If one roti is divided among 10 people equally then how much will each person get? Write in words and as a number.

Now, divide 7 rotis among 3 people equally. How many rotis will each one get?



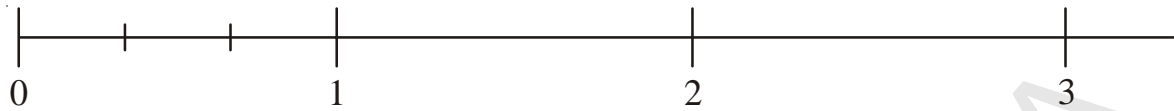
- (a) How many full roties?
- (b) How many one-third roties?

**Do This**

1. What do you get when you divide 11 by 5?
2. What do you get when you divide 13 by 6?
3. What do you get when you divide 9 by 8?
4. What do you get when you divide 12 by 5?

Now let us mark these numbers on the number line.

Mark  $\frac{1}{3}$  on this number line.



Mark  $\frac{1}{5}$  on this number line.



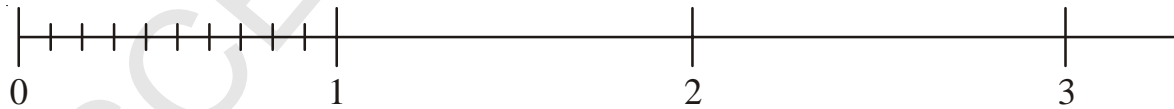
Mark  $\frac{1}{6}$  on this number line.



Mark  $\frac{1}{8}$  on this number line.



Mark  $\frac{1}{10}$  on this number line.



**Do This**

Which is greater?

(a)  $\frac{1}{10}$  or  $\frac{1}{5}$

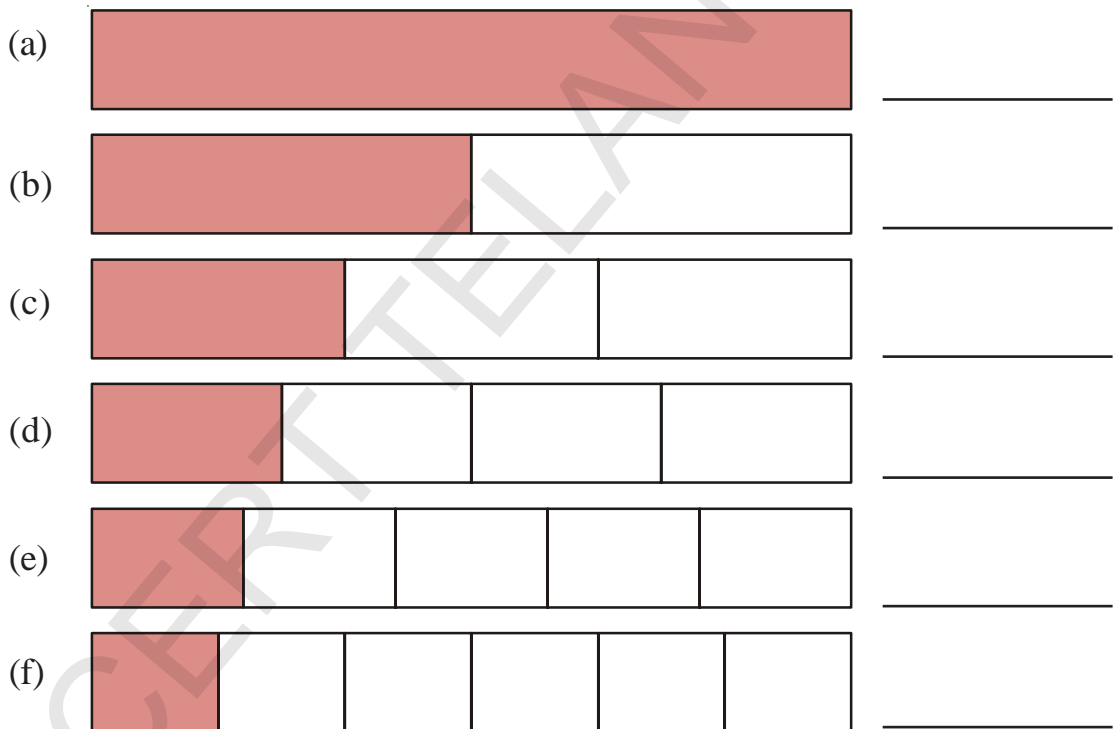
(b)  $\frac{1}{5}$  or  $\frac{1}{6}$

(c)  $\frac{1}{4}$  or  $\frac{1}{8}$

$\frac{1}{2}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1\frac{1}{2}, 2\frac{1}{2}, 1\frac{1}{4}, \frac{5}{2}, \frac{9}{4}, \frac{1}{8}, \frac{1}{10}$  etc are all numbers and can be shown on the number line. They are called fractional numbers or fractions. They are used when an object or a group of objects is divided into equal parts. The number below the line is called the denominator and tells us the number of parts in which the object or group of objects is being divided into. The number above the line is called the numerator and tells us the number of parts that we are taking out.

### Try This

1. Write the coloured portions as fractions. Which fraction is the greatest? Which fraction is the smallest?

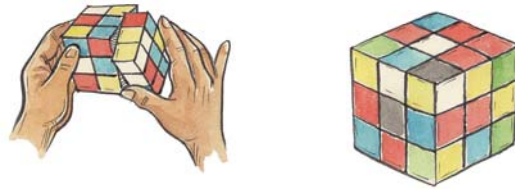


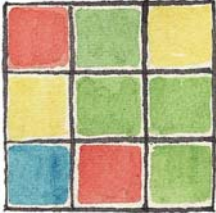
2. Which is greater?

(a)  $2\frac{1}{3}$  or  $2\frac{1}{5}$       (b)  $4\frac{1}{8}$  or  $4\frac{1}{4}$       (c)  $6\frac{1}{7}$  or  $6\frac{1}{9}$

(e)  $10\frac{1}{2}$  or  $10\frac{1}{4}$       (e)  $10\frac{1}{2}$  or  $11\frac{1}{2}$

## Play with Rubik's cube



1. 
- Express the blue coloured part as a fraction?
  - Express the green coloured part as a fraction?
  - Express the red coloured part as a fraction?
  - Express the yellow coloured part as a fraction?
  - Which fraction is the greatest? Which fraction is smallest?

## What part of the medicine tablet strip is remaining?

- Rama took 3 tablets on the first day of her fever. What part of the tablets did she take? What part of the tablets left? \_\_\_\_\_
- She took 2 more tablets the next day. Now, what part of the tablets is left? \_\_\_\_\_
- She took one more the third day. Now what part of the tablets is left? \_\_\_\_\_
- Which part of the medicine tablets in the strip is more- the one that is remaining or the part that was taken? \_\_\_\_\_



## Flower beds

Mangalam grows flowers on his land. He has divided his land into 9 equal parts.

- Which colour flower grows on the biggest part of the land? What part of the total land is this? \_\_\_\_\_
- What part of the land are the white and orange flowers grown on? Is this part bigger than the part on which the red colour flowers are grown? \_\_\_\_\_

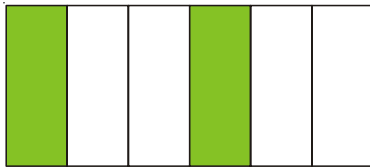


## Who ploughed more?

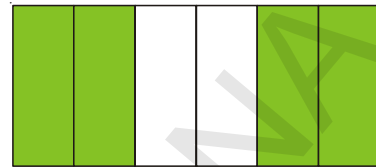
Somla, Mangya and Valya have fields of equal area.

All have divided their fields into six equal parts but have cultivated unequal parts.

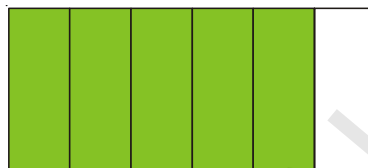
The cultivated parts are shaded in the pictures below.



Somla's field



Mangya's field



Valya's field

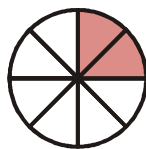
- What part of his field has Somla cultivated?
- What part of his field has Mangya cultivated?
- What part of his field has Valya cultivated?
- Who has cultivated the largest part of his field?
- Who has cultivated the smallest part of his field?

### Do This

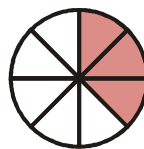
Express the coloured part of circles given below as fractions. Which fraction is greatest? Which fraction is smallest?



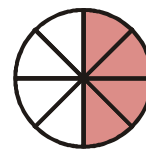
\_\_\_\_\_



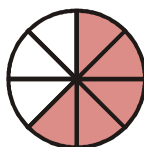
\_\_\_\_\_



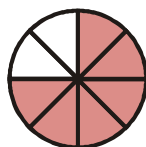
\_\_\_\_\_



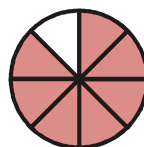
\_\_\_\_\_



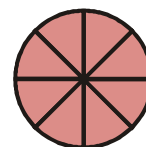
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



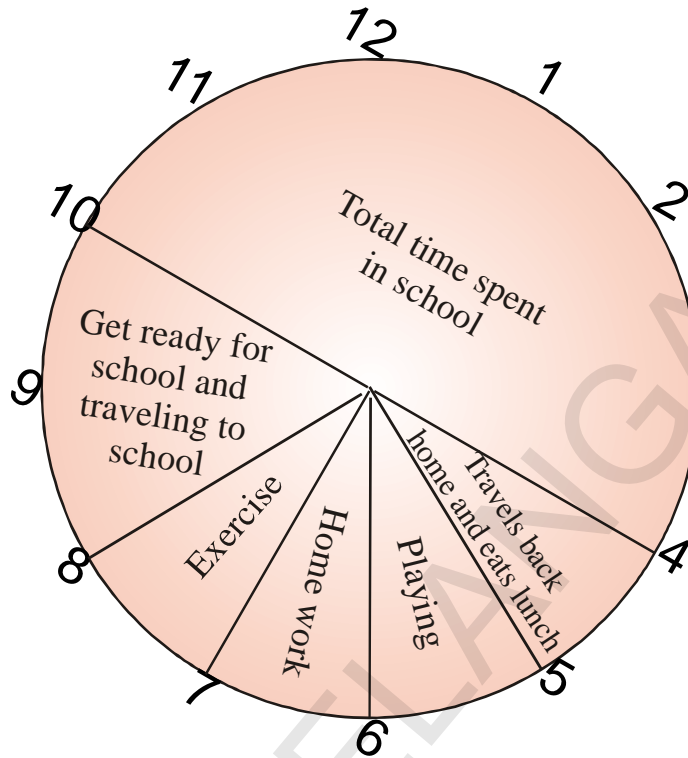
\_\_\_\_\_

Greatest fraction \_\_\_\_\_

Smallest Fraction \_\_\_\_\_

### From 7 am to 7 pm

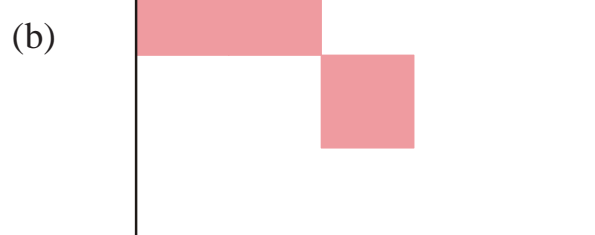
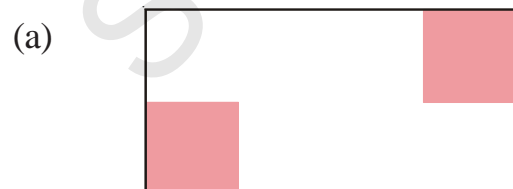
Koushik wakes up at 7 o'clock in the morning. The watch given below tells us what he does till 7 o'clock in the evening.



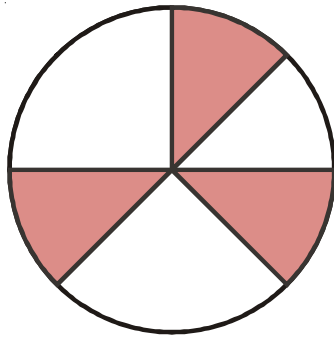
- (a) What part of 12 hours does Koushik spend on exercise?
- (b) What part of 12 hours does Koushik spend in school?
- (c) What part of 12 hours does Koushik spend on playing and doing homework?

### Do This

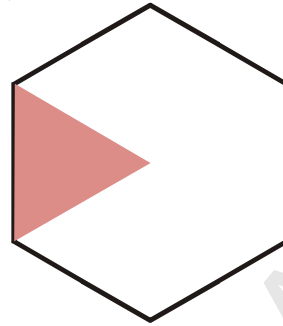
1. What part of these figures is coloured?



(c)

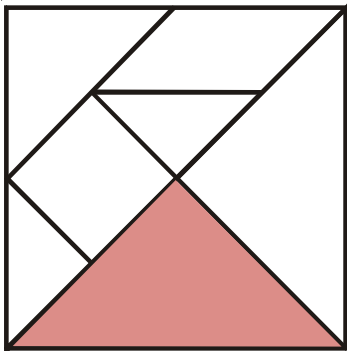


(d)

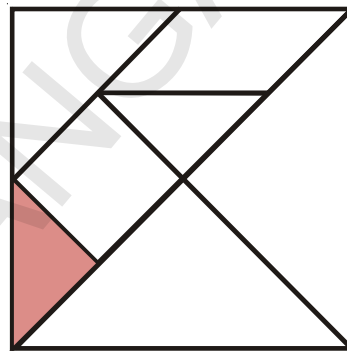


2. What part of these tangram is coloured?

(a)

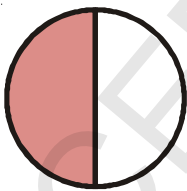


(b)

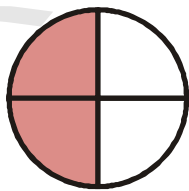


**Part that look alike**

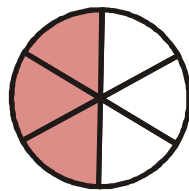
What part is shaded?



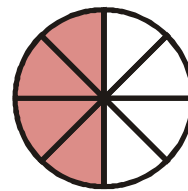
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

Looking at the above pictures can you say that  $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$  ?

## Activity

Take a piece of paper. Fold it into two equal halves. Now colour one half.

Now fold this half into half again. Open the piece of paper. How many total parts is the paper divided in now? What part of the paper is shaded now?

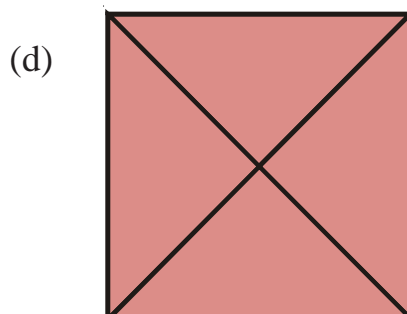
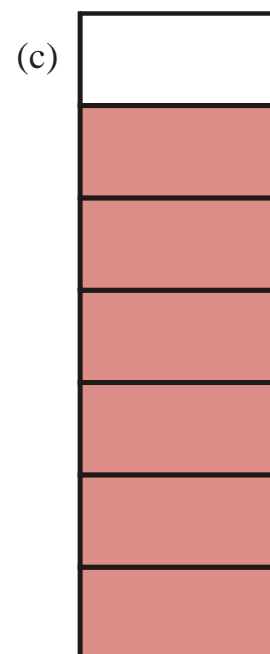
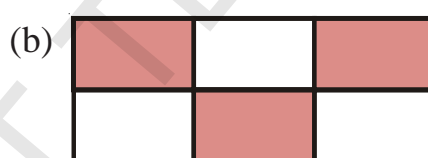
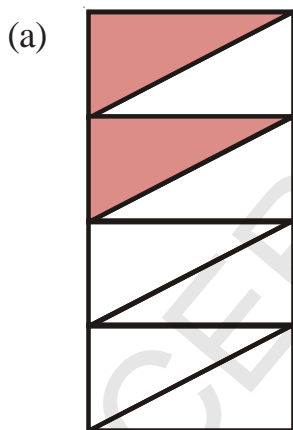
Can we say that  $\frac{1}{2} = \frac{2}{4}$

Try folding the paper into 6 parts now. How many total parts is the paper divided in now? What part of the paper is shaded now?

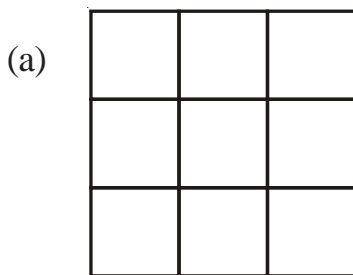
What about when you fold the paper into 8 parts?

## Exercise

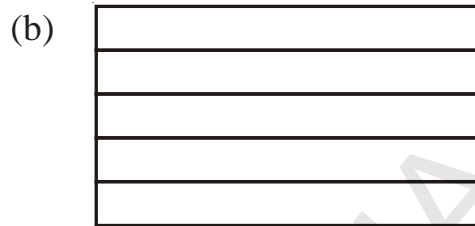
1. The figures given below have been divided into equal parts. What part each figure has been shaded?



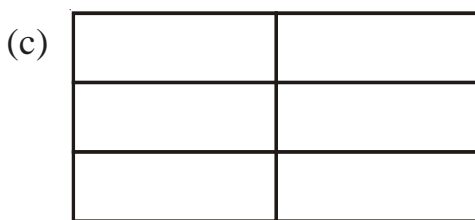
2. Colour that part of the figure that has been written below it.



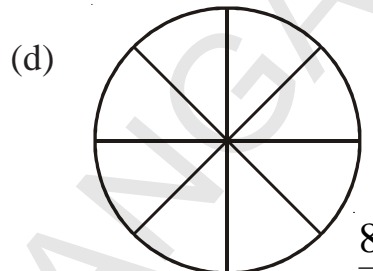
$$\frac{4}{9}$$



$$\frac{3}{5}$$



$$\frac{5}{6}$$



$$\frac{8}{8}$$

3. Govind bought 12 kg potatoes.  $\frac{2}{3}$  of the potatoes were big and  $\frac{1}{3}$  of them were small. How many kgs of potatoes were big?
4. Usman cycles  $\frac{7}{10}$  of the distance from home to school. The rest of the distance he walks. What part of the distance does he walk?
5. One day has 24 hours. If Ravi sleeps for  $\frac{1}{3}$  part of hours, studies and works for  $\frac{1}{2}$  part of hours and plays for  $\frac{1}{6}$  part of hours in the day, then how many hours does he spend in each of these activities?
6. Earrings weigh 32 grams. If  $\frac{7}{8}$  part of the weight is silver, then how many grams of silver is there in the earrings?

7. A class has 32 students.  $\frac{3}{4}$  part of them are boys. How many boys are there in the class?
8. Radha read  $\frac{1}{6}$  part of her book in the morning and  $\frac{3}{6}$  part in the evening. How much has she read? Write as a fractional number.
9. John gave his friends  $\frac{2}{5}$  part of the cake. How much was left with him?
10. When Abdulla climbed up three fourth of the tree, how much was left to climb?
11. John bought 12 apples from the market. He and his family ate  $\frac{5}{12}$  part of the apples and  $\frac{3}{12}$  part of apples got spoilt. How many apples are left? Write as fractional number.
12. Mohan got  $\frac{2}{5}$  of a chocolate and Renuka got  $\frac{3}{5}$  part. Who got more chocolate?
13. Hari spent  $\frac{3}{4}$  part of his pocket money on Sunday and  $\frac{1}{4}$  part of his pocket money on Monday. On which day did he spend more?
14. Ashish finished  $\frac{7}{12}$  part of his home work on Saturday and  $\frac{3}{12}$  part on Sunday.  
(a) What part of the home work did Ashish finish in the two days?  
(b) What part of the home work is still left?
15. There were 15 flowers in a rosebush. Vani picked  $\frac{1}{5}$  part of them for decorating her room. How many flowers did she pick?
16. Ramu bought  $\frac{3}{4}$  kg of apples from the market. He gave  $\frac{1}{4}$  kg to his brother. What part of the apples is left with him?

# 14

## Factors and multiples

There are many hills around Ramapuram village. Heena, Harika and Deepika wanted to go up to a hill on Sunday. One needed to climb 50 steps to reach the top. While climbing, Heena stopped at every second step, Harika stopped at every third step and Deepika stopped at every fourth step.

- (a) So, Heena stopped at steps 2, 4,

\_\_\_\_, \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ .

- (b) Harika stopped at steps 3, 6, \_\_\_\_

\_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ .

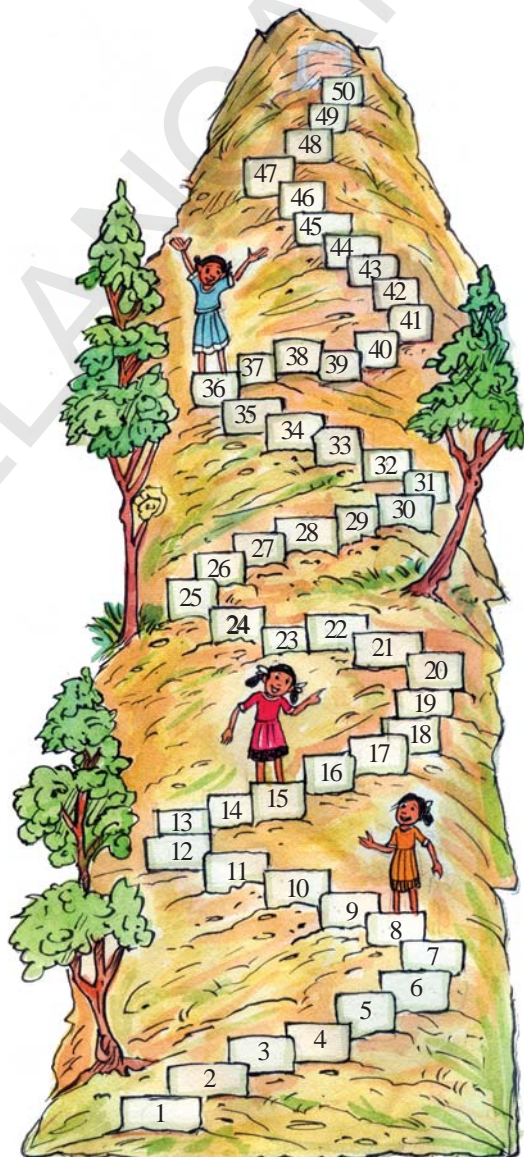
- (c) Deepika stopped at steps 4, 8, \_\_\_\_

\_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ .

- (d) At which steps did Heena and Harika both stop 6, \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ .

- (e) At which steps did Heena and Deepika both stop 4, \_\_\_\_ , \_\_\_\_ , \_\_\_\_ ,  
 \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ , \_\_\_\_ .

- (f) At which steps did all the three stop 12, \_\_\_\_ , \_\_\_\_ , \_\_\_\_ .



## Multiples

Let us look for numbers divisible by 2, 5 and 10 in the table given below.

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

- (a) (i) Put a '•' mark besides the numbers which when divided by 2 and leaves no remainder.

- (ii) Now, write down all these numbers-

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- (iii) Which are the digits in the ones place in all these numbers?

So, all numbers that are divisible by 2 have \_\_, \_\_, \_\_, \_\_ and \_\_ in the ones place.

Numbers that are divisible by 2 are called even numbers.  
Numbers that are not divisible by 2 are called odd numbers. All numbers that are divisible by 2 are also called multiples of 2.

- (b) (i) Put a 'x' mark besides the numbers which when divided by 5 and leaves no remainder.

- (ii) Now, write these numbers.

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- (iii) Which are the digits in the ones place in all these numbers?

So, all numbers that are divisible by 5 have \_\_ or \_\_ in their ones place.

All numbers that are divisible by 5 are called multiples of 5.

- (c) (i) Put a '✓' mark besides the numbers which when divided by 10 and leaves no remainder.

- (ii) Now, write these numbers.

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- (iii) Which is the digit in the ones place in all these numbers?

So, all numbers that are divisible by 10 have 0 in their ones place.

All numbers that are divisible by 10 are called multiples of 10.

### Try This

All multiples of 10 will also be multiples of 2 and 5. Is this statement true or false? Why?

## Activity

### Skip the multiples of 3

Make children sit in a circle. Any child starts by saying 1, the child sitting next to her says 2 and the next says 'skip' instead of 3 as 3 is multiple of 3. The game continues like this and children have to say 'skip' instead of a multiple of 3.

A child who forgets to say 'skip' is out of the game. The two children who do not get out till the end are the winners of the game.

Play this game with multiples of 4 and 5 also.



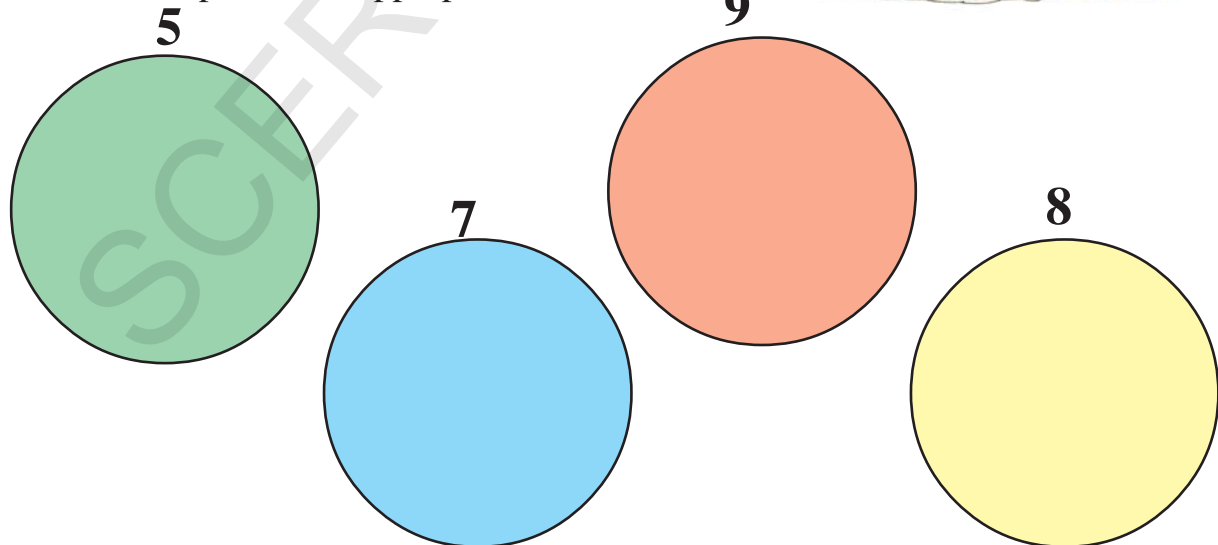
### Play in pairs

Roll two dice together. Make a two digit number based on the dots showing on the dice.

Akhila says 52 and Ganesh says 25.

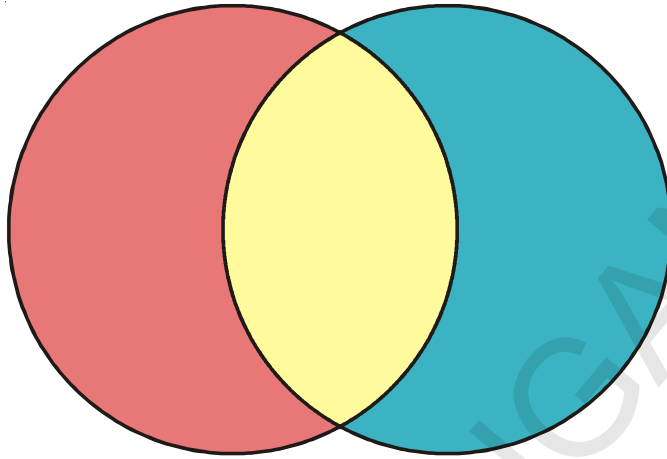
Are these numbers multiples of any of the numbers written below?

Put the multiples in the appropriate circle.



## Common multiples

Put multiples of 3 in the red circle and multiples of 5 in the blue circle. If the number is multiple of both 3 and 5 put it in the yellow area.

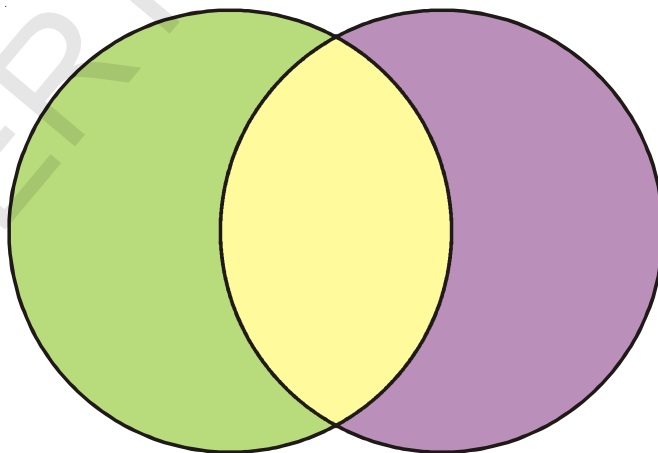


- (a) Write down the numbers which are multiples of both 3 and 5. \_\_\_\_\_

These numbers are called common multiples of 3 and 5.

- (b) Which is the smallest common multiple of 3 and 5? \_\_\_\_\_

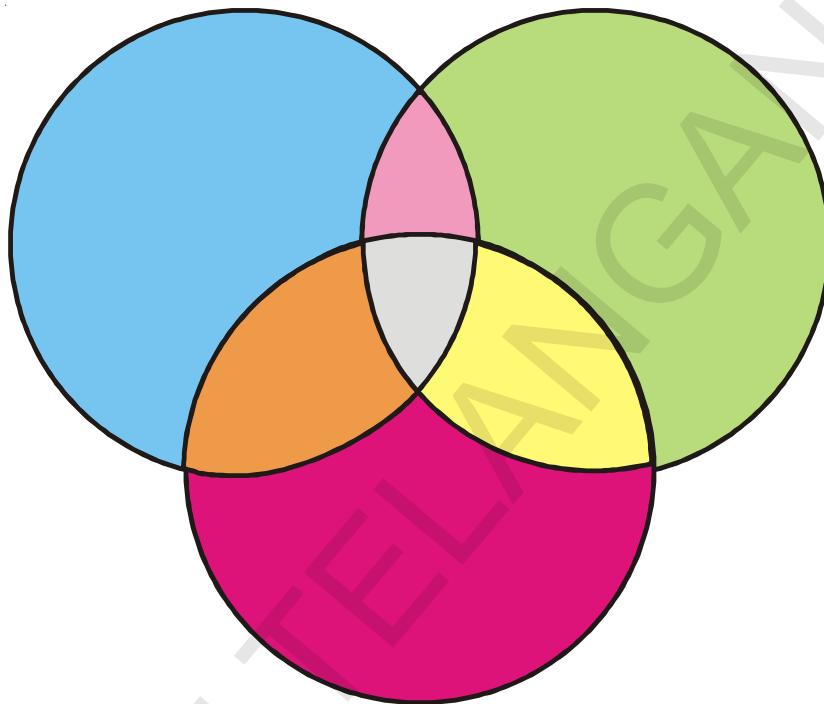
Now write the multiples of 2 in the green coloured circle and the multiples of 7 in the purple coloured circle. Write their common multiples in the yellow area.



- (a) Which is the smallest common multiple of 2 and 7? \_\_\_\_\_

### Try This

- Write the multiples of 2 in the blue coloured circle, the multiples of 3 in the green coloured circle and the multiples of 4 in the red coloured circle. Write the common multiples of 2 and 3 in the pink area, common multiples of 3 and 4 in the yellow area and common multiples of 2 and 4 in the orange area.



- Are there numbers which are common multiples of 2, 3 and 4? Where will you write them?
- Which is the smallest common multiple of 2, 3 and 4?

### Do This

- Which of these numbers are divisible by 2?

49    64    96    112    153    190    272  
297    308    529    666    780    981    995

2. Which of these numbers are divisible by 5? By 10? By both?

Number	Divisible by 5	Divisible by 10	Divisible by both
5			
65			
120			
175			
335			
400			
585			

3. Which of the following are multiples of 4?

2      8      14      26      36      44

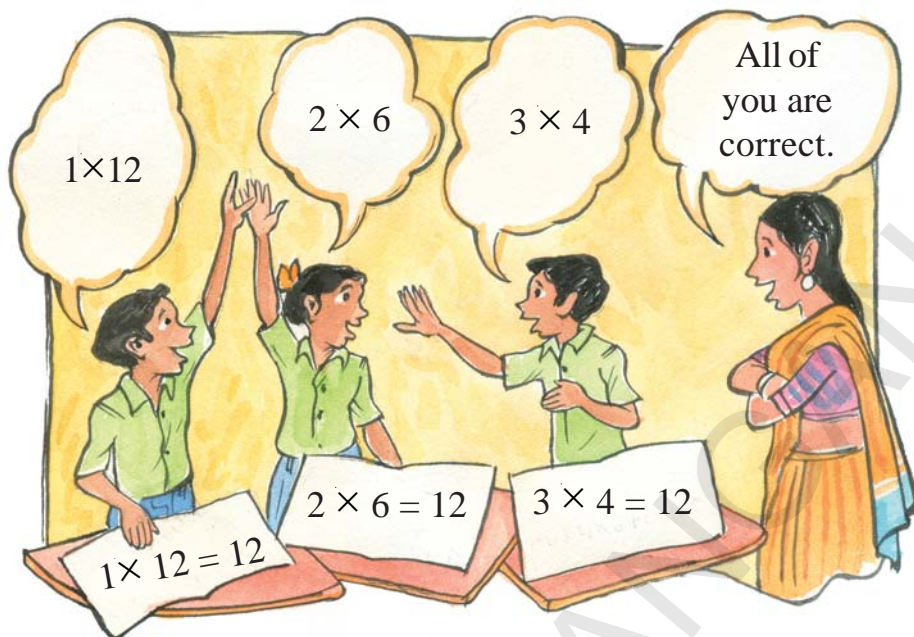
Are all multiples of 4 also multiples of 2?

4. Write down any 5 multiples of 9.
5. Write down any 5 multiples of 6.
6. Complete the following table below. Whether all multiples of 6 are also multiples of 2 and 3?

Number	Divisible by 2	Divisible by 3	Divisible by 6
9			
14			
18			
24			
22			
36			
44			
27			
33			

## Factors

Teacher: Write 12 as the product of 2 numbers.



Teacher : We get 12 when we multiply 3 and 4. So 12 is a multiple of 3 and 4. Similarly 12 is a multiple of 2 and 6 and 12 is also a multiple of 1 and 12. 1, 2, 3, 4, 6 and 12 are called the factors of 12.

(a) Now, find the factors of 18. Hint : There are 6 factors.

You will find all but are the factors of 12 and 18 in the given table. Now fill this incomplete multiplication table and find out

- What are the factors of 20?
- What are the factors of 36?
- What are the factors of 15?
- What are the factors of 7?
- Which number has only one factor?
- Which numbers have only 2 factors?
- Which number is a factor of all numbers?

×	1	2	3	4	5	6	7	8	9	10
1										
2						12			18	
3				12		18				
4			12							
5										
6		12	18							
7										
8										
9		18								
10										

## Exercise

1. Which of these numbers are odd and which of these numbers are even?

23, 18, 65, 70, 47, 325, 610, 354, 289,  
842, 169, 431, 400, 553, 724, 807, 999

2. Encircle the numbers which are divisible by 5.

10, 25, 70, 52, 45, 68, 94, 85, 100, 71, 20, 58,  
43, 235, 400, 353, 255, 91, 78, 420, 32, 99

Which of these numbers are also divisible by 10?

3. Write the first 10 multiples of 5 and 4.

(a) Multiples of 5 = \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(b) Multiples of 4 = \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(c) Common multiples of 4 and 5 = \_\_\_\_\_, \_\_\_\_\_

4. Write the factors of the following numbers.

(a) 14                      (b) 24                      (c) 16                      (d) 42

5. (a) Write the first 6 multiples of 3.

(b) Write the first 6 multiples of 9.

(c) Are all the multiples of 3 also multiples of 9?

(d) Are all the multiples of 9 also multiples of 3?

6. (a) Write the first 6 multiples of 12.

(b) Write the first 3 multiples of 4.

(c) Are all the multiples of 4 also multiples of 12?

(d) Are all the multiples of 12 also multiples of 4?

7. Are all numbers which are divisible by 10 also divisible by 2 and 5?

Number	Divisible by 2	Divisible by 5
10	✓	✓
20		
30		
40		
50		
150		
210		

Extend this list with numbers of your choice and check.

8. The teacher gave Julie and Jasmine ribbon of equal length. Jasmine cut pieces of 5 inches each from her ribbon and Julie cut pieces of 7 inches each. Both girls had no ribbon left after they had cut their ribbons. What is the minimum length of ribbon that the teacher could have given to the girls?
9. There are 10 boys and 15 girls in a class. The teacher wants to divide the children into groups such that each group contains an equal number of boys and girls. What is the greatest number of groups that she can make like this?
10. A truck can carry 12 sacks weighing 100 kg each at one time. Another truck can carry 15 sacks weighing 100 kg each at one time. If both trucks carry an equal number of bags in the day, then what is the minimum number of sacks they could have carried?
11. There are 3 clocks in a shop. One climes after every 5 minutes, the second after every 15 minutes and third after every 30 minutes. If all of them have climed at 10 o'clock for how many hours they all again clim (at what time)?

**The mirror never lies?**

Radha is going to movie at 6:15.

Radha: I have only 5 minutes to get ready.

But Radha is wrong. She has 25 minutes. Why is Radha confused?



Radha soon realised her mistake. Mean while Santosh came there, she decided to test him. Radha showed a letter in the mirror and Santhosh had to guess.

M is easy. It looks the same in the mirror. But P looks different.

**Do This**

- Here are some letters. Tick the ones which look different in the mirror.

B

Z

Q

V

A

F

H



I can tell which letter will look the same without using a mirror.

Radha wrote some letters as shown here. She then folded the paper into half and opened it.

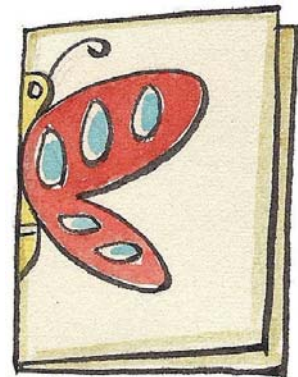
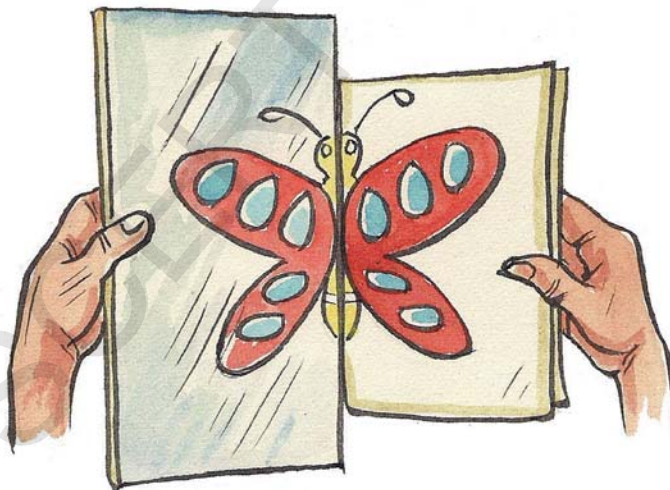
Radha: When I fold the paper the left half of the letter completely covers the right half. These letters are symmetrical because one half covers the other half completely. These letters are Symmetrical because one half completely covered the other half and they will look the same in the mirror.



### Activity

#### Colour half - See the full

Take a paper and fold it. Draw half the butterfly as shown. here-



Put a strip of mirror on the fold. What do you see?

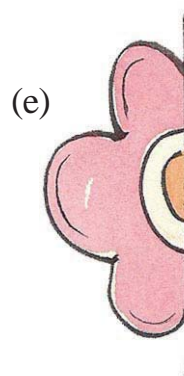
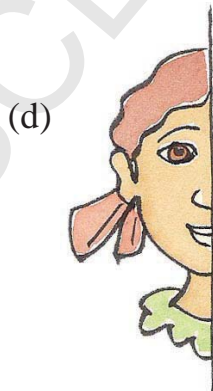
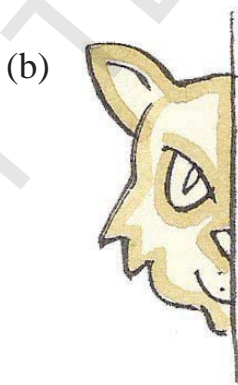
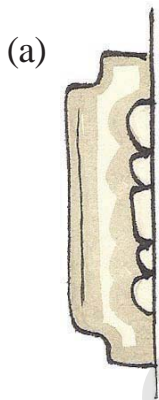
## Try This

1. Put a mirror on the line and get a complete figure.



## Do This

1. Complete the pictures.



## Lines which divide into equal halves

Draw lines on the letters H, I, K and D to get halves that cover each other.

Santhosh: I have divided K like this

Radha: I have divided D like this



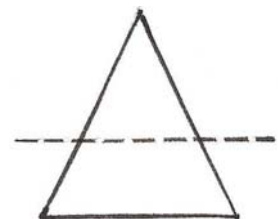
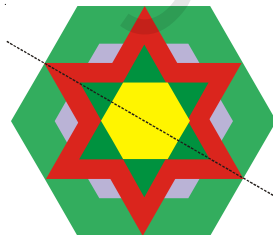
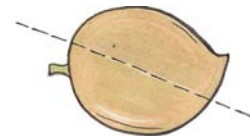
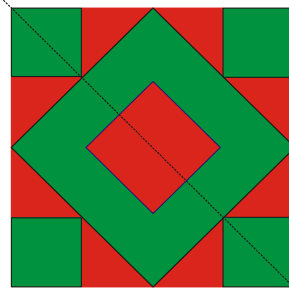
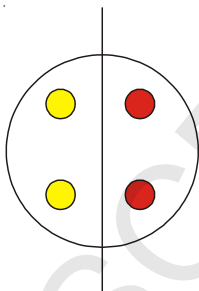
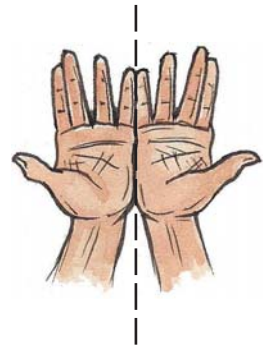
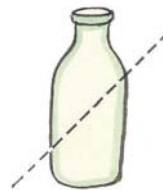
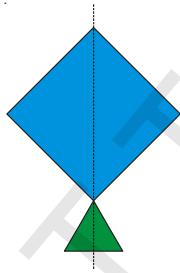
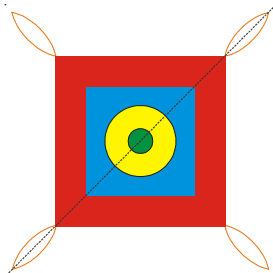
Santhosh: H and I can be divided in more than one way



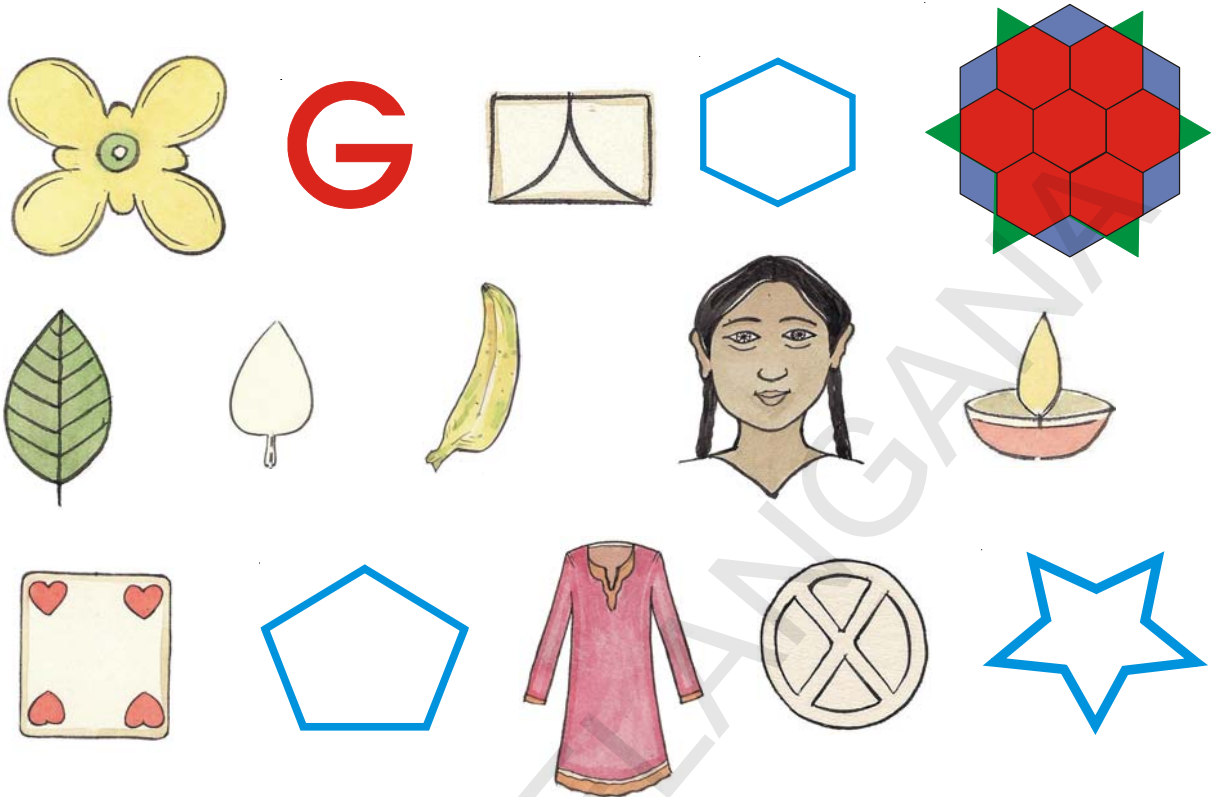
H, K, I, D are symmetrical letters and the lines drawn by Santhosh and Radha are called the **lines of symmetry**.

### Do This

1. See if the lines drawn by Santhosh and Radha are lines of symmetry. Put (×) if they are not. Make sure that the colours also match.



2. Draw lines of symmetry for the given figures. Put (×) on the figure which has no line of symmetry.



### Try This

Draw two lines of symmetry for X. The two halves formed should cover each other.



### Activity

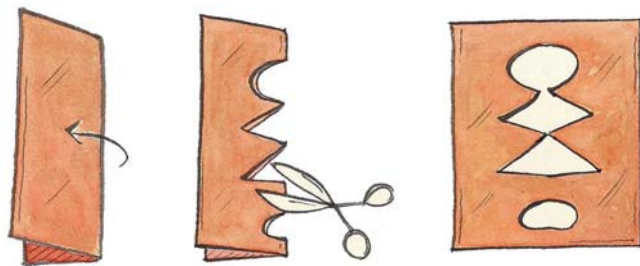
#### Symmetrical figures by cutting paper.

Take a paper and fold it.

Cut it as shown

Open it and see the design

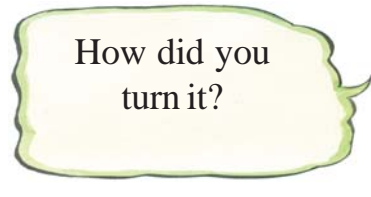
Will one half cover the other?



## Half a turn or less



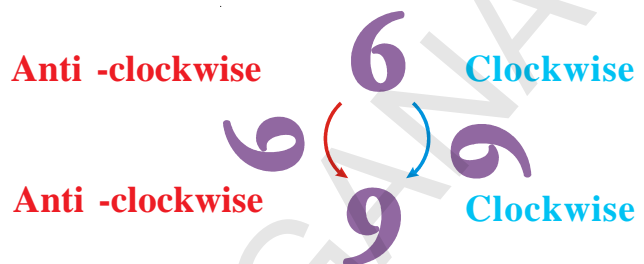
Look Radha! I get 9 if I turn 6.



How did you turn it?

We can turn 6 in two ways.

We can turn it like the hands of a clock. Or we can turn it in the opposite direction.



Either way we will get 6 on taking one complete turn. Half turns in both directions will give us 9.

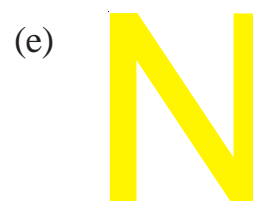
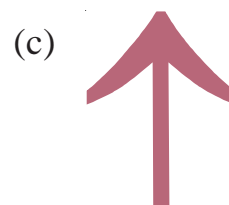
### Try This

1. In which of these digits do you get the same digit after half a turn?

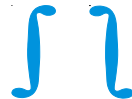
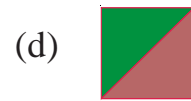
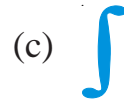
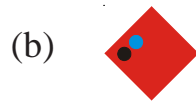
1      0      8      3      5

### Do This

1. Look at the pictures. Draw how they will look after a half  $\left(\frac{1}{2}\right)$  turn.



2. How will the figure look after a half  $\left(\frac{1}{2}\right)$  turn? Tick ( $\checkmark$ ) the correct option.



3. We get N again if we give it a  $\frac{1}{2}$  turn. Think of three more English letters that look the same after  $\frac{1}{2}$  turns.

**Turn a quarter  $\left(\frac{1}{4}\right)$**

Look at the figure. 'T' has turned half of a  $\frac{1}{2}$  turn.



So we say that it has turned a quarter  $\left(\frac{1}{4}\right)$  turn.

See some more quarter turns.



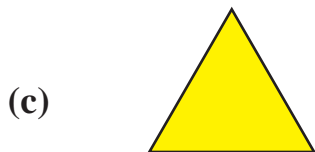
Notice, they are all turning anti-clockwise. How will they look if we give them clock-wise  $\frac{1}{4}$  turn?

## Try This

1. Some figures are given. Draw how they will look after  $\frac{1}{2}$  turn and  $\frac{1}{4}$  turn.

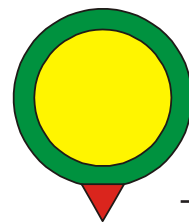
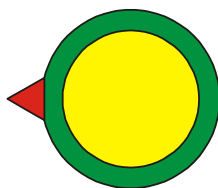
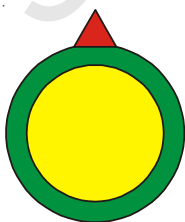
$\frac{1}{4}$  turn

$\frac{1}{2}$  turn



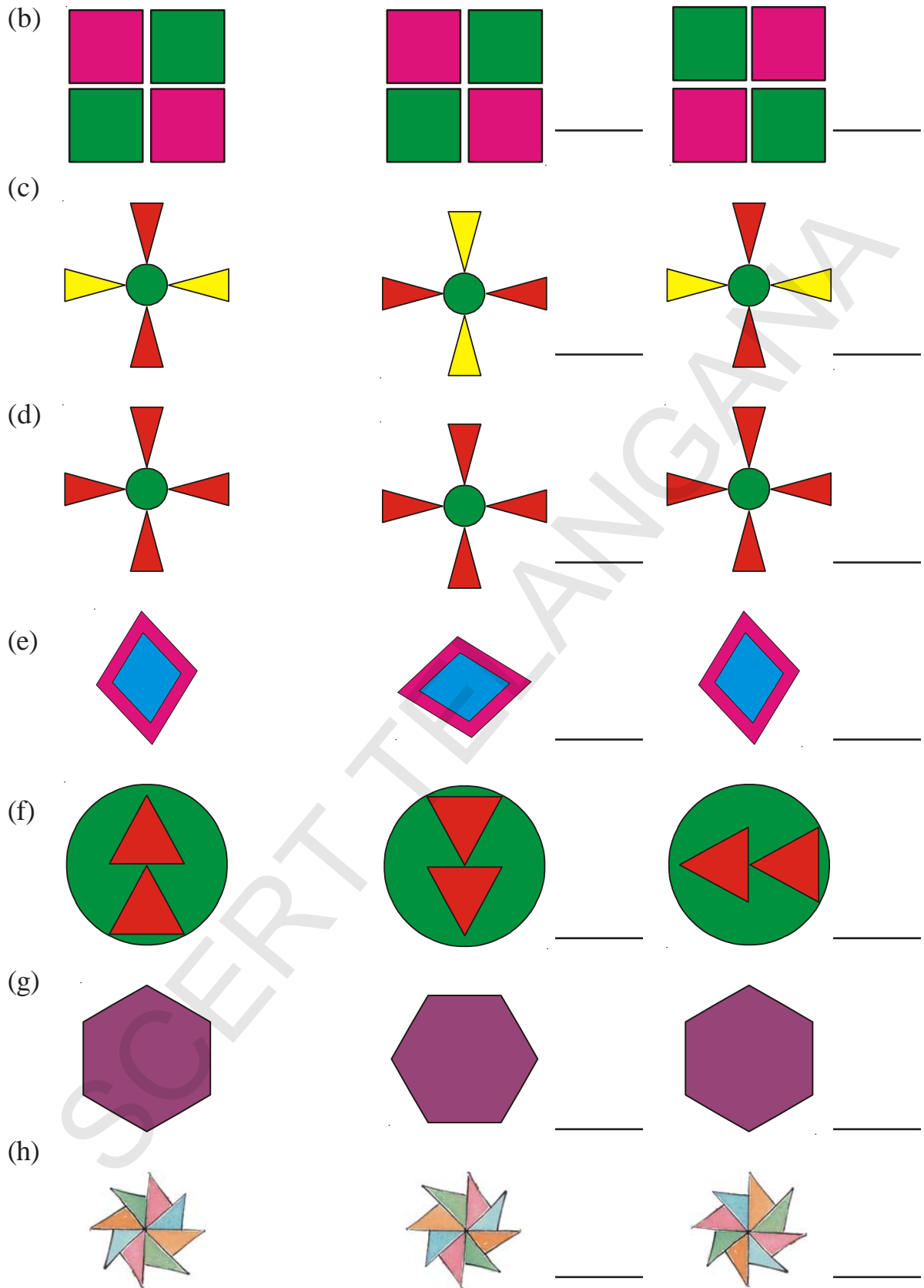
2. Some figures are given below. How will they look after  $\frac{1}{2}$  turn and  $\frac{1}{4}$  turn. Write next to the two options given against each? Which figures look the same after a  $\frac{1}{4}$  turn? Which look the same after a  $\frac{1}{2}$  turn?

(a)




\_\_\_\_\_

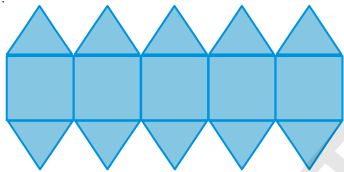
\_\_\_\_\_



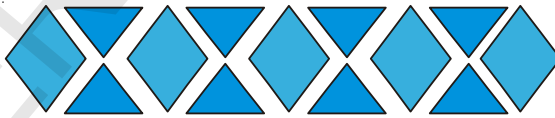
One day, Sharada and Srikar went to the market. They saw some sarees in a shop. The sarees had beautiful borders with lovely patterns!!

Look at some of the patterns in the borders.

In this pattern  is repeating itself continuously.






Here  this and  are repeating alternately.



### Do This

1. Extend the border patterns given below and state the rule for each.



Now make more patterns using these shapes- ,  and . You can use one, two or all three shapes in one pattern.

SCERT TELANGANA

## Activity

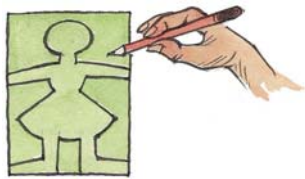
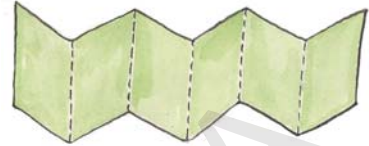
### Paper chains

Take a long thin strip of paper.

Fold it like a fan.

Draw a doll on the folded paper like shown.

Cut along the dark lines. Now open it and observe.



Try to make paper chains using other figures.

### Patterns that rotate and repeat

Now let us learn about some other types of patterns.

Extend the patterns given below and also write the rule. .



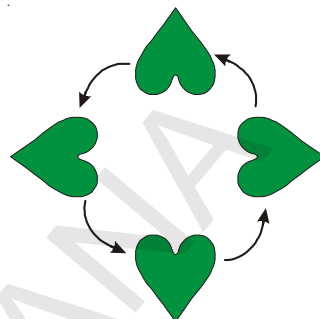
### Do This

1. Now make two more patterns using the same block.

Now look at this pattern-



How will you extend this pattern? If you see carefully, you will find that the leaves turn by an equal amount till they complete a circle. Look at this picture and understand the movement of leaves better. Each turn is  $\frac{1}{4}$  part of the entire circular rotation.



Look at the leaves in this pattern they are repeatedly taking  $\frac{1}{2}$  turns.



Now carry forward this pattern and identify the turn that is being taken. What is the difference between this pattern and the pattern given right above it?



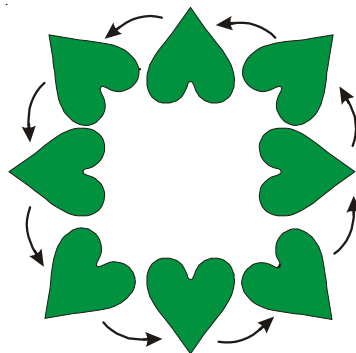
Look at this pattern



Here the leaf is repeatedly making less than  $\frac{1}{4}$  turn.

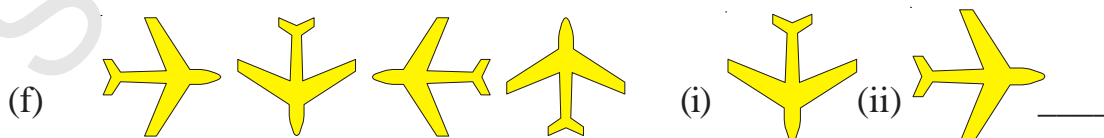
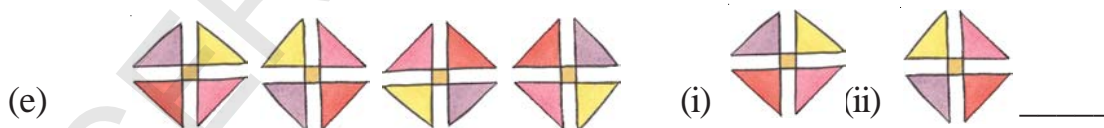
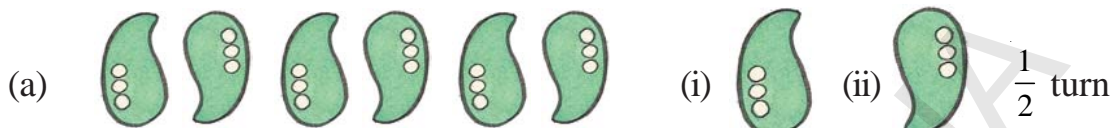
Look at the picture and understand the movement of leaves better.

Each turn is  $\frac{1}{8}$  part of the entire circular rotation.



## Do This

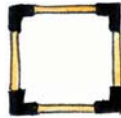
1. Look at the patterns given below. Tick the block that will come next and identify the turns that are being taken in each case?





## Number Patterns

Some patterns follow number rules. See how the number of match sticks keeps increasing by one.



Draw the next figure in the pattern. Write the pattern in numbers. 3, 4 \_\_\_\_\_

Sharada drew two more patterns.

(a)



(b)



Sharada is adding two leaves each time.



We can write Sharada's patterns like this:

(a) 2       $2 + 2 = 4$     $4 + 2 = 6$        $6 + 2 = 8$       .....

(b) 1       $1 + 2 = 3$     $3 + 2 = 5$        $5 + 2 = 7$       .....

So these series of numbers make a pattern and can be extended based on their rule.

### Do This

1. Look carefully at given number series.

5      10      15      20      25      ..

**Who is right?**

The rule is to multiply 1, 2, 3 ... by 5



The rule is to add 5 to the number before.



2. Can you complete the given series in both directions?

(a) \_\_\_\_\_ 125 130 135 \_\_\_\_\_

(b) \_\_\_\_\_ 30 40 50 \_\_\_\_\_

(c) \_\_\_\_\_ 120 110 \_\_\_\_\_ 70 \_\_\_\_\_

(d) \_\_\_\_\_ 600 700 \_\_\_\_\_

3. Carry forward the pattern and make one more pattern based on the rule.

(a) 40, 35, 30, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(b) 11, 16, 21, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(c) 15, 30, 45, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(d) 33, 36, 39, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(e) 1, 5, 9, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(f) 82, 76, 70, 64, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

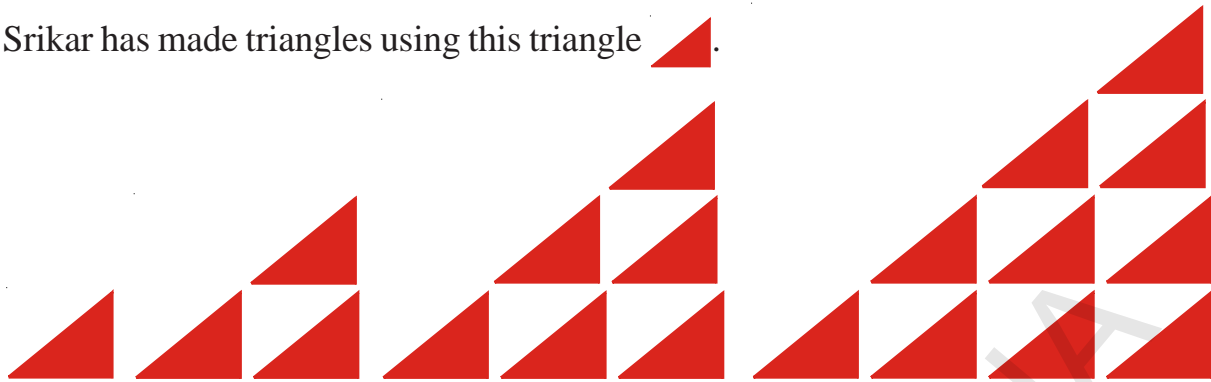
(g) 91, 84, 77, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(h) 123, 112, 101, 90, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Srikar has made triangles using this triangle .



We can write the rule as a series of numbers like this.

$$1 \quad 1 + 2 = 3 \quad 1 + 2 + 3 = 6 \quad 1 + 2 + 3 + 4 = 10$$

(a) Write the next numbers that will come in this sequence. \_\_\_\_\_

We added consecutive numbers to get a triangle shape. Suppose we added only odd numbers-

$$1$$

$$1 + 3 = 4$$

$$1 + 3 + 5 = 9$$

$$1 + 3 + 5 + 7 = 16$$

Srikar tried to arrange these numbers using dots. This what he got-



Sharada realized that she could write the rule of the number pattern 1, 4, 9, 16 as

$$1 = 1 \times 1$$

$$4 = 2 \times 2$$

$$9 = 3 \times 3$$

$$16 = 4 \times 4$$

(b) Write the next 3 numbers in the series given above. \_\_\_\_\_

### Tricks with your age

- (a) Ask your friend- "Write down your age. Add 5 to it. Multiply the sum by 2. Subtract 10 from it. Next divide it by 2. What do you get?"

Is your friend surprised?

- (b) Write your age \_\_\_\_\_

Multiply it by 7 \_\_\_\_\_

Again multiply the answer by 13 \_\_\_\_\_

Multiply again that answer by 11 \_\_\_\_\_

Now look at your last answer. Can you find your age in that answer? How many times does your age show in the answer?

Now try these tricks with other people.

### Some more tricks

- (c) Take a number

Double it

Multiply by 5

Divide your answer by 10.

Why do you think this is the case?

- (d) Take a number

Double it

Again double it

Add the number you took first to the answer

Now again double it

Divide by 10

Why do you think this is the case?

(e) Now take a two digit number, such that both digits are different, say- 27

Now reverse the digits 72

Subtract the smaller number from the bigger number  $72 - 27 = 45$

Is the number a multiple of 9 ?

Now reverse the digits of the difference = 54

Add these two numbers  $45 + 54 = 99$

Is the number divisible by 11 ?

Try with many more two digits numbers and see if the above is true.

**Srikar was learning the nine's table.**

$$9 \times 1 = 09$$

$$9 \times 2 = 18$$

$$9 \times 3 = 27$$

$$9 \times 4 = 36$$

$$9 \times 5 = 45$$

The digit in unit place  
is decreasing by 1.

The digit in 10's place  
is increasing by 1.



Is Sharada right? Check.

$$9 \times 6 = 54 \quad 9 \times 7 = 63 \quad 9 \times 8 = 72 \quad 9 \times 9 = 81 \quad 9 \times 10 = 90$$

Srikar: What about  $9 \times 11 = 99$  ? I don't think it follows your rule.

Help Sharada think of a rule that is followed by all multiples of 9.

Suppose we add individual digits of the multiples of 9.

$$18 \quad 1+8 = 9$$

$$27 \quad 2+7 = 9$$

$$36 \quad 3+6 = 9$$

$$45 \quad 4+5 = 9$$

Rule : We get 9 on adding the individual digits of the multiples of 9.

Check the addition rule for other multiples of 9.

$$9 \times 6 = 54$$

$$9 \times 7 = 63$$

$$9 \times 8 = 72 \dots\dots\dots$$

What happens when we come to  $9 \times 11 = 99$  ? This time the rule does not break.

$$9 + 9 = 18$$

$$1 + 8 = 9$$

## Do This

- Circle the numbers that are multiples of 9.  
243   889   556   666   775   432   360   621   988   927
- Write a three digit number that is a multiple of 9.
- Write a four digit number that is a multiple of 9.
- Write a five digit number that is a multiple of 9.

## Magic squares

Look at the given grid.

(a) Add the numbers in the first row. We get  $8+1+6 = \underline{\quad}$ .

(b) Add the numbers in the last row. We get  $\underline{\quad}$ .

(c) Add the numbers in the middle column. We get  $\underline{\quad}$ .

(d) Add the numbers on the diagonal. We get  $6+5+4 = 15$ .

6	1	8
7	5	3
2	9	4

This special number grid is called a magic square.

- Fill the grid with numbers between 11 and 19.

Each number should come once.

The total of each line should be 45.

	11	
		13
12		14

- Fill the grid with numbers between 21 and 29.

Each number should come once.

The total of each line should be 75.

	21	
	29	

3. Fill the grid with numbers between 41 and 49.

Each number should come once.

The total of each line should be 135.

46		
	45	43
		44

4. Now look at all the 4 magic squares you have made so far and answer the following :
- Write the 4 numbers that were in the centre of each magic square.
  - The sum of each line in first magic square is  $15 = 3 \times \underline{\hspace{2cm}}$
  - The sum of each line in second magic square is  $3 \times \underline{\hspace{2cm}}$
  - The sum of each line in third magic square is  $3 \times \underline{\hspace{2cm}}$
  - The sum of each line in fourth magic square is  $3 \times \underline{\hspace{2cm}}$

### Try This

- Complete the given magic square by filling numbers between 121 and 129. The sum of the numbers in each line should be 375.
- Try to make a magic square using numbers between 26 and 34.

128		124
	127	

### Do This

- Carry forward the pattern and make one more pattern based on the rule.

(a) 8, 16, 24, 32, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(b) 45, 54, 63, 72, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(c) 49, 56, 63, 70, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(d) 3, 6, 10, 15, 49 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(e) 16, 25, 36, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(f) 3, 15, 75, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(g) 10, 40, 160 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(h) 7, 21, 63 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(i) 6, 12, 24 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(j) 2, 4, 8, 16 \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

(k) 64, 32, 16 \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

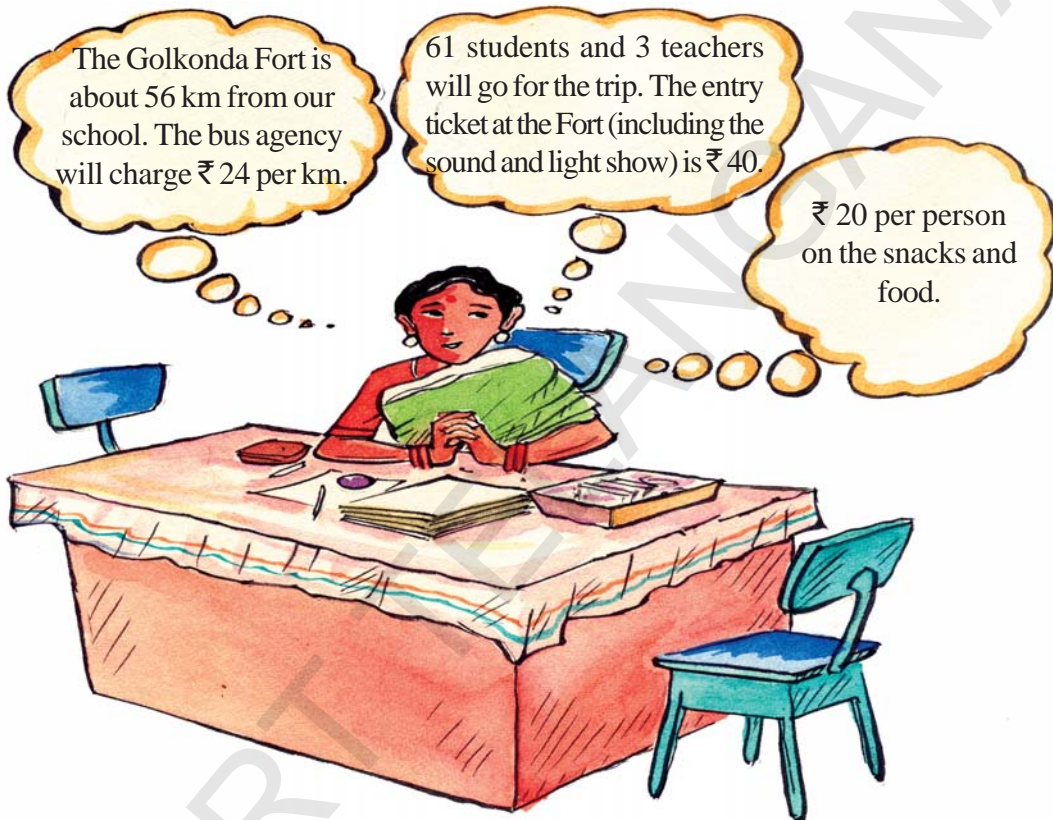
(l) 6, 30, 150 \_\_\_\_\_

Your pattern \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

# 17

## Trip to the Golkonda Fort

The teachers of Gummadidala Primary School are planning to take the children of class 4 and 5 to Golkonda Fort. The head teacher is estimating the expenditure for the trip.



- (a) What is the total amount that will be due to the bus agency?
- (b) How much money is needed for the tickets at Golkonda Fort?
- (c) So cost per head will be
  - (i) travel cost ₹ \_\_\_\_\_
  - (ii) ticket cost ₹ \_\_\_\_\_
  - (iii) food cost ₹ \_\_\_\_\_
  - (iv) total cost ₹ \_\_\_\_\_

There might be some other smaller costs so let me ask each person to pay ₹ 110.

## The day of the trip

The trip was planned for 10 /11/12

- (a) Write this date specifying the day, month and year? \_\_\_\_\_

Everybody gathered at school at 7 AM on the day. The bus arrived after 20 minutes. Everybody was seated in the bus within 15 minutes.



- (b) At what time did the bus arrive at school?  
(c) At what time did they start journey?

The driver stopped the bus at a petrol pump to fill fuel tank.

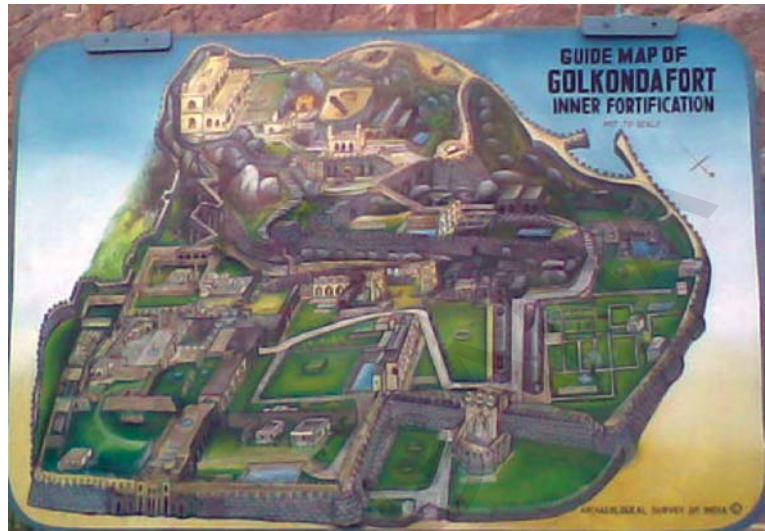
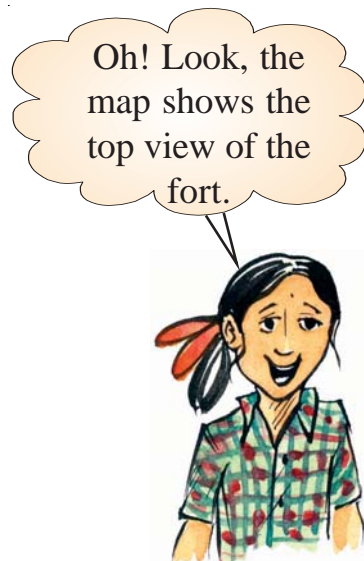
- (a) If the bus travels 5 km in one liter of diesel then how much diesel is needed for the trip?  
(b) If 1 liter of diesel costs ₹ 54 then how much will the bus driver has to pay at the petrol pump?

56 km to the fort  
and another 56 km  
back to school

## At Golkonda Fort

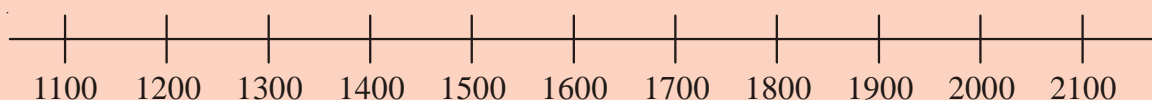


On reaching the fort the children started looking interestedly at the fort map near the entrance of the fort.



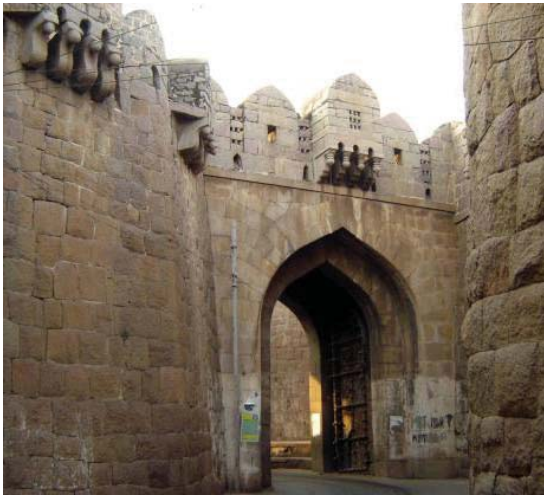
Teacher Radha explained the history of the Fort to the children- The Golconda Fort is built on a 400 feet high stone hill. The fort has got its name from the Telugu words 'Golla Konda' meaning 'shepherd's hill'. Legend has it that a shepherd boy had found an idol lying on the 'Mangalavaram' hill and told the king who had got a mud fort built around it in the year 1143 AD. This fort was made bigger and stronger in the year 1500 AD and by 1590 AD, the Golconda fort had a strong 10 km long stone wall.

- (a) About how many years back was the mud fort built on the 'Mangalavaram' hill?  
500      700      900
- (b) About how many years back were the walls of the fort built in stone?  
700      600      500
- (c) Represent the following on the time line given below.
  - (i) The year in which the mud fort was made.
  - (ii) The century (100 years) in which the fort was made longer and stronger.
  - (iii) The current year
  - (iv) The year in which your father was born.



Kalpna teacher further explained the fort has various halls, temples, mosques, barracks for housing soldiers, prison cells, stables, gardens etc. When we have seen the fort I will ask you to show them to me on the map you are looking at right now.

The group then entered the fort through the Fateh Darwaza. The words Fateh Darwaza, mean 'the victory gate'.



Manoj: This gate is so big.

Pallavi: It is so much bigger than any gate I have ever seen.

Teacher: Yes, it is 13 ft wide and 25 ft high. It is made of teak wood which is studded with steel spikes, to protect the fort against enemy elephant charge.

- (a) How wide and high is your school gate?
- (b) About how many times more is the length of the fateh darwaza than your school gate?
- (c) About how many times more is the width of the fateh darwaza than your school gate?

One more thing is very special about this gate. If you clap or shout under its dome you can hear its sound at the Bala Hisar Pavilion which was the highest point of the fort and about one kilometer away. In the past this was used to serve as a warning in times of danger.



The group then started exploring the fort. They came across this box shaped piece of iron in one of the enclosures. Many children tried to lift it but none could. Their teacher also could not lift it.



How much do you think the iron piece weighed?

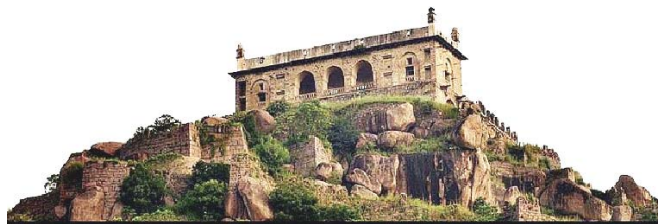
This iron piece weighs 260 kg and was used to test soldiers' strength in the past.

- (a) If one child weighs 40 kg then the weight of how many such children is equal the weight of the iron piece?

Then they came across this beautiful mosque.



The group then reached the Bala Hisar gate. The children counted 380 steps to the Balahisar pavilion where they could hear the sounds of claps at the Fateh darwaza.



When the children looked down at the city from Balahisar Pavilion the city looked like this-



Then the group went to see Nagina Bagh. The garden had various square and rectangular shaped grass court patches.



- (a) If a square shaped patch has a 2m side then, what is its perimeter?
- (b) If this patch is lined with bricks of length 25 cm each, then how many such bricks are needed to line the patch?
- (c) If there are 13 such patches then how many bricks are needed?
- (d) If the rectangular shaped patch is 3 m long and 1m 50 cm wide then, what is its perimeter?
- (e) If this patch is lined with bricks of length 25 cm, then how many such bricks are needed to line the patch?
- (f) If there are 19 such patches then how many bricks are needed?

The group went to various other interesting sites and came out of the fort by 2.30 PM.

On coming out of the fort, the children came across the fort map again.

- (a) Teacher: Now children! can you identify the Bala Hisar Pavilion and the Mosque in the map.

The children were also looking at the fort walls with interest. The teacher explained the perimeter of the fort is about 10 km.

- (b) Estimate the perimeter of your school boundary. About how many times more is the perimeter of the fort.

She further explained that the fort has 8 gates and 87 semi-circular bastions like these. In the past a certain number of soldiers used to be stationed in each bastion to protect the fort.

How many soldiers  
are needed to  
protect this fort



- (c) If 9 soldiers are stationed at each bastion and 2 at each gate, then how many soldiers would be protecting the fort?

On their journey back, the group stopped at a restaurant to eat lunch and by the time they reached the school it was 5 pm.



## GUIDELINES FOR TEACHER

### Curricular and Pedagogical

Dear teachers,

There are 17 chapters in this book. Broadly, they cover two areas- numbers and space. Building number sense at the primary stage involves an ability to read, write and understand bigger numbers as well as skill in the four fundamental operations- addition, subtraction, multiplication and division. It also involves seeing relationships between different operations for e.g., between addition and subtraction and between multiplication and division as well as engaging with properties of operations like commutative and distributive properties. Ability to engage with number patterns is also an integral part of a growing number sense. Fractions build up on the understanding of division and also prepare children for denser concepts such as percentages, ratios etc., as well as a growing number set, all these to come in the upper primary classes. Spatial understanding is about seeing the world in terms of 3D and 2D shapes, understanding the relationship between the 3D and 2D world, visualizing the world from different positions and also exploring patterns and symmetry. Measurements involve quantification of various spatial and non spatial concepts like length, weight, capacity, time and area and the use of the four operations in all these areas also consolidates number sense. Estimation remains an important part of both numbers and space. Data handling involves visualizing numbers through various types of pictures and graphs. We request you to help children enjoy both the numerical and spatial aspects of mathematics.

There are a few things that we would also like to mention about the nature of classroom transaction in a primary mathematics classroom. First, using concrete objects is essential at this stage. Some examples of concrete objects that are needed at the primary stage are dice, number cards, the 100 beads mala, meter rod, measuring tape, weights, clock, calendar, boxes of various shapes, bottles of various capacities, mirror etc. Second, concepts need to be placed in experiences that are meaningful for children such that children can see a connection between the mathematics they are doing in the classroom and the mathematics in the outside the world. The book makes an attempt to place concepts in situations that children can make sense of and we request you to also prepare more problems which will help children in relating concepts to local situations. Also encourage children to make their own mathematical problems and solve them. Third, there may be many ways to solve a problem. Please, encourage children to develop their own strategies to solve problems and also give space to them to discuss their strategies with each other. In fact, collaborative learning is a resource for the classroom and children should be encouraged to solve problems in pairs and groups.

You are also requested to organize field trips, metric melas, math exhibitions, learning corners, quiz, math club activities etc., whenever possible in the course of the year.

Lastly, we request all of you to read all chapters carefully and plan accordingly before you enter the classroom. We also feel that it would greatly benefit classroom transaction if you would solve all the problems given in a chapter before teaching it. There is also the expectation that you would arrange for whatever teaching-learning material (TLM) is required for building concepts, for e.g., a meter rope for length, one liter bottles for capacity etc.

A note about the books: Children have been provided space to solve problems not only at the end of the chapter but at various points during the course of the chapter. In fact, the process of concept building is a process in which the child is engaging in a dialogue with the text and space is provided to

him/her to articulate what he/she has understood at regular intervals. 'Do This' exercises provide children practice on the concept taught and are supposed to be done by the students on their own. 'Try this' exercises have an element of challenge to them and invite children to think. 'Think and discuss' problems again have an element of challenge and are also meant to be worked on in pairs and groups. The 'Exercise' given at the end of the chapter covers various learning points in the chapter.

### **Some chapter-wise guidelines are given below-**

#### **Shapes**

- Encourage children to identify both 3D and 2D shapes in objects around them
- Also encourage an exploration of actual objects of different 3D shapes so that children can understand their various features
- Provide space to children to articulate their understanding of these features rather than provide them with definitions
- Encourage children to open various kinds of boxes and observe their nets
- Create situations, where the children observe objects and locations from different views and encourage them to draw what they see
- Showing some local maps of the school, locality, village etc., and encourage children to locate places on them

#### **Numbers**

- Help children understand the base 10 number system using contexts like the 100 beads mala, the number line, the 100 number table etc.
- Provide ample opportunities to children to make numbers from digits and compare numbers

#### **Addition and subtraction**

- Encourage children to add and subtract bigger numbers as well as estimate sums and differences
- Create many more meaningful word problems of all three types- 'combine', 'compare' and 'change' structures and ask children to solve them. It is also important to give children opportunities to make word problems of addition, subtraction and also those which involve both operations

#### **Multiplication**

- Encourage children to multiply bigger numbers as well as estimate products
- Create many more meaningful word problems of all types- equal groupings, rate product, array product and cartesian product (in class 5) and ask children to solve them. It is also important to give children opportunities to make word problems of multiplication
- Children should be given ample opportunities to split numbers at 10, 100 etc using the distributive law and then multiply
- Encourage children to see the relationship between multiplication and division as well as commutative and distributive properties of multiplication

## Division

- Encourage children to divide bigger numbers as well as estimate quotients
- Create many more meaningful word problems of all types- Grouping and Equal sharing. and ask children to solve them. It is also important to give children opportunities to make word problems on division as well

## Fractions

- Students use half, quarter, three fourth in their daily life without understanding them as fractional numbers. Use these meaningful experiences to introduce fractions to children
- In understanding fractions it is important for children to understand that the whole can be one object or a group of objects. It is also important for them to understand that the object or group of objects is being divided into equal parts
- It is also important to see the relationship fractions have with division and their entity as numbers on the number line

## Measurements

- Length, weight, time and capacity have been used to introduce children to the area of measurements
- Children have a variety of rich experiences in all these areas and they should be utilized in classroom transactions. In fact, children whose parents are involved in professions that constantly engage with various units of length, weight and capacity should be treated as an invaluable resource for the classroom
- A very important part of understanding length, weight, capacity and time is understanding how long a centimeter, meter etc is, how heavy a kilogram, few grams is, how much a liter is etc. So provide children opportunities to use a meter length rope, kilogram sack of sand etc and also the actual measures wherever possible
- Wherever possible use field trips and project works, which gives perceptual experience and make them to understand different measurements and their conversions

## Patterns

- Children see patterns all around them both in the man made world and in nature. Encourage children to identify the patterns they see all around them
- Encourage children not only to identify patterns but also create patterns of their own
- Encourage children to make number patterns

## Symmetry

- Encourage children to identify symmetrical objects all around them.
- Encourage children to see symmetry in nature around them.
- Encourage use of mirror in the classroom for understanding line symmetry

## Data handling

- Give children opportunities to collect data in their school and home surroundings and then organize it in different ways i.e., using tables, pictographs and bar charts.

# Syllabus

## I SPATIAL UNDERSTANDING (16 hrs.)

### Shapes and spatial understanding

- Identifies and reads floor maps routes/road maps
- Draws simple floor maps of familiar locations
- Identifies nets of cubes
- Uses shapes to create different shapes (tangram)
- Uses a dot sheet to make various 2D shapes
- Extends and makes tiling patterns
- Explores line symmetry in familiar 3-D objects expressed as 2 D shapes.
- Explores rotations of familiar 2-D shapes.
- Identifies angles in the environment
- Identifies right angles
- Identifies angles more than and less than right angles
- Draws right angle and angles more than and less than right angles.
- Identifies centre and radius of a circle.

### Patterns (3 hrs.)

- Identifies, carries forward and makes visual patterns based on alternations and rotation
- Identifies the block or unit of the pattern

## II NUMBERS (40 hrs.)

### Numbers upto 10000

- Using word problems/ contextual situations, reads, writes and compares 3 & 4-digit numbers.
- Understands place value in 3, 4-digit numbers
- Expands a number using place value
- Makes numbers using 4 digits
- Skip counting in hundreds and thousands

### Addition and Subtraction

- Using word problems/ contextual situations for a additions and subtractions up to 9999. (compare-combination and comparison types of word problems)
- Estimates sums and differences of 3, 4 digit numbers
- Frames word problems
- Appreciates the commutative property of addition
- Understands the relationship between addition and subtraction

### Multiplication

- Using word problems/ contextual situations multiplies 2 & 3-digit numbers with 2-digit numbers using the standard (column) algorithm as well as the distributive law. (array product - rate product and grouping - Cartesian product types of word problems)
- Multiply with 10s, 100s, 1000s
- Frames word problems.
- Estimates products  $3 \times 1$ ,  $3 \times 2$

### Division

- Using word problems/ contextual situations dividing 2-digit numbers by two digit numbers and three digit numbers by two digit numbers- with remainder and without remainder (using both equal grouping and sharing)
- Understands the patterns which emerge from division by 10

- Uses standard division algorithms for 2 & 3 digit numbers divided by one and two-digit numbers as well as 4 digit numbers by one digit numbers.
- Frames word problems.
- Even and odd numbers
- Tests of divisibility for 2, 5 & 10.
- Estimates quotients
- Explores the relationship between multiplication and division using 2 & 3-digit numbers

### **Fractional Numbers**

- Finds the fractional part of a collection/ object
- Applies simple fractions to measurements
- Identifies equivalent fractions  $\frac{1}{2}$ ,  $\frac{2}{4}$ ,  $\frac{3}{6}$  and  $\frac{4}{8}$
- Compares like and unlike fractions (without LCM)
- Addition and subtraction of like fractions

### **Patterns (3 hrs.)**

- Identifies patterns in square numbers, triangular numbers
- Identifies patterns in multiplication and division
- Numbers between consecutive square numbers
- Identifies the patterns in the multiples of 9

## **III MEASUREMENT (26 hrs.)**

### **Length, Weight, Capacity**

- Understands the meaning of a foot and relates feet to inches.
- Understands the meaning of quintal and its relationship with kilograms
- Converts kilometer to meter; meter to centimeter, liter to milliliter; kilogram to gram; quintal to kilogram
- Solves problems involving length, weight and capacity using all the above mentioned units
- Estimates length, weight, capacity
- Understands the concept of area
- Determines area intuitively
- Calculates perimeter

### **Time**

- Appreciates the difference in time in terms of seconds, minutes, hours, days, months and years
- Converts hours into minutes and minutes into seconds
- Expresses time, using the terms, 'am' and 'pm'
- Understands 24 hour clock and conversion between 12 and 24 hour clocks
- Reads the date
- Appreciates movement of time in years

## **IV DATA HANDLING (6 hrs.)**

- Reading a pictograph
- Understands the importance of an appropriate scale for pictograph
- Reading bar graphs
- Organizing data using tally marks

## **V DAY TO DAY MATH (5 hrs.) (Money, Length, Weight, Capacity, Space)**

- Word problems/ contextual situations using more than one operation and/ or more than one concept and/or multiple stages of solving
- Estimation in daily life

## Academic Standards

*Academic standards are clear statements about what students must know and be able to do.  
The following are categories on the basis of which we lay down academic standards*

### Problem Solving

Using concepts and procedures to solve mathematical problems

#### (a) Kinds of problems

Problems can take various forms- puzzles, word problems, pictorial problems, procedural problems, reading data, tables, graphs etc.

#### (b) Stages of problem solving

- Reads problems
- Identifies all pieces of information/data
- Separates relevant pieces of information
- Understanding what concept is involved
- Selection of procedure
- Solving the problem

#### (c) Complexity

**The complexity of a problem depends on**

- Making connections( as defined in the connections section)
- Number of steps in the problem
- Number of operations in the problem
- The amount of context unraveling required in the problem
- Nature of procedures in the problem

### Reasoning Proof

- Reasoning between various steps (involves conjuncture invariably).
- Understanding and making mathematical generalizations and conjectures
- Understanding and justifying procedures
- Examining logical arguments.

- Understanding the notion of proof
- Using inductive and deductive logic
- Testing mathematical conjectures

### Communication

- Writing and reading mathematical expressions like  
 $3 + 4 = 7$   
 $\frac{3}{4}$
- Creating mathematical expressions
- Explaining mathematical ideas in his/her own words like- a square is closed figure having four equal sides and all equal angles
- Explaining mathematical procedures like- adding two digit numbers involves first adding the digits in the units place and then adding the digits at the tens place/ keeping in mind carry over.
- Explaining mathematical logic

### Connections

- Connecting concepts within a mathematical domain- for example relating adding to multiplication, parts of a whole to a ratio, to division. Patterns and symmetry, measurements and space
- Making connections with daily life
- Connecting mathematics to different subjects
- Connecting concepts of different mathematical domains like data handling and arithmetic or arithmetic and space
- Connecting concepts to multiple procedures

### Visualization and Representation

- Interprets and reads data in a table, number line, pictograph, bar graph, 2-D figures, 3-D figures, pictures
- Making tables, number line, pictograph, bar graph, pictures